Quality of Surface Waters of the United States 1950

Parts 1–4. North Atlantic Slope Basins to St. Lawrence River Basin

Prepared under the direction of S. K. LOVE, *Chief, Quality-of-Water Branch*

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PREFACE

This report was prepared by the Geological Survey in cooperation with the States of Delaware, Florida, Georgia, Illinois, Indiana, Kentucky, North Carolina, Ohio, Pennsylvania, South Carolina, Virginia, and West Virginia, and other agencies, by personnel of the Water Resources Division under the direction of:

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INTRODUCTION

The quality-of-water investigations of the United States Geological Survey are concerned with chemical and physical characteristics of the surface and ground water supplies of the Nation. Most of the investigations carried on in cooperation with States and other Federal agencies deal with the amounts of matter in solution and in suspension in streams.

The records of chemical analyses, suspended sediment, and temperature for surface waters given in this volume serve as a basis for determining the suitability of the waters examined for industrial, agricultural, and domestic uses insofar as such use is affected by the dissolved or suspended mineral matter in the waters. The discharge of a stream and, to a lesser extent, the chemical quality are related to variations in rainfall and other forms of precipitation. In general, lower concentrations of dissolved solids may be expected during the periods of high flow than during periods of low flow. The concentration in some streams may change materially with relatively small variations in flow, whereas for other streams the quality may remain relatively uniform throughout large ranges in discharge. The quantities of suspended sediment carried by streams are also related to discharge, and during flood periods the sediment concentrations in many streams vary over wide ranges.

The regular yearly publication of records of chemical analyses, suspended sediment, and water temperature was begun by the Geological Survey in 1941. The annual records prior to 1948 were published in a single volume for the entire country. Beginning in 1948, the records were published in two volumes, and beginning in 1950, in four volumes, covering the drainage basins shown in figure 1. The samples for which data are given were collected from October 1, 1948, to September 30, 1949. Descriptive statements are given for each sampling station for which regular series of chemical analyses or sediment determinations have been made. These statements include the location of the stream-sampling station, drainage area, length of time for which records are available, extremes of dissolved solids, total hardness, sediment loads, water temperature, and other pertinent data. Records of water discharge of the streams at, or near, the sampling point for the sampling period are included in most tables of analyses. The records are arranged by drainage basins, according to Geological Survey practice in reporting records of stream flow.

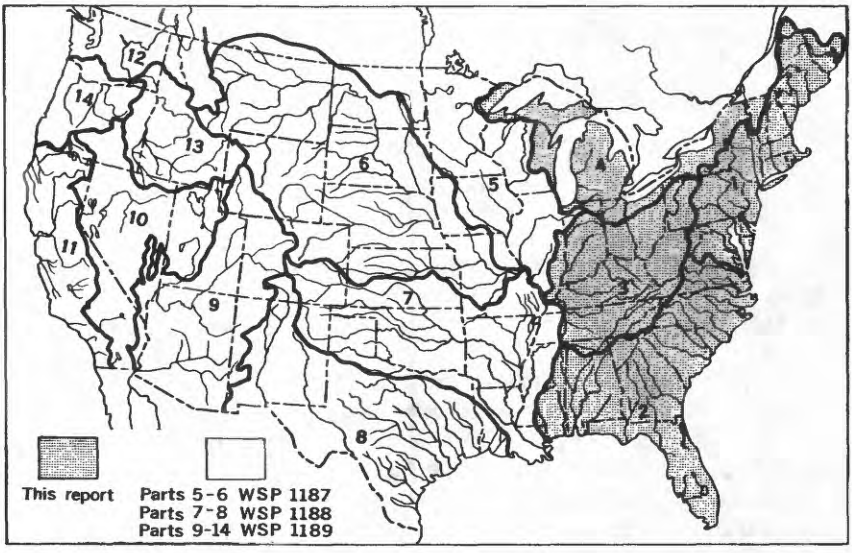

Figure 1. Map of the United States showing basins covered by the four water-supply papers on quality of surface waters in 1950. The shaded portion represents the section of the country covered by this volume; the unshaded portion represents the section of the country covered by other water-supply papers.

During the year ended September 30, 1950, 109 regular sampling stations on 92 streams for the study of the chemical character of surface waters were maintained by the Geological Survey in the area covered by this volume. Samples were collected less frequently during the year at many other points. Water temperatures were measured daily at 71 of the regular sampling stations. Not all analyses of samples of surface water collected during the year have been included. Single analyses of an incomplete nature generally have been omitted. Also, determinations made on the daily samples before compositing have not been reported. Specific conductance was usually determined on each daily sample, and pH, chloride, or other determinations were also made on many of the daily samples. As noted in the table headings these data are available for reference at the district offices listed under Division of Work, on pages

Quantities of suspended sediment are reported for 13 stations during the year ended September 30, 1950. The sediment samples were collected from one to five times daily at most stations, depending on the rate of flow and changes in stage of the stream. Sediment samples were collected less frequently during the year at many other points. In connection with measurements of sediment discharge, sizes of sediment particles were determined at 10 of the stations. As noted under "Remarks" in

the table headings, suspended-sediment concentrations also were determined from the samples collected for chemical analysis in some parts of the country. The data do not provide a reliable basis for computing the loads of suspended sediment carried by the stream but may be of value for design and operation of filtration plants utilizing these stream waters. Records of these infrequent determinations are available for reference in the district offices listed.

Material which is transported essentially in continuous contact with the stream bed is termed bed load and is not considered in this report. All other undissolved material in transport is termed suspended sediment and generally constitutes the major part of the total sediment load. At the present time no reliable method has been developed for determining bed load on a routine basis.

COLLECTION AND EXAMINATION OF SAMPLES

CHEMICAL QUALITY

Samples for chemical analysis were usually collected daily at, or near, points on streams where gaging stations are maintained for measurement of water discharge. Most of the analyses were made on 10-day composites of daily samples collected for a period of a year at each sampling point. Three composite samples were usually prepared each month by mixing together equal volumes of daily samples collected from the 1st to the 10th, from the 11th to the 20th, and during the remainder of the month. For some streams that are subject to sudden and large changes in chemical composition or concentration, samples were composited for shorter periods on the basis of the concentration of dissolved solids indicated by measurements of specific conductance of the daily samples.

The samples were analyzed according to methods regularly used by the Geological Survey. These methods are essentially the same as or are modifications of methods described in recognized authoritative publications for the mineral analysis of water samples (Collins, 1928; Am. Public Health Assoc., 1946).

For those waters containing moderately large quantities of soluble salts, the value reported for dissolved solids is the sum of the quantities of the various determined constituents using the carbonate equivalent of the reported bicarbonate. In other analyses the value reported as dissolved solids is the residue on evaporation after drying at 180°C for 1 hour. Specific conductance is given for most analyses and was determined by means of a conductance bridge using a standard potassium chloride solution as reference.

SUSPENDED SEDIMENT

In general, samples were collected daily with the US D-43 depth-integrating sampler (U. S. Inter-agency, 1948, p. 70-76) from a fixed sampling point at one vertical in the cross section. The US DH-48 hand sampler was used at many stations during periods of low flow. Suspended-sediment samples, consisting of depth-integrated samples at three or more verticals in the cross section were made periodically to determine the cross-sectional distribution of the suspended concentration with respect to that at the daily sampling vertical. In streams where comparatively rapid fluctuations in transverse distribution of water discharge or sediment concentration are encountered at the sampling point, samples were taken regularly at two or more verticals to determine the average concentration across the section. During periods of high flow, samples were taken two or more times throughout the day at many sampling stations, and during periods of rapidly changing flow samples were taken hourly at some stations.

Sediment concentrations were determined by filtration or evaporation of the samples as required. At many stations the mean daily concentration for some days was obtained by plotting the instantaneous concentrations on the original or copies of the original gage-height chart. The plotted concentrations adjusted, if necessary, for cross-sectional distribution with respect to that at the daily sampling vertical, were connected or averaged by continuous curves to obtain a concentration graph. This graph represented the estimated concentration at any time and, for most periods, mean daily concentrations were determined from the graph. When the concentration and water discharge were changing rapidly, the day was often subdivided for this computation. For some periods when the day-to-day variation in the concentration was negligible, the data were not plotted, and the average concentration of the samples was used as the mean concentration for the day. For certain stations, when the discharge and sediment concentrations were relatively low and varied only slightly from day to day, the samples for a number of days were composited and the mean daily concentrations and mean daily loads are shown.

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

In many instances where there were no observations for several days, the sediment loads for individual days are not estimated, as numerous factors influencing the quantities of transported sediment made it very difficult to make accurate estimates of sediment loads for individual days. However, estimated sedi-

ment loads for missing days in an otherwise continuous period of sampling have been included in monthly and annual totals for most streams to provide a complete record.

In addition to the records of total quantities of sediment, records of the particle sizes of sediment are included also. The particle sizes of the suspended sediments were determined periodically for many of the stations. As much of the material carried in suspension can pass through the finest sieves, the bottom-withdrawal tube method (U. S. Inter-agency, 1943, p. 82-90) was used in most of the analyses. Generally, sieves were used in the determination of particle sizes for sediments which were predominantly coarser than 0. 062 mm. Size distribution for some sediments was determined by a combination of sieves and pipette methods in which the size fraction 0. 062 mm and larger was analyzed by sieves and that smaller than 0. 062 mm was analyzed by the pipette method (Kilmer and Alexander, 1949). Native or distilled water, as noted in the tables of analyses, was used as the settling medium. In some instances, chemical dispersing agents were added to the settling medium. As settling diameters of the clay and colloidal fractions are often affected by the chemical character of the settling medium, analyses made using native water more nearly simulate particle sizes existing in the stream. Results of analyses using distilled water or using a settling medium containing dispersing agents approximate ultimate particle sizes of the finer fractions. The concentration of sediment suspension for analysis was reduced to less than 10,000 parts per million, where necessary, by means of a sample splitter, in order to stay within limits recommended for the bottom-withdrawal tube or pipette method. The concentration of suspended sediment used in the bottom-withdrawal tube was often different from the concentration in the original suspension. The weight of sediment used is indicated in the tables of analyses.

TEMPERATURE

For most of the stations, daily water temperatures were obtained at the time that the chemical quality or sediment samples were collected. So far as practicable the water temperatures were observed at about the same time each day for an individual river station in order that the data would be relatively unaffected by diurnal variations in temperature. For most large, swiftly flowing streams the diurnal variation in water temperature is probably small, but for sluggish or shallow streams the daily range in temperature may amount to several degrees and may follow closely changes in air temperature. The thermometers used for determination of water temperature were accurate to plus or minus about 0. 5°F.

Records of thermograph observations consist of maximum and minimum temperatures for each day, the average of the maximum daily temperatures, and the average of the minimum daily temperatures.

EXPRESSION OF RESULTS

The dissolved mineral constituents are reported in parts per million. A part per million is a unit weight of a constituent in a million unit weights of water. Equivalents per million are not given in this report although the expression of analyses in equivalents per million is sometimes preferred. An equivalent per million is a unit chemical combining weight of a constituent in a million unit weights of water and is calculated by dividing the concentration in parts per million by the chemical combining weight of the constituent. For convenience in making this conversion the reciprocals of chemical combining weights of the most commonly reported constituents (ions) are given in the following table:

Constituent	Factor	Constituent	Factor
Iron (Fe^{++})	0.0358	Carbonate (CO_3^{--})	0.0333
Iron (Fe^{+++})	.0537	Bicarbonate (HCO_3^-)	.0164
Calcium (Ca^{++})	.0499	Sulfate (SO_4^{--})	.0208
Magnesium (Mg^{++})	.0822	Chloride (Cl^-)	.0282
Sodium (Na^+)	.0435	Fluoride (F^-)	.0526
Potassium (K^+)	.0256	Nitrate (NO_3^-)	.0161

Results given in parts per million can be converted to grains per United States gallon by dividing by 17.12. A calculated quantity of sodium and potassium is given in some analyses and is the quantity of sodium needed in addition to the calcium and magnesium to balance the acid constituents.

The total hardness, as calcium carbonate ($CaCO_3$), is calculated from the equivalents of calcium and magnesium except for a few samples for which the reported values also include equivalents of free mineral acid, aluminum, iron, and manganese when present in significant quantities. The hardness caused by calcium and magnesium (and other ions if significant) equivalent to the carbonate and bicarbonate is called carbonate hardness; the hardness in excess of this quantity is called noncarbonate hardness.

In the analyses of most waters used for irrigation, the quantity of dissolved solids is given in tons per acre-foot as well as in parts per million. Percent sodium has been computed for those analyses where sodium and potassium are reported separately by dividing the equivalents per million of sodium by the sum of the equivalents per million of calcium, magnesium, sodium, and potassium and multiplying the quotient by 100. In analyses where sodium and potassium were calculated and reported as a combined value, the value reported for percent sodium will include the equivalent quantity of potassium. In most waters of moder-

ate to high concentration, the proportion of potassium is much smaller than that of sodium.

Specific conductance values are expressed in reciprocal ohms (micromhos at 25°C). The discharge of the streams is reported in second-feet (See Stream Flow, p. 20) and the temperature in degrees Fahrenheit. Color is expressed in units of the platinum-cobalt scale proposed by Hazen (1892, p. 427-428). Hydrogen-ion concentration (pH) is given as the negative logarithm of the number of moles of ionized hydrogen per liter of water.

An average of analyses (arithmetical or weighted) for the water year is given for most daily sampling stations. An arithmetical average represents the composition of water that would be contained in a vessel or reservoir that had received equal quantities of water from the river each day for the water year. A weighted average represents approximately the composition of water that would be found in a reservoir containing all of the water passing a given station during the year after thorough mixing in the reservoir. The weighted average of the analyses is computed by multiplying the discharge for the sampling period by the quantities of the individual constituents for the corresponding period and dividing the sum of the products by the sum of the discharges. Water as represented by the weighted average is less concentrated than that represented by the average of the individual analyses for most streams because at times of high discharge the rivers generally have lower concentrations of dissolved solids.

Mean daily sediment concentrations are expressed in parts per million by weight. Daily sediment loads are expressed in tons per day, and except for subdivided days are usually obtained by multiplying mean daily sediment concentration in parts per million by the mean daily discharge, and the conversion factor 0.0027.

Particle-size analyses are expressed in percentages finer than indicated sizes in millimeters. The size classification used in this report is that recommended by the American Geophysical Union Subcommittee on sediment terminology (Lane, et al; 1947, p. 937). Other data included as pertinent to the size analyses for many streams are the date of collection, the stream discharge and sediment concentration when sample was collected, the concentration of the suspension during analysis, and the method of analysis.

COMPOSITION OF SURFACE WATERS

All natural waters contain dissolved mineral matter. Water in contact with soils or rock, even for only a few hours, will dissolve some rock materials. The quantity of dissolved mineral matter in a natural water depends primarily on the type of rocks or soils through which the water has passed and the length

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of time it has been in contact with the rocks or soils. Some streams are fed by both surface runoff and underground water from springs or seeps. Such streams reflect the chemical character of their concentrated underground sources during dry periods and are more dilute during periods of heavy rainfall. Underground water is usually more highly concentrated than surface runoff as it remains in contact with the rocks and soils for much longer periods. The concentration of dissolved solids in a river water is frequently increased by drainage from mines or oil fields, by the addition of industrial or municipal wastes, or--in irrigated regions--by return drain waters.

The mineral constituents and physical properties of natural waters reported in the tables of analyses include those that have a practical bearing on the value of the waters for most purposes. The analyses generally include results for silica, iron, calcium, magnesium, sodium, potassium (or sodium and potassium together as sodium), bicarbonate, sulfate, chloride, fluoride, nitrate, boron, and dissolved solids. Aluminum, manganese, color, pH, acidity, oxygen consumed, and other dissolved constituents and physical properties are reported for certain streams. The source and significance of the different constituents and properties of natural waters are discussed in the following paragraphs.

MINERAL CONSTITUENTS IN SOLUTION

Silica (SiO_2)

Silica is dissolved from practically all rocks. Some natural surface waters contain less than 5 parts per million of silica and few contain more than 50 parts, but the more common range is from 10 to 30 parts per million. Silica affects the usefulness of a water because it contributes to the formation of boiler scale; it usually is removed from feed water for high-pressure boilers. Silica also forms troublesome deposits on the blades of steam turbines.

Aluminum (Al)

Aluminum is usually present only in negligible quantities in natural waters except in areas where the waters have been in contact with the more soluble rocks of high aluminum content such as bauxite and certain shales. Acid waters often contain large amounts of aluminum. It may be troublesome in feed waters where it tends to be deposited as a scale on boiler tubes.

Manganese (Mn)

Manganese is dissolved in appreciable quantities from rocks in some sections of the country. Waters impounded in large reservoirs may contain manganese that has been dissolved from the mud on the bottom of the reservoir by action of carbon dioxide produced by anaerobic fermentation of organic matter. Manganese is not regularly determined in areas where it is not present in the waters in appreciable amounts. It is especially objectionable in water used in laundry work and in textile processing. Concentrations as low as 0.2 part per million may cause a dark-brown or black stain on fabrics and porcelain fixtures. Appreciable quantities of manganese are often found in waters containing objectionable quantities of iron.

Iron (Fe)

Iron is dissolved from many rocks and soils. On exposure to the air, normal basic waters that contain more than 1 part per million of iron soon become turbid with the insoluble reddish ferric oxide produced by oxidation. Surface waters, therefore, seldom contain as much as 1 part per million of dissolved iron, although some acid waters carry large quantities of iron in solution. Iron causes reddish-brown stains on white porcelain or enameled ware and fixtures and on fabrics washed in the water.

Calcium (Ca)

Calcium is dissolved from practically all rocks and soils, but the highest concentrations are usually found in waters that have been in contact with limestone, dolomite, and gypsum. Calcium and magnesium make water hard and are largely responsible for the formation of boiler scale. Most waters associated with granite or silicious sands contain less than 10 parts per million of calcium; waters in areas where rocks are composed of dolomite and limestone contain from 30 to 100 parts per million; and waters that have come in contact with deposits of gypsum may contain several hundred parts per million.

Magnesium (Mg)

Magnesium is dissolved from many rocks, particularly from dolomitic rocks. Its effect in water is similar to that of calcium. The magnesium in soft waters may amount to only 1 or 2 parts per million, but water in areas that contain large quantities of dolomite or other magnesium-bearing rocks may contain from 20 to 100 parts per million or more of magnesium.

Sodium and potassium (Na and K)

Sodium and potassium are dissolved from practically all rocks. Sodium is the predominant cation in some of the more highly mineralized waters found in the western Untied States. Natural waters that contain only 3 or 4 parts per million of the two together are likely to carry almost as much potassium as sodium. As the total quantity of these constituents increases, the proportion of sodium becomes much greater. Moderate quantities of sodium and potassium have little effect on the usefulness of the water for most purposes, but waters that carry more than 50 or 100 parts per million of the two may require careful operation of steam boilers to prevent foaming. More highly mineralized waters that contain a large proportion of sodium salts may be unsatisfactory for irrigation.

Carbonate and bicarbonate (CO_3 and HCO_3)

Bicarbonate occurs in waters largely through the action of carbon dioxide, which enables the water to dissolve carbonates of calcium and magnesium. Carbonate as such is not usually present in appreciable quantities in natural waters. The bicarbonate in waters that come from relatively insoluble rocks may amount to less than 50 parts per million; many waters from limestone contain from 200 to 400 parts per million. Bicarbonate in moderate concentrations in water has no effect on its value for most uses. Bicarbonate or carbonate is an aid in coagulation for the removal of suspended matter from water.

Sulfate (SO_4)

Sulfate is dissolved from many rocks and soils--in especially large quantities from gypsum and from beds of shale. It is formed also by the oxidation of sulfides of iron and is therefore present in considerable quantities in waters from mines. Sulfate in waters that contain much calcium and magnesium causes the formation of hard scale in steam boilers and may increase the cost of softening the water.

Chloride (Cl)

Chloride is dissolved from rock materials in all parts of the country. Surface waters in the humid regions are usually low in chloride, whereas streams in arid or semiarid regions may contain several hundred parts per million of chloride leached from soils and rocks, especially where the streams receive return drainage from irrigated lands or are affected by ground-water inflow carrying appreciable quantities of chloride. Large quantities of chloride may affect the industrial use of water by in-

creasing the corrosiveness of waters that contain large quantities of calcium and magnesium.

Fluoride (F)

Fluoride has been reported as being present in some rocks to about the same extent as chloride. However, the quantity of fluoride in natural surface waters is ordinarily very small compared to that of chloride. Recent investigations indicate that the incidence of dental caries is less when there are small amounts of fluoride present in the water supply than when there is none. However, excess fluoride in water is associated with the dental defect known as mottled enamel if the water is used for drinking by young children during calcification or formation of the teeth (Dean, 1936, p. 1269-1272). This defect becomes increasingly noticeable as the quantity of fluoride in water increases above 1.5 to 2.0 parts per million.

Nitrate (NO_3)

Nitrate in water is considered a final oxidation product of nitrogenous material and in some instances may indicate previous contamination by sewage or other organic matter. The quantities of nitrate present in surface waters usually amount to less than 5 parts per million (as NO_3) and have no effect on the value of the water for ordinary uses.

It has been reported that as much as 2 parts per million of nitrate in boiler water tends to decrease intercrystalline cracking of boiler steel. Studies made in Illinois indicate that nitrates in excess of 70 parts per million (as NO_3) may contribute to methemoglobinemia ("blue babies") (Faucett and Miller, 1946, p. 593), and more recent investigations conducted in Ohio show that drinking water containing nitrates in the range of 44 to 88 parts per million or more (as NO_3) may be the cause of methemoglobinemia in infants (Waring, 1949). In a report published by the National Research Council, Maxcy (1950, p. 271) concludes that a nitrate content in excess of 44 parts per million (as NO_3) should be regarded as unsafe for infant feeding.

Boron (B)

Boron in small quantities has been found essential for plant growth, but irrigation water containing more than 1 part per million boron is detrimental to citrus and other boron-sensitive crops. Boron is reported in Survey analyses of surface waters in arid and semiarid regions of the Southwest and West where irrigation is practiced or contemplated, but few of the surface waters analyzed have harmful concentrations of boron.

Dissolved solids

The reported quantity of dissolved solids--the residue on evaporation--consists mainly of the dissolved mineral constituents in the water. It may also contain some organic matter and water of crystallization. Waters with less than 500 parts per million of dissolved solids are usually satisfactory for domestic and some industrial uses. Waters containing several thousand parts per million of dissolved solids are sometimes successfully used for irrigation where practices permit the removal of soluble salts through the application of large volumes of water on well-drained lands.

PROPERTIES AND CHARACTERISTICS OF WATER

Oxygen consumed

The value for oxygen consumed furnishes an approximation of the oxidizable matter in the unfiltered and filtered samples and gives a partial measure of polluting materials such as sewage and oxidizable industrial wastes. Naturally highly colored waters may have relatively high oxygen consumed, although waters that are not noticeably colored may contain oxidizable material.

Color

In water analysis the term "color" refers to the appearance of water that is free from suspended solids. Many turbid waters that appear yellow, red, or brown when viewed in the stream show very little color after the suspended matter has been removed. The yellow-to-brown color of some waters is usually caused by organic matter extracted from leaves, roots, and other organic substances in the ground. In some areas objectionable color in water results from industrial wastes and sewage. Clear deep water may appear blue as the result of a scattering of sunlight by the water molecules. Water for domestic use and some industrial uses should be free from any perceptible color. A color less than 10 usually passes unnoticed. Some swamp waters have natural color of 200 to 300 or more.

Hydrogen-ion concentration (pH)

The degree of acidity or alkalinity of water, as indicated by the hydrogen-ion concentration, expressed as pH, is related to the corrosive properties of water, and is useful in determining the proper treatment for coagulation that may be necessary at water-treatment plants. A pH value of 7.0 indicates that the water is neither acid nor alkaline. Waters having pH values progressively lower than 7.0 denote increasing acidity, whereas values progressively higher than 7.0 denote increasing alkalinity.

(See p. 13). The pH of most natural surface waters ranges between 6 and 8. Some alkaline surface waters have pH values greater than 8. 0, and waters containing free mineral acid usually have pH values less than 4. 5.

Specific conductance (micromhos at 25 C)

The specific conductance of a water is a measure of its capacity to conduct a current of electricity. The conductance varies with the concentration and degree of ionization of the different minerals in solution and with the temperature of the water. When considered in conjunction with results of determinations for other constituents, specific conductance is a useful determination and plays an important part in indicating changes in concentration of the total quantity of dissolved minerals in surface waters. (See p. 7 .)

Hardness

Hardness is the characteristic of water that receives the most attention in industrial and domestic use. It is usually recognized by the increased quantity of soap required to produce lather. The use of hard water is also objectionable because it contributes to the formation of scale in boilers, water heaters, radiators, and pipes, with the resultant decrease in rate of heat transfer, possibility of boiler failure, and loss of flow.

Hardness is caused almost entirely by compounds of calcium and magnesium. Other constituents--such as iron, manganese, aluminum, barium, strontium, and free acid--also cause hardness, although they usually are not present in quantities large enough to have any appreciable effect. Water that has less than 60 parts per million of hardness is usually rated as soft and suitable for many purposes without further softening. Waters with hardness ranging from 61 to 120 parts per million may be considered moderately hard, but this degree of hardness does not seriously interfere with the use of water for many purposes except for use in high-pressure steam boilers and in some industrial processes. Waters with hardness ranging from 121 to 200 parts per million are considered hard, and laundries and industries may profitably soften such supplies. Water with hardness above 200 parts per million usually requires some softening before being used for most purposes.

Total acidity

The total acidity of a natural water represents the content of free carbon dioxide, mineral acids, and salts--especially sulfates of iron and aluminum--that hydrolyze to give hydrogen ions. Acid waters are very corrosive and generally contain excessive amounts of objectionable constituents, such as iron, aluminum, and manganese.

Corrosiveness

The corrosiveness of a water is that property which makes the water aggressive to metal surfaces and frequently results in the appearance of the "red water" caused by solution of iron. The disadvantages of iron in water have been discussed previously. Additionally, corrosion causes the deterioration of water pipes, steam boilers, and water-heating equipment. Many waters that do not appreciably corrode cold-water lines will aggressively attack hot-water lines. Oxygen, carbon dioxide, free acid, and acid-generating salts are the principal constituents in water that cause corrosion. In a general way, very soft waters of low mineral content tend to be more corrosive than hard waters containing appreciable quantities of carbonates and bicarbonates of calcium and magnesium.

Percent sodium

Percent sodium is reported in most of the analyses of waters collected from streams in the western part of the country where irrigation is practiced extensively. The proportion of sodium to all the basic constituents in the water has a bearing on the suitability of a water for irrigation. (See p. 6 .) Waters in which the percent sodium is more than 60 may be injurious when applied to certain types of soils, particularly when adequate drainage is not provided (Magistad and Christiansen, 1944, p. 8-9; Wilcox, 1948, p. 6).

SEDIMENT

Fluvial sediment is generally regarded as that sediment which is transported by, suspended in, or deposited by water. Suspended sediment is that sediment which remains in suspension in water owing to the upward components of turbulent currents or by colloidal suspension. Most fluvial sediment results from the normal process of erosion, which in turn is part of the geologic cycle of rock transformation. In some instances, this normal process may have been accelerated by agricultural practices. Sediment also results from a number of industrial activities. In certain sections, waste materials from mining, logging, oil-field, and other industrial operations introduce large quantities of suspended as well as dissolved material.

The quantity of sediment, transported or available for transportation, is affected by climatic conditions, form or nature of precipitation, vegetal cover, topography, and land use. An important property of fluvial sediment is the fall velocity of the particles in transport. Particle sizes, as determined by various

methods, represent mechanical diameters, which are related to sedimentation diameters indirectly. Sediment particles in the sand-size (0.062 mm) range do not appear to be affected by flocculation or dispersion resulting from the mineral constituents in solution. The sedimentation diameter of clay and silt particles in suspension may vary considerably from point to point in a stream or reservoir, depending on the mineral matter in solution and in suspension and the degree of turbulence present. The size of sediment particles in transport at any point depends on the type of erodible and soluble material in the drainage area, the degree of flocculation present, time in transport, and characteristics of the transporting flow. The flow characteristics include velocity of water, turbulence, and the depth, width, and roughness of the channel. As a result of these variable characteristics, the size of particles transported, as well as the total sediment load, is in constant adjustment with the characteristics and physical features of the stream and drainage area.

PUBLICATIONS

Reports giving chemical analyses, suspended-sediment loads, and water temperatures of samples of surface water made by the Geological Survey have been published yearly since 1941. Records for the years ended September 30, 1941, 1942, 1943, 1944, 1945, 1946, 1947, 1948, and 1949, for many of the stations listed in this report are given in Water-Supply Papers 942, 950, 970, 1022, 1030, 1050, 1102, 1132, and 1162.

Geological Survey reports containing analyses of surface-water samples collected prior to 1941 are listed below. Publications dealing largely with the quality of ground-water supplies and only incidentally covering the chemical composition of surface-waters are not included. Publications that are out of print are preceded by an asterisk.

PROFESSIONAL PAPER

*135. Composition of river and lake waters of the United States, 1924.

BULLETINS

*479. The geochemical interpretation of water analyses, 1911.
770. The data of geochemistry, 1924.

WATER-SUPPLY PAPERS

*108. Quality of water in the Susquehanna River drainage basin, with an introductory chapter on physiographic features, 1904.

*161. Quality of water in the upper Ohio River basin and at Erie, Pa., 1906.
*193. The quality of surface waters in Minnesota, 1907.
*236. The quality of surface waters in the United States, Part 1, Analyses of waters east of the one hundredth meridian, 1909.
*237. The quality of the surface waters of California, 1910.
*239. The quality of the surface waters of Illinois, 1910.
*273. Quality of the water supplies of Kansas, with a preliminary report on stream pollution by mine waters in southeastern Kansas, 1911.
*274. Some stream waters of the western United States, with chapters on sediment carried by the Rio Grande and the industrial application of water analyses, 1911.
*339. Quality of the surface waters of Washington, 1914.
*363. Quality of the surface waters of Oregon, 1914.
*418. Mineral springs of Alaska, with a chapter on the chemical character of some surface waters of Alaska, 1917.
*596-B. Quality of water of Colorado River in 1925-26, 1928.
*596-D. Quality of water of Pecos River in Texas, 1928.
*596-E. Quality of the surface waters of New Jersey, 1928.
*636-A. Quality of water of the Colorado River in 1926-28, 1930.
*636-B. Suspended matter in the Colorado River in 1925-28, 1930.
*638-D. Quality of water of the Colorado River in 1928-30, 1932.
*839. Quality of water of the Rio Grande basin above Fort Quitman, Tex., 1938.
*889-E. Chemical character of surface water of Georgia, 1944.
*998. Suspended sediment in the Colorado River, 1925-41, 1947.
1110-C. Quality of water of Conchas Reservoir, New Mexico, 1939-49, 1952.

Many of the reports listed are available for consultation in the larger public and institutional libraries. Copies of Geological Survey publications still in print may be purchased at a nominal cost from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., who will, upon request, furnish lists giving prices.

COOPERATION

The table on p. 17-19 lists State and local agencies that cooperated in quality-of-water investigations in the drainage basins included in this volume. The locations of quality-of-water district offices responsible for the data collected in the drainage basins are given in the table, also.

By reorganization in 1949, the activities of the Ohio Water Resources Board were assumed by the Ohio Department of Natural Resources.

In addition to these cooperative programs, many of the stations were operated from funds appropriated directly to the Geo-

State	Cooperating agency	Drainage basin	District office
Delaware	Newcastle County Soil Conservation District Marvin V. Klair, president.	North Atlantic slope.	1302 Custom House, Philadelphia 6, Pa.
Florida	Florida Geological Survey, Herman Gunter, director.	South Atlantic slope and Eastern Gulf of Mexico.	P. O. Box 607, Ocala, Fla.
	Central and Southern Florida Flood Control District, Cities of Miami and Miami Beach, Fla.		
Georgia	Georgia Department of Mines, Mining, and Geology, Garland Peyton, director.	South Atlantic slope and Eastern Gulf of Mexico, Ohio River.	P. O. Box 607, Ocala, Fla.
Illinois Indiana Kentucky	Ohio River Valley Water Sanitation Commission, Edward J. Cleary, executive director and chief engineer.	Ohio River.	2822 East Main Street, Columbus 9, Ohio.
Kentucky	Agricultural and Industrial Development Board of Kentucky, George W. Hubley, Jr., executive director.	Ohio River.	2822 East Main Street, Columbus 9, Ohio.

State	Cooperating agency	Drainage basin	District office
North Carolina	North Carolina Department of Conservation and Development George R. Ross, director.	South Atlantic slope and Eastern Gulf of Mexico.	P. O. Box 2857, Post Office Building, Raleigh, N. C.
Ohio	Ohio Department of Natural Resources, A. W. Marion, director.	Ohio River, St. Lawrence River.	2822 East Main Street, Columbus 9, Ohio.
Ohio, Pennsylvania, West Virginia	Ohio River Valley Water Sanitation Commission, Edward J. Cleary, executive director and chief engineer.	Ohio River.	2822 East Main Street, Columbus 9, Ohio.
Pennsylvania	Pennsylvania Department of Commerce, Theodore Roosevelt III, secretary. Pennsylvania Department of Forests and Waters, M. F. Draemel, secretary.	North Atlantic slope, Ohio River, St. Lawrence River.	1302 Custom House, Philadelphia 6, Pa.
South Carolina	South Carolina Research, Planning, and Development Board, L. W. Bishop, director.	South Atlantic slope and Eastern Gulf of Mexico.	P. O. Box 2857 Post Office Building, Raleigh, N. C.

State	Cooperating agency	Drainage basin	District office
Virginia	Virginia Department of Conservation and Development, W. A. Wright, director. [a]	North Atlantic slope, South Atlantic slope.	P. O. Box 1488, University Station, Charlottesville, Va.

a Succeeded by S. S. Kellam, June 1950.

logical Survey for quality-of-water investigations.

Assistance in collecting records was given by many municipal, State, and Federal agencies.

DIVISION OF WORK

The quality-of-water program was conducted by the water resources division of the Geological Survey, Carl G. Paulsen, chief hydraulic engineer, and S. K. Love, chief of the quality of water branch. The records were collected and prepared for publication under the supervision of the following: In Florida, S. K. Love; in North Carolina and South Carolina, F. H. Pauszek; in Virginia, G. W. Whetstone; in Ohio, W. L. Lamar; and in Delaware and Pennsylvania, W. F. White. Any additional analytical data on file can be obtained by writing the responsible Survey district office.

STREAM FLOW

Most of the records of stream discharge, used in conjunction with the chemical analyses and in the computation of sediment loads in this volume, are published in Geological Survey reports on the surface-water supply of the United States. The discharge reported for a composite sample is usually the average of the mean daily discharges for the normal composite period. For analyses in which the composite periods differ from the normal 10-or 11-day period, the discharges reported are the averages of the mean daily discharges for the days indicated. The discharges reported in the tables of single analyses either are daily mean discharges or are discharges for the time at which samples were collected, computed from a stage-discharge relation or from a discharge measurement.

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CHEMICAL ANALYSES, WATER TEMPERATURES, AND SUSPENDED SEDIMENT

PART 1. NORTH ATLANTIC SLOPE BASINS

DELAWARE RIVER BASIN

DELAWARE RIVER AT NARROWSBURG, N. Y.

LOCATION.--At bridge on U. S. highway 106 at Narrowsburg, Sullivan County, about 9 miles upstream from gaging station above Lackawaxen River near Barryville.
DRAINAGE AREA.--2,023 square miles (above gaging station).
RECORDS AVAILABLE.--Chemical analyses: October 1948 to September 1950.
Water temperatures: October 1948 to September 1950.
REMARKS.--Records of specific conductance of daily samples available in district office at Philadelphia, Pa. Extremes omitted because of periodic pollution which makes it misleading to report extremes or averages. Records of discharge for water year October 1949 to September 1950 based on records for Delaware River above Lackawaxen River near Barryville, which are given in Water-Supply Paper 1171.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																	Total	Noncarbonate
Oct. 1-10, 1949	862	3	6.7	70.5					--		22	10	3		0.6		25	7
Oct. 11-20	577	4	6.7	71.8					--		24	11	2		.9		26	6
Oct. 21-31	651	2	6.7	71.8					--		23	11	2		.7		26	7
Nov. 1-10	1,346	0	6.8	68.8					2.7		20	10	2		.3		24	8
Nov. 11-20	2,456	0	6.7	61.1					2.0		14	11	2		.9		22	11
Nov. 21-30	1,999	1	6.7	61.2					--		14	14	2		1.2		22	11
Dec. 1-10	1,536	2	6.7	61.6					--		16	14	--		1.2		22	9
Dec. 11-20	8,669	3	6.7	52.0					--		10	9.5	2		2.1		20	12
Dec. 21-31	6,740	3	6.6	50.9					--		10	11	1		1.6		18	10
Jan. 1-10, 1950	7,223	1	6.8	58.7					--		16	10	2		1.6		18	5
Jan. 11-20	7,470	5	6.8	52.0					--		11	11	2		1.9		18	9
Jan. 21-31	3,938	10	6.4	56.3					--		12	9.0	2		1.0		21	11
Feb. 1-10	3,017	12	6.5	60.8					--		14	10	2		1.2		25	14
Feb. 11-20	3,954	--	--	--					--		--	--	--		--		--	--
Feb. 21-28	2,125	--	--	--					--		--	--	--		--		--	--
Mar. 1-10	4,620	10	7.2	58.8					--		10	11	1		2.7		22	14
Mar. 11-20	5,787	5	7.4	162					--		42	16	7		7.8		60	26
Mar. 21-28, 31	7,411	5	7.2	52.7					--		10	11	1		2.1		19	11
Mar. 29, 30	33,050	60	8.4	2,120					--		275	110	260		3.0		88	0

Apr. 1-10	20,336	10	7.3	45.0					--	8	9.8	0		1.8		17	10
Apr. 11-20	5,681	5	7.4	48.0					--	10	10	0		1.4		17	9
Apr. 21-30	6,564	5	6.4	46.8					--	6	9.5	2		.8		17	12
May 1-10	5,523	10	6.5	50.5					--	11	9.8	1		.8		18	9
May 11-16, 19-20	4,020	5	6.6	52.6					--	13	10	1		.8		20	9
May 17	2,720	--	8.7	1,100					257	358	40	59		.4		66	0
May 18	2,980	15	6.5	125					--	--	--	--		--		30	--
May 21-31	4,435	5	6.7	51.0					--	12	9.6	1		.7		19	9
June 1-10	3,651	5	6.7	55.3					--	16	9.0	1		1.1		21	8
June 11-20	2,882	5	6.8	55.0					--	15	9.0	1		1.0		20	8
June 21, 25-30	2,775	5	6.8	56.2					--	16	8.3	1		1.1		21	8
June 22	2,700	--	6.3	1,380					--	34	95	200		2.1		83	55
June 23	2,410	--	6.5	392					--	54	30	46		.5		57	13
June 24	2,150	10	6.3	117					--	25	17	6		.8		26	6
July 1-10	1,726	5	6.9	57.8					--	17	9.0	1		.9		20	6
July 11-20	2,098	10	6.7	54.5					--	17	8.0	1		1.3		22	8
July 21-31	1,853	1	6.6	56.7					1.7	17	8.5	1		.6		21	7
Aug. 1-10	1,987	1	6.6	59.5					1.2	18	7.5	1		.7		22	7
Aug. 11, 12, 14-20	1,214	3	6.8	62.1					1.3	19	9.0	1		.7		24	8
Aug. 13	915	10	6.3	115					13	41	13	6		.3		28	0
Aug. 21-30	1,809	1	6.8	60.2					3.3	20	9.5	1		.7		21	5
Aug. 31	1,150	5	8.7	2,250					664	a1,100	227	217		.8		55	0
Sept. 1, 3-5, 7-10	1,918	1	7.0	64.1					64.1	21	10	1		.1		22	5
Sept. 2	3,850	5	7.4	906					--	298	34	90		1.2		77	0
Sept. 6	1,880	1	6.5	153					--	45	19	8		2.0		54	17
Sept. 11-20	1,575	1	7.0	62.6					--	21	10	1		.3		22	5
Sept. 21, 22, 27-30	8,953	1	7.2	64.9					--	22	10	1		.2		23	5
Sept. 23-26	9,835	420	8.8	5,880					1,840	b3,680	278	490		7.0		15	0
Average	4,069	6	--	97.0					--	19	16	4		1.4		30	8

a Includes equivalent of 285 parts per million of carbonate (CO_3).
b Includes equivalent of 897 parts per million of carbonate (CO_3).

DELAWARE RIVER BASIN--Continued

DELAWARE RIVER AT NARROWSBURG, N. Y. --Continued

Temperature (°F) of water, water year October 1949 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	52	52	34	34	32	--	40	46	65	75	75	75
2	52	47	35	33	34	--	40	50	65	72	78	74
3	52	46	34	43	33	--	50	59	60	72	86	73
4	60	47	33	47	--	--	48	60	65	75	76	74
5	55	47	33	44	--	--	45	50	61	75	73	73
6	56	42	33	39	--	--	40	58	65	80	73	74
7	57	45	32	32	--	--	42	58	67	80	73	70
8	63	48	--	32	--	--	42	50	70	78	82	70
9	64	48	--	32	--	--	42	55	70	78	70	73
10	67	49	--	33	--	--	43	54	70	74	75	71
11	64	49	--	32	--	--	46	53	70	75	74	70
12	60	48	--	32	--	--	45	57	61	74	70	67
13	55	46	33	32	--	--	42	62	61	74	75	64
14	56	49	32	40	--	--	39	61	65	70	72	64
15	54	48	32	35	--	--	41	59	67	75	72	62
16	53	41	32	32	--	--	44	61	67	79	75	60
17	56	43	33	32	--	--	45	59	67	75	76	63
18	58	42	37	34	--	--	46	56	63	79	74	62
19	56	40	42	32	--	--	52	54	59	78	75	62
20	55	42	50	32	--	--	52	59	60	75	70	61
21	53	39	42	--	--	--	50	59	65	79	--	60
22	57	37	--	32	--	--	48	56	70	78	74	61
23	55	35	36	32	--	--	45	58	70	73	75	59
24	55	38	40	32	--	38	44	57	74	70	76	59
25	52	36	42	32	--	37	44	64	75	72	70	60
26	53	--	--	32	--	40	55	65	74	70	74	60
27	52	33	38	34	--	41	52	64	71	74	74	55
28	47	33	38	33	--	44	50	60	70	75	78	57
29	50	33	36	34	--	46	46	58	74	78	78	56
30	55	33	32	32	--	40	50	64	75	78	78	59
31	55	--	32	32	--	36	--	61	--	78	78	--
Average	56	43	--	34	--	--	46	58	67	75	75	65

DELAWARE RIVER AT TRENTON, N. J.

LOCATION.--At Trenton Water Works, raw-water intake, Calhoun Street, at Trenton, Mercer County, Sediment samples collected at Calhoun Street Bridge, 200 feet downstream from gaging station which is half a mile upstream from Assunpink Creek.
DRAINAGE AREA.--6,780 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1944 to September 1950.
Water temperaturem: October 1944 to September 1950.
Sediment records: September 1949 to September 1950.
EXTREMES, 1949-50.--Specific conductance: Maximum, 205 micromhos Oct. 21-31; minimum, 68.2 micromhos Apr. 1-10.
Hardness: Maximum, 83 ppm Oct. 21-31; minimum, 25 ppm Apr. 1-10.
Water temperatures: Maximum, 81°F Aug. 1, minimum 33°F on several days in February and March.
EXTREMES, 1944-50.--Specific conductance (1948-50): Maximum, 222 micromhos Sept. 11-20, 1949; minimum, 68.2 micromhos Apr. 1-10, 1950.
Dissolved solids (1944-47): Maximum, 117 ppm Sept. 11-20, 1946; minimum, 44 ppm Mar. 21-31, 1945.
Hardness (1944-47) (1949-50): Maximum, 85 ppm Sept. 11-20, 1946; minimum, 25 ppm Apr. 1-10, 1950.
Water temperatures: Maximum, 88°F July 30, 1949; Aug. 30, 1948; minimum, 33°F on many days during winter months.
REMARKS.--Temperature records furnished by the City of Trenton, N. J. Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1171.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																	Total	Non-carbonate
Oct. 1-10, 1949	3,312	6	6.9	182							52	27	7.8		2.5		68	25
Oct. 11-20	2,559	6	6.9	189							56	28	8.4		2.2		74	28
Oct. 21-31	2,510	7	7.0	205							59	31	10		2.5		83	35
Nov. 1-10	3,825	7	6.9	181							49	27	10		2.4		68	28
Nov. 11-20	5,289	10	6.9	147							38	25	5.6		2.9		56	25
Nov. 21-30	4,868	10	7.1	129							34	21	5.0		3.1		50	22
Dec. 1-10	4,292	8	7.1	141							36	22	5.9		3.5		54	24
Dec. 11-14	8,678	8	7.2	155							39	26	6.5		4.0		58	26
Dec. 15-20	16,570	8	6.5	84.9							16	16	2.8		3.3		32	19
Dec. 21-31	14,730	8	6.8	101							22	19	3.5		3.7		38	20
Jan. 1-10, 1950	14,570	7	6.7	97.3							22	18	3.5		3.2		36	18
Jan. 11-20	17,420	7	6.7	89.6							18	18	3.5		3.3		34	19
Jan. 21-31	10,000	7	6.9	109							25	19	4.2		3.0		42	22
Feb. 1-10	10,880	4	7.1	125							29	23	4.5		3.8		47	23
Feb. 11-20	17,250	8	6.9	124							27	24	4.4		4.4		47	25
Feb. 21-28	10,200	4	7.2	136							32	24	4.5		4.1		53	27
Mar. 1-10	11,360	6	7.1	141							36	24	5.0		3.5		56	26
Mar. 11-20	19,520	8	7.0	99.4							24	18	3.4		2.9		37	17
Mar. 21-31	33,540	6	7.3	107							26	18	3.1		3.7		41	20

DELAWARE RIVER BASIN--Continued

DELAWARE RIVER AT TRENTON, N. J.--Continued

Chemical analyses, in parts per million, water year October 1949 to September 1950--Continued

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																	Total	Non-carbonate
Apr. 1-10, 1950.....	42,400	4	5.9	68.2							16	12	3.6		1.7		25	12
Apr. 11-20.....	15,450	4	7.3	97.4							25	16	3.0		2.3		37	16
Apr. 21-30.....	15,230	7	7.6	95.9							26	15	2.9		2.0		35	14
May 1-10	14,230	8	7.0	100							28	17	3.0		1.6		38	15
May 11-20	10,760	8	7.0	112							34	18	3.6		1.7		43	15
May 21-31.....	15,490	10	7.0	101							29	17	2.9		1.8		39	15
June 1-10	15,760	9	7.1	113							35	17	3.2		1.7		35	6
June 11-20	10,350	7	7.0	127							40	18	4.0		1.6		42	9
June 21-30	8,548	6	7.0	126							41	17	4.2		2.0		42	8
July 1-10.....	6,557	6	7.0	146							43	21	4.6		1.8		50	15
July 11-20	9,779	13	7.0	139							38	22	4.4		3.7		55	24
July 21-31	6,494	8	7.1	146							44	22	4.9		1.7		58	22
Aug. 1-10.....	5,805	6	7.1	150							43	22	4.9		2.5		57	22
Aug. 11-20.....	3,810	7	7.1	169							50	24	6.0		2.6		65	24
Aug. 21-31	5,109	7	7.1	157							43	21	6.0		2.8		60	25
Sept. 1-10.....	4,493	6	7.3	162							50	23	6.0		2.8		62	21
Sept. 11-20.....	5,863	8	7.4	174							52	24	6.0		2.8		65	22
Sept. 21-30	3,807	5	7.6	178							56	25	7.2		2.1		66	20
Average	11,160	7	--	133							36	21	4.9		2.7		50	20

DELAWARE RIVER BASIN--Continued

DELAWARE RIVER AT TRENTON, N. J.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	62	57	37	36	38	33	40	52	64	76	81	78
2	64	54	37	37	38	34	41	52	63	75	71	80
3	63	53	37	37	38	33	43	52	64	76	77	79
4	63	54	36	40	36	33	44	53	65	77	72	66
5	64	51	36	44	36	35	39	55	66	77	73	64
6	64	48	36	45	37	35	--	57	64	76	73	71
7	64	48	36	46	36	37	44	57	66	74	73	70
8	64	49	36	45	36	39	43	59	70	75	73	72
9	66	50	36	39	36	41	43	57	70	75	73	72
10	67	51	36	37	36	36	43	59	72	76	75	73
11	69	54	36	37	37	34	45	59	73	71	77	73
12	70	55	37	36	36	35	46	57	72	73	76	71
13	69	56	41	36	38	36	46	59	70	75	74	69
14	66	--	42	37	38	36	45	62	70	--	75	66
15	65	52	35	37	37	36	45	63	68	73	74	66
16	63	51	35	39	37	38	45	60	66	72	74	67
17	63	49	35	38	37	37	46	61	66	72	76	66
18	61	48	35	37	38	38	48	63	66	75	76	64
19	59	46	36	38	38	38	49	60	67	75	77	66
20	59	45	37	36	37	38	52	57	65	77	77	66
21	58	46	38	36	33	39	52	55	66	76	73	65
22	60	43	39	36	34	39	50	58	67	76	72	65
23	59	41	45	36	33	39	50	60	68	77	71	65
24	58	39	38	37	34	39	49	60	70	74	72	64
25	55	41	40	39	35	39	48	62	72	72	75	59
26	57	40	40	39	35	39	49	63	75	74	74	59
27	54	37	41	41	33	41	50	63	77	72	75	59
28	53	--	45	40	33	43	52	63	76	75	77	60
29	54	37	41	40	--	46	54	64	75	76	78	60
30	55	37	39	42	--	41	54	62	73	75	79	61
31	58	--	37	40	--	38	--	63	--	79	78	--
Average	61	48	38	39	34	38	47	59	69	75	75	67

DELAWARE RIVER BASIN--Continued

DELAWARE RIVER AT TRENTON, N. J.--Continued

Suspended sediment, water year October 1949 to September 1950

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	3,590	9	87	3,340	9	81	4,970	6	80
2	3,940	8	85	3,430	8	74	4,750	4	51
3	3,680	7	70	3,460	7	65	4,860	5	66
4	3,520	5	48	3,750	10	101	4,900	6	79
5	3,280	3	27	3,910	10	106	4,360	6	71
6	2,960	4	32	4,110	14	155	4,040	4	44
7	2,930	6	48	4,220	10	114	3,780	6	61
8	3,020	6	49	4,280	10	116	4,040	6	65
9	3,160	8	51	3,940	10	106	3,850	4	42
10	3,040	6	49	3,810	9	93	3,370	4	36
11	2,790	5	38	3,590	10	97	3,070	4	33
12	2,630	4	28	3,400	10	92	3,490	9	85
13	2,760	4	30	3,310	10	89	4,250	14	161
14	3,160	6	51	3,400	14	129	23,900	328	s 25,200
15	2,740	4	30	4,710	23	292	31,900	121	s 10,900
16	2,520	4	27	7,130	75	s 1,520	20,100	48	2,600
17	2,290	5	31	8,120	65	1,430	14,300	12	463
18	2,220	5	30	6,900	27	503	11,900	4	129
19	2,090	4	23	6,290	13	221	10,600	3	86
20	2,390	5	32	6,040	8	130	10,600	2	57
21	2,500	6	40	5,430	4	59	11,000	2	59
22	2,320	4	25	5,120	9	124	10,300	2	56
23	2,140	4	23	5,430	10	147	9,710	1	26
24	2,020	2	11	5,550	7	105	9,990	1	27
25	2,020	2	11	5,090	6	82	13,600	4	147
26	2,190	2	12	4,530	5	61	12,600	1	34
27	2,440	2	13	4,220	6	68	17,300	171	s 8,550
28	2,960	4	32	4,460	4	48	20,900	117	6,600
29	2,930	6	48	4,320	6	70	22,400	78	4,720
30	2,990	5	40	4,530	6	73	18,900	28	1,430
31	3,100	4	33	--	--	--	15,300	15	620
Total	86,320	--	1,150	139,820	--	6,350	339,030	--	62,580
	January			February			March		
1	12,700	11	377	12,800	8	276	8,570	2	46
2	11,400	9	277	13,200	5	178	8,770	3	71
3	11,100	8	240	14,300	11	425	8,220	4	89
4	10,800	13	379	12,700	12	411	7,220	3	59
5	11,100	9	270	11,400	6	185	7,400	2	40
6	11,300	3	92	10,300	3	83	7,080	1	19
7	13,000	9	316	9,990	4	108	7,260	4	78
8	23,200	40	s 2,550	9,880	6	160	7,690	2	42
9	22,900	32	1,980	10,600	4	114	16,700	59	s 3,340
10	18,200	15	737	13,600	18	661	34,700	194	18,900
11	21,300	22	1,270	13,900	16	600	35,700	160	15,400
12	26,300	30	2,130	15,300	12	496	25,300	40	2,730
13	21,800	20	1,180	14,400	8	311	23,200	21	1,320
14	18,200	10	491	17,200	15	697	22,200	22	1,320
15	17,400	12	564	23,100	48	2,990	18,700	16	808
16	16,700	9	406	21,300	41	2,360	16,200	15	656
17	14,500	13	509	19,300	44	2,290	14,800	12	480
18	13,600	10	367	17,900	22	1,060	14,000	16	605
19	12,800	9	311	16,000	11	475	13,100	10	354
20	11,600	11	345	14,100	10	381	12,000	5	162
21	9,820	8	212	11,700	8	253	12,700	6	206
22	8,820	8	191	11,200	7	212	19,200	35	1,810
23	8,270	8	179	10,400	7	197	28,800	209	s 16,900
24	8,420	8	182	10,100	7	191	31,200	184	15,500
25	9,290	6	150	10,900	4	118	28,100	57	4,320
26	10,200	5	138	10,600	2	57	24,000	24	1,560
27	11,200	6	181	8,770	2	47	24,200	19	1,240
28	11,400	5	154	7,930	2	43	25,700	21	1,460
29	11,100	6	180	--	--	--	45,200	184	s 27,600
30	10,400	8	225	--	--	--	74,100	343	68,700
31	11,100	6	180	--	--	--	55,700	99	s 14,900
Total	429,920	--	16,760	372,870	--	15,380	677,710	--	200,700

s Computed by subdividing day.

DELAWARE RIVER BASIN--Continued

DELAWARE RIVER AT TRENTON, N. J.--Continued

Suspended sediment, water year October 1949 to September 1950--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	42,000	43	4,880	12,300	5	166	15,000	12	486
2	35,700	26	2,510	14,900	5	201	17,700	22	1,050
3	32,300	18	1,570	17,000	8	367	17,600	20	950
4	36,600	16	1,580	15,600	10	421	16,500	13	579
5	57,000	71	10,900	14,100			18,500	22	1,100
6	76,600	191	39,500	14,500	3	120	18,900	24	1,220
7	55,000	87	12,900	15,900			16,200	13	569
8	36,700	31	3,070	13,800			14,000	12	454
9	28,400	20	1,530	12,500			12,200	8	264
10	23,700	12	768	11,700	2	66	11,000	10	297
11	20,900	9	508	11,000			10,200	12	330
12	18,900	7	357	11,600			10,200	14	386
13	17,700	8	382	11,000			10,200	14	386
14	16,800	7	318	9,820	2	56	9,710	12	315
15	15,600	5	211	8,720			10,200		
16	14,400	5	194	8,770	12	284	11,700	12	353
17	13,100	3	106	9,560			11,400		
18	12,300	4	133	9,500			10,200		
19	12,300	10	332	11,900	10	315	9,450		
20	12,500	6	202	15,700			10,200		
21	14,300	12	463	16,100			9,990	10	264
22	20,200	18	982	14,900			9,400		
23	18,100	14	684	13,300	14	572	9,290		
24	15,500	8	335	14,600			8,520		
25	15,000	5	202	16,700			7,780	8	180
26	15,000	4	162	17,200			7,690		
27	14,200	4	153	15,700			9,290		
28	14,400	4	156	14,100	16	659	8,930	11	256
29	13,300	6	215	14,000			7,640		
30	12,300	5	166	17,200	22	1,020	6,950	7	131
31	--	--	--	16,600	17	762	--	--	--
Total	730,800	--	85,470	420,270	--	10,830	346,540	--	12,480

Day	July			August			September		
1	6,820	7	126	4,710	2	26	4,460	20	241
2	6,510			5,090			4,040	6	65
3	5,590			7,820			4,140	9	101
4	5,430	5	77	7,220	19	374	5,840	27	426
5	5,630			6,860			5,800	15	235
6	6,130			6,290	6	97	4,860	8	105
7	8,320			5,630			4,360	8	94
8	7,690			4,900	6	79	4,010	4	43
9	6,680	10	198	4,780	9	116	3,720	4	40
10	6,770			4,750	10	128	3,700	17	s 215
11	6,770	8	146	4,600	10	124	7,180	230	4,460
12	10,700	38	1,100	4,680	11	139	6,340	55	941
13	11,000			4,320	9	105	6,290	30	509
14	12,200			3,880	10	105	6,900	32	596
15	12,500	30	958	3,160	6	51	6,770	20	366
16	11,600			2,960	6	48	6,170	15	250
17	9,560			3,430	5	46	5,590	8	121
18	8,220	13	290	3,340	7	63	4,930	6	80
19	7,880			3,340	6	54	4,280	5	58
20	7,360			4,390	28	332	4,180	5	56
21	7,000			6,460	50	872	4,390	6	71
22	7,130			6,640	31	556	4,280	6	69
23	7,500	8	151	7,360	30	596	4,040	4	44
24	6,250			5,960	14	225	4,080	3	33
25	5,710			5,010	8	108	3,850	2	21
26	6,420	6	98	4,680	7	89	3,310	2	18
27	7,310			4,140	6	67	3,220	2	17
28	7,180	4	75	3,780	5	51	3,850	1	10
29	6,290			3,280	5	44	3,650	1	9.9
30	5,710	2	29	3,460	4	37	3,400	1	9.2
31	4,930			5,430	91	1,330	--	--	--
Total	234,790	--	8,680	152,350	--	6,730	141,630	--	9,300

Total discharge for year (second-foot-days) 4,072,050
Total load for year (tons) 436,410

s Computed by subdividing day.

DELAWARE RIVER BASIN--Continued

DELAWARE RIVER AT EASTON, PA.

LOCATION.--At raw-water intake, Easton Filter Plant, Easton, Northampton County.
DRAINAGE AREA.--4,535 square miles (above gaging station).
RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1950.
EXTREMES, 1949-50.--Specific conductance: Maximum, 117 micromhos Oct. 21-31; minimum, 55.8 micromhos Apr. 1-10.
Hardness: Maximum, 45 ppm Oct. 21-31; minimum, 22 ppm Apr. 1-10.
EXTREMES, 1947-50.--Specific conductance: Maximum, 135 micromhos Aug. 21-31, 1949; minimum, 55.8 micromhos Apr. 1-10, 1950.
REMARKS.--Records of specific conductance of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1949 to September 1950 based on records for Delaware River at Belvidere, N. J., which are given in Water-Supply Paper 1171.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																	Total	Non-carbonate
Oct. 1-10, 1949	1,811	6	6.7	107	2.1	0.02	12	3.1	4.7		37	13	6.0	0.1	0.4	68	43	12
Oct. 11-20	1,380	8	7.6	114	3.2	--	--	--	5.5		42	16	3.1	--	.6	--	44	10
Oct. 21-31	1,321	5	7.3	117	2.6	--	--	--	5.1		42	16	3.2	--	.7	--	45	11
Nov. 1-10	2,318	8	7.4	104	2.4	--	--	--	4.1		35	15	3	--	.6	--	40	11
Nov. 11-20	3,801	8	7.3	88.5	2.8	--	--	--	3.1		28	14	3.1	--	1.0	--	36	13
Nov. 21-30	3,403	5	6.9	87.4	--	--	--	--	3.6		27	14	1.4	--	1.4	--	32	10
Dec. 1-10	2,819	5	7.0	88.3	--	--	--	--	3.7		27	13	2.2	--	1.7	--	32	10
Dec. 11-20	11,499	7	6.7	74.5	--	--	--	--	2.6		19	13	2.6	--	2.3	--	29	13
Dec. 21-31	10,328	8	7.0	71.0	--	--	--	--	2.9		16	13	3.5	--	2.1	--	27	14
Jan. 1-10, 1950	11,163	8	6.8	70.3	--	--	--	--	1.9		16	13	2.2	--	1.8	--	27	14
Jan. 11-20	12,981	8	6.8	67.7	5.3	02	7.6	1.9	2.3		15	14	2.4	.1	1.4	45	27	14
Jan. 21-31	7,364	7	7.0	76.1	--	--	--	--	2.3		20	13	2.6	--	1.7	--	30	14
Feb. 1-10	6,922	9	7.1	86.0	--	--	--	--	2.3		23	15	2.6	--	1.1	--	34	15
Feb. 11-20	9,646	9	7.2	94.4	--	--	--	--	1.7		24	17	2.6	--	2.1	--	39	19
Feb. 21-28	6,629	8	7.3	101	--	--	--	--	--		30	18	3.0	--	1.6	--	41	16
Mar. 1-10	9,497	8	7.3	96.3	--	--	--	--	--		29	15	2.9	--	2.0	--	39	15
Mar. 11-20	13,859	7	7.0	76.7	--	--	--	--	--		19	13	2.1	--	1.8	--	30	14
Mar. 21-31	24,982	6	6.7	76.3	--	--	--	--	3.7		23	14	2.0	--	2.3	--	30	11
Apr. 1-10	36,520	6	6.8	55.8	5.2	05	6.2	1.6	2.8		15	12	1.5	.0	1.6	43	22	10
Apr. 11-20	11,615	4	7.0	70.6	--	--	--	--	3.1		23	12	1.6	--	1.4	--	28	9
Apr. 21-30	11,847	4	7.0	68.9	--	--	--	--	1.7		20	12	1.4	--	1.1	--	28	12
May 1-10	10,881	8	6.9	71.7	--	--	--	--	2.0		22	11	1.5	--	1.0	--	28	10
May 11-20	8,265	11	7.0	75.9	--	--	--	--	1.4		23	11	1.6	--	.7	--	30	11
May 21-31	10,921	13	7.0	79.9	--	--	--	--	2.4		25	12	1.6	--	1.1	--	31	10
June 1-10	10,963	17	6.8	85.0	--	--	--	--	5.8		29	13	1.6	--	1.3	--	28	4
June 11-20	7,358	12	6.8	89.4	--	--	--	--	5.3		31	12	1.8	--	1.3	--	30	5
June 21-30	6,300	13	6.8	86.8	--	--	--	--	5.5		29	12	1.8	--	1.3	--	28	4

July 1-10	4,230	11	6.9	95.5	--	--	--	--	4.7	33	13	1.8	--	1.4	--	34	7
July 11-20	6,417	15	6.9	105	--	--	--	--	4.6	37	15	4.5	--	2.1	--	44	14
July 21-31	4,587	12	7.4	98.8	--	--	--	--	2.4	33	12	2.0	--	1.0	--	38	11
Aug. 1-10	4,177	12	6.6	91.9	--	--	--	--	3.3	34	13	1.9	--	1.3	--	38	10
Aug. 11-20	2,665	7	7.3	105	--	--	--	--	3.1	38	13	2.4	--	.7	--	42	11
Aug. 21-31	3,535	9	7.2	96.0	--	--	--	--	2.2	34	12	2.0	--	.8	--	39	11
Sept. 1-10	3,259	9	7.2	95.4	--	--	--	--	2.3	35	11	2.2	--	.9	--	39	10
Sept. 11-20	3,652	4	7.2	96.0	--	--	--	--	--	36	12	1.1	--	.6	--	39	10
Sept. 21-30	2,487	4	7.4	97.1	--	--	--	--	--	37	11	2.5	--	.4	--	41	11
Average	8,111	11	--	88.0	--	--	--	--	--	28	13	2.4	--	1.3	--	34	11

DELAWARE RIVER BASIN--Continued

LEHIGH RIVER AT WALNUTPORT, PA.

LOCATION.--At highway bridge, 0.3 mile downstream from gaging station at Walnutport, Northampton County, and 0.1 mile upstream from Trout Creek.
DRAINAGE AREA.--889 square miles.
RECORDS AVAILABLE.--Chemical analyses: February to September 1950.
Sediment records: May 1948 to September 1950.
EXTREMES, 1949-50.--Sediment loads: Maximum daily 18,200 tons Mar. 29: minimum daily 1.1 tons Sept. 28.
EXTREMES, 1947-50.--Sediment loads: Maximum daily, 84,400 tons Dec. 30, 1948; minimum daily 1 ton on many days.
REMARKS.--Records of specific conductance and pH of daily samplee available in district office at Philadelphia, Pa. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1171.

Chemical analyses, in parts per million, February to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	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	Hardness as $CaCO_3$		Total acidity as H_2SO_4
																				Total	Noncarbonate	
Feb. 21, 1950 ..	2,050	42	3	6.1	87.8	4.9		0.02	--	7.6	3.4	2.3		6	29	2.0	0.0	3.0	54	33	28	
Mar. 8	1,880	36	3	4.6	101	5.1	1.7	.03	0.3	7.0	1.8	3.5		4	33	2.5	.0	1.6	57	25	22	14
Apr. 19	1,610	55	2	5.8	97.4	4.1		.02	--	7.0	3.1	6.0		8	32	1.5	.0	.6	66	30	24	
May 17	1,280	56	2	6.2	95.0	3.9		.02	--	6.8	3.1	5.4		8	33	1.5	.0	.6	69	30	23	
May 31	2,640	--	3	6.6	82.2	4.4		.02	--	6.4	2.6	6.0		10	26	2.0	.0	1.0	59	27	18	
June 15	2,030	--	3	5.4	81.2	4.8		.01	.1	6.6	2.6	3.5		6	26	2.0	.0	1.1	47	27	22	
June 29	713	73	2	5.5	127	5.4		.04	.4	8.0	4.3	7.4		6	45	1.5	.0	.9	77	38	33	
July 13	1,640	70	3	5.3	85.7	5.0		.01	.2	6.7	2.9	4.4		7	28	2.0	.0	1.7	52	29	23	
July 26	860	69	2	5.5	115	5.4		.01	.3	8.5	3.7	5.4		5	41	3.0	.0	1.3	71	36	32	
Aug. 8	496	66	2	5.5	133	5.2		.05	.2	9.2	3.8	11		9	48	3.0	.0	1.5	85	39	31	
Aug. 30	426	74	4	6.9	163	5.2		.03	.4	11	4.2	12		10	61	2.0	.0	1.3	108	45	36	
Sept. 13	902	62	3	6.0	131	6.3		.01	.3	8.6	3.4	13		11	45	2.5	.0	2.0	83	35	26	
Sept. 27	408	66	4	6.1	153	5.5		.05	.7	10	4.3	12		9	56	3.0	.0	1.7	97	43	35	

DELAWARE RIVER BASIN--Continued

LEHIGH RIVER AT WALNUTPORT, PA.--Continued

Suspended sediment, water year October 1949 to September 1950

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-fset)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	1,020	21	58	860	9	21	810	10	22
2	822	16	36	748	6	12	772	8	17
3	713	13	25	713	8	15	748	15	30
4	636	12	21	1,000	19	51	620	6	10
5	616	11	18	1,040	12	34	702	8	15
6	636	8	14	930	8	20	680	9	17
7	636	6	10	860	8	19	658	6	11
8	724	7	14	810	5	11	660	6	11
9	691	9	17	735	4	7.9	580	5	7.8
10	616	8	13	680	5	9.2	520	2	2.8
11	578	8	12	658	5	8.9	600	3	4.9
12	558	6	9.0	647	4	7.0	748	22	45
13	558	8	12	669	8	14	2,840	443	s 4,780
14	530	3	4.3	1,630	53	233	3,620	225	2,200
15	513	1	1.4	1,430	45	174	2,740	35	259
16	504	3	4.1	1,200	24	78	2,100	17	96
17	479	4	5.2	1,080	22	64	1,850	8	40
18	470	8	10	1,030	19	53	1,740	8	38
19	454	4	4.9	958	19	49	1,910	8	41
20	445	4	4.8	916	16	40	1,810	13	63
21	408	6	6.6	888	17	41	1,620	18	79
22	400	3	3.2	848	17	39	1,530	21	87
23	400	5	5.4	760	4	8.2	1,780	29	139
24	392	4	4.2	760	2	4.1	2,370	42	269
25	385	4	4.2	772	7	15	1,890	12	61
26	636	8	14	760	12	25	1,850	30	150
27	735	9	18	691	6	11	4,860	362	s 5,060
28	606	4	6.5	702	9	17	5,130	144	1,990
29	558	3	4.5	798	8	17	4,000	44	475
30	540	2	2.9	848	9	21	3,200	13	112
31	713	4	7.7	--	--	--	2,710	8	59
Total	17,972	--	371	26,421	--	1,120	57,648	--	16,190

Day	January			February			March		
1	2,500	8	54	1,850	19	95	1,460	42	165
2	2,300	7	43	2,260	20	122	1,250	29	98
3	2,280	6	37	2,760	29	216	1,050	21	58
4	2,350	10	63	2,480	15	100	1,100	28	63
5	2,180	7	41	2,260	11	67	1,200	28	91
6	2,710	15	110	2,110	9	51	1,250	41	139
7	5,030	300	4,070	2,010	14	76	1,100	26	77
8	4,140	46	513	1,760	13	62	1,880	40	203
9	3,200	9	78	2,130	23	132	6,750	410	7,470
10	3,700	25	250	2,690	41	298	4,840	58	759
11	4,560	55	678	2,570	21	146	4,000	30	324
12	3,860	20	208	2,600	15	105	3,600	22	213
13	3,460	12	112	2,620	13	92	3,460	18	168
14	3,330	10	90	2,980	20	161	3,050	17	140
15	2,930	10	79	4,010	62	671	2,660	18	129
16	2,620	7	49	4,700	64	812	2,480	16	107
17	2,300	10	62	4,140	26	291	2,260	18	110
18	2,220	11	66	3,600	16	156	2,220	19	114
19	2,090	13	73	3,080	11	92	1,950	15	79
20	1,760	10	48	2,500	16	108	1,850	11	55
21	1,680	10	45	2,050	19	105	3,480	120	1,130
22	1,660	7	31	2,240	33	200	4,840	115	1,500
23	1,660	8	36	2,220	38	228	6,310	167	2,840
24	1,740	12	56	2,010	27	147	6,150	108	1,800
25	1,910	20	103	1,890	23	117	5,130	54	748
26	1,830	19	94	1,600	20	86	4,560	35	431
27	1,850	14	70	1,300	21	74	4,840	36	470
28	1,700	11	50	1,300	31	109	7,800	412	s 11,100
29	1,700	11	50	--	--	--	10,800	624	18,200
30	1,790	15	72	--	--	--	7,980	146	3,140
31	1,630	12	59	--	--	--	6,300	72	1,230
Total	78,870	--	7,390	69,720	--	4,920	117,600	--	53,170

s Computed by subdividing day.

DELAWARE RIVER BASIN--Continued

LEHIGH RIVER AT WALNUTPORT, PA.--Continued

Suspended sediment, water year October 1949 to September 1950--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-fset)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	5,420	40	585	2,300	20	124	2,900	38	298
2	4,980	22	296	2,460	18	120	2,710	14	102
3	4,980	20	269	2,220	13	78	2,410	10	65
4	6,300	50	851	2,050	10	55	3,740	59	596
5	7,350	88	1,750	1,990			3,730	28	282
6	6,450	55	958	1,970			3,150	12	102
7	4,840	20	261	1,770	10	49	2,660	17	122
8	4,000	13	140	1,550			2,260	6	37
9	3,460	11	103	1,430			1,990	10	54
10	3,020	10	82	1,380			1,760	6	29
11	2,780	12	90	1,340	12	44	2,030	5	28
12	2,620	10	71	1,280			1,810	7	34
13	2,410	12	78	1,230			1,530	4	17
14	2,220	12	72	1,150			1,680	12	55
15	2,050	11	61	1,170	12	41	2,030	22	121
16	1,930	10	52	1,430			1,810		
17	1,810	10	49	1,280	12	42	1,680	16	67
18	1,700	9	41	1,620			1,430		
19	1,610	18	78	2,600			1,280		
20	2,210	58	346	2,410	24	141	1,280		
21	2,530	28	191	2,070			1,280		
22	2,050	12	66	1,810			1,410	18	63
23	1,830	11	54	1,720			1,210		
24	1,830	9	45	2,370	20	117	1,060		
25	1,910	10	52	2,730			972		
26	1,930	11	57	2,730			902	11	28
27	1,870	12	60	2,370	16	104	822		
28	1,740	14	66	2,110			748		
29	1,590	11	47	2,850	36	277	713	9	18
30	1,620	10	44	2,900	14	105	785	10	21
31	--	--	--	2,640			--	--	--
Total	91,040	--	6,920	60,930	--	2,790	53,772	--	2,630

Day	July			August			September		
1	798	13	28	578			430	9	10
2	713	10	19	578	5	8	408	10	11
3	772	10	21	596			400	8	8.6
4	810	12	26	647			408	7	7.7
5	1,150	68	s328	587			364	6	5.9
6	2,390	162	1,050	568	8	13	344	10	9.3
7	1,480	27	108	522			331	8	7.2
8	1,090	18	53	496	4	5.3	331	8	7.2
9	902	15	36	462	4	5.0	324	6	5.2
10	835	16	36	438	6	7.1	627	13	s36
11	1,760	68	323	430	7	8.1	1,310	38	134
12	1,990	46	247	415	6	6.7	902	11	27
13	1,640	23	102	392	7	7.4	902	14	34
14	2,200			370	7	7.0	1,120	18	55
15	1,740			364	6	5.9	944	13	33
16	1,460	24	109	344	6	5.6	810	9	20
17	1,310			350	4	3.8	691	6	11
18	1,180			350	6	5.7	606	6	9.8
19	1,030			598	56	s180	568	4	6.1
20	944	12	33	1,320	121	s502	540	3	4.4
21	916			724	10	20	513	2	2.8
22	822			578	10	16	530	4	5.7
23	748			530	8	11	540	3	4.4
24	760	12	27	504	6	8.2	496	4	5.3
25	1,000			470	6	7.6	454	4	4.9
26	860			445	8	9.6	430	7	8.1
27	748			430	6	7.0	408	5	5.5
28	680	9	18	400	4	4.3	400	1	1.1
29	647			415	4	4.5	385	2	2.1
30	669			426	9	10	378	2	2.1
31	596	5	8.0	488	12	16	--	--	--
Total	34,640	--	3,150	15,815	--	940	16,904	--	484

Total discharge for year (second-foot-days) 641,332
Total load for year (tons) 100,075

s Computed by subdividing day.

LEHIGH RIVER AT WALNUTPORT, PA.--Continued

Particle-size analyses of suspended sediment, December 1949 to March 1950
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second-feet)	Suspended sediment											Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters									
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
Dec. 13, 1949	11:20 a.m.	2,570	204				26	50	76	94	98	99		100		DSWC
Dec. 27	10:25 a.m.	5,400	396				22	44	70	70	89	98		100		DSWC
Jan. 11, 1950	3:35 p.m.	Composite	20				28	38	59	79	92	99		100		DSWC
Jan. 24	3:30 p.m.															
Feb. 9	6:05 p.m.															
Mar. 8	11:00 p.m.															

DELAWARE RIVER BASIN--Continued

LEHIGH RIVER AT CATASAQUA, PA.

LOCATION.--At Race Street Bridge at Catasaqua, Northampton County.
DRAINAGE AREA.--1,012 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1944 to September 1950.
Water temperatures: October 1944 to September 1950.
EXTREMES, 1949-50.--Specific conductance: Maximum, 203 micromhos Sept. 1-10; minimum, 70.3 micromhos Apr. 1-10.
Water temperatures: Maximum, 75°F Aug. 2, 30, 31, Sept. 1, 2; minimum, freezing point on many days during winter months.
Hardness: Maximum, 75 ppm Sept. 1-10; minimum, 24 ppm Apr. 1-10.
EXTREMES, 1944-50.--Dissolved solids (1944-47) (1949-50): Maximum, 169 ppm Oct. 1-10, 1944; minimum, 45 ppm Apr. 1-10, 1950.
Hardness (1944-47) (1949-50): Maximum, 106 ppm Oct. 1-10, 1944; minimum, 24 ppm Apr. 1-10, 1950.
Specific conductance: Maximum, 254 micromhos Oct. 1-10, 1944; minimum, 70.3 micromhos Apr. 1-10, 1950.
Water temperatures: Maximum, 77°F July 2, 1945; minimum, freezing point on many days during winter months.
REMARKS.--Records of specific conductance of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1949 to September 1950 based on records for Lehigh River at Bethlehem, which are given in Water-Supply Paper 1171.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																	Total	Non-carbonate
Oct. 1-10, 1949	758	3	6.7	138	5.1	0.02	12	4.5	6.0		14	41	3.6	0.2	2.1	87	48	37
Oct. 11-20	581	6	6.8	160	6.3	.03	15	5.8	3.7		15	47	4.5	.1	1.8	96	61	49
Oct. 21-31	603	6	6.7	162	6.1	.02	15	5.7	5.2		17	48	4.5	.1	2.2	102	61	47
Nov. 1-10	840	4	6.5	126	--	--	--	--	--		13	37	3.4	--	1.8	--	49	38
Nov. 11-20	1,020	4	6.8	124	5.6	.02	11	4.5	3.9		11	38	2.5	.1	2.5	74	46	37
Nov. 21-30	814	4	6.8	118	5.4	.03	10	4.3	3.2		9	35	2.5	.1	2.4	69	43	35
Dec. 1-10	713	4	6.9	130	5.5	.02	11	4.8	3.7		12	38	2.4	.1	2.7	76	47	37
Dec. 11-20	1,844	6	6.2	103	5.8	.05	9.6	3.4	3.8		9	32	2.1	.1	2.9	72	38	31
Dec. 21-31	2,606	8	6.3	92.6	5.7	.06	8.8	3.0	2.9		9	27	2.1	.1	2.4	58	34	27
Jan. 1-10, 1950	2,903	6	6.5	90.3	5.0	.03	8.1	3.1	2.1		8	25	2.0	.1	2.4	60	33	26
Jan. 11-20	2,702	5	6.4	89.5	5.0	.01	8.0	2.4	2.8		6	25	1.9	.1	2.4	51	30	25
Jan. 21-31	1,694	5	6.4	99.4	5.1	.02	8.8	2.4	6.1		11	30	2.1	.1	2.0	62	32	23
Feb. 1-10	2,283	5	6.6	105	5.5	.02	9.4	2.8	4.7		10	30	2.1	.1	3.2	67	35	27
Feb. 11-20	3,455	4	6.8	104	5.4	.02	10	3.2	4.6		11	30	2.9	.1	4.4	67	38	29
Feb. 21-28	1,645	4	6.6	114	5.0	.03	11	3.9	3.6		10	33	3.5	.2	4.0	70	44	35
Mar. 1-10	2,157	5	6.4	115	6.0	.03	10	3.8	5.1		12	33	3.1	.1	3.4	71	41	31
Mar. 11-20	2,643	7	6.3	89.0	5.3	.02	7.8	2.9	3.6		9	26	2.2	.1	1.7	55	31	24
Mar. 21-31	6,100	6	6.7	86.0	5.0	.07	7.9	2.5	3.6		10	23	2.0	.1	3.3	55	30	22
Apr. 1-10	4,539	4	6.1	70.3	4.2	.06	6.0	2.3	3.5		5	23	1.8	.1	1.4	45	24	20
Apr. 11-20	2,135	4	6.4	94.5	4.1	.04	8.6	3.1	3.8		7	30	2.8	.1	1.6	59	34	28
Apr. 21-30	1,870	7	6.6	90.8	3.8	.10	8.0	2.9	4.7		10	28	2.1	.2	1.4	56	32	24
May 1-10	1,954	3	6.6	94.7	5.6	.10	10	4.3	--		8	27	1.9	.1	1.8	67	43	36
May 11-20	1,646	2	6.5	110	6.8	.08	12	3.0	2.7		11	33	2.0	.1	2.1	75	42	33
May 21-31	2,425	4	6.6	99.3	9.8	.06	9.8	3.0	3.3		15	26	1.9	.1	2.0	70	37	24

June 1-10	2,595	6	5.8	91.6	5.3	.06	7.9	2.9	4.7	11	26	2.8	.1	2.0	57	32	23
June 11-20	1,740	4	5.9	103	5.2	.04	8.8	3.2	5.1	11	30	3.0	.0	2.1	63	35	26
June 21-30	1,114	4	6.0	122	4.8	.08	10	3.8	7.2	11	39	3.1	.1	2.4	74	41	32
July 1-10	1,222	4	5.9	129	5.0	.03	11	4.1	5.1	12	37	3.2	.1	2.7	78	44	34
July 11-20	1,650	8	6.1	117	5.5	.07	11	3.5	4.4	14	32	3.0	.1	2.8	72	42	30
July 21-31	1,040	4	6.3	148	4.9	.02	13	4.5	6.2	15	43	3.1	.1	3.5	88	51	39
Aug. 1-10	703	4	7.0	169	7.8	.02	16	5.6	6.1	21	49	3.6	.1	3.2	105	63	46
Aug. 11-20	538	4	7.0	201	7.2	.01	18	6.6	8.3	24	59	3.9	.1	4.0	123	72	52
Aug. 21-31	610	4	7.0	177	5.0	.02	16	5.9	6.5	21	50	3.6	.1	4.5	109	64	47
Sept. 1-10	546	3	6.8	203	5.9	.05	19	6.7	7.0	26	57	4.0	.1	4.6	127	75	54
Sept. 11-20	961	4	6.8	150	5.3	.05	14	4.8	4.5	17	41	3.2	.1	3.8	93	55	41
Sept. 21-30	589	3	6.8	186	5.1	.04	17	5.8	7.4	22	53	3.6	.2	4.4	115	66	48
Average	1,698	5	--	122	5.6	0.04	11	4.0	4.7	13	36	2.8	0.1	2.7	76	44	34

DELAWARE RIVER BASIN--Continued

LEHIGH RIVER AT CATASAQUA, PA.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	58	50	36	34	36	32	40	48	60	70	74	75
2	56	50	36	36	36	32	40	48	60	69	75	75
3	56	48	34	40	36	32	44	52	62	71	74	74
4	56	48	31	44	34	32	44	56	62	72	71	73
5	60	46	32	48	34	32	48	58	60	72	69	70
6	60	44	32	48	34	34	44	56	60	72	68	65
7	60	44	32	46	36	34	40	56	62	68	68	65
8	60	44	32	38	32	36	42	56	66	69	69	66
9	62	46	32	34	34	36	40	54	66	70	70	67
10	64	46	32	36	36	32	40	56	68	71	71	69
11	66	46	34	38	36	34	44	56	70	69	72	70
12	66	48	34	34	38	34	44	58	68	68	71	66
13	66	48	36	36	38	36	44	56	66	71	69	64
14	66	50	36	38	36	34	40	58	64	70	69	63
15	64	48	34	38	36	36	40	60	61	68	69	61
16	60	44	32	38	38	36	40	58	60	67	70	61
17	58	44	32	36	38	34	44	56	--	66	71	59
18	56	44	32	36	38	36	46	60	63	70	71	59
19	56	40	34	36	38	34	50	56	64	71	72	60
20	54	40	36	34	34	36	52	54	61	72	73	61
21	54	40	38	32	32	38	50	52	60	70	67	62
22	56	38	40	34	32	38	48	54	64	69	65	63
23	54	36	42	36	32	38	48	58	65	69	66	61
24	54	36	40	38	32	38	46	58	69	68	68	58
25	54	36	36	40	34	40	46	58	72	67	69	55
26	52	34	36	42	32	40	46	60	71	67	69	55
27	50	36	40	40	32	40	50	60	73	68	71	54
28	48	34	42	40	32	44	52	62	70	69	73	55
29	50	34	38	38	--	42	52	58	70	70	74	56
30	50	34	36	38	--	40	50	58	69	72	75	59
31	52	--	34	38	--	38	--	60	--	72	75	--
Average	57	41	35	38	35	36	44	57	65	76	71	63

SCHUYLKILL RIVER AT PORT CARBON, PA.

302255 O - 54 - 4

LOCATION.--At Mill Street Bridge at Port Carbon, Schuylkill County, 0.1 mile upstream from Mill Creek.
DRAINAGE AREA.--27.1 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1950.
Sediment records: February 1949 to September 1950.
EXTREMES, 1949-50.--Sediment loads: Maximum daily, 731 tons, July 5; minimum daily, 0.1 tons on many days.
EXTREMES, 1948-50.--Sediment loads: Maximum daily, 731 tons July 5, 1950; minimum daily, 0.1 tons on many days.
REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge computed from wire-weight gage readings and high-flow, water-stage recorder record. Water discharge records are not published.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	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	Hardness as $CaCO_3$		Total acidity as H_2SO_4
																				Total	Noncarbonate	
Oct. 14, 1949	8.2	54	7	3.30	986	13	8.6	0.54	6.7	69	42	8.7		0	434	4.0	0.0	0.6	702	345	345	136
Jan. 6, 1950	52	48	4	3.40	649	12	5.8	.09	4.5	44	25	10		0	279	2.0	.0	.4	431	213	213	104
Jan. 19	52	41	6	3.40	634	12	4.3	.27	3.9	48	25	10		0	281	1.0	.0	.3	422	223	223	84
Feb. 3	68	37	5	3.85	522	9.8	7.8	.16	2.7	35	20	6.3		0	220	5.0	.0	1.4	328	170	170	70
Feb. 15	166	40	3	3.85	417	9.0	6.5	.10	2.2	30	17	5.5		0	198	3.0	.0	1.3	276	145	145	66
Mar. 15	63	37	2	3.70	608	11	8.9	.18	3.1	42	26	8.5		0	287	3.0	.0	.7	414	212	212	92
Mar. 27	183	43	2	3.90	465	9.2	7.8	.12	2.3	32	19	7.1		0	229	2.5	.0	.9	309	158	158	70
Apr. 11	60	45	2	3.85	681	12	13	.52	3.7	47	30	7.8		0	322	3.0	.0	.4	472	241	241	100
Apr. 24	47	50	2	4.35	624	12	8.7	.20	3.7	46	28	8.4		0	287	4.5	.0	.6	454	230	230	116
May 3	57	52	2	4.40	562	12	7.3	.17	3.1	38	23	7.7		0	248	5.0	.0	.6	382	189	189	84
May 23	56	57	3	4.10	557	11	4.9	.17	3.0	39	23	5.8		0	240	3.5	.0	.6	356	192	192	80
June 6	96	68	3	4.15	530	11	4.7	.07	2.6	40	22	5.8		0	229	2.5	.0	.4	344	190	190	72
June 22	33	70	2	4.25	757	10	9.6	.24	3.9	51	32	10		0	331	3.5	.0	.3	492	259	259	182
July 6	102	67	2	4.35	602	9.3	12	.29	2.8	38	23	6.9		0	259	4.0	.0	.3	404	189	189	156
July 25	63	62	2	4.40	572	8.8	9.9	.18	3.2	40	21	10		0	250	4.0	.0	.3	389	186	186	136
Aug. 7	26	63	2	3.60	788	15	7.9	.39	4.5	58	35	9.0		0	355	3.0	.0	.6	544	289	289	198
Aug. 21	40	64	2	3.40	791	15	16	.31	4.7	48	30	8.4		0	354	5.0	.0	1.2	512	243	243	236
Sept. 11	35	66	4	3.50	755	14	14	.20	4.0	46	29	9.8		0	326	4.5	.0	1.0	488	234	234	200
Sept. 25	18	58	3	3.60	878	16	13	.18	4.8	60	36	10		0	391	6.0	.0	.5	575	298	298	206

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT PORT CARBON, PA.--Continued

Suspended sediment, water year October 1949 to September 1950

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	11	38	1.1	9:1	6	0.1	13	26	0.9
2	9.7	28	.7	8.8	14	.3	12	44	1.4
3	8.8	15	.4	8.8	10	.2	9.4	a38	1.0
4	8.5	12	.3	12	10	.3	8.5	35	.8
5	9.4	12	.3	8.2	8	.2	8.5	25	.6
6	8.2	107	2.4	9.1	8	.2	8.5	22	.5
7	9.1	28	.7	9.1	4	.1	8.2	43	.9
8	8.8	7	.2	8.2	3	.1	8.5	45	1.0
9	7.3	7	.1	8.5	1	.1	9.4	25	.6
10	8.5	18	.4	8.8	2	.1	9.1	22	.5
11	7.0	7	.1	8.5	1	.1	10	27	.7
12	6.8	5	.1	9.1	1	.1	21	152	8.6
13	7.6	7	.1	11	86	2.6	73	975	192
14	8.2	15	.3	21	145	8.2	37	70	7.0
15	8.2	7	.2	14	55	2.1	21	130	7.4
16	8.5	6	.1	9.4	23	.6	21	22	1.2
17	7.9	12	.3	10	42	1.1	21	41	2.3
18	8.2	22	.5	10	21	.6	30	102	8.3
19	7.9	8	.2	10	34	.9	33	66	5.9
20	7.9	6	.1	10	22	.6	28	50	3.8
21	7.9	4	.1	13	18	.6	24	43	2.8
22	7.9	5	.1	10	11	.3	27	32	2.3
23	7.9	4	.1	9.1	17	.4	28	124	9.4
24	8.5	16	.4	10	17	.5	28	46	3.5
25	20	138	7.5	9.4	25	.6	22	28	1.7
26	22	114	6.8	9.7	32	.8	33	348	31
27	9.1	22	.5	9.4	28	.7	114	1,460	448
28	12	16	.5	8.2	22	.5	95	195	50
29	12	11	.4	20	28	1.5	83	157	35
30	11	16	.5	13	24	.8	73	117	23
31	14	19	.7	--	--	--	61	60	9.9
Total	299.8	--	26.2	315.4	--	25.3	978.1	--	862

Day	January			February			March		
1	55	50	7.4	44	95	11	30	50	4.0
2	54	40	5.8	68	203	37	27	80	5.8
3	58	145	23	68	73	13	26	35	2.5
4	50	123	17	65	50	8.8	27	29	2.1
5	45	114	14	63	44	7.5	21	40	2.3
6	52	112	16	62	81	14	23	36	2.2
7	66	122	22	63	59	10	19	38	1.9
8	50	55	7.4	47	60	7.6	36	500	49
9	50	31	4.2	85	318	73	46	440	55
10	102	750	207	80	190	41	33	135	12
11	100	150	40	73	45	8.9	34	118	11
12	86	108	25	75	46	9.3	43	118	14
13	79	90	19	87	148	35	47	130	16
14	78	66	14	106	260	75	40	95	10
15	64	55	9.5	166	765	343	63	78	13
16	62	105	18	148	490	196	63	64	11
17	58	79	12	120	215	70	57	60	9.2
18	58	48	7.5	110	125	37	53	70	10
19	52	44	6.2	108	135	39	46	39	4.8
20	44	42	5.0	83	102	23	42	30	3.4
21	44	50	5.9	87	110	26	110	570	169
22	43	34	3.9	68	75	14	124	220	74
23	42	35	4.0	71	65	12	218	940	553
24	46	244	30	51	48	6.6	208	490	275
25	44	76	9.0	49	60	7.9	200	225	122
26	42	68	7.7	42	35	4.0	196	250	132
27	44	67	8.0	38	40	4.1	183	380	188
28	46	58	7.2	33	39	3.5	200	820	443
29	33	48	4.3	--	--	--	193	420	219
30	43	56	6.5	--	--	--	186	225	113
31	47	103	13	--	--	--	186	170	85
Total	1,737	--	580	2,160	--	1,140	2,780	--	2,610

a Estimated.

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT PORT CARBON, PA.--Continued

Suspended sediment, water year October 1949 to September 1950--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	148	162	65	73	144	28	94	235	60
2	132	145	52	60	63	10	90	133	32
3	122	90	30	57	40	6.2	100	200	54
4	129	82	29	59	40	6.4	136	290	106
5	110	72	21	57	28	4.3	108	119	35
6	92	61	15	59	25	4.0	96	52	13
7	87	70	16	54	26	3.8	80	57	12
8	82	40	8.9	50	23	3.1	75	54	11
9	71	36	6.9	47	26	3.3	65	40	7.0
10	68	27	5.0	47	30	3.8	65	45	7.9
11	60	40	6.5	44	25	3.0	60	37	6.0
12	59	64	10	43	20	2.3	49	25	3.3
13	59	103	16	39	20	2.1	44	30	3.6
14	56	151	23	38	12	1.2	65	296	52
15	54	62	9.0	41	38	4.2	57	46	7.1
16	47	43	5.5	43	30	3.5	53	63	9.0
17	43	30	3.5	39	26	2.7	47	28	3.6
18	43	99	12	56	255	39	42	40	4.5
19	42	60	6.8	82	80	13	40	25	2.7
20	54	125	18	53	26	3.7	38	15	1.5
21	46	35	4.3	49	24	3.2	38	15	1.5
22	40	30	3.2	47	25	3.2	33	17	1.5
23	38	15	1.5	56	374	56	30	13	1.1
24	47	165	21	71	170	33	29	12	.9
25	53	175	25	63	36	6.1	28	13	1.0
26	54	68	9.9	62	35	5.9	25	15	1.0
27	47	23	2.9	59	25	4.0	22	10	.6
28	43	20	2.3	57	18	2.8	18	14	.7
29	51	28	3.9	63	125	28	14	12	.5
30	57	84	13	75	45	9.1	14	8	.3
31	--	--	--	71	45	8.6	--	--	--
Total	2,034	--	446	1,714	--	308	1,655	--	440

Day	July			August			September		
1	9.4	12	0.3	35	20	1.9	19	12	0.6
2	7.9	12	.2	32	15	1.3	19	10	.5
3	24	39	2.5	35	29	2.8	18	15	.7
4	29	25	1.9	29	20	1.6	17	14	.6
5	81	1,310	s731	28	44	3.3	16	13	.6
6	102	370	102	32	93	8.0	14	18	.7
7	63	52	8.9	26	18	1.3	14	12	.5
8	41	32	3.5	25	24	1.6	15	10	.4
9	31	22	1.8	25	32	2.2	14	11	.4
10	29	170	13	26	17	1.2	46	580	72
11	128	1,030	s398	25	19	1.3	35	55	5.2
12	122	125	41	22	18	1.1	25	18	1.2
13	117	253	80	21	14	.8	28	32	2.4
14	117	126	40	21	12	.7	26	46	3.2
15	92	62	15	18	9	.4	22	17	1.0
16	73	48	9.4	18	9	.4	21	13	.7
17	68	44	8.1	18	8	.4	18	15	.7
18	68	72	13	17	6	.3	17	12	.5
19	54	38	5.5	52	473	s169	17	12	.5
20	46	31	3.9	85	390	90	17	11	.5
21	40	31	3.3	40	32	3.5	19	10	.5
22	34	89	8.2	32	42	3.6	22	14	.8
23	31	28	2.3	29	43	3.4	22	26	1.5
24	32	44	3.8	25	28	1.9	19	16	.8
25	63	212	36	21	16	.9	18	15	.7
26	42	33	3.8	19	15	.8	17	15	.7
27	39	20	2.1	21	10	.6	16	15	.6
28	38	22	2.3	21	6	.4	16	13	.6
29	39	25	2.6	20	13	.7	17	15	.7
30	41	20	2.2	19	17	.9	17	10	.5
31	36	20	1.9	21	20	1.1	--	--	--
Total	1,737.3	--	1,550	858	--	307	601	--	100

Total discharge for year (second-foot-days) 16,869.6
Total load for year (tons) 8,394.5

s Computed by subdividing day.

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT PORT CARBON, PA.--Continued

Particle-size analyses of suspended sediment, January to July 1950
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second-feet)	Suspended sediment											Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
Jan. 19, 1950	1:20 p.m.	Composite	39				12	41	63	82	88	94		--		DSWC
Mar. 15	9:55 a.m.															
Feb. 15	1:15 p.m.	178	668				10	27	45	68	76	83		91		DSWC
Feb. 3	11:45 a.m.	Composite	56				3	14	37	47	51	56		56		DSWC
May 23	2:15 p.m.															
June 6	2:20 p.m.															
July 5	7:00 p.m.	164	1,050				9	20	45	50	84	95		97		DSWC
July 6	11:35 a.m.	75	119				11	30	58	74	84	96		99		DSWC

SCHUYLKILL RIVER AT LANDINGVILLE, PA.

Location.--At gaging station at highway bridge at Landingville, Schuylkill County, 0.1 mile upstream from Mahannon Creek and 5 miles downstream from mouth of West Branch Schuylkill River.
DRAINAGE AREA.--133 square miles.
RECORDS AVAILABLE.--Chemical analyses: December 1947 to September 1950.
Sediment records: September 1947 to September 1950.
EXTREMES, 1949-50.--Sediment loads: Maximum daily, 3,390 tons Mar. 28; minimum daily, 6 tons Oct. 24.
EXTREMES, 1947-50.--Sediment loads: Maximum daily, 18,740 tons Dec. 30, 1948; minimum daily, 6 tons Oct. 24, 1949.
REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1171.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	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	Hardness as $CaCO_3$		Total acidity as H_2SO_4
																				Total	Noncarbonate	
Oct. 11, 1949	56	69	7	4.00	1,050	9.5	1.5	0.11	5.6	95	47	48		0	506	9.0	0.0	8.6	849	430	430	42
Oct. 21	49	63	5	4.50	1,090	11	2.6	.10	5.7	100	52	52		4	545	11	.0	11	872	463	460	40
Oct. 28	58	45	5	4.25	983	12	7.3	.12	5.7	94	48	25		0	492	8.0	.1	10	766	431	431	56
Nov. 2	69	49	4	4.45	933	12	1.0	1.5	5.7	88	45	37		0	479	8.0	.0	.2	749	405	405	58
Nov. 9	60	54	3	4.30	961	11	.4	.22	5.7	90	45	42		0	482	8.0	.0	4.8	761	410	410	32
Nov. 15	85	52	1	3.80	780	11	6.2	.13	4.7	69	33	16		0	365	7.0	.0	8.0	559	308	308	73
Nov. 21	54	42	1	3.65	915	11	6.2	.21	6.1	80	45	18		0	447	7.0	.0	11	680	385	385	90
Dec. 1	65	40	5	4.30	1,050	11	5.0	.35	6.1	95	52	40		0	532	7.0	.0	11	851	451	451	94
Dec. 9	65	32	5	4.40	1,130	10	5.5	.13	7.3	109	59	41		0	614	7.0	.0	5.8	955	515	515	110
Dec. 14	201	38	3	4.30	613	9.2	3.4	.06	3.2	49	26	22		0	280	4.5	.0	6.4	462	229	229	40
Dec. 21	124	43	3	4.15	717	9.8	6.5	.09	3.8	58	32	22		0	338	6.0	.0	6.4	517	276	276	62
Dec. 28	462	43	4	4.25	408	8.4	4.2	.09	2.3	30	16	9.5		0	173	2.5	.0	5.2	296	141	141	40
Jan. 6, 1950	248	48	3	4.10	712	10	7.6	.15	3.8	54	33	20		0	338	6.0	.0	4.9	516	270	270	68
Jan. 12	405	36	3	4.15	556	9.8	5.8	.09	2.8	40	25	14		0	252	3.5	.0	6.8	390	203	203	58
Jan. 19	236	41	3	4.00	695	11	7.1	.08	3.8	54	33	15		0	321	3.5	.0	3.6	500	270	270	66
Jan. 26	186	49	2	4.00	759	12	5.2	.12	4.4	65	38	18		0	368	4.0	.0	4.2	562	318	318	66
Feb. 2	356	40	1	4.8	464	9.5	3.7	.07	2.5	40	22	11		3	209	3.5	.0	5.8	326	190	188	41
Feb. 8	262	37	3	4.10	550	10	3.3	.13	3.1	47	29	8.6		0	251	3.0	.0	4.0	394	236	236	50
Feb. 17	843	40	5	4.7	448	9.8	4.6	.23	2.1	35	21	11		2	201	3.0	.0	4.4	317	174	172	42
Feb. 23	382	39	10	3.90	605	10	7.6	.09	4.4	47	29	8.4	2.9	0	295	2.4	.1	1.0	427	236	236	54
Mar. 2	213	32	3	4.35	710	12	10	.08	3.8	57	35	15		0	351	5.0	.0	4.2	528	286	286	83
Mar. 10	248	41	2	4.20	616	10	6.8	.13	3.5	47	29	12		0	277	5.5	.0	5.6	442	236	236	84
Mar. 15	245	39	3	4.40	639	11	6.8	.11	3.7	54	31	13		0	299	3.0	.0	3.6	492	262	262	76
Mar. 22	445	40	3	4.7	438	8.8	4.2	.08	2.4	35	22	9.6		4	195	4.0	.0	3.4	306	178	175	48
Mar. 29	1,300	44	3	4.7	428	10	6.8	.07	2.6	29	20	11		2	196	2.5	.0	1.8	312	155	153	67

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT LANDINGVILLE, PA.--Continued

Chemical analyses, in parts per million, water year October 1949 to September 1950--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	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	Hardness as $CaCO_3$		Total acidity as H_2SO_4
																				Total	Non-carbonate	
Apr. 5, 1950	476	48	4	4.45	664	13	9.3	0.08	4.6	50	34	9.8		0	355	4.0	0.0	1.6	551	263	263	98
Apr. 12	265	46	2	4.5	705	13	10	.08	4.9	56	35	13		2	360	4.0	.0	1.0	590	284	282	102
Apr. 18	199	56	1	4.6	784	14	11	.11	5.4	63	43	15		1	409	6.5	.0	.6	634	334	333	102
Apr. 25	238	48	1	4.8	661	11	7.1	.08	4.3	55	33	14		3	331	4.5	.0	.6	562	273	270	76
May 2	275	50	1	4.7	600	11	7.6	.08	3.9	49	30	11		4	297	4.0	.0	.8	479	246	242	80
May 9	208	53	2	4.7	664	12	8.8	.07	4.6	57	33	13		4	329	3.0	.0	.5	552	278	275	84
May 16	227	65	2	5.1	617	11	8.6	.12	3.3	52	30	16		16	306	6.0	.0	.6	509	253	240	78
May 22	213	62	2	4.9	597	12	8.6	.11	4.0	52	29	14		14	300	2.5	.0	1.2	482	249	238	74
May 31	303	60	4	4.5	541	11	7.3	.08	3.5	43	27	11		2	265	5.0	.0	1.3	475	218	217	65
June 5	510	60	2	4.35	516	11	8.4	.09	3.5	39	25	10		0	250	4.5	.0	1.1	450	200	200	82
June 12	248	63	2	4.25	697	13	14	.14	4.9	57	36	13		0	361	5.0	.0	.9	644	290	290	93
June 19	199	59	5	4.6	725	13	10	.05	5.0	60	37	14		4	377	6.0	.0	.6	563	302	299	150
June 27	119	79	5	4.6	830	14	11	.07	5.7	74	43	16		2	433	7.5	.0	1.0	653	361	360	176
July 5	266	--	2	4.8	800	13	8.1	.16	4.6	70	42	16		6	404	5.5	.0	.6	637	347	342	114
July 10	151	65	3	4.8	768	13	8.7	.09	4.6	68	40	16		10	387	5.5	.0	1.0	615	334	326	80
July 17	250	72	5	4.6	627	13	10	.12	3.9	48	31	11		6	309	6.0	.0	1.4	484	247	242	100
July 24	190	64	3	4.5	757	10	11	.14	4.9	59	41	19		0	382	7.0	.0	2.6	579	316	316	184
July 31	136	74	2	4.8	854	11	10	.17	5.6	70	42	29		0	447	7.0	.0	.8	678	347	341	212
Aug. 1	128	69	2	4.30	799	13	17	.19	4.5	54	35	12		0	378	5.5	.0	3.0	630	279	279	131
Aug. 21	147	69	3	4.00	780	13	6.8	.09	4.7	66	37	18		0	379	7.0	.0	4.7	587	317	317	214
Aug. 28	80	68	1	4.20	934	14	4.6	.23	6.3	90	53	20		0	491	5.0	.0	2.9	740	442	442	176
Aug. 29	74	77	2	4.10	1,030	16	22	.37	6.0	88	45	16		0	512	6.5	.0	5.9	911	355	355	183
Sept. 5	65	60	2	4.8	914	13	3.0	.18	6.0	90	50	22		6	482	6.0	.0	1.7	733	430	425	222
Sept. 11	173	66	2	4.6	619	11	3.1	.14	3.7	54	29	14		5	295	5.0	.0	5.6	444	254	250	140
Sept. 18	80	65	2	4.8	956	14	3.1	.12	6.4	89	51	28		6	500	9.0	.0	1.5	766	432	427	178
Sept. 25	72	54	4	4.9	924	13	5.2	.15	6.2	86	52	23		8	491	6.5	.0	1.1	731	428	422	152
Average	235	53	3	--	738	11	7.1	0.15	4.5	62	36	19		2	365	5.5	0.0	3.6	579	305	303	96

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT LANDINGVILLE, PA.--Continued

Suspended sediment, water year October 1949 to September 1950

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	80	221	48	89	155	37	65	170	30
2	69	95	18	69	105	20	67	190	34
3	53	129	18	67	280	51	74	195	39
4	54	202	29	101	375	102	61	110	18
5	69	155	29	78	160	34	58	118	18
6	60	87	14	80	114	25	60	148	24
7	67	125	23	65	102	18	65	218	38
8	82	218	48	63	144	24	67	185	33
9	70	180	34	60	235	38	65	253	44
10	54	53	8	60	344	56	65	178	31
11	56	119	18	63	430	73	61	94	15
12	60	130	21	61	334	55	72	212	41
13	67	156	28	70	510	96	258	1,800	1,250
14	60	93	15	159	1,400	601	201	500	271
15	65	132	23	85	170	39	177	248	119
16	58	69	11	87	137	32	157	216	92
17	48	79	10	65	5,850	1,030	136	188	69
18	51	128	18	65	800	140	140	148	56
19	51	122	17	72	397	77	147	200	78
20	49	105	14	78	272	57	134	186	67
21	49	152	20	54	145	21	124	225	75
22	58	210	33	53	190	27	130	202	71
23	60	117	19	51	216	30	175	380	180
24	37	65	6	70	195	37	179	268	130
25	44	120	14	65	232	41	138	82	31
26	130	550	193	61	230	38	163	74	s40
27	67	194	35	65	270	48	560	1,410	2,130
28	58	195	31	49	166	22	462	710	886
29	70	163	31	82	307	68	395	380	405
30	61	58	10	72	222	43	346	365	341
31	105	304	86	--	--	--	312	250	211
Total	1,962	--	922	2,159	--	2,980	5,114	--	6,870
	January			February			March		
1	281	180	137	243	364	239	217	240	141
2	262	230	163	356	465	447	213	215	124
3	265	160	114	408	217	239	188	104	53
4	250	310	209	382	158	163	188	103	52
5	240	216	140	353	70	67	188	80	40
6	248	170	114	318	170	146	177	100	48
7	324	358	313	297	208	167	168	163	74
8	286	115	89	262	405	286	240	184	119
9	262	130	92	369	393	392	359	420	407
10	426	768	s1,090	392	290	307	248	158	106
11	435	510	599	399	88	95	252	127	86
12	405	455	498	399	50	54	265	153	109
13	402	342	371	422	159	181	278	186	140
14	382	293	302	574	244	378	252	278	189
15	327	115	102	828	468	1,050	245	180	119
16	286	222	171	968	830	2,170	229	190	117
17	248	408	273	843	158	360	220	230	137
18	248	412	276	704	144	274	227	183	112
19	236	205	131	606	130	213	215	144	84
20	222	188	113	490	70	93	192	90	47
21	220	130	77	408	145	160	415	574	s764
22	213	75	43	395	168	179	445	265	318
23	188	188	95	382	180	186	961	779	s2,100
24	208	550	306	333	128	115	932	552	1,390
25	192	730	379	294	78	62	952	515	1,320
26	186	480	241	265	42	30	904	418	1,020
27	201	325	176	231	115	72	1,040	570	1,600
28	177	190	91	215	163	94	1,270	990	3,390
29	192	175	91	--	--	--	1,300	760	2,670
30	188	340	173	--	--	--	1,010	258	704
31	222	350	210	--	--	--	843	230	524
Total	8,220	--	7,180	12,136	--	8,220	14,633	--	18,100

s Computed by subdividing day.

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT LANDINGVILLE, PA.--Continued

Suspended sediment, water year October 1949 to September 1950--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	712	135	259	303	240	196	639	1,060	1,830
2	621	170	285	275	182	135	646	582	1,020
3	563	185	281	278	317	238	621	477	800
4	521	280	394	270	254	185	664	495	887
5	476	340	437	265	192	137	510	284	391
6	418	360	406	270	134	98	438	225	266
7	389	332	349	255	110	76	382	162	167
8	366	158	166	222	173	104	343	171	158
9	340	55	50	208	192	108	312	162	136
10	312	130	110	208	197	111	312	166	140
11	289	195	152	199	187	100	306	153	126
12	265	200	143	197	173	92	248	256	171
13	250	170	115	199	144	77	234	234	148
14	252	210	143	188	62	32	346	391	s404
15	245	215	142	204	182	100	286	176	136
16	229	110	68	227	245	150	258	162	113
17	204	130	72	188	226	115	245	207	137
18	199	190	102	238	442	284	215	153	89
19	188	240	122	265	322	230	199	153	82
20	238	280	180	252	182	124	192	104	54
21	213	135	78	240	86	56	186	135	68
22	204	150	83	213	86	49	170	130	60
23	204	105	58	238	259	166	157	117	50
24	220	250	148	340	547	502	168	126	57
25	238	380	244	278	370	278	159	90	39
26	238	258	166	278	226	170	132	63	22
27	220	238	141	275	211	157	119	90	29
28	227	255	156	278	182	137	113	86	26
29	229	178	110	372	408	410	113	90	28
30	252	145	99	318	250	215	126	122	42
31	--	--	--	303	158	129	--	--	--
Total	9,322	--	5,260	7,844	--	4,810	8,839	--	7,680

Day	July			August			September		
1	130	153	54	128	95	33	78	90	19
2	130	108	38	119	80	26	89	144	35
3	155	270	113	136	120	44	103	105	29
4	142	168	65	121	83	27	89	72	17
5	266	892	s1,590	128	90	31	65	84	15
6	356	800	769	147	280	111	60	80	13
7	217	188	110	109	52	15	60	92	15
8	170	81	37	97	54	14	60	70	11
9	149	44	18	97	60	16	74	88	18
10	151	100	41	101	49	13	252	1,060	s1,100
11	697	1,240	s3,050	99	47	13	173	300	140
12	372	345	346	99	85	23	128	97	33
13	340	234	215	103	74	21	130	167	59
14	349	312	s326	87	54	13	128	139	48
15	284	188	144	85	99	23	111	111	33
16	284	184	141	82	55	12	107	100	29
17	250	110	74	74	55	11	101	82	22
18	252	230	157	80	54	12	80	84	18
19	213	212	122	141	488	s287	74	100	20
20	204	180	99	349	1,230	s1,450	82	88	19
21	190	120	62	147	120	48	74	106	21
22	195	128	68	117	115	36	84	132	30
23	190	210	108	105	84	24	99	158	42
24	190	180	92	97	65	17	93	90	23
25	353	820	s953	89	78	19	72	109	21
26	215	135	78	103	90	25	65	163	29
27	195	92	48	97	57	15	67	118	21
28	173	86	40	80	46	10	63	120	20
29	175	114	54	74	52	10	65	117	21
30	168	82	37	74	74	15	74	109	22
31	136	81	30	85	92	21	--	--	--
Total	7,291	--	9,080	3,450	--	2,440	2,798	--	1,940

Total discharge for year (second-foot-days) 83,768
Total load for year (tons) 75,482

s Computed by subdividing day.

SCHUYLKILL RIVER AT LANDINGVILLE, PA.--Continued

Particle-size analyses of suspended sediment, water year October 1949 to September 1950
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second-feet)	Suspended sediment											Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters									
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
Oct. 7, 1949	1:45 p.m.	87	129				13	35	60	86	90	94		97	--	DSWC
Oct. 11	11:00 a.m.	61	86				6	16	61	91	94	97		98	--	DSWC
Oct. 21	2:25 p.m.	51	158				29	48	71	94	97	98		100	--	DSWC
Nov. 9	1:30 p.m.	61	229				12	33	64	90	97	99		100	--	DSWC
Nov. 17	1:45 p.m.	74	a 20,600				8	23	47	100	--	--		--	--	DSWC
Dec. 1	4:05 p.m.	80	153				20	42	73	89	92	97		--	--	DSWC
Dec. 8	3:00 p.m.	74	163				15	45	73	88	93	97		--	--	DSWC
Jan. 6, 1950	10:20 a.m.	Composite	450				2	4	6	44	49	56		73	90	DSWC
Jan. 19	11:35 a.m.															
Jan. 26	11:05 a.m.															
Feb. 6	1:55 a.m.															
Feb. 17	2:50 p.m.															
Feb. 23	1:35 p.m.															
Mar. 10	1:50 p.m.	Composite	294				4	10	15	58	62	69		82	99	DSWC
Mar. 15	11:35 a.m.															
Mar. 22	11:05 a.m.															
Mar. 29	2:20 p.m.	1,170	754				1	5	13	27	38	53		74	86	DSWC
Apr. 5	11:45 a.m.	Composite	215				2	7	13	74	79	84		93	--	DSWC
Apr. 12	12:40 p.m.															
Apr. 18	2:05 p.m.															
May 2	10:40 a.m.															
May 9	11:30 a.m.															
May 16	3:40 p.m.	253	1,610				11	43	74	86	89	90		93	--	DSWC
May 18	8:05 p.m.	192	1,050				4	13	17	86	92	95		96	--	DSWC
May 22	11:25 a.m.	199	336				1	5	9	11	12	13		96	--	DSWC
May 31	9:45 a.m.	Composite	145				1	5	20	37	50	67		83	--	DSWC
June 5	1:30 p.m.															

a Upstream culm detention reservoir breached 11/17/49.

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT LANDINGVILLE, PA.--Continued

Particle-size analyses of suspended sediment, water year October 1949 to September 1950--Continued
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water; W, in diatilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second-feet)	Suspended sediment											Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters									
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
June 12, 1950	11:30 a. m.	243	225				2	8	16	26	30	37		55	--	DSWC
June 19	3:00 p. m.	188	53				2	8	42	54	75	84		97	--	DSWC
June 27	1:45 p. m.	119	129				16	41	58	71	78	83		91	--	DSWC
July 5	9:15 p. m.	119	3,440				1	3	4	82	93	98		99	--	DSWC
July 11	9:00 a. m.	896	1,300				7	19	32	69	79	90		96	--	DSWC
July 11	11:55 a. m.	708	874				6	13	16	62	75	87		96	--	DSWC
July 5	2:30 p. m.	Composite	79				5	20	55	75	82	88		94	--	DSWC
July 10	11:30 a. m.															
July 17	2:05 p. m.															
July 24	2:45 p. m.															
Aug. 19	5:00 p. m.	155	2,630				2	6	10	86	97	99		100	--	DSWC
Aug. 21	11:45 a. m.	153	165				10	30	57	73	79	86		95	--	DSWC
Sept. 10	12:50 p. m.	177	614				4	22	36	55	86	96		98	--	DSWC
Sept. 11	9:05 a. m.	Composite	135				11	10	52	72	79	89		99	--	DSWC
Sept. 25	1:20 p. m.															

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT AUBURN, PA.

LOCATION.--At bridge on State Highway 895, 100 feet downstream from gaging station at Auburn, Schuylkill County, which is 0.4 mile upstream from Pine Creek, and 3 miles downstream from Plum Creek.
DRAINAGE AREA.--160 square miles.
RECORDS AVAILABLE.--Chemical analyses: December 1947 to September 1950.
Sediment records: October 1947 to September 1950.
EXTREMES, 1949-50.--Sediment loads: Maximum daily, 3,830 tons Mar. 23; minimum daily, 7.6 tons Oct. 17.
EXTREMES, 1947-50.--Sediment loads: Maximum daily, 29,540 tons Dec. 30, 1948; minimum daily, 7.6 tons Oct. 17, 1949.
REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1171.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	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	Hardness as $CaCO_3$		Total acidity as H_2SO_4
																				Total	Non-carbonate	
Oct. 7, 1949	69	62	3	4.30	943	11	5.2	0.11	5.5	86	42	30		0	453	8.0	0.0	7.4	720	387	387	54
Oct. 11	63	74	3	4.25	1,010	10	3.6	.11	4.6	88	44	45		0	485	9.0	.0	8.0	774	400	400	46
Oct. 21	63	56	4	4.00	1,010	11	1.3	.02	4.8	92	45	48		0	497	8.0	.0	9.6	773	415	415	38
Oct. 28	63	46	4	3.95	897	12	2.3	.04	5.4	89	42	27		0	437	7.0	.0	9.6	692	395	395	68
Nov. 2	74	50	1	3.95	799	9.9	3.6	.13	4.6	72	41	18		0	383	8.0	.0	8.8	584	348	348	62
Nov. 9	65	52	1	4.05	887	8.8	2.0	.13	4.3	80	45	28		0	435	9.5	.0	9.4	658	385	385	51
Nov. 18	76	42	5	4.15	796	10	3.1	.09	5.2	75	38	18		0	388	7.0	.0	4.5	596	343	343	42
Dec. 1	81	40	5	4.10	902	10	3.1	.11	5.1	78	44	26		0	436	7.0	.0	8.8	690	376	376	54
Dec. 9	79	32	4	4.25	1,030	12	3.9	.11	6.7	96	49	30		0	518	6.5	.0	13	845	441	441	62
Dec. 16	182	32	3	4.05	669	9.0	5.2	.08	3.6	52	31	15		0	301	5.0	.0	9.6	454	257	257	48
Dec. 20	165	45	3	4.25	611	8.6	2.6	.06	3.3	48	27	25		0	281	5.5	.0	6.6	454	231	231	50
Dec. 28	601	43	3	4.40	337	7.9	2.9	.06	1.7	21	15	7.0		0	137	3.5	.0	5.8	212	114	114	26
Jan. 9, 1950	366	38	4	4.15	573	9.8	5.2	.07	2.6	42	26	15		0	260	2.5	.0	5.0	404	212	212	52
Jan. 16	396	42	4	4.20	557	10	4.7	.05	2.9	42	26	14		0	255	2.0	.0	3.6	400	212	212	46
Jan. 25	251	42	3	4.20	688	11	4.9	.16	3.8	58	36	18		0	330	3.0	.0	4.5	504	293	293	54
Jan. 30	273	43	4	4.30	602	10	3.9	.08	3.2	48	30	18		0	280	3.0	.0	5.5	432	243	243	38
Feb. 6	417	37	3	4.15	392	8.8	2.1	.05	1.8	30	19	8.9		0	171	2.0	.0	5.8	269	153	153	40
Feb. 15	1,160	36	2	4.40	256	7.8	1.8	.03	1.0	20	10	4.2		0	95	2.0	.0	6.6	169	91	91	25
Feb. 23	442	37	2	4.25	515	10	5.0	.06	2.7	42	26	10		0	237	3.0	.0	4.4	366	212	212	56
Mar. 1	253	38	2	4.40	607	11	6.6	.07	3.4	51	30	12		0	284	4.0	.0	5.4	443	251	251	56
Mar. 6	187	42	2	4.40	674	12	8.9	.08	3.7	55	35	12		0	326	4.5	.0	4.8	506	279	279	75
Mar. 13	325	37	2	4.35	517	9.4	5.5	.10	3.0	40	24	12		0	239	2.5	.0	4.2	388	198	198	76
Mar. 20	202	37	2	4.6	631	11	7.6	.07	3.7	52	32	12		1	308	2.0	.0	3.2	476	261	261	65
Mar. 27	1,430	43	3	4.40	348	8.0	3.9	.08	1.8	25	15	8.5		0	154	2.0	.0	3.4	252	124	124	48

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT AUBURN, PA.--Continued

Chemical analyses, in parts per million, water year October 1949 to September 1950--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	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	Hardness as $CaCO_3$		Total acidity as H_2SO_4
																				Total	Noncarbonate	
Apr. 3, 1950	580	48	2	4.25	571	12	9.7	0.09	3.8	40	28	12		0	285	3.0	0.0	1.9	466	215	215	94
Apr. 10	328	42	2	4.5	666	12	12	.13	4.5	50	34	8.6		0	333	4.0	.0	3.0	558	265	265	96
Apr. 17	240	41	2	4.6	718	13	12	.10	4.9	58	38	12		1	375	3.5	.0	.8	618	301	300	96
Apr. 24	242	48	2	4.7	740	12	13	.12	5.0	62	38	13		1	390	5.0	.0	.8	665	311	310	92
May 1	363	54	3	4.5	518	9.2	6.1	.08	3.1	38	23	7.8		2	233	3.5	.0	1.1	383	189	188	60
May 9	248	53	2	4.9	612	11	8.2	.05	3.8	50	29	16		16	308	4.5	.0	.4	498	244	231	70
May 15	229	56	2	4.9	644	12	10	.11	4.1	56	32	15		16	334	3.5	.0	.7	534	271	258	78
May 22	251	66	3	4.5	544	10	6.1	.07	3.5	45	27	11		2	266	4.0	.0	1.2	463	223	223	62
May 31	363	61	3	4.45	479	10	4.6	.06	2.9	38	23	8.6		0	228	4.0	.0	1.3	396	189	189	54
June 6	481	60	2	4.35	490	--	--	--	--	--	--	--		--	227	5.0	.0	2.3	--	182	182	118
June 13	259	--	4	4.35	678	12	11	.11	4.3	52	33	11		0	332	5.0	.0	1.0	502	265	265	180
June 22	184	68	5	4.6	704	12	12	.11	4.5	56	35	14		11	354	6.5	.0	.5	530	284	275	166
June 26	143	86	2	4.5	786	13	13	.06	4.8	67	40	16		3	401	3.0	.0	1.6	633	332	329	96
July 5	253	78	2	4.7	801	13	12	.07	4.8	70	41	19		9	413	3.5	.0	1.2	632	343	336	84
July 10	177	67	2	4.8	712	12	7.4	.06	4.3	61	35	13		10	361	3.0	.0	1.8	566	296	288	70
July 17	308	70	3	4.7	580	12	5.7	.15	3.5	45	29	12		5	281	6.5	.0	1.7	447	232	227	102
July 24	205	64	2	4.5	761	9.8	11	.11	4.8	63	32	21		0	382	5.0	.0	2.5	578	289	289	180
July 31	153	73	2	4.5	815	10	11	.15	4.9	69	37	22		0	416	6.0	.0	2.3	628	324	324	200
Aug. 7	127	68	5	4.7	839	14	11	.08	5.1	74	43	20		6	431	5.0	.0	2.6	691	361	357	80
Aug. 14	92	64	3	4.8	968	12	14	.08	6.4	91	53	19		4	509	6.0	.0	1.7	834	445	442	88
Aug. 21	174	63	3	4.10	673	12	6.3	.09	4.3	53	31	14		0	323	4.0	.0	5.6	492	260	260	178
Aug. 28	94	70	2	3.75	910	13	5.7	.18	5.6	79	49	20		0	447	6.0	.0	8.3	668	399	399	148
Sept. 5	79	71	3	3.85	903	13	6.8	.15	5.3	80	47	20		0	452	7.0	.0	7.5	697	393	393	179
Sept. 11	328	68	3	4.5	426	9.4	1.3	.07	2.2	38	19	12		3	183	6.0	.0	6.0	295	168	165	110
Sept. 19	107	62	2	4.6	652	11	2.1	.07	3.7	59	31	18		3	310	6.0	.0	1.4	486	275	272	100
Sept. 25	88	55	2	4.7	800	11	2.8	.13	5.0	76	41	20		5	407	5.5	.0	1.2	630	358	354	172

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT AUBURN, PA.--Continued

Suspended sediment, water year October 1949 to September 1950

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	87	320	75	94	171	43	81	190	42
2	73	234	46	74	98	20	76	170	35
3	57	80	12	74	182	36	85	194	45
4	60	170	28	111	320	96	74	142	28
5	71	277	53	85	156	36	71	125	24
6	66	172	31	85	125	29	77	135	28
7	69	163	30	68	65	12	76	182	37
8	98	245	65	65	128	22	77	194	40
9	76	185	38	65	140	25	79	250	53
10	60	53	8.6	62	200	33	83	204	46
11	63	81	14	66	302	54	74	150	30
12	68	87	16	71	302	58	76	215	44
13	77	121	25	71	300	58	305	1,320	1,090
14	65	87	15	174	1,190	559	270	600	437
15	76	105	22	94	368	93	210	270	153
16	66	78	14	98	220	58	182	202	99
17	56	50	7.6	81	5,700	1,250	172	204	95
18	58	74	12	76	2,130	437	165	126	56
19	62	88	15	88	718	171	180	194	94
20	62	80	13	94	330	84	165	185	82
21	63	107	18	76	295	60	150	230	93
22	69	102	19	68	206	38	155	280	117
23	73	120	24	68	215	39	197	320	170
24	51	58	8.0	81	220	48	232	315	197
25	56	77	12	85	243	56	195	85	45
26	138	540	201	77	230	48	197	210	112
27	77	139	29	83	235	53	692	1,430	s2,800
28	63	168	29	65	218	38	601	525	852
29	74	149	30	98	370	98	500	330	446
30	66	82	15	88	258	61	432	240	280
31	105	263	75	--	--	--	384	260	290
Total	2,205	--	1,000	2,485	--	3,710	6,313	--	7,980
	January			February			March		
1	346	120	112	351	295	279	253	200	137
2	314	125	106	474	255	326	242	155	101
3	408	150	125	566	302	461	205	155	86
4	282	180	137	514	125	173	218	110	65
5	276	210	157	461	140	174	200	108	56
6	279	125	94	417	145	163	187	84	42
7	390	335	353	396	165	176	174	130	61
8	375	225	228	346	172	161	240	217	141
9	366	90	89	442	276	329	414	830	928
10	573	332	s636	510	228	314	279	165	124
11	645	290	505	494	125	167	288	175	136
12	566	155	237	481	111	144	302	150	122
13	531	180	258	491	122	162	325	130	114
14	507	150	205	696	272	511	293	180	142
15	445	195	234	1,160	526	s1,690	276	135	101
16	396	165	176	1,330	488	1,750	253	120	82
17	337	170	155	1,050	182	516	242	150	98
18	337	200	182	820	115	255	242	190	124
19	311	155	130	696	122	229	223	115	69
20	288	130	101	556	141	212	202	70	38
21	270	105	77	468	138	174	506	642	s1,200
22	256	150	104	458	130	161	653	665	1,170
23	229	165	102	442	153	183	1,440	962	s3,830
24	259	300	210	393	127	135	1,430	525	2,030
25	251	415	281	357	102	98	1,400	380	1,440
26	242	375	245	316	93	79	1,230	418	1,390
27	259	305	213	270	107	78	1,430	585	2,260
28	245	190	126	245	128	85	1,560	638	2,690
29	270	170	124	--	--	--	1,520	375	1,540
30	273	320	236	--	--	--	1,190	230	739
31	311	285	239	--	--	--	915	162	400
Total	10,737	--	6,180	15,200	--	9,180	18,332	--	21,480

s Computed by subdividing day.

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT AUBURN, PA.--Continued

Suspended sediment, water year October 1949 to September 1950--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	732	182	360	363	166	163	660	810	1,440
2	660	145	258	351	174	165	696	348	654
3	580	170	266	343	178	165	649	182	319
4	545	176	259	337	191	174	704	231	439
5	484	155	202	319	214	184	562	169	256
6	442	205	245	316	207	177	481	169	220
7	414	185	207	305	132	109	429	133	154
8	387	80	84	270	153	112	393	136	144
9	360	90	87	248	128	86	360	153	149
10	328	75	66	245	174	115	348	105	99
11	302	85	69	237	187	120	348	156	147
12	270	105	77	232	157	98	285	78	60
13	262	155	110	229	146	90	259	101	71
14	267	133	96	218	85	50	363	456	s 497
15	270	135	98	229	106	66	331	217	194
16	256	90	62	270	246	179	290	117	92
17	240	104	68	215	166	96	279	143	108
18	237	164	105	253	260	178	242	98	64
19	223	203	122	322	314	273	237	81	52
20	270	316	230	290	167	131	234	104	66
21	251	202	137	279	97	73	223	114	69
22	226	136	83	251	81	55	184	110	55
23	223	142	86	245	133	88	160	78	34
24	242	143	93	405	592	647	170	98	45
25	293	439	347	334	234	211	172	77	36
26	273	328	242	331	146	130	143	52	20
27	253	215	147	325	159	140	125	88	30
28	265	270	193	328	122	108	120	81	26
29	259	244	171	439	187	222	118	91	29
30	288	142	110	402	124	134	136	147	54
31	--	--	--	363	127	124	--	--	--
Total	10,102	--	4,680	9,294	--	4,660	9,701	--	5,620

Day	July			August			September		
1	136	207	76	136	120	44	87	62	15
2	138	119	44	132	106	38	94	102	26
3	177	260	124	141	141	54	116	137	43
4	165	190	85	136	92	34	102	73	20
5	253	438	s 828	136	108	40	79	51	11
6	543	1,300	s 2,340	160	216	93	71	62	12
7	288	300	233	127	97	33	71	68	13
8	215	240	139	109	141	42	69	70	13
9	184	166	82	109	125	37	79	84	18
10	177	115	55	109	109	32	330	419	s 501
11	940	918	s 2,970	109	117	35	328	610	540
12	517	192	268	109	94	28	208	205	115
13	411	271	301	107	87	25	190	280	144
14	445	495	595	92	88	22	192	270	140
15	351	188	178	88	195	46	167	198	89
16	348	198	186	85	151	35	153	125	52
17	208	205	170	81	132	29	141	175	67
18	293	358	283	85	159	36	120	170	55
19	245	152	100	163	344	s 226	107	125	36
20	226	178	109	387	1,020	s 982	107	142	41
21	210	155	88	174	350	164	96	120	31
22	205	165	91	141	320	122	100	134	36
23	205	128	71	127	112	38	111	184	55
24	205	148	82	118	88	28	107	197	57
25	384	826	s 933	107	92	27	88	80	19
26	229	215	133	113	103	31	79	110	23
27	208	150	84	107	74	21	81	110	24
28	184	136	68	94	53	13	76	110	23
29	184	190	94	83	85	19	76	80	16
30	180	128	62	83	51	11	81	90	20
31	153	114	47	88	84	20	--	--	--
Total	8,687	--	10,920	3,836	--	2,400	3,706	--	2,260

Total discharge for year (second-foot-days) 100,598
Total load for year (tons) 80,030

s Computed by subdividing day.

SCHUYLKILL RIVER AT AUBURN, PA.--Continued

Particle-size analyses of suspended sediment, water year October 1949 to September 1950
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second-feet)	Suspended sediment												Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
Oct. 7, 1949	11:25 a.m.	89	118				12	29	57	85	89	93		97	--	DSWC
Oct. 11	1:25 p.m.	71	87				10	26	64	96	96	98		99	--	DSWC
Oct. 21	11:25 a.m.	71	123				9	33	74	100	--	--		--	--	DSWC
Oct. 28	12:05 p.m.	74	215				14	36	78	95	--	--		--	--	DSWC
Nov. 23	1:25 p.m.	71	336				9	29	57	80	84	86		92	--	DSWC
Dec. 9	2:05 p.m.	83	394				13	41	70	87	90	93		97	--	DSWC
Dec. 20	2:05 p.m.	200	361				4	12	23	34	37	41		50	100	DSWC
Dec. 27	2:45 p.m.	722	1,320				14	28	45	68	81	89		95	--	DSWC
Dec. 16	1:00 p.m.															
Jan. 16, 1950	4:05 p.m.															
Jan. 23	2:25 p.m.															
Jan. 30	1:00 p.m.	Composite	368				1	4	10	38	40	45		61	84	DSWC
Feb. 23	11:00 a.m.															
Mar. 6	1:50 p.m.															
Feb. 15	3:15 p.m.	1,250	536				5	16	34	66	80	91		98	100	DSWC
Feb. 16	10:05 a.m.	1,360	692				7	17	32	58	68	81		94	--	DSWC
Mar. 1	10:15 a.m.	296	180				10	24	48	84	87	94		99	100	DSWC
Mar. 13	10:30 a.m.															
Mar. 20	9:55 a.m.															
Mar. 27	2:20 p.m.	Composite	191				3	9	23	60	72	82		93	--	DSWC
Apr. 3	1:30 p.m.															
Apr. 10	10:25 a.m.															
Apr. 17	10:50 a.m.															
Apr. 24	1:55 p.m.	Composite	121				6	17	27	62	70	78		93	--	DSWC
May 1	1:30 p.m.															
May 9	9:05 a.m.															
May 15	1:50 p.m.															
May 22	3:15 p.m.	Composite	119				5	17	31	43	49	57		79	94	DSWC
May 31	12:25 p.m.															
Aug. 14	8:50 a.m.															
Aug. 20	7:15 p.m.															
Aug. 21	8:35 a.m.	Composite	348				2	3	7	10	76	85		92	98	DSWC
Aug. 28	12:55 p.m.															
Sept. 5	1:50 p.m.															

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT BERNE, PA.

LOCATION.--At gaging station at highway bridge at Berne, Berks County, half a mile upstream from Mill Creek, and 6½ miles downstream from Little Schuylkill River.
DRAINAGE AREA.--355 square miles.
RECORDS AVAILABLE.--Chemical analyses: December 1947 to September 1950.
Water temperatures: February 1948 to September 1950.
Sediment records: October 1947 to September 1950.
EXTREMES, 1949-50.--Dissolved solids: Maximum, 672 ppm Oct. 11-20; minimum, 184 ppm Mar. 21-31.
Hardness: Maximum, 357 ppm Oct. 11-20; minimum, 93 ppm Mar. 21-31.
Specific conductance: Maximum, 881 micromhos Oct. 11-20; minimum, 267 micromhos Mar. 21-31.
Water temperatures: Maximum, 82°F Aug. 29; minimum, freezing Mar. 2.
EXTREMES, 1947-50.--Dissolved solids: Maximum, 755 ppm Sept. 11-20, 1948; minimum, 164 ppm May 5-10, 1948.
Hardness: Maximum, 501 ppm Sept. 11-20, 1948; minimum, 93 ppm Mar. 21-31, 1950.
Water temperatures (1948-50): Maximum, 82°F Aug. 29, 1950; minimum, freezing point on many days during winter months.
Sediment loads: Maximum daily, 90,180 tons Nov. 12, 1947; minimum daily, 0.3 tons Sept. 2, 1949.
REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1171.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (°F)	Color	pH	Specific conductance (micromhos at 25° C)	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	Hardness as $CaCO_3$		Total acidity as H_2SO_4
																				Total	Noncarbonate	
Oct 1-10, 1949..	175		5	3.85	760	12	7.8	0.13	4.3	63	37	17		0	377	4.0	0.0	5.6	569	309	309	96
Oct 11-20	142		5	3.75	881	13	8.3	.19	5.1	74	42	18		0	429	5.0	.0	5.2	672	357	357	94
Oct. 21-31	194		5	3.80	825	11	7.3	.16	4.9	72	42	18		0	406	7.0	.0	6.0	614	352	352	106
Nov. 1-10	224		3	3.60	737	10	7.8	.16	4.2	60	37	11		0	356	7.0	.0	6.2	538	302	302	89
Nov. 11-20	247		5	3.95	692	11	8.4	.11	4.1	56	30	12		0	326	6.0	.0	6.8	496	263	263	78
Nov. 21-30	203		5	3.80	763	12	10	.11	4.9	59	32	14		0	352	5.0	.0	7.2	560	279	279	86
Dec. 1-10	163		3	3.80	816	11	7.3	.13	4.6	65	34	16		0	374	6.0	.0	10	628	302	302	78
Dec. 11-20	512		3	4.00	543	8.8	3.9	.14	3.0	41	20	15		0	234	4.5	.0	6.8	392	185	185	52
Dec. 21-31	890		2	4.25	418	8.2	4.7	.13	1.9	30	19	7.6		0	188	4.5	.0	5.2	284	153	153	42
Jan. 1-10, 1950..	793		2	4.25	420	8.5	5.0	.09	2.0	30	17	7.1		0	184	5.5	.0	4.2	277	145	145	46
Jan. 11-20	1,000		3	4.25	383	8.8	3.4	.07	1.9	28	16	10		0	161	3.5	.0	4.7	262	136	136	42
Jan. 21-31	526		3	4.20	504	9.5	5.0	.08	2.7	37	23	10		0	230	3.0	.0	4.4	364	187	187	50
Feb. 1-10	1,060		4	4.30	325	8.5	2.6	.03	1.6	25	13	6.9		0	136	3.5	.0	4.2	211	116	116	32
Feb. 11-20.....	1,910		4	4.40	284	8.2	2.2	.05	1.4	21	12	6.3		0	115	2.5	.0	4.0	191	102	102	30
Feb. 21-28	930		4	4.40	421	9.8	3.4	.04	2.3	34	20	9.3		0	194	4.0	.0	2.1	304	167	167	44
Mar. 1-10	601		4	4.45	484	9.8	3.9	.05	2.8	40	23	10		0	223	3.5	.0	2.1	351	194	194	50
Mar. 11-20.....	700		4	4.5	418	9.5	3.7	.06	2.3	33	20	8.5		4	190	3.5	.0	2.4	302	161	161	42
Mar. 21-31.....	2,800		4	4.6	267	7.5	2.1	.03	1.3	19	11	6.4		2	110	3.0	.0	2.6	164	93	91	26

Apr. 1-10	1,250		2	5.0	451	10	5.5	.05	2.7	33	21	7.8		2	210	5.0	.0	1.6	344	169	167	68
Apr. 11-20	724		2	4.9	531	11	7.6	.05	3.2	40	27	7.1		1	258	6.0	.0	1.7	417	211	210	78
Apr. 21-30	601		1	5.0	498	10	5.7	.05	3.2	38	25	8.7		2	235	6.0	.0	1.6	403	198	196	82
May 1-10	791		4	4.15	415	8.7	6.7	.10	2.2	30	18	6.0		0	185	3.5	.0	3.7	282	149	149	52
May 11-20	638		5	4.45	485	9.3	7.9	.06	2.7	38	23	7.5		0	226	4.5	.0	3.3	342	185	185	86
May 21-31	841		5	4.5	367	8.4	4.8	.08	1.9	28	17	5.7		0	160	3.5	.0	3.2	249	140	140	66
June 1-10	1,030		3	4.20	365	9.0	5.7	.03	1.9	24	15	7.3		0	157	2.0	.0	3.2	251	122	122	54
June 11-20	561		3	4.30	505	10	8.4	.05	3.0	36	22	12		0	232	2.0	.0	3.2	364	180	180	80
June 21-30	342		2	4.35	781	13	8.6	.16	4.2	58	35	13		0	367	4.0	.0	5.0	593	289	289	110
July 1-10	491		2	4.40	771	12	7.9	.11	4.3	61	35	14		0	360	4.0	.0	4.9	594	296	296	94
July 11-20	840		2	4.6	507	11	5.0	.08	2.7	39	22	9.4		4	223	3.0	.0	5.0	381	188	184	56
July 21-31	433		4	4.6	637	12	8.1	.11	3.8	54	29	9.2		8	314	3.5	.0	1.9	492	254	247	96
Aug. 1-10	274		2	4.5	568	12	11	.13	4.2	55	34	13		0	339	5.0	.0	4.7	568	277	277	92
Aug. 11-20	270		2	3.75	811	13	12	.27	4.6	62	36	15		0	380	6.0	.0	7.3	586	303	303	210
Aug. 21-31	236		1	4.00	732	13	11	.18	4.2	56	33	13		0	340	6.0	.0	4.7	526	275	275	200
Sept. 1-10	213		2	4.00	809	14	12	.11	4.8	65	37	15		0	394	6.5	.0	3.8	602	314	314	218
Sept. 11-20	404		2	4.25	589	12	7.6	.09	3.5	48	26	12		0	276	6.5	.0	3.5	434	227	227	158
Sept. 21-30	211		3	4.25	717	13	12	.18	4.4	58	33	14		0	353	6.5	.0	2.5	550	280	280	198
Average	647		3	--	569	11	6.8	0.10	3.2	45	26	11		1	266	4.5	0.0	4.3	422	218	218	86

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DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT BERNE, PA.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	56	54	40	39	37	37	--	48	61	70	76	80
2	56	50	38	44	40	32	47	54	60	72	77	78
3	55	--	37	45	37	35	49	55	63	74	74	76
4	59	47	36	54	36	35	56	56	62	73	70	76
5	62	47	38	54	39	37	55	62	60	--	68	72
6	61	48	37	50	42	43	48	57	61	69	67	--
7	61	--	35	45	39	37	47	60	64	67	67	--
8	62	45	35	35	34	44	46	54	67	69	68	--
9	63	47	35	35	--	40	46	54	68	74	69	--
10	64	47	35	40	38	37	47	56	72	69	74	--
11	57	47	35	40	45	37	50	56	73	69	71	--
12	66	48	37	36	47	40	52	61	65	69	69	--
13	64	48	36	40	37	42	46	55	65	71	66	--
14	59	50	37	43	36	42	42	66	65	69	64	--
15	62	48	35	40	43	43	44	61	62	68	66	65
16	56	45	33	40	43	38	52	56	62	69	67	65
17	54	44	33	38	43	43	54	60	66	68	74	65
18	55	43	34	40	42	42	55	62	65	72	71	67
19	55	40	--	36	--	--	55	55	65	70	72	65
20	55	40	43	34	34	43	57	52	62	73	70	65
21	53	43	44	35	34	42	52	54	62	70	66	65
22	57	39	46	38	35	41	55	57	66	69	67	64
23	54	38	44	43	37	37	52	60	68	69	70	63
24	54	39	40	45	40	44	46	58	72	69	75	56
25	50	40	35	47	37	45	--	60	75	66	75	55
26	54	37	--	50	34	44	50	62	74	68	79	57
27	47	39	45	45	34	44	--	62	75	66	79	58
28	54	35	43	40	34	53	56	62	70	70	80	60
29	50	36	40	38	--	46	56	53	70	71	82	60
30	53	40	43	42	--	43	52	64	68	73	80	--
31	55	--	37	40	--	44	--	64	--	73	81	--
Average	57	44	38	42	38	41	51	58	66	70	72	--

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT BERNE, PA.--Continued

Suspended sediment, water year October 1949 to September 1950

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	224	5	3.0	294	17	14	189	16	8.2
2	196	5	2.6	241	11	7.2	175	12	5.7
3	178	3	1.4	217	12	7.0	182	14	6.9
4	168	5	2.3	241	a14	9.1	164	12	5.3
5	168	9	4.1	231	a8	5.0	154	23	9.6
6	168	8	3.6	220	a7	4.2	168	64	29
7	161	6	2.6	203	a8	4.4	157	32	14
8	185	9	4.5	203	6	3.3	157	29	12
9	161	6	2.6	199	4	2.2	130	10	3.5
10	140	4	1.5	89	4	2.1	150	5	2.0
11	134	2	.7	196	3	1.6	189	5	2.5
12	134	4	1.5	210	2	1.1	238	10	6.4
13	161	5	2.2	210	9	5.1	755	490	1,000
14	147	3	1.2	420	35	40	910	160	394
15	143	4	1.5	267	14	10	692	49	92
16	147	6	2.4	238	8	5.1	534	76	110
17	137	4	1.5	241	6	3.9	515	63	87
18	134	2	.7	234	4	2.5	420	70	79
19	140	2	.8	220	6	3.6	456	31	38
20	140	3	1.1	231	30	19	414	48	54
21	140	1	.4	224	14	8.5	368	25	25
22	143	5	1.9	210	13	7.4	352	18	17
23	147	2	.8	203	16	8.8	390	31	33
24	137	2	.7	203	17	9.3	636	67	115
25	134	9	3.3	210	17	9.6	438	20	24
26	290	29	23	196	18	9.5	463	40	50
27	254	4	2.8	175	17	8.0	2,140	661	s4,100
28	206	1	.6	185	21	10	1,740	228	1,070
29	206	2	1.1	203	17	9.3	1,320	155	554
30	203	2	1.1	220	12	7.1	1,070	75	217
31	276	11	8.2	--	--	--	870	95	223
Total	5,302	--	85.7	6,734	--	238	16,536	--	8,390
	January			February			March		
1	776	56	117	806	28	61	604	11	18
2	713	15	29	1,100	72	214	564	12	18
3	706	18	34	1,460	106	418	499	8	11
4	685	28	52	1,300	70	246	558	12	18
5	615	5	8.3	1,120	49	148	577	12	19
6	615	8	13	968	30	78	448	8	9.6
7	854	75	173	902	14	34	418	8	9.0
8	846	66	151	748	19	38	473	12	15
9	798	53	114	950	57	146	1,150	82	255
10	1,320	112	s494	1,250	53	179	723	16	31
11	1,770	73	348	1,180	40	127	702	20	38
12	1,420	46	176	1,110	35	105	744	11	22
13	1,300	44	154	1,110	46	138	814	22	48
14	1,190	44	141	1,580	123	525	807	11	24
15	959	22	57	3,220	327	s2,940	737	6	12
16	830	34	76	3,670	334	3,310	695	8	15
17	706	16	31	2,450	198	1,310	667	8	14
18	664	12	22	1,870	110	555	660	11	20
19	636	26	45	1,580	80	341	604	9	15
20	548	26	38	1,320	89	317	570	6	9.2
21	515	19	26	1,180	110	350	1,440	236	s1,570
22	502	15	20	1,100	59	175	1,870	185	934
23	489	18	24	1,080	56	163	4,510	478	s6,020
24	508	15	21	990	25	67	3,450	185	1,720
25	567	12	18	894	20	48	2,850	168	1,290
26	496	22	29	772	14	29	2,270	94	576
27	522	20	28	730	25	49	2,880	145	1,130
28	482	19	25	695	18	34	3,410	210	1,930
29	508	23	32	--	--	--	3,470	235	2,200
30	567	a39	60	--	--	--	2,610	112	789
31	636	a57	98	--	--	--	2,070	107	598
Total	23,743	--	2,650	37,135	--	12,140	43,844	--	19,380

s Computed by subdividing day.
a Estimated.

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT BERNE, PA.--Continued

Suspended sediment, water year October 1949 to September 1950--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	1,750	75	354	926	15	38	1,240	19	64
2	1,570	72	305	942	10	25	1,340	19	69
3	1,410	25	95	926	10	25	1,210	2	6.5
4	1,390	15	56	886	7	17	1,410	6	23
5	1,260	25	85	814	5	11	1,140	1	3.1
6	1,160	16	50	786	5	11	990	1	2.7
7	1,060	19	54	730	6	12	863	2	4.7
8	1,010	10	27	667	6	11	772	1	2.1
9	950	8	21	625	4	6.8	695	4	7.5
10	894	8	19	611	3	4.9	646	1	1.8
11	856	8	18	590	5	8.0	653	1	1.8
12	814	8	18	564	7	11	570	1	1.5
13	779	5	11	551	2	3.0	499	1	1.4
14	772	8	17	532	1	1.4	701	11	s24
15	751	6	12	551	2	3.0	730	4	7.9
16	716	5	9.7	681	1	1.8	570	3	4.6
17	667	3	5.4	558	1	1.5	538	4	5.8
18	625	3	5.1	590	2	3.2	473	6	7.7
19	590	3	4.8	918	6	15	442	5	6.0
20	674	10	18	642	2	4.5	430	3	3.5
21	639	5	8.6	807	2	4.3	424	6	6.9
22	564	3	4.6	737	1	2.0	388	6	6.3
23	532	3	4.3	674	2	3.6	358	3	2.9
24	538	2	2.9	974	15	39	358	6	5.8
25	639	4	6.9	849	3	6.9	358	6	5.8
26	590	7	11	814	3	6.6	334	6	5.4
27	577	5	7.8	751	2	4.0	304	3	2.5
28	639	5	8.6	716	4	7.7	286	10	7.7
29	632	4	6.8	1,050	12	34	298	12	9.7
30	660	4	7.1	974	6	16	310	7	5.9
31	--	--	--	902	16	39	--	--	--
Total	25,708	--	1,250	23,538	--	377	19,330	--	308

Day	July			August			September		
1	304	6	4.9	304	2	1.6	192	2	1.0
2	304	5	4.1	298	1	.8	186	1	.5
3	340	9	8.3	298	1	.8	208	1	.6
4	346	9	8.4	316	2	1.7	214	1	.6
5	382	92	95	280	11	8.3	165	2	.9
6	1,380	178	s940	298	9	7.2	145	1	.4
7	597	10	16	264	8	5.7	140	1	.4
8	460	7	8.7	230	10	6.2	140	2	.8
9	400	7	7.6	225	11	6.7	145	1	.4
10	394	5	5.3	225	9	5.5	593	137	s366
11	1,590	155	s989	225	5	3.0	918	28	69
12	1,100	22	65	220	2	1.2	499	7	9.4
13	807	50	109	203	2	1.1	400	2	2.2
14	1,090	41	129	198	1	.5	448	2	2.4
15	765	12	25	186	2	1.0	382	2	2.1
16	716	15	29	186	1	.5	334	2	1.8
17	674	9	16	176	1	.5	298	1	.8
18	625	6	10	181	1	.5	269	2	1.5
19	544	2	2.9	220	3	1.8	247	2	1.3
20	492	2	2.6	902	46	s120	242	1	.6
21	460	4	5.0	394	4	4.3	236	1	.6
22	430	2	2.3	286	2	1.5	242	2	1.3
23	418	8	9.0	258	1	.7	247	5	3.3
24	406	4	4.4	236	1	.6	236	3	1.9
25	677	18	s37	220	1	.6	214	2	1.2
26	480	6	7.8	220	1	.6	198	2	1.1
27	430	5	5.8	208	1	.6	186	3	1.5
28	388	3	3.1	220	1	.6	186	3	1.5
29	370	1	1.0	192	1	.5	176	1	.5
30	364	4	3.9	181	1	.5	186	1	.5
31	340	6	5.5	186	1	.5	--	--	--
Total	18,073	--	2,560	8,036	--	186	8,272	--	476

Total discharge for year (second-foot-days) 236,251
Total load for year (tons) 48,040.7

s Computed by subdividing day.

SCHUYLKILL RIVER AT BERNE, PA.--Continued

Particle-size analyses of suspended sediment, December 1949 to October 1950
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second-feet)	Suspended sediment												Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
Dec. 27, 1949	1:55 p.m.	Composite	92				5	11	24	40	49	63		86	98	DSWC
Jan. 18, 1950	11:55 a.m.															
Jan. 25	1:10 p.m.															
Feb. 1	1:50 p.m.															
Feb. 8	11:20 a.m.															
Feb. 15	12:05 p.m.															
Mar. 7	10:10 a.m.															
June 16	1:45 p.m.	Composite	35				8	24	49	76	83	88		96	--	DSWC
June 23	2:25 p.m.															
July 11	6:00 p.m.															
July 21	9:50 a.m.															
Sept. 8	11:30 a.m.	Composite	88				7	29	76	98	--	--		--	--	DSWC
Oct. 6	12:00 m.															

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT POTTSTOWN, PA.

LOCATION.--At gaging station at Hanover Street Bridge in Pottstown, Montgomery County.
DRAINAGE AREA.--1,147 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1944 to September 1950.
Water temperatures: October 1944 to September 1950.
Sediment records: March 1948 to September 1950.
EXTREMES, 1949-50.--Dissolved solids: Maximum, 349 ppm Aug. 11-20; minimum, 131 ppm Feb. 11-20.
Hardness: Maximum, 230 ppm Oct. 21-31; minimum, 84 ppm Feb. 11-20.
Specific conductance: Maximum, 511 micromhos Oct. 11-20, 21-31; minimum, 206 micromhos Feb. 11-20.
Sediment loads: Maximum daily, 29,700 tons Mar. 23; minimum daily, 2.3 tons Sept. 7, 8.
EXTREMES, 1944-50.--Dissolved solids: Maximum, 393 ppm Oct. 11-20, 1944; minimum, 119 ppm Mar. 1-10, 1945.
Hardness: Maximum, 258 ppm Oct. 11-20, 1944; minimum, 79 ppm Mar. 1-10, 1945.
Specific conductance: Maximum, 564 micromhos Oct. 11-20, 1944; minimum, 185 micromhos Mar. 1-10, 1945.
Water temperatures: Maximum, 85°F Aug. 29, 1948; minimum, freezing point on many days during winter months.
Sediment loads (1947-50); Maximum daily, 64,100 tons Dec. 31, 1948; minimum daily, 2.3 tons Sept. 7, 8, 1950.
REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1171.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																	Total	Non-carbonate
Oct. 1-10, 1949	490	8	7.0	482	5.8	0.05	48	21	13		53	158	14	0.2	7.2	311	206	163
Oct. 11-20	399	7	7.1	511	5.6	.05	53	23	14		58	177	14	.2	7.2	331	227	179
Oct. 21-31	453	11	7.0	511	5.7	.05	56	22	10		58	172	14	.2	7.2	333	230	183
Nov. 1-10	571	7	7.7	436	3.5	.04	44	18	9.1		56	138	5.5	.2	7.0	290	184	138
Nov. 11-20	587	8	7.2	452	8.8	.04	45	20	7.8		49	143	12	.1	6.7	294	195	154
Nov. 21-30	499	8	7.2	454	8.6	.06	46	20	8.0		46	147	12	.1	8.2	293	197	159
Dec. 1-10	500	8	7.2	473	9.0	.08	47	20	13		47	156	13	.1	9.3	306	200	161
Dec. 11-20	1,220	6	6.7	355	9.1	.06	36	14	9.7		37	114	9.1	.1	8.0	231	147	117
Dec. 21-31	2,144	6	6.6	295	8.7	.03	29	12	6.5		34	88	6.8	.1	8.1	187	122	94
Jan. 1-10, 1950	1,759	7	6.6	287	8.8	.06	28	12	3.8		26	88	5.2	.1	8.7	185	119	98
Jan. 11-20	2,395	5	6.8	261	7.8	.04	26	10	7.0		22	85	5.2	.1	8.8	180	105	87
Jan. 21-31	1,291	5	6.8	341	8.5	.06	33	11	14		30	113	7.0	.1	8.0	236	128	110
Feb. 1-10	3,098	5	6.9	247	7.5	.06	25	9.4	6.0		28	73	5.8	.1	8.4	178	101	78
Feb. 11-20	5,431	7	6.8	206	6.8	.04	21	7.8	5.0		27	57	4.4	.1	9.2	131	84	62
Feb. 21-28	2,129	6	6.9	279	7.5	.04	28	12	5.3		29	87	6.0	.1	9.6	180	119	95
Mar. 1-10	1,389	7	7.1	328	7.9	.09	34	14	9.2		33	113	6.6	.2	9.8	215	142	64
Mar. 11-20	1,678	8	6.9	292	7.8	.05	29	11	8.3		34	87	7.2	.2	8.0	189	118	90
Mar. 21-31	6,444	8	6.6	208	7.7	.04	21	7.9	5.3		26	61	4.0	.2	6.7	134	85	64

Apr. 1-10	2,842	7	6.7	304	7.8	.03	29	13	6.9	24	104	4.9	.2	6.8	200	126	106
Apr. 11-20	1,595	4	6.8	344	7.2	.02	34	15	7.9	29	119	6.0	.2	8.8	236	147	123
Apr. 21-30	1,587	3	6.9	343	6.6	.02	33	15	8.9	32	116	6.2	.2	8.8	230	144	118
May 1-10	1,847	3	7.0	292	6.6	.04	29	12	7.5	32	94	5.4	.2	7.2	208	122	96
May 11-20	1,722	3	6.9	313	6.1	.04	31	13	9.5	36	103	5.9	.2	7.2	224	131	101
May 21-31	2,618	4	6.9	254	6.5	.06	26	9.3	7.2	39	71	4.8	.2	7.0	177	103	71
June 1-10	2,675	4	6.5	261	6.9	.05	27	11	3.4	37	74	5.9	.1	5.2	167	113	82
June 11-20	1,511	4	6.6	336	9.0	.05	36	15	3.8	36	111	6.6	.1	6.4	224	152	122
June 21-30	982	4	6.6	415	8.8	.05	43	19	6.0	38	144	8.2	.1	7.0	283	185	154
July 1-10	1,035	3	6.5	424	8.5	.06	46	20	4.4	30	160	6.6	.2	6.9	296	197	172
July 11-20	1,771	5	6.9	385	8.9	.08	39	16	6.7	25	136	7.5	.1	6.0	262	163	143
July 21-31	934	8	6.9	439	8.0	.07	44	18	12	32	158	9.6	.1	5.9	307	184	158
Aug. 1-10	688	8	6.7	468	9.3	.03	47	19	13	36	165	12	.0	7.6	326	195	166
Aug. 11-20	543	8	6.8	502	8.1	.05	49	21	17	44	175	15	.1	7.8	349	209	173
Aug. 21-31	624	8	6.6	468	10	.06	47	19	15	34	170	12	.0	7.6	341	195	168
Sept. 1-10	532	8	6.9	456	9.9	.06	41	19	18	41	152	14	.1	9.1	319	180	147
Sept. 11-20	1,574	1	6.9	315	8.2	.06	32	12	8.3	40	94	7.8	.2	6.3	203	129	96
Sept. 21-30	658	3	6.8	386	8.0	.06	39	16	9.8	41	125	10	.2	7.5	255	163	130
Average	1,625	6	--	365	7.8	0.05	37	15	8.9	37	120	8.3	0.1	7.6	245	160	123

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT POTTSTOWN, PA.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

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

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT POTTSTOWN, PA.--Continued

Suspended sediment, water year October 1949 to September 1950

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	775	25	52	746	176	355	600	14	23
2	551	6	8.9	654	77	136	550	6	8.9
3	469	5	6.3	554	28	42	500	13	18
4	443	4	4.8	637	33	57	520	4	5.6
5	424	4	4.6	632	27	46	500	2	2.7
6	429	5	5.8	565	26	40	470	2	2.5
7	429	5	5.8	539	16	23	470	2	2.5
8	458	6	7.4	508	20	28	490	2	2.6
9	495	7	9.3	451	30	36	460	4	5.0
10	432	7	8.2	428	68	79	440	2	2.4
11	424	20	23	469	35	44	460	5	6.2
12	400	11	12	479	28	36	650	15	26
13	419	12	14	488	27	36	1,440	167	649
14	448	14	17	578	74	116	2,240	260	1,570
15	409	16	18	926	114	285	1,730	70	327
16	400	27	29	690	24	45	1,320	65	232
17	391	10	11	603	21	34	1,080	65	190
18	368	9	8.9	565	12	18	1,040	25	70
19	359	13	13	549	12	18	1,120	50	151
20	368	19	19	524	9	13	1,120	17	51
21	350	13	12	513	17	24	1,000	24	65
22	354	15	14	490	12	16	930	8	20
23	346	10	9.3	480	12	16	922	11	27
24	350	12	11	470	11	14	1,120	33	100
25	363	13	13	484	7	9.2	1,120	27	82
26	563	63	96	503	2	2.7	987	70	187
27	690	240	447	488	2	2.6	3,990	525	s6,110
28	530	75	107	460	4	5.0	4,680	330	4,170
29	446	36	43	524	9	13	3,610	218	2,120
30	428	29	33	576	9	14	2,930	143	1,130
31	564	58	88	--	--	--	2,300	143	888
Total	13,875	--	1,150	16,573	--	1,600	40,789	--	18,240
	January			February			March		
1	1,930	72	375	2,140	44	254	1,350	16	58
2	1,780	52	250	2,810	98	744	1,300	14	49
3	1,680	75	340	3,870	168	1,760	1,050	9	26
4	1,730	52	243	3,740	117	1,180	1,000	12	32
5	1,540	52	216	3,230	123	1,070	1,160	35	110
6	1,410	16	61	2,870	76	589	1,160	11	35
7	1,780	26	125	2,750	47	349	1,040	11	31
8	2,030	51	279	2,300	41	255	1,210	23	75
9	1,730	32	150	3,010	179	1,450	2,690	185	1,340
10	1,980	58	310	4,260	255	2,930	1,930	84	438
11	3,810	377	3,880	4,000	121	1,310	1,590	35	150
12	3,350	168	1,520	3,610	95	926	1,680	28	127
13	2,930	102	807	3,480	92	865	1,980	38	203
14	2,810	112	850	5,970	364	5,870	2,190	39	231
15	2,460	60	399	7,840	504	10,700	1,830	32	158
16	2,080	32	180	8,680	600	14,100	1,660	68	308
17	1,780	43	207	7,200	338	6,570	1,590	125	537
18	1,680	42	191	5,520	155	2,310	1,500	100	405
19	1,640	24	106	4,400	103	1,220	1,460	57	225
20	1,410	28	107	3,610	70	682	1,280	22	76
21	1,280	20	69	2,690	64	465	2,600	153	s1,360
22	1,240	13	43	2,630	49	348	4,540	332	4,070
23	1,240	10	33	2,580	58	404	10,300	1,010	s29,700
24	1,200	11	36	2,360	79	503	10,400	608	17,100
25	1,280	18	62	2,140	72	416	7,680	294	6,100
26	1,240	16	53	1,830	36	178	6,020	162	2,630
27	1,240	24	60	1,500	13	53	6,160	182	2,690
28	1,240	16	53	1,300	16	56	6,300	180	3,060
29	1,200	47	152	--	--	--	6,600	252	4,490
30	1,360	16	59	--	--	--	5,600	138	2,090
31	1,680	36	163	--	--	--	4,680	84	1,060
Total	55,740	--	11,400	102,320	--	57,560	101,550	--	78,960

s Computed by subdividing day.

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT POTTSTOWN, PA.--Continued

Suspended sediment, water year October 1949 to September 1950--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	4,070	114	1,250	1,920	153	793	3,480	135	1,270
2	3,590	163	1,580	2,320	242	1,520	3,590	157	1,520
3	3,370	49	446	2,180	213	1,250	3,040	97	796
4	3,260	71	625	2,230	173	1,040	3,260	107	942
5	2,930	82	649	1,830	142	702	3,040	88	722
6	2,620	60	424	1,830	75	370	2,520	76	517
7	2,370	59	377	1,740	55	258	2,270	78	478
8	2,170	48	281	1,560	50	211	2,020	42	229
9	2,070	46	257	1,470	58	230	1,830	46	227
10	1,970	36	191	1,390	53	199	1,700	43	197
11	1,920	43	223	1,390	51	191	1,740	38	178
12	1,880	57	289	1,310	52	184	1,560	39	164
13	1,740	49	230	1,270	53	182	1,390	35	131
14	1,650	77	343	1,230	50	166	1,390	33	124
15	1,600	81	350	1,230	47	156	1,970	38	202
16	1,520	49	201	1,650	68	303	1,700	54	220
17	1,470	28	111	1,600	82	354	1,470		
18	1,390	30	113	1,590	63	271	1,350		
19	1,350	20	73	3,020	258	s2,200	1,230	42	142
20	1,430	28	108	2,930	155	1,230	1,310		
21	1,650	68	303	2,470	80	534	1,270		
22	1,470	59	234	2,170	41	240	1,190		
22	1,350	67	244	2,070	57	319	1,070		
24	1,390	28	105	3,150	163	1,390	1,030	34	94
25	1,600	86	372	2,720	108	793	1,030		
26	1,700	86	395	2,520	72	490	958		
27	1,560	33	139	2,320	76	476	898		
28	1,700	94	431	2,070	87	486	824	17	38
29	1,650	281	1,250	2,920	140	s1,190	775		
30	1,600	152	657	3,370	152	1,380	775		
31	--	--	--	3,020	80	652	--	--	--
Total	60,040	--	12,250	64,490	--	19,760	51,680	--	9,459

Day	July			August			September		
1	775	20	42	719	21	42	533	2	2.9
2	747			698			521	2	2.8
3	782			768			606	6	9.8
4	860	40	81	782			692	4	7.5
5	637			740			557	3	4.5
6	1,550	146	s870	660	21	38	497	2	2.7
7	1,700	85	390	634			433	2	2.3
8	1,310	18	64	620			433	2	2.3
9	958	14	36	601	14	23	433	3	3.5
10	1,030	12	33	653	9	16	1,620	372	s3,480
11	2,070	114	s724	620	3	5.0	4,850	410	5,370
12	2,940	207	1,640	801	6	9.7	2,010	40	217
13	1,880	69	350	557	3	4.5	1,310	29	103
14	2,060	45	212	527	3	4.3	1,350	24	87
15	1,810			539	6	8.7	1,600	40	173
16	1,560			509	6	8.2	1,230	12	40
17	1,560			450	9	11	995	10	27
18	1,350	26	87	460	9	11	860	6	14
19	1,230			467	6	7.6	789	2	4.3
20	1,250			706	34	s93	747	6	12
21	1,110	12	31	1,170	70	221	726	15	29
22	995			712	4	7.7	747	4	8.1
23	912			614	2	3.3	768	4	8.3
24	890			801	4	6.5	719	2	3.9
25	958			557	3	4.5	686	4	7.2
26	1,190	34	100	533	3	4.3	627	3	5.1
27	995			515	8	11	808	2	3.3
28	898			475	3	3.8	588	4	6.3
29	817	9	20	501	28	38	569	2	3.1
30	761			497	4	5.4	557	2	3.0
31	747			685	2	3.7	--	--	--
Total	38,332	--	6,000	19,161	--	831	28,641	--	9,840

Total discharge for year (second-foot-days) 593,191
Total load for year (tons) 226,841

s Computed by subdividing day.

SCHUYLKILL RIVER AT POTTSTOWN, PA.--Continued

Particle-size analyses of suspended sediment, March to July 1950
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second-feet)	Suspended sediment												Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
Mar. 23, 1950	7:45 a.m.	9,210	1,210				17	30	44	62	70	76		83		DSWC
Mar. 23	9:00 p.m.	12,120	2,430				7	16	28	46	57	67		77		DSWC
Apr. 20	10:10 a.m.															
May 18	7:40 a.m.	Composite	63				15	25	39	54	69	82		97		DSWC
May 29	2:50 p.m.															
July 6	10:50 a.m.															
July 11	10:30 a.m.															
July 11	11:55 a.m.	Composite	137				4	11	22	34	51	66		89		DSWC
July 12	7:00 a.m.															
July 13	10:40 a.m.															

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT BELMONT FILTERS, PHILADELPHIA, PA.

LOCATION.--At Belmont Filters, Philadelphia, Philadelphia County, 1.6 miles upstream from gaging station at Fairmount Dam in Philadelphia.
DRAINAGE AREA.--1,890 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1950.
Water temperatures: October 1945 to September 1950.
EXTREMES, 1949-50.--Dissolved solids: Maximum, 341 ppm Oct. 1-10; minimum, 124 ppm Feb. 11-20.
Hardness: Maximum, 210 ppm Aug. 21-31; minimum, 80 ppm Feb. 11-20.
Specific conductance: Maximum, 503 micromhos Aug. 21-31; minimum, 201 micromhos Feb. 11-20.
Water temperatures: Maximum, 85°F Aug. 2, 3; minimum, freezing point Jan. 23.
EXTREMES, 1944-50.--Dissolved solids: Maximum, 358 ppm Oct. 11-20, 1947; minimum, 123 ppm Feb. 21-29, 1948, Jan. 1-10, 1949.
Hardness: Maximum, 215 ppm Oct. 11-20, 1947; minimum, 73 ppm Jan. 1-10, 1949.
Specific conductance: Maximum, 537 micromhos Oct. 11-20, 1947; minimum, 189 micromhos Jan. 1-10, 1949.
Water temperatures: Maximum, 85°F Aug. 1, 1949, Aug. 2, 3, 1950; minimum, freezing point on many days during winter months.
REMARKS.--Samples collected at raw-water intake on west side of river at Belmont Filters by City of Philadelphia. Records of specific conductance of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1949 to September 1950 based on records for Schuylkill River at Philadelphia, which are given in Water-Supply Paper 1171.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																	Total	Non-carbonate
Oct. 1-10, 1949	388	7	6.9	492	3.5	0.10	46	22	19		85	135	21	0.2	7.0	341	205	136
Oct. 11-20	261	7	6.8	478	3.3	.08	44	22	14		88	115	23	.2	7.7	326	200	128
Oct. 21-31	368	8	7.9	497	3.9	.04	46	20	14		89	128	10	.2	6.8	318	197	124
Nov. 1-10	476	7	7.6	447	4.2	.04	43	18	10		74	121	8.0	.1	6.6	289	181	121
Nov. 11-20	470	8	7.8	436	4.3	.04	42	18	9.1		76	113	8.5	.2	7.6	282	179	116
Nov. 21-30	351	6	6.9	435	10	.04	44	18	12		69	120	16	.1	8.3	278	184	127
Dec. 1-10	348	8	6.7	447	10	.04	44	18	16		71	121	18	.2	10	286	184	126
Dec. 11-20	1,496	7	6.8	378	10	.06	38	15	11		53	106	14	.1	8.0	240	156	113
Dec. 21-31	3,147	11	6.8	291	10	.06	30	11	8.1		48	75	9.2	.1	8.8	182	120	81
Jan. 1-10, 1950	2,057	8	6.9	272	9.7	.05	26	10	7.8		38	70	7.8	.2	9.1	174	106	75
Jan. 11-20	2,870	6	6.9	261	9.2	.04	25	10	5.6		32	69	7.0	.1	9.4	166	104	77
Jan. 21-31	1,369	6	6.9	321	9.9	.04	31	13	5.9		40	87	9.2	.2	8.3	203	131	98
Feb. 1-10	4,735	8	6.8	245	8.2	.03	23	9.0	9.8		36	65	7.6	.2	8.9	154	94	65
Feb. 11-20	8,587	8	6.9	201	7.6	.03	20	7.3	5.8		32	49	5.9	.1	8.5	124	80	54
Feb. 21-28	3,007	7	7.0	259	8.3	.03	25	10	7.6		37	69	7.5	.1	8.8	162	104	73
Mar. 1-10	1,997	10	6.9	312	9.8	.05	31	12	8.0		47	82	8.9	.1	9.2	200	127	88
Mar. 11-20	2,845	10	7.0	272	9.6	.05	26	10	6.4		38	68	7.9	.2	7.6	172	106	75
Mar. 21-31	10,280	12	6.9	206	8.2	.05	20	7.6	4.3		33	48	5.2	.2	7.0	132	81	54

Apr. 1-10	3,928	8	7.0	265	8.9	.05	26	10	5.8	30	76	6.4	.2	6.4	170	106	81
Apr. 11-20	1,943	3	7.0	315	7.8	.02	30	13	10	42	93	7.9	.1	9.3	216	128	94
Apr. 21-30	1,874	3	7.0	331	7.6	.04	32	14	9.1	47	97	8.8	.1	6.3	231	137	99
May 1-10	2,315	3	7.1	290	6.2	.04	28	12	8.0	43	81	7.6	.2	7.2	200	119	84
May 11-20	2,102	3	7.0	309	7.1	.04	30	13	9.1	49	86	8.5	.2	7.2	214	128	88
May 21-31	3,626	3	7.0	244	9.0	.04	25	8.8	6.7	44	61	6.2	.1	5.8	164	99	63
June 1-10	3,678	4	7.1	244	9.1	.04	26	9.3	4.9	45	61	5.9	.1	6.0	171	103	66
June 11-20	1,692	2	7.1	306	9.4	.04	30	12	9.8	48	85	8.0	.1	7.5	210	124	85
June 21-30	967	4	6.7	351	10	.04	36	15	5.0	59	91	10	.1	6.2	228	152	103
July 1-10	1,040	4	6.8	439	8.8	.05	46	20	7.4	57	138	12	.1	6.9	300	197	150
July 11-20	2,145	5	6.7	329	8.7	.05	34	14	4.0	43	96	8.0	.1	5.5	222	142	107
July 21-31	890	4	6.7	405	7.7	.04	42	17	7.8	54	121	12	.1	5.2	270	175	130
Aug. 1-10	984	4	7.1	406	9.1	.04	40	17	12	59	118	14	.2	5.4	259	170	121
Aug. 11-20	408	5	7.1	466	12	.01	44	19	16	69	130	18	.2	6.5	299	188	131
Aug. 21-31	561	4	7.0	503	10	.12	48	22	13	66	146	19	.2	6.4	331	210	156
Sept. 1-10	484	4	7.0	437	8.9	.02	41	18	12	69	111	18	.2	6.7	279	176	120
Sept. 11-20	1,914	6	7.0	323	13	.03	31	13	7.5	52	82	10	.2	5.7	203	131	88
Sept. 21-30	526	8	7.2	401	16	.02	38	16	13	78	94	15	.2	6.2	256	161	97
Average	2,411	6	--	358	8.6	0.04	34	14	9.3	54	95	11	0.2	7.3	233	144	100

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT BELMONT FILTERS, PHILADELPHIA, PA. --Continued

Temperature (°F) of water, water year October 1949 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	65	58	40	--	44	35	41	--	68	80	83	80
2	65	60	40	--	43	35	45	57	68	80	85	80
3	65	60	41	38	41	33	45	57	66	80	85	80
4	65	60	40	40	40	35	46	57	66	78	80	80
5	64	45	40	40	39	35	49	57	--	76	77	80
6	65	52	38	40	36	36	51	57	66	80	77	78
7	65	51	39	41	37	35	51	61	67	80	76	77
8	66	50	38	48	38	36	50	61	67	80	76	76
9	67	50	38	46	37	36	50	62	69	79	77	76
10	68	53	38	42	37	35	50	64	70	78	77	77
11	69	51	38	43	38	40	--	57	74	75	--	75
12	74	53	38	41	38	39	--	67	75	69	78	76
13	73	57	38	39	39	39	--	65	75	77	78	75
14	70	59	38	50	38	38	--	65	74	77	78	75
15	73	55	42	40	39	39	49	64	74	75	77	75
16	67	55	42	41	39	40	49	66	74	77	78	70
17	66	55	38	39	39	40	48	58	73	75	78	70
18	54	53	38	41	38	40	48	69	72	77	78	70
19	62	50	40	40	38	40	51	67	72	79	78	68
20	67	53	38	40	38	42	53	67	71	80	79	70
21	67	47	39	40	36	40	58	62	72	80	79	--
22	70	46	39	38	37	41	54	60	71	80	78	74
23	62	45	39	32	36	41	54	61	72	80	78	--
24	62	46	39	38	36	40	54	62	73	80	78	70
25	62	43	39	39	35	40	54	65	75	78	78	65
26	65	43	40	40	36	40	55	62	75	80	78	62
27	58	42	42	40	36	40	55	65	79	80	78	65
28	57	41	40	45	35	42	50	65	--	78	78	62
29	57	42	41	45	--	48	50	65	82	80	80	62
30	63	40	42	40	--	47	49	65	70	80	78	62
31	67	--	44	45	--	47	--	65	--	--	80	--
Average	65	51	40	38	38	39	50	63	72	78	79	73

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT MANAYUNK, PHILADELPHIA, PA.

LOCATION.--At Green Lane Avenue Bridge at Manayunk, Philadelphia County, 5 miles upstream from gaging station at Fairmount Dam.
DRAINAGE AREA.--1,893 square miles (above Fairmount Dam).
RECORDS AVAILABLE.--Sediment records: November 1947 to September 1950.
EXTREMES, 1949-50.--Sediment loads: Maximum daily, 186,600 tons Mar. 23; minimum daily, 2 tons Dec. 11.
EXTREMES, 1947-50.--Sediment loads: Maximum daily, 482,100 tons Dec. 30, 1948; minimum daily, 2 tons Dec. 11, 1949.
REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1949 to September 1950 based on records for Schuylkill River at Philadelphia (Fairmount Dam), which are given in Water-Supply Paper 1171, and includes water diverted by the city of Philadelphia for municipal water supply.

Suspended sediment, water year October 1949 to September 1950

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1------	894	32	77	949	27	69	725	10	20
2------	833	13	29	1,050	17	48	724	10	20
3------	691	13	24	858	16	37	656	11	19
4------	646	14	24	680	20	37	626	11	19
5------	587	8	13	761	12	25	624	10	
6------	591	14	22	745	7	14	568	3	5
7------	593	11	18	716	6	12	596	4	6
8------	612	8	13	655	8	14	570	5	8
9------	619	10	17	638	10	17	590	4	6
10------	646	12	21	614	8	13	555	6	9
11------	622	4	7	550	10	15	556	1	2
12------	608	7	12	587	14	22	562	6	9
13------	562	9	14	615	9	15	1,700	1	5
14------	562	6	9	690	14	26	4,080	170	1,860
15------	571	7	11	844	16	36	2,920	115	907
16------	558	10	15	1,160	23	72	2,160	53	309
17------	542	14	20	868	18	42	1,510	38	155
18------	533	9	13	756	12	24	1,300	25	88
19------	502	7	9	697	7	13	1,360	16	59
20------	500	7	9	696	8	15	1,540	16	66
21------	479	10	13	688	8	15	1,490	15	60
22------	499	8	11	474	10	13	1,310	15	53
23------	479	12	16	630	8	14	1,270	21	72
24------	481	9	12	677	4	7	1,240	20	67
25------	480	13	17	682	11	20	1,560	15	62
26------	747	18	36	689	17	32	1,450	60	235
27------	708	13	25	615	6	10	7,420	1,220	s 30,600
28------	928	7	17	620	6	10	8,420	675	15,300
29------	819	20	44	615	8	13	5,790	330	5,160
30------	650	14	25	634	10	17	4,320	125	1,460
31------	859	22	51	--	--	--	3,380	75	684
Total-	19,397	--	644	21,453	--	717	61,552	--	57,340

s Computed by subdividing day.

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT MANAYUNK, PHILADELPHIA, PA.--Continued

Suspended sediment, water year October 1949 to September 1950--Continued

Day	January			February			March		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	2,780	30	225	4,250	97	1,110	2,150	17	99
2	2,440	18	119	5,030	100	1,360	2,170	24	141
3	2,240	16	97	7,170	285	5,520	1,780	17	82
4	2,320	20	125	5,480	140	2,070	1,540	22	92
5	2,270	17	104	4,670	87	1,100	1,680	20	91
6	1,970	18	96	3,920	43	455	1,790	14	68
7	1,950	22	116	3,920	36	381	1,670	10	45
8	2,720	11	81	3,490	29	273	1,700	18	83
9	2,420	17	111	4,440	106	s1,970	4,410	198	2,360
10	2,230	22	133	7,800	363	7,640	4,000	156	1,680
11	4,460	168	2,020	6,320	188	3,210	2,800	60	454
12	4,680	168	2,120	5,360	105	1,520	2,780	34	255
13	3,830	62	641	4,730	83	805	3,940	60	838
14	3,710	54	541	11,500	852	s28,500	5,050	114	1,550
15	3,380	31	283	17,400	1,900	89,300	3,830	45	441
16	2,810	32	243	13,500	1,150	41,900	3,040	26	213
17	2,420	26	170	10,300	680	18,900	2,770	23	172
18	2,160	19	111	7,840	370	7,830	2,650	35	251
19	2,100	17	96	6,420	240	4,160	2,480	43	288
20	1,970	6	32	5,350	175	2,530	2,200	34	202
21	1,640	12	53	4,140	82	917	4,490	200	s4,170
22	1,570	8	34	3,720	59	593	8,130	460	10,100
23	1,540	3	12	3,850	54	561	21,800	2,750	s186,600
24	1,500	3	12	3,680	45	447	17,400	1,480	69,500
25	1,460	6	24	3,330	38	342	11,100	660	19,800
26	1,530	7	29	2,980	30	241	8,670	370	8,660
27	1,500	7	28	2,450	30	198	8,970	300	7,270
28	1,560	10	42	2,080	15	84	9,670	408	10,700
29	1,540	5	21	--	--	--	9,980	366	9,860
30	1,760	8	38	--	--	--	9,000	298	7,240
31	2,550	25	172	--	--	--	7,080	225	4,300
Total	73,010	--	7,930	165,120	--	223,900	170,520	--	347,400

Day	April			May			June		
1	6,020	172	2,800	2,380	22	141	5,080	76	1,040
2	5,380	128	1,860	2,970	22	176	5,780	159	2,480
3	4,860	100	1,310	3,470			4,650	80	1,000
4	4,810	85	1,100	3,290	30	246	4,560	72	886
5	4,520	80	976	2,900			5,120	81	1,120
6	3,920	65	688	2,510			3,740	33	333
7	3,500	48	454	2,480			3,170	22	188
8	3,180	39	335	2,190			2,800	20	151
9	3,020	30	245	1,930	16	92	2,510	16	11
10	2,850	19	146	1,870			2,260	18	11
11	2,700	18	131	1,830			2,250		
12	2,680	18	130	1,740			2,180	22	119
13	2,520	15	102	1,600	13	59	1,870		
14	2,370	29	185	1,540			1,730		
15	2,210	40	239	1,670			1,950		
16	2,110	37	211	1,940	18	94	2,480	18	103
17	2,040	19	105	2,190			2,260		
18	1,940	15	79	2,260	20	122	1,840		
19	1,840	16	79	4,180	96	1,080	1,630		
20	1,860	16	80	4,890	114	1,510	1,630	16	72
21	2,060	17	94	3,700	78	779	1,810		
22	2,140	15	87	3,040	38	312	1,600		
23	1,920	12	62	2,650	26	186	1,440		
24	1,840	13	65	4,430	100	1,200	1,290		
25	2,020	17	93	4,980	102	1,370	1,340	15	53
26	2,310	18	112	3,700	62	619	1,200		
27	2,240	18	109	3,410	41	377	1,120		
28	2,410	24	156	2,900	31	243	995	14	39
29	2,390	22	142	3,580	57	551	981		
30	2,160	22	128	6,100	157	2,590	967	12	31
31	--	--	--	4,480	68	832	--	--	--
Total	85,820	--	12,300	92,800	--	13,950	72,233	--	8,760

s Computed by subdividing day.

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT MANAYUNK, PHILADELPHIA, PA.--Continued

Suspended sediment, water year October 1949 to September 1950--Continued

Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	965	12	31	927	12	30	1,040	18	50
2	976	14	36	889	121	725	747	8	16
3	926			7,790			804	18	39
4	1,030	e 20	56	1,980			949	24	62
5	1,070	e 19	55	1,030	22	64	854	19	44
6	833	10	22	994	18	48	690	13	24
7	2,280	31	19	850	13	30	625	14	24
8	1,690	13	59	629	14	31	587	15	24
9	1,440	12	47	813	16	35	578	11	17
10	2,200	47	279	786	8	17	942	41	104
11	2,300	38	236	864	11	26	5,150	326	s 5,180
12	4,120	115	1,280	806	9	20	3,960	282	3,020
13	3,020	45	367	784	8	17	2,230	62	373
14	2,620	24	170	735	7	14	1,840	34	169
15	2,700			690	10	19	2,400	138	894
16	2,550			696	10	19	2,020	47	255
17	2,110	14	68	648	10	17	1,400	26	98
18	1,930			821	11	18	1,150	15	46
19	1,610			677	13	24	1,000	15	40
20	1,490			711	15	29	936	10	25
21	1,530	10	35	997	27	73	912	8	20
22	1,360			1,200	21	68	930	5	13
23	1,200			831	20	45	959	4	10
24	1,120			758	8	16	897	10	24
25	1,130	11	37	736	8	16	827	5	11
26	1,250			716	10	19	777	6	13
27	1,420			691	8	15	729	6	12
28	1,140			660	10	18	720	9	17
29	1,050	12	32	686	15	28	699	11	21
30	999			706	18	34	717	14	27
31	928			1,070	22	63	--	--	--
Total	50,987	--	3,690	33,221	--	3,030	38,069	--	10,670

Total discharge for year (second-foot-days) 884,182
Total load for year (tons) 690,331

e Estimated.
s Computed by subdividing day.

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DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT MANAYUNK, PHILADELPHIA, PA.--Continued

Particle-size analyses of suspended sediment, January to March 1950
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second-feet) a	Suspended sediment											Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters									
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
Jan. 4, 1950	10:45 a. m.	Composite	219				5	11	24	54	64	79		91		DSWC
Jan. 17	11:00 a. m.															
Jan. 31	12:35 p. m.															
Feb. 16	12:50 p. m.															
Mar. 9	2:05 p. m.															

a Includes diversion for City of Philadelphia water supply.

LITTLE SCHUYLKILL RIVER AT SOUTH TAMAQUA, PA.

LOCATION.--At State Rt. 443 highway bridge, 3½ miles downstream from Panther Creek.
DRAINAGE AREA.--69.6 square miles.
RECORDS AVAILABLE.--Chemical records: April 1950 to September 1950.
Sediment records: April 1950 to September 1950.
EXTREMES.--Sediment loads (April to September 1950): Maximum daily, 542 tons Sept. 10; minimum daily, 7.8 tons Aug. 13.
REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa.

Chemical analyses, in parts per million, April to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	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	Hardness as $CaCO_3$		Total acidity as H_2SO_4
																				Total	Noncarbonate	
Apr. 11, 1950	302	45	2	4.00	762	12	16	0.32	3.6	47	32	8.4		0	335	8.0	0.0	4.0	533	249	249	130
Apr. 18	132	54	2	4.00	898	13	20	.41	4.6	51	40	8.7		0	409	8.0	.0	1.6	668	292	292	172
Apr. 25	148	51	3	3.80	784	12	19	.28	4.2	50	34	9.4		0	385	6.0	.0	2.2	571	265	265	134
May 3	164	51	2	4.10	692	10	13	.25	3.3	42	28	9.5		0	308	4.0	.0	3.0	507	220	220	128
May 10	132	55	2	4.20	701	8.2	19	.95	3.8	47	21	13		0	336	5.0	.0	.8	496	204	204	220
May 22	132	53	2	4.5	710	8.1	21	.17	3.8	52	23	16		0	362	5.0	.0	2.6	546	224	224	228
July 6	161	68	3	4.15	709	12	11	.27	3.6	48	29	8.0		0	322	6.0	.0	1.9	512	239	239	112
July 11	261	67	2	4.10	617	6.2	7.6	.15	2.9	52	23	12		0	285	4.0	.0	.8	427	224	224	138
Aug. 2	78	73	3	3.50	1,190	16	29	.65	7.3	93	57	16		0	649	9.0	.0	.7	934	466	466	372
Aug. 22	76	64	2	3.50	1,140	14	32	.52	7.2	82	54	12		0	619	9.0	.0	.9	897	427	427	390
Sept. 12	80	62	2	3.45	1,220	18	29	.34	7.7	92	58	13		0	657	12	.0	.5	975	468	468	410
Sept. 26	43	54	4	3.35	1,380	18	35	.66	8.7	107	68	18		0	722	17	.0	.5	1,110	547	547	468

DELAWARE RIVER BASIN--Continued

LITTLE SCHUYLKILL RIVER AT SOUTH TAMAQUA, PA.--Continued

Suspended sediment, April to September 1950

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	403	257	281	142	a80	31	198	260	139
2	352	72	68	202	a89	49	191	95	49
3	321	220	191	184	110	55	202	105	57
4	318	276	237	205	85	47	184	45	22
5	299	207	167	178	195	94	202	80	44
6	268	260	188	154	90	38	202	100	55
7	257	105	73	151	45	18	174	195	92
8	223	a60	36	158	1,020	435	151	190	77
9	209	a50	28	142	232	89	142	150	58
10	212	46	26	132	185	66	138	210	78
11	198	280	150	129	100	35	135	75	27
12	184	695	346	118	114	36	112	55	17
13	145	285	112	104	104	29	110	170	50
14	154	109	45	99	45	12	188	520	264
15	191	a80	41	118	375	119	148	175	70
16	148	a40	16	138	152	57	132	145	52
17	132	178	63	115	280	87	124	85	28
18	132	110	39	124	640	214	110	40	12
19	154	260	108	154	580	241	110	125	37
20	181	115	56	142	230	88	112	215	65
21	158	50	21	145	60	23	129	255	89
22	148	a40	16	132	355	127	118	245	78
23	132	a40	14	135	195	71	110	235	70
24	145	230	90	181	340	166	110	135	40
25	148	265	106	164	395	175	104	110	31
26	135	345	126	167	300	135	104	300	84
27	126	178	60	148	110	44	99	230	62
28	124	98	33	135	60	22	99	250	67
29	112	a80	24	198	340	182	102	300	83
30	104	a40	11	171	60	28	102	275	76
31	--	--	--	164	180	80	--	--	--
Total	5,813	--	2,770	4,629	--	2,890	4,142	--	1,970

Day	July			August			September		
1	102	790	218	78	190	40	62	475	79
2	97	150	39	78	280	59	58	245	38
3	102	275	76	90	460	112	68	160	29
4	124	370	124	80	240	52	57	75	12
5	161	875	380	74	190	38	58	240	38
6	161	550	239	72	70	14	54	350	51
7	121	100	33	70	130	25	58	560	88
8	104	90	25	70	225	43	57	560	86
9	102	70	19	68	195	36	54	600	87
10	102	70	19	70	220	24	121	1,660	542
11	261	650	458	68	255	47	99	500	134
12	154	175	73	68	320	59	80	520	112
13	195	625	329	64	45	7.8	90	880	214
14	184	350	174	68	120	22	87	330	77
15	161	173	75	66	360	64	70	315	59
16	161	90	39	64	670	116	58	270	42
17	164	116	51	62	390	65	52	140	20
18	158	196	84	68	470	86	54	170	25
19	132	167	59	138	826	s567	55	410	61
20	129	194	68	154	300	125	54	430	63
21	121	192	63	82	90	20	55	550	82
22	107	110	32	76	260	53	54	625	91
23	104	44	12	74	500	100	47	440	56
24	118	255	81	68	640	117	47	170	22
25	129	220	77	72	850	165	44	200	24
26	104	185	52	68	460	85	43	200	23
27	102	171	47	64	60	10	47	280	36
28	80	120	26	68	270	50	43	210	24
29	78	78	16	64	490	85	43	395	46
30	74	40	8.0	64	610	105	39	395	42
31	74	54	11	60	630	102	--	--	--
Total	3,966	--	3,010	2,330	--	2,510	1,808	--	2,300

s Computed by subdividing day.
a Estimated.

DELAWARE RIVER BASIN--Continued

LITTLE SCHUYLKILL RIVER AT SOUTH TAMAQUA, PA.--Continued

Particle-size analyses of suspended sediment, April to August 1950
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second-feet)	Suspended sediment											Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters									
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
Apr. 6, 1950	3:05 p.m.	268	433				11	33	63	83	91	94		97		DSWC
Apr. 18	9:30 a.m.	Composite	210				4	17	40	85	93	97		99		DSWC
May 3	12:20 p.m.															
May 10	12:45 p.m.															
May 22	12:35 p.m.															
July 1	12:00 m.	102	1,740				4	9	36	95	99	100		100		DSWC
July 5	10:30 p.m.	276	2,570				1	4	9	27	44	64		92		DSWC
July 11	11:10 a.m.	310	642				--	--	--	33	47	69		91		DSWC
Aug. 23	7:00 p.m.	74	518				6	23	39	97	98	99		--		DSWC
Aug. 25	7:00 a.m.	60	1,350				4	13	19	98	99	100		--		DSWC
Aug. 26	10:00 a.m.	64	1,040				7	20	52	98	--	--		--		DSWC
Aug. 30	7:00 a.m.	56	1,180				5	16	39	99	--	--		--		DSWC
Aug. 30	10:00 a.m.	60	1,220				6	19	36	98	--	--		--		DSWC
Aug. 31	10:00 a.m.	62	952				5	20	30	94	--	--		--		DSWC

LITTLE SCHUYLKILL RIVER AT DREHERSVILLE, PA.

LOCATION.--At highway bridge at Drehersville, Schuylkill County, 700 feet downstream from gaging station, which is 2½ miles downstream from Indian Run, and 5½ miles upstream from mouth.
DRAINAGE AREA.--122 square miles.
RECORDS AVAILABLE.--Chemical analyses: December 1947 to September 1950.
Sediment records: October 1947 to September 1950.
EXTREMES, 1949-50.--Sediment loads: Maximum daily, 7,290 tons Dec. 27, 1949; minimum daily, 0.2 tons Aug. 24, 28-31, Sept. 30, 1950.
EXTREMES, 1947-50.--Sediment loads: Maximum daily, 23,130 tons Nov. 8, 1947; minimum daily, 0.2 tons Aug. 24, 28-31, Sept. 30, 1950.
REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1171.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	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	Hardness as $CaCO_3$		Total acidity as H_2SO_4
																				Total	Noncarbonate	
Oct. 3, 1949	62	64	7	3.60	923	9.5	21	0.70	5.7	62	40	17		0	464	5.0	0.0	2.8	744	319	319	170
Oct. 10	62	73	5	3.60	975	12	16	.34	6.5	72	44	19		0	498	8.0	.0	1.0	806	361	361	188
Oct. 17	51	56	5	3.65	1,050	16	17	.16	6.8	79	45	18		0	527	8.0	.0	1.2	815	382	382	216
Oct. 24	48	58	3	3.80	1,120	15	18	.15	7.2	87	52	17		0	567	6.0	.0	4.0	904	431	431	208
Oct. 31	93	61	4	3.45	884	14	16	.17	5.5	68	37	11		0	439	4.0	.0	3.4	662	322	322	150
Nov. 9	73	47	2	3.40	879	13	14	.27	5.4	68	35	14		0	430	5.0	.0	6.6	652	314	314	150
Nov. 15	109	49	1	3.70	567	10	10	.13	3.3	43	24	6.0		0	265	7.0	.0	4.2	392	206	206	111
Nov. 21	78	42	2	3.40	856	12	16	.55	5.1	58	35	12		0	418	5.0	.0	6.0	616	289	289	158
Dec. 2	76	39	5	3.60	936	12	17	.15	5.4	74	38	14		0	458	7.0	.0	6.8	694	341	341	152
Dec. 9	55	32	5	3.55	948	14	21	.15	6.1	68	39	15		0	468	6.0	.0	6.6	709	330	330	168
Dec. 14	264	32	4	4.15	354	8.0	4.7	.08	1.8	24	11	10		0	144	3.5	.0	3.0	244	105	105	50
Dec. 20	163	43	4	4.00	461	9.2	7.6	.10	2.6	31	16	11		0	195	4.5	.0	4.1	333	143	143	72
Dec. 29	435	42	2	4.25	274	7.8	4.4	.06	1.2	17	9.6	2.2		0	109	4.0	.0	2.4	173	82	82	46
Jan. 5, 1950	226	51	3	3.95	480	9.9	9.4	.10	2.4	31	18	9.7		0	211	6.0	.0	4.4	318	151	151	76
Jan. 12	425	37	2	4.25	301	8.1	3.4	.04	1.2	19	11	8.6		0	116	2.5	.0	5.2	190	93	93	48
Jan. 18	256	42	2	4.00	447	9.4	5.5	.09	2.0	28	16	8.0		0	186	4.5	.0	5.4	288	136	136	68
Jan. 25	203	44	2	4.10	499	9.8	10	.09	2.5	34	20	11		0	241	7.0	.0	4.6	343	167	167	76
Feb. 2	336	37	2	4.20	417	8.2	7.1	.08	1.9	29	16	8.0		0	170	7.0	.0	5.8	268	138	138	56
Feb. 8	269	36	1	4.30	413	9.0	8.1	.07	1.7	29	16	5.7		0	173	7.0	.0	3.9	276	138	138	60
Feb. 17	750	39	2	4.35	241	7.5	4.4	.11	.9	15	8.1	3.6		0	99	4.0	.0	5.0	148	71	71	46
Feb. 20	450	34	3	3.95	387	8.9	8.6	.12	1.5	22	14	4.7		0	172	5.0	.0	3.8	249	112	112	66
Feb. 28	247	32	5	3.70	546	10	11	.17	2.8	34	22	5.8		0	248	3.0	.0	2.7	365	175	175	84
Mar. 7	163	37	1	4.00	619	10	14	.13	3.1	42	28	9.6		0	302	7.0	.0	2.6	468	220	220	106
Mar. 14	274	40	2	4.35	428	8.6	6.8	.07	2.0	29	17	5.6		0	179	4.5	.0	4.8	296	142	142	66
Mar. 21	707	37	3	4.5	393	7.5	7.0	.14	2.1	28	16	6.9		2	171	3.0	.0	2.8	281	136	134	64
Mar. 28	1,180	47	3	4.7	242	6.5	3.6	.05	1.0	15	8.4	5.3		2	93	2.0	.0	3.0	154	72	70	40

DELAWARE RIVER BASIN--Continued

LITTLE SCHUYLKILL RIVER AT DREHERSVILLE, PA.--Continued

Chemical analyses, in parts per million, water year October 1949 to September 1950--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	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	Hardness as $CaCO_3$		Total acidity as H_2SO_4
																				Total	Noncarbonate	
Apr. 13, 1950	252	40	3	4.45	395	8.2	7.9	0.08	1.9	26	16	5.1		0	169	2.5	0.0	2.6	284	131	131	74
Apr. 14	235	41	2	4.45	526	10	12	.10	2.9	39	23	10		0	256	3.0	.0	1.9	421	192	192	96
Apr. 18	191	50	3	4.20	558	11	12	.13	3.0	38	23	11		0	266	2.5	.0	2.2	435	189	189	112
Apr. 25	239	52	3	4.05	491	9.4	11	.09	2.7	35	20	10		0	232	3.0	.0	2.2	369	170	170	90
May 2	328	51	2	4.6	366	8.2	6.8	.12	1.8	24	14	6.6		4	161	1.5	.0	2.4	258	117	114	66
May 9	218	52	2	4.45	482	10	9.7	.14	2.6	33	19	8.7		0	219	3.5	.0	4.6	349	160	160	78
May 16	231	62	2	3.85	490	8.9	10	.13	2.7	36	20	7.5		0	229	3.0	.0	2.0	360	172	172	86
May 23	252	--	2	4.10	401	8.2	7.8	.04	2.1	28	17	3.8		0	182	4.5	.0	2.0	336	140	140	67
June 13	170	62	2	3.95	397	8.8	5.7	.07	2.1	27	16	4.3		0	177	5.0	.0	2.4	303	133	133	68
June 19	156	60	3	4.30	553	10	11	.09	2.9	34	22	6.2		0	250	3.5	.0	.4	370	175	175	98
June 27	134	75	2	3.80	1,270	12	22	.12	6.4	104	55	16		0	644	5.0	.0	2.6	985	486	486	212
July 7	195	74	3	4.10	810	12	13	.21	4.2	58	34	12		0	378	3.5	.0	3.6	580	284	284	134
July 18	226	71	2	4.30	665	10	8.7	.10	3.2	56	29	8.0		0	315	3.0	.0	2.7	476	259	259	88
Aug. 7	90	64	2	4.7	909	14	11	.09	6.1	82	49	17		5	470	4.0	.0	2.2	778	406	402	88
Aug. 14	73	65	3	4.8	1,020	15	12	.12	6.8	96	55	22		6	544	6.0	.0	.7	878	466	461	92
Aug. 22	104	61	2	3.60	813	14	18	.19	4.8	54	36	11		0	400	2.0	.0	3.6	600	283	283	280
Sept. 5	64	66	2	3.50	1,010	16	25	.23	6.1	72	47	12		0	530	6.0	.0	2.9	789	373	373	348
Sept. 12	137	66	3	3.65	700	12	15	.11	3.5	48	28	11		0	313	7.0	.0	6.7	476	235	235	202
Sept. 19	90	62	4	3.55	902	15	22	.23	5.1	63	40	12		0	461	6.0	.0	3.3	686	322	322	280
Sept. 26	78	--	3	3.50	1,000	15	26	.52	5.0	70	44	12		0	502	7.0	.0	3.3	769	356	356	330
Average	229	51	3	--	639	11	12	0.16	3.6	46	27	10		0	305	4.5	0.0	3.5	476	227	226	121

DELAWARE RIVER BASIN--Continued

LITTLE SCHUYLKILL RIVER AT DREHERSVILLE, PA.--Continued

Suspended sediment, water year October 1949 to September 1950

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	76	74	15	87	190	45	76	210	43
2	69	69	13	73	610	120	76	182	37
3	62	28	4.7	71	194	37	76	240	49
4	64	105	18	71	320	61	64	165	29
5	69	305	57	80	260	56	69	90	17
6	66	365	65	76	295	60	66	308	55
7	73	510	100	69	90	17	66	275	49
8	82	560	124	76	150	31	64	640	111
9	64	144	25	73	184	36	55	125	19
10	62	54	9.0	69	245	46	60	125	20
11	66	220	39	69	255	48	64	138	24
12	64	345	60	60	450	73	76	175	36
13	73	710	140	69	230	43	296	3,680	2,940
14	60	456	74	166	1,820	816	264	1,450	1,030
15	60	215	35	109	280	82	222	1,050	629
16	57	407	63	98	212	56	191	560	289
17	51	200	28	93	176	44	199	800	430
18	57	500	77	95	230	59	166	425	191
19	57	700	108	87	233	55	180	550	267
20	55	860	131	82	155	34	163	380	167
21	53	505	72	78	59	12	149	320	129
22	55	765	114	78	186	39	140	288	109
23	50	480	65	78	176	37	163	435	191
24	48	70	9.1	78	173	36	180	395	192
25	53	450	64	76	70	14	149	145	56
26	112	1,950	590	76	198	40	163	250	110
27	73	340	67	66	140	25	677	3,800	s 7,290
28	62	248	42	69	131	24	549	1,550	2,300
29	62	264	44	87	189	44	435	890	1,050
30	55	158	23	82	291	65	350	725	685
31	93	510	128	--	--	--	305	500	412
Total	2,003	--	2,400	2,441	--	2,160	5,753	--	18,960

Day	January			February			March		
1	274	340	252	243	61	40	226	34	21
2	264	320	228	336	160	145	207	21	12
3	264	305	217	400	156	168	180	29	14
4	247	290	193	380	111	114	191	38	20
5	226	295	180	346	98	92	173	20	9.3
6	203	225	123	328	72	64	170	19	8.7
7	286	734	s 606	314	53	45	163	18	7.9
8	282	305	232	269	48	35	226	102	62
9	292	230	181	336	182	165	435	207	243
10	448	1,030	s 1,510	365	112	110	292	45	35
11	446	580	730	350	87	82	274	38	28
12	425	405	465	346	87	81	274	37	27
13	395	375	400	365	93	92	300	38	31
14	375	275	278	483	250	326	274	29	21
15	318	225	193	880	835	1,980	260	34	24
16	287	150	116	978	400	1,060	243	32	21
17	264	170	121	750	138	279	226	30	18
18	256	100	69	608	92	151	222	25	15
19	239	85	55	532	66	95	199	16	8.6
20	210	60	34	450	54	66	195	10	5.3
21	199	45	24	385	62	65	707	903	s 2,770
22	191	30	15	360	60	58	614	180	298
23	188	40	20	341	50	46	1,180	385	1,230
24	210	110	62	314	35	30	986	168	447
25	203	48	26	292	36	28	902	120	292
26	184	31	15	256	36	25	792	104	222
27	188	28	14	247	25	17	986	112	298
28	170	40	18	247	35	23	1,180	188	599
29	188	57	29	--	--	--	1,180	151	481
30	199	50	27	--	--	--	932	102	257
31	214	78	45	--	--	---	750	72	146
Total	8,155	--	6,480	11,501	--	5,480	14,939	--	7,670

s Computed by subdividing day.

DELAWARE RIVER BASIN--Continued

LITTLE SCHUYLKILL RIVER AT DREHERSVILLE, PA.--Continued

Suspended sediment, water year October 1949 to September 1950--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	652	49	86	341	45	41	328	14	12
2	584	30	47	328	18	16	314	15	13
3	538	28	41	328	14	12	292	13	10
4	527	30	43	314	13	11	390	32	34
5	478	30	39	300	13	11	323	10	8.7
6	420	30	34	282	12	9.1	300	10	8.1
7	375	23	23	252	10	6.8	274	5	3.7
8	355	14	13	231	9	5.6	247	4	2.7
9	336	21	19	218	12	7.1	226	7	4.3
10	210	18	15	207	10	5.6	218	5	2.9
11	296	12	9.6	199	8	4.3	214	4	2.3
12	274	30	22	194	10	5.0	188	2	1.0
13	252	31	21	170	6	2.8	170	2	.9
14	235	29	18	166	5	2.2	252	19	13
15	226	19	12	188	6	3.0	231	6	3.8
16	207	14	7.8	231	8	5.0	188	4	2.0
17	199	11	5.9	180	6	2.9	180	3	1.5
18	191	11	5.7	207	18	10	156	4	1.7
19	184	10	5.0	305	32	26	156	4	1.7
20	269	32	23	292	21	17	156	3	1.3
21	226	9	5.5	274	11	8.1	170	8	3.7
22	199	9	4.8	260	12	8.4	157	13	5.5
23	191	6	3.1	252	8	5.5	153	12	5.0
24	214	18	10	318	33	28	149	12	4.8
25	239	14	9.0	274	18	13	140	13	4.9
26	243	16	10	269	9	6.5	137	16	5.9
27	231	12	7.5	239	9	5.8	134	16	5.8
28	239	10	6.5	222	4	2.4	124	17	5.7
29	226	9	5.5	328	25	22	124	23	7.7
30	239	12	7.7	287	11	8.5	124	23	7.7
31	--	--	--	282	4	3.0	--	--	--
Total	9,155	--	560	7,928	--	315	6,215	--	185

Day	July			August			September		
1	124	19	6.4	115	6	1.9	76	4	0.8
2	109	16	4.7	112	6	1.8	76	6	1.2
3	112	25	7.6	121	8	2.6	76	4	.8
4	149	42	17	118	4	1.3	69	4	.8
5	244	79	s 132	101	6	1.6	64	6	1.0
6	358	104	s 141	93	4	1.0	64	7	1.2
7	195	20	11	90	6	1.5	64	6	1.0
8	160	20	8.6	90	8	1.9	64	7	1.2
9	149	14	5.6	87	4	.9	64	5	.9
10	153	18	7.4	87	4	.9	184	115	57
11	310	112	94	85	6	1.4	207	34	19
12	239	42	27	82	5	1.1	137	11	4.1
13	252	41	28	73	6	1.2	124	13	4.3
14	323	56	49	73	2	.4	137	17	6.3
15	247	15	10	78	6	1.3	109	10	2.9
16	231	13	8.1	78	4	.8	107	11	3.2
17	239	13	8.4	78	3	.6	87	7	1.6
18	226	17	10	80	3	.6	82	6	1.3
19	195	9	4.8	201	183	s 245	90	10	2.4
20	184	8	4.0	306	161	s 170	93	8	2.0
21	170	13	6.0	127	9	3.1	85	8	1.8
22	160	9	3.9	104	4	1.1	93	8	2.0
23	146	10	3.9	93	2	.5	93	8	2.0
24	156	18	7.6	87	1	.2	80	8	1.7
25	239	64	41	85	4	.9	73	7	1.4
26	166	12	5.4	85	2	.5	78	9	1.9
27	156	12	5.0	73	2	.4	78	6	1.3
28	134	10	3.6	71	1	.2	78	6	1.3
29	124	5	1.7	76	1	.2	76	4	.8
30	118	5	1.6	76	1	.2	76	1	.2
31	109	4	1.2	78	1	.2	--	--	--
Total	5,877	--	666	3,103	--	445	2,784	--	127

Total discharge for year (second-foot-days) 79,854
Total load for year (tons) 45,448

s Computed by subdividing day.

LITTLE SCHUYLKILL RIVER AT DREHERSVILLE, PA.--Continued

Particle-size analyses of suspended sediment, October 1949 to July 1950
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second-feet)	Suspended sediment												Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
Oct. 10, 1949	1:10 p. m.	55	86				14	38	52	80	91	94		97		DSWC
Oct. 17	2:00 p. m.	50	81				14	36	58	89	92	94		97		DSWC
Oct. 24	1:40 p. m.	43	45				15	36	67	100	--	--		--		DSWC
Oct. 31	1:35 p. m.	140	737				4	15	45	97	100	--		--		DSWC
Nov. 9	10:40 a. m.	76	203				17	47	74	94	97	98		100		DSWC
Nov. 15	1:10 p. m.	101	127				11	45	76	96	100	--		--		DSWC
Dec. 2	9:15 a. m.	73	237				16	48	75	93	95	98		--		DSWC
Dec. 4	12:50 p. m.	59	173				15	36	72	93	97	99		--		DSWC
Jan. 5, 1950	12:35 p. m.	222	108				14	37	59	76	90	96		--		DSWC
Jan. 31	9:30 a. m.	210	1,510				--	--	--	0	1	3		15	68	DSWC
Mar. 3	3:35 p. m.	Composite	86				4	10	29	52	68	85		96		DSWC
Mar. 10	3:15 p. m.															
Mar. 22	3:00 p. m.															
Apr. 14	12:50 p. m.															
May 2	7:50 a. m.															
June 1	3:10 p. m.	Composite	6				33	55	74	89	89	92		96		DSWC
June 20	1:45 p. m.															
July 18	11:50 a. m.															

DELAWARE RIVER BASIN--Continued

PERKIOMEN CREEK AT GRATERS FORD, PA.

LOCATION.--At highway bridge at Graterford, Montgomery County, 1,650 feet downstream from gaging station at Graterford.
DRAINAGE AREA.--279 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1948 to September 1950.
Sediment records: April 1948 to September 1950.
EXTREMES, 1949-50.--Sediment loads: Maximum daily, 19,600 tons Mar. 23; minimum daily, 0.0 tons Sept. 24.
EXTREMES, 1947-50.--Sediment loads: Maximum daily, 19,600 tons Mar. 23, 1950; minimum daily, 0.0 tons Sept. 24, 1950.
REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1171.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
Oct. 6, 1949	40	71	10	7.6	222	7.8	0.02	24	8.3	9.3		94	29	7.0	0.0	0.8	135	94	17
Oct. 20	43	64	12	7.9	248	11	.02	26	9.7	12		110	27	7.0	.0	.4	149	105	15
Nov. 3	67	51	15	7.9	251	14	.02	25	11	11		98	33	9.0	.1	1.8	155	108	27
Nov. 16	88	56	5	7.2	215	14	.01	22	8.1	10		77	29	7.0	.0	3.4	134	88	25
Dec. 6	58	36	6	7.9	237	13	.01	25	9.0	10		91	32	7.0	.0	2.8	146	99	25
Dec. 22	183	46	10	6.9	212	12	.04	21	8.2	10		52	44	7.5	.0	6.8	136	86	44
Dec. 27	4,790	56	60	6.6	145	10	.49	12	6.6	5.2		24	32	5.0	.0	8.8	110	57	37
Jan. 4, 1950	250	50	15	7.0	198	13	.06	19	8.2	7.9		48	39	7.0	.0	8.0	133	81	42
Jan. 24	163	39	10	7.6	207	12	.07	20	8.7	6.8		58	38	5.0	.0	7.9	136	86	38
Feb. 9	2,090	37	13	6.9	152	10	.10	13	5.7	7.6		32	33	4.5	.0	7.4	99	56	30
Feb. 14	3,730	39	25	7.0	143	9.2	.22	13	5.8	6.5		29	33	4.0	.0	7.2	98	56	33
Feb. 21	260	32	5	7.9	171	14	.02	16	7.0	6.4		40	35	5.0	.0	8.0	117	69	36
Mar. 9	1,190	42	30	7.7	147	9.5	.36	14	5.9	5.6		34	29	5.0	.0	7.2	103	59	31
Mar. 23	7,020	41	70	7.3	108	7.2	.88	10	4.5	4.2		18	25	2.0	.0	8.0	94	43	29
Apr. 4	446	62	5	7.9	159	13	.02	16	6.5	6.6		46	31	4.0	.0	5.6	108	67	29
Apr. 20	142	55	5	8.0	186	7.5	.02	19	7.5	9.0		62	31	5.5	.0	3.2	117	78	27
May 18	126	63	7	7.3	211	10	.02	22	8.6	7.2		80	32	5.0	.0	2.3	124	90	25
May 31	434	54	20	6.9	168	13	.02	17	6.8	5.3		51	32	3.5	.0	3.5	112	70	29
June 14	98	66	10	7.4	194	11	.03	21	7.9	8.0		75	29	5.0	.0	2.0	118	85	23
June 29	49	74	5	7.3	210	11	.04	22	7.7	11		90	27	5.0	.0	2.4	129	87	13
July 13	102	79	10	7.2	177	11	.05	18	7.0	7.9		68	25	6.0	.0	3.1	114	74	18
July 27	44	77	4	7.0	210	6.8	.21	24	8.2	11		122	5.6	6.0	.0	3.1	130	94	0
Aug. 3	58	75	10	7.4	203	8.2	.02	21	7.7	9.9		79	27	6.5	.0	2.7	121	84	19
Aug. 8	40	81	6	7.4	230	12	.01	24	8.2	11		100	28	2.5	.0	1.6	142	94	12
Sept. 13	96	65	15	7.0	191	13	.01	19	6.9	7.2		65	29	7.5	.0	2.6	121	76	22
Sept. 27	44	53	5	7.2	246	7.8	.02	24	9.5	11		86	34	7.0	.0	2.2	140	99	28

DELAWARE RIVER BASIN--Continued

PERKIOMEN CREEK AT GRATERS FORD, PA.--Continued

Suspended sediment, water year October 1949 to September 1950

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	71	10	1.9	166	23	10	86	3	0.7
2	51	14	1.9	94	9	2.3	69	4	.7
3	52	12	1.7	67	4	0.7	65	6	1.1
4	43	12	1.4	76	3	.6	58	5	.8
5	38	10	1.0	83	3	.7	65	5	.9
6	40	8	0.9	65	2	.4	58	6	.9
7	42	8	.9	60	3	.5	56	2	.3
8	45	9	1.1	54	2	.3	65	3	.5
9	45	9	1.1	51	2	.3	54	4	.6
10	45	11	1.4	52	3	.4	54	4	.6
11	43	10	1.2	52	7	1.0	67	2	.4
12	45	8	1.0	47	6	.8	122	3	1.0
13	37	6	.6	51	8	1.1	1,490	230	925
14	35	6	.6	202	26	14	818	120	265
15	42	6	.7	138	25	9.3	354	14	13
16	34	6	.5	88	16	3.8	217	7	4.1
17	40	4	.4	71	8	1.5	176	4	1.9
18	38	3	.3	63	7	1.2	162	2	.9
19	35	4	.4	63	4	.7	258	2	1.4
20	43	7	.8	58	6	.9	290	2	1.6
21	33	11	1.0	63	5	.9	209	4	2.3
22	31	8	.7	58	6	.9	183	7	3.5
23	31	8	.7	52	8	1.1	187	7	3.5
24	37	10	1.0	42	5	.6	338	12	11
25	32	16	1.4	53	4	.6	209	10	5.6
26	72	17	3.3	52	6	.8	183	a10	4.9
27	122	20	6.6	49	6	.8	4,790	500	6,470
28	71	11	2.1	49	4	.5	2,380	40	257
29	60	12	1.9	58	3	.5	940	13	33
30	58	16	2.5	94	2	.5	480	6	7.8
31	131	22	7.8	--	--	--	290	6	4.7
Total	1,542	--	48.8	2,171	--	57.7	14,773	--	8,020
	January			February			March		
1	250	6	4.0	935	13	33	178	6	2.9
2	230	6	3.7	1,790	49	s325	163	4	1.8
3	220	5	3.0	1,500	26	105	115	4	1.2
4	250	2	1.4	595	3	4.8	120	5	1.6
5	220	1	0.6	417	2	2.2	135	5	1.8
6	190	6	3.1	408	3	3.3	139	3	1.1
7	290	11	8.6	588	6	9.5	123	2	0.7
8	300	11	8.9	365	3	3.0	231	20	12
9	230	5	3.1	2,090	103	s1,050	1,190	170	546
10	800	14	30	1,530	57	235	343	52	48
11	1,300	42	147	1,050	11	31	280	32	24
12	450	7	8.5	637	10	17	356	25	24
13	350	5	4.7	678	17	31	1,180	95	303
14	440	9	11	3,730	123	s1,310	750	80	162
15	350	9	8.5	4,730	143	s1,980	440	65	77
16	270	3	2.2	1,730	33	154	366	25	25
17	220	5	3.0	1,020	10	28	314	12	10
18	210	3	1.7	740	6	12	309	12	10
19	230	2	1.2	540	4	5.8	244	9	5.9
20	165	2	.9	350	a3	2.8	226	a19	12
21	156	1	.4	260	a3	2.1	2,080	299	s2,680
22	152	1	.4	280	a3	2.3	1,170	110	348
23	163	1	.4	295	a6	4.8	7,020	785	s19,600
24	163	1	.4	280	5	3.8	1,680	45	204
25	170	2	.9	260	6	4.2	956	20	52
26	156	2	.8	190	6	3.1	775	27	56
27	193	3	1.6	160	6	2.6	1,480	112	448
28	210	4	2.3	150	10	4.1	1,520	130	535
29	248	4	2.7	--	--	--	971	52	136
30	350	5	4.7	--	--	--	871	68	160
31	924	36	s110	--	--	--	528	27	39
Total	9,850	--	380	27,298	--	5,370	26,253	--	25,530

s Computed by subdividing day.
a Estimated.

DELAWARE RIVER BASIN--Continued

PERKIOMEN CREEK AT GRATERS FORD, PA.--Continued

Suspended sediment, water year October 1949 to September 1950--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	434	16	19	257	8	5.6	604	31	50
2	388	14	15	270	6	4.4	581	87	136
3	361	20	19	309			329	18	16
4	446	22	26	270			672	12	22
5	361	6	5.9	218	6	4.0	430	10	12
6	314	2	1.7	193			270	7	5.1
7	262	1	.7	174			205	3	1.7
8	239	2	1.3	139			159	4	1.7
9	222	3	1.8	120	6	2.2	139	4	1.5
10	201	2	1.1	117			126		
11	197	3	1.6	117			120	8	2.4
12	189	5	2.6	109	4	1.2	106		
13	178	4	1.9	104			93		
14	170	2	.9	101			98		
15	156	1	.4	101			133	8	2.6
16	152	2	.8	139	5	1.6	126		
17	146	3	1.2	120			117		
18	142	4	1.5	126			93		
19	139	6	2.2	548	12	11	88	8	2.1
20	142	8	3.1	324			98		
21	159	8	3.4	205			104		
22	139	4	1.5	152	29	13	93		
23	136	4	1.5	160			79	7	1.5
24	152	7	2.9	1,200	50	162	72		
25	205	6	3.3	749	51	103	79		
26	193	4	2.1	372	13	13	69		
27	182	6	2.9	280	8	5.3	59	8	1.2
28	185	6	3.0	214			52		
29	174	6	2.8	1,160	103	s 533	49		
30	170	8	3.7	796	27	58	52	6	.8
31	--	--	--	434	9	11	--	--	--
Total	6,534	--	135	9,576	--	1,010	5,295	--	285.0

Day	July			August			September		
1	51	6	0.78	32	7	0.65	114	19	5.9
2	45			36			61	8	1.3
3	49	12	1.8	58	68	11	56	4	.6
4	60			82	57	13	99	7	1.9
5	59			61	44	5.6	69	2	.4
6	56	4	.59	46	31	3.9	48	5	.6
7	53			44	4	.45	43	2	.2
8	48			40			36	a3	.3
9	42			34	4	.4	34	a3	.3
10	116	10	5.0	37	4	.4	131	a4	1.4
11	361			58	4	.6	419	a52	59
12	229			44	4	.5	139	12	4.5
13	102	4	1.1	37	4	.4	96	4	1.0
14	144			37	2	.2	149	3	1.2
15	93	6	1.6	32	2	.2	139	1	.4
16	79			32	10	.9	93	34	8.5
17	79			29	8	.6	70	1	.2
18	69			27	7	.5	59	1	.2
19	58	4	.62	27	2	.1	56	1	.2
20	52			30	1	.1	54	1	.1
21	53			33	3	.3	49	1	.1
22	44			31	5	.4	53	1	.1
23	42			31	6	.5	63	1	.2
24	44	4	.49	30	5	.4	59	0	.0
25	47			30	4	.3	54	1	.1
26	49			26	6	.4	45	1	.1
27	44			25	5	.4	44	1	.1
28	43	4	.46	29	6	.5	43	1	.1
29	35			24	6	.4	42	1	.1
30	35			28	7	.5	42	1	.1
31	38	7	.70	178	38	18	--	--	--
Total	2,319	--	42.9	1,288	--	62.7	2,459	--	89.2

Total discharge for year (second-foot-days) 109,360
Total load for year (tons) 41,031.3

s Computed by subdividing day.
a Estimated.

PERKIOMEN CREEK AT GRATERS FORD, PA.--Continued

Particle-size analyses of suspended sediment, December 1949 to May 1950
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second-feet)	Suspended sediment													Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
Dec. 13, 1949	2:55 p.m.	2,350	459				19	41	70	94	98	--		--		DSWC
Dec. 22	3:55 p.m.	Composite	95				30	55	78	96	98	99		100		DSWC
Dec. 27	2:30 p.m.															
Jan. 4, 1950	12:10 p.m.															
Jan. 11	11:50 a.m.															
Jan. 24	9:35 a.m.															
Jan. 30	2:50 p.m.															
Feb. 5	2:50 p.m.															
Feb. 14	11:50 a.m.															
Mar. 9	12:05 p.m.															
May 29	2:00 p.m.	2,150	76				20	41	61	83	89	95		99		DSWC

DELAWARE RIVER BASIN--Continued

BRANDYWINE CREEK AT CHADDS FORD, PA.

LOCATION.--At gaging station at Pennsylvania Railroad bridge at Chadds Ford, Delaware County.
DRAINAGE AREA.--287 square miles.
RECORDS AVAILABLE.--Chemical analyses: January 1948 to September 1950.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1171.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
Oct. 3, 1949	108	--	7	7.1	187	9.9	0.04	17	6.0	9.3		59	22	8.1	0.2	5.0	113	67	19
Nov. 10	119	--	7	7.9	192	5.1	.03	17	6.2	8.5		55	25	7.1	.1	6.2	119	68	23
Dec. 17	150	--	12	6.6	183	11	.33	16	5.9	8.1		44	27	8.5	.0	7.0	112	64	28
Jan. 18, 1950	--	--	7	6.9	171	12	.05	16	5.8	7.8		47	24	6.9	.1	8.9	107	64	25
Feb. 24	304	--	11	6.8	160	14	.12	14	5.1	7.2		40	21	7.8	.1	7.0	99	56	23
Mar. 27	564	--	6	7.4	141	12	.12	13	4.7	6.7		35	23	5.1	.0	8.0	94	52	23
May 4	421	56	5	6.7	133	12	.10	12	4.4	7.0		38	18	5.6	.2	8.1	93	48	17
June 8	309	70	5	6.2	147	10	.12	13	4.9	7.6		45	18	5.8	.1	6.4	96	53	16
July 13	260	76	5	7.6	132	11	.03	12	3.9	5.4		36	17	4.5	.2	4.4	91	46	16
Aug. 17	149	72	3	7.6	176	8.8	.04	16	5.7	8.3		57	19	7.8	.2	4.0	109	63	17
Sept. 22	370	61	7	7.8	179	--	--	---	--	9.6		52	23	7.8	--	6.7	--	62	19

BRANDYWINE CREEK AT WILMINGTON, DEL.

LOCATION.--At Henry Clay Bridge, in Wilmington, New Castle County, 0.2 mile upstream from gaging station at Wilmington, and 4.4 miles upstream from mouth.
DRAINAGE AREA.--314 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1950.
Sediment records: December 1946 to September 1950.
REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1171.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
Oct. 1, 1949.....	a153	65	6	7.0	183	7.5	0.04	17	5.6	8.9		58	22	7.1	0.2	4.6	115	65	18
Nov. 8	a140	48	7	7.4	170	6.0	.04	16	5.6	6.2		50	21	6.5	.1	5.3	106	63	22
Nov. 30	a180	39	6	7.3	179	6.0	.06	16	5.6	8.4		50	24	6.9	.1	6.5	111	63	22
Dec. 31	225	36	20	6.5	158	12	.08	14	5.2	6.5		41	22	6.5	.1	5.7	103	56	23
Jan. 31, 1950	407	44	8	7.3	160	10	.05	15	5.5	6.7		45	22	6.4	.1	7.0	101	60	23
Feb. 28	210	34	10	7.1	163	14	.13	15	5.3	5.9		42	21	7.0	.0	7.5	101	59	25
Apr. 1	550	--	13	7.7	140	12	.04	13	4.9	7.4		42	20	6.1	.1	5.7	91	53	18
Apr. 28	614	56	5	6.6	136	7.2	.10	12	4.3	7.8		37	19	6.8	.1	5.8	89	48	17
May 31	510	64	5	6.8	131	12	.08	11	4.5	6.7		38	17	4.8	.1	5.7	89	46	15
June 30	a265	--	1	7.0	151	12	.04	14	5.0	7.5		48	19	6.0	.1	4.9	100	56	16
Aug. 1	a149	--	10	6.8	163	--	--	--	--	8.5		54	19	6.8	--	3.4	--	58	14
Sept. 1	a295	--	8	7.4	158	--	--	--	--	8.4		46	21	7.1	--	3.3	--	54	16

a Mean daily discharge.

DELAWARE RIVER BASIN--Continued

BRANDYWINE CREEK AT WILMINGTON, DEL.--Continued

Suspended sediment, water year October 1949 to September 1950

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	153	11	4.5	330	19	17	162	4	1.8
2	132	8	2.9	230	14	8.7	140	1	.4
3	121	8	2.6	195	5	2.6	144	8	3.1
4	121	8	2.6	190	4	2.1	140	4	1.5
5	124	8	2.7	180	3	1.5	132	6	2.1
6	117	13	4.1	171	3	1.4	124	4	1.4
7	153	14	5.8	157	4	1.7	132	2	.7
8	235	15	9.5	140	6	2.3	140	3	1.1
9	171	4	1.8	132	6	2.1	132	1	.4
10	144	4	1.6	128	6	2.1	121	1	.3
11	136	9	3.3	128	4	1.4	162	1	.4
12	128	6	2.1	124	6	2.0	185	2	1.0
13	124	4	1.4	128	6	2.1	518	37	52
14	121	6	2.0	180	11	5.3	550	29	43
15	124	5	1.7	205	12	6.6	283	9	6.9
16	121	4	1.3	153	6	2.5	210	7	4.0
17	121	6	2.0	144	6	2.3	171	6	2.8
18	124	3	1.0	136	4	1.5	176	6	2.9
19	121	12	3.9	136	18	6.6	230	4	2.5
20	121	4	1.3	136	3	1.1	241	4	2.6
21	117	2	.6	132	4	1.4	195	4	2.1
22	117	2	.6	117	2	.6	176	4	1.9
23	117	4	1.3	121	2	.6	180	5	2.4
24	117	4	1.3	124	1	.3	215	4	2.3
25	121	5	1.6	140	1	.4	190	3	1.5
26	309	20	17	136	2	.7	171	3	1.4
27	247	10	6.7	132	1	.4	961	205	s772
28	166	9	4.0	124	1	.3	686	89	165
29	210	9	5.1	149	2	.8	393	15	16
30	210	15	8.5	180	4	1.9	289	7	5.5
31	372	18	18	--	--	--	230	4	2.5
Total	4,815	--	123	4,678	--	80.3	7,779	--	1,100
	January			February			March		
1	215	4	2.3	542	11	16	316	a6	5.1
2	205	2	1.1	630	22	38	295	10	8.0
3	225	2	1.2	750	38	77	210	6	3.4
4	271	3	2.2	428	16	18	253	9	6.2
5	241	4	2.6	330	15	13	265	35	25
6	215	4	2.3	302	13	11	271	38	28
7	220	5	3.0	337	11	10	259	53	37
8	230	4	2.5	295	10	8.0	362	83	81
9	195	2	1.1	533	14	20	742	65	130
10	205	2	1.1	774	40	84	400	36	39
11	295	3	2.4	510	20	28	344	9	8.4
12	235	4	2.5	421	6	6.8	488	8	11
13	215	2	1.2	386	1	1.1	854	24	55
14	225	4	2.4	1,130	81	s279	734	22	43
15	210	3	1.7	1,670	238	1,070	480	14	18
16	185	3	1.5	926	47	117	414	4	4.5
17	180	2	1.0	582	6	9.4	386	2	2.1
18	185	2	1.0	495	3	4.0	365	2	2.0
19	195	3	1.6	465	1	1.2	344	4	3.7
20	180	2	1.0	421	2	2.3	323	13	11
21	171	2	.9	330	2	1.8	1,000	131	s557
22	180	2	1.0	386	2	2.1	998	160	427
23	185	4	2.0	407	2	2.2	3,100	928	s9,100
24	190	4	2.1	393	4	4.2	1,430	275	1,060
25	190	5	2.6	358	3	2.9	878	20	48
26	185	6	3.0	323	2	1.8	718	6	12
27	200	6	3.2	259	2	1.4	694	4	7.5
28	220	7	4.2	265	a3	2.2	862	14	33
29	205	5	2.8	--	--	--	814	30	66
30	220	4	2.4	--	--	--	814	28	62
31	351	7	6.6	--	--	--	606	11	18
Total	6,624	--	66.5	14,648	--	1,830	20,019	--	11,900

s Computed by subdividing day.
a Estimated.

DELAWARE RIVER BASIN--Continued

BRANDYWINE CREEK AT WILMINGTON, DEL.--Continued

Suspended sediment, water year October 1949 to September 1950--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	550	4	5.9	428	16	18	694	30	56
2	534	2	2.9	450	18	22	614	40	66
3	510	2	2.8	654	24	42	480	26	34
4	550	14	21	550	23	34	694	49	92
5	510	13	18	450	15	18	598	41	66
6	480	3	3.9	428	24	28	465	29	36
7	458	2	2.5	400	18	19	421	21	24
8	442	1	1.2	344	16	15	393	24	25
9	435	1	1.2	330	20	18	365	22	22
10	421	2	2.3	337	20	18	351	21	20
11	435	1	1.2	358	16	15	372	17	17
12	442	2	2.4	344	16	15	330	16	14
13	428	2	2.3	323	18	16	316	15	13
14	407	2	2.2	316	18	15	337	14	13
15	393	1	1.1	351	20	19	393	18	19
16	386	3	3.1	526	22	31	379	19	19
17	379	3	3.1	386	11	11	365	16	16
18	379	2	2.1	486	17	22	316	16	14
19	365	6	5.9	1,730	242	s 1,180	337	23	21
20	379	6	6.1	894	60	145	372	22	22
21	400	3	3.2	574	18	28	450	27	33
22	372	4	4.0	488	15	20	372	18	18
23	379	4	4.1	472	16	20	316	17	14
24	400	5	5.4	886	50	120	302	17	14
25	442	4	4.8	614	26	43	365	31	31
26	435	6	7.0	495	17	23	295	22	18
27	400	9	9.7	465	16	20	271	18	13
28	574	28	43	428	14	16	241	23	15
29	450	20	24	686	24	45	241	23	15
30	400	12	13	694	21	39	265	28	20
31	--	--	--	510	18	25	--	--	--
Total	13,135	--	209	16,397	--	2,100	11,710	--	800

Day	July			August			September		
1	241	20	13	149	2	0.8	295	42	33
2	230	17	11	149	2	.8	241	20	13
3	225	18	11	2,330	719	s 7,080	302	20	16
4	283	28	21	798	122	s 320	259	16	11
5	253	24	16	358	15	14	215	18	10
6	283	25	19	283	7	5.3	190	16	8.2
7	271	22	16	253	8	5.5	185	10	5.0
8	230	21	13	230	13	8.1	180	12	5.8
9	215	20	12	220	11	6.5	185	13	6.5
10	414	52	58	215	10	5.8	435	25	29
11	1,060	144	s 545	225	12	7.3	1,360	187	s 756
12	718	188	364	265	12	8.6	654	75	132
13	365	82	81	215	10	5.8	400	21	23
14	488	45	59	205	12	6.6	435	18	21
15	316	26	22	195	12	6.3	798	124	267
16	323	52	45	185	10	5.0	465	60	75
17	295	23	18	195	8	4.2	344	26	24
18	265	18	13	190	9	4.6	283	18	14
19	230	21	13	205	11	6.1	265	19	14
20	215	16	9.3	215	14	8.1	259	17	12
21	205	14	7.7	215	9	5.2	271	13	9.5
22	200	16	8.6	195	7	3.7	442	21	25
23	190	16	8.2	205	13	7.2	344	18	17
24	185	15	7.5	200	12	6.5	277	15	11
25	200	6	3.2	195	10	5.3	247	12	8.0
26	190	13	6.7	190	8	4.1	235	16	10
27	190	17	8.7	180	8	3.9	235	20	13
28	171	15	6.9	171	8	3.7	225	20	12
29	166	18	8.1	180	10	4.9	225	20	12
30	157	10	4.2	372	70	70	225	21	13
31	153	11	4.5	458	76	94	--	--	--
Total	8,927	--	1,430	9,641	--	7,720	10,476	--	1,610

Total discharge for year (second-foot-days) 128,849
Total load for year (tons) 28,968.8

s Computed by subdividing day.

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DELAWARE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN DELAWARE RIVER BASIN IN PENNSYLVANIA

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	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	Hardness as $CaCO_3$		Total acidity as H_2SO_4
																				Total	Noncarbonate	
SCHUYLKILL RIVER AT POTTSVILLE																						
Oct. 4, 1949	27	56	10	4.6	1,020	14	7.3	0.17	7.9	92	52	26		2	533	6.0	0.0	0.8	871	491	489	96
Oct. 18	25	53	5	4.6	1,050	14								4	577	6.0	.0	.4		498		--
Oct. 25	24	48	5	4.25	1,110	14								0	615	6.0	.0	.3		552		110
SCHUYLKILL RIVER AT MOUNT CARBON																						
Oct. 4, 1949	31	57	20	4.8	856	12	4.3	4.1	6.1	81	40	25		3	461	7.0	0.0	1.5	682	413	410	56
Oct. 18	28	54	35	6.5	948	14								8	484	5.0	.0	2.0		436		--
Oct. 25	27	50	10	4.8	916	12								5	488	7.0	.0	.4		444		38
SCHUYLKILL RIVER AT LANDINGVILLE																						
Oct. 4, 1949	38	59	6	4.9	885	10	3.6	0.11	5.9	86	42	30		2	464	8.0	0.0	0.6	697	418	417	32
Oct. 18	53	52	7	6.1	948	10								12	477	9.0	.0	.4		468		
Oct. 25	44	59	8	5.3	892	11								10	450	8.0	.0	.3		448		
SCHUYLKILL RIVER AT PORT CLINTON																						
Oct. 4, 1949	65	59	5	4.8	683	11	2.8	0.11	4.6	68	34	19		4	347	6.0	0.0	0.8	514	334	330	46
Oct. 18	63	53	6	5.1	770	9.2								6	382	7.0	.0	.5		332		--
Oct. 25	56	48	5	4.8	782	10								7	397	7.0	.0	.6		352		38
SCHUYLKILL RIVER AT HAMBURG																						
Oct. 4, 1949	200	62	5	4.8	771	12	14	0.19	5.2	66	32	19		2	399	6.0	0.0	1.6	601	384	382	90
Oct. 18	136	57	5	4.35	898	12								0	474	6.0	.0	1.0		456		100
Oct. 25	139	53	5	4.40	925	13								0	500	6.0	.0	1.0		472		96
SCHUYLKILL RIVER AT BERNE																						
Oct. 4, 1949	206	63	5	4.8	586	13	13	0.24	5.5	66	32	20		2	399	6.0	0.0	1.5	586	379	378	82
Oct. 18	140	56	5	4.45	686	12								0	471	6.0	.0	1.0		424		88
Oct. 25	143	51	4	4.45	906	12								0	494	6.0	.0	1.0		424		94

SCHUYLKILL RIVER AT LEESPORT

Oct. 4, 1949.....	165	61	5	6.6	700	12	6.5	0.166	5.1	62	35	20		4	362	6.0	0.0	2.3	542	344	341	
Oct. 18.....	132	--	5	6.7	826	12								8	428	6.0	.0	1.6		400		
Oct. 25.....	114	50	5	6.7	861	12								5	447	6.0	.0	1.4		384		72

SCHUYLKILL RIVER NEAR MUHLENBERG STATION

Oct. 4, 1949.....	238	64	5	6.8	464	13		0.02		44	19	9.5		21	192	4.0	0.0	1.3	311	188	171	
Oct. 18.....	189	59	5	7.0	597	9.9								18	269	5.5	.0	2.3		268		
Oct. 25.....	158	54	5	7.0	644	8.9								25	299	4.5	.0	2.7		292		

SCHUYLKILL RIVER TWO MILES BELOW ANGELICA CREEK NEAR READING

Oct. 4, 1949.....	337	66	5	6.7	449	6.5		0.04		44	19	12		56	144	12	0.0	7.2	289	188	142	
Oct. 18.....	262	63	10	6.9	551	9.5								68	179	20	.1	4.4		220		
Oct. 25.....	234	--	15	6.9	591	8.8								96	199	16	.0	.7		244		

SCHUYLKILL RIVER AT MONOCACY

Oct. 5, 1949.....	402	65	5	6.8	429	7.0		0.03		42	18	15		56	138	14	0.0	6.0	276	179	133	
Oct. 19.....	314	60	10	7.1	511	9.4								66	168	17	.0	10		212		
Oct. 26.....	306	57	8	7.0	518	9.4								72	176	12	.0	9.6		218		

SCHUYLKILL RIVER AT STOWE

Oct. 5, 1949.....	414	66	10	6.9	435	8.0		0.02		42	18	17		55	137	13	0.0	6.2	279	179	134	
Oct. 19.....	324	58	7	7.3	489	8.4								64	168	10	.0	8.1		210		
Oct. 26.....	315	55	8	7.1	501	7.6								72	174	11	.0	9.0		214		

SCHUYLKILL RIVER AT SANATOGA

Oct. 5, 1949.....	465	66	10	7.3	424	5.5		0.09		42	19	12		60	135	11	0.1	7.4	258	183	134	
Oct. 19.....	361	59	5	7.0	479	8.8								73	157	10	.0	7.2		204		
Oct. 26.....	346	55	10	7.1	485	12								74	157	12	.1	6.0		201		

DELAWARE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN DELAWARE RIVER BASIN IN PENNSYLVANIA--Continued

Chemical analyses, in parts per million, water year October 1949 to September 1950--Continued

Date of collection	Discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	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	Hardness as $CaCO_3$		Total acidity as H_2SO_4
																				Total	Noncarbonate	
SCHUYLKILL RIVER AT PHOENIXVILLE																						
Oct. 5, 1949	477	66	5	7.4	487	6.5		0.09		49	22	15		53	172	13	0.0	8.6	309	213	169	
Oct. 19	370	58	10	7.2	513	10								90	161	17	.1	7.6		206		
Oct. 26	355	56	8	7.2	540	8.5								79	172	19	.1	8.8		215		
SCHUYLKILL RIVER BELOW FRENCH CREEK AT PHOENIXVILLE																						
Oct. 5, 1949	508	65	5	7.2	476	8.5		0.08		46	22	13		53	165	12	0.1	7.0	300	205	162	
Oct. 19	394	58	10	7.2	450	12								74	131	15	.2	6.2		181		
Oct. 26	378	55	5	7.1	472	9.2								76	139	16	.1	6.4		187		
SCHUYLKILL RIVER AT PORT KENNEDY																						
Oct. 5, 1949	549	65	10	7.2	474	4.5		0.17		46	21	13		57	162	12	0.1	6.4	297	201	154	
Oct. 19	434	59	8	7.4	475	11								78	137	16	.0	5.6		190		
Oct. 26	419	--	8	7.3	475	7.6								80	143	16	.0	6.6		189		
SCHUYLKILL RIVER AT CONSHOHOCKEN																						
Oct. 5, 1949	585	71	20	7.1	506	4.0		0.14		50	21	15		77	158	16	0.1	8.1	321	211	148	
Oct. 19	462	65	10	7.2	519	9.6								104	132	25	.0	5.8		202		
Oct. 26	447	61	10	7.2	520	7.6								107	134	26	.0	3.6		197		
SCHUYLKILL RIVER AT GIRARD AVENUE IN PHILADELPHIA																						
Oct. 5, 1949	328	67	10	7.2	499	3.0		0.11		50	22	18		85	139	20	0.1	8.8	296	215	146	
Oct. 19	232	60	8	7.2	478	8.0								93	122	18	.2	8.6		193		
Oct. 26	550	60	10	7.2	481	8.5								100	124	18	.0	5.4		192		
SCHUYLKILL RIVER AT PASSAYUNK AVENUE IN PHILADELPHIA																						
Oct. 5, 1949		74	30	7.1	588	2.5		0.37		48	20	35		116	144	37	0.1	16	340	202	107	
Oct. 19		70	125	7.3	686	9.8								138	112	76	.1	.5		178		
Oct. 26		68	80	7.1	609	11								152	115	40	.1	.6		186		

WEST BRANCH SCHUYLKILL RIVER AT CRESSONA

Oct. 4, 1949.....	24	51	5	5.0	1,210	9.5	3.3	0.14	5.2	115	59	63		5	665	4.0	0.0	0.7	1,020	558	554	26
Oct. 18.....	13	50	7	6.5	1,360	8.8								14	754	4.0	.0	5.8		684		
Oct. 25.....	13	57	3	6.2	1,250	9.6								16	677	5.0	.0	.7		584		

LITTLE SCHUYLKILL RIVER AT TAMAQUA

Oct. 4, 1949.....	16	54	6	4.20	218	7.0	5.7	0.16	0.9	14	5.6	4.3		0	91	2.0	0.0	1.2	142	93	93	56
Oct. 18.....	12	50	5	4.30	253	9.2								0	110	2.0	.0	1.3		108		68
Oct. 25.....	10	45	2	4.10	264	9.4								0	113	2.0	.0	1.3		72		68

LITTLE SCHUYLKILL RIVER AT SOUTH TAMAQUA

Oct. 4, 1949.....	54	56	5	3.55	1,190	17	29	1.2	7.7	102	49	16		0	640	5.0	0.0	0.7	950	637	637	218
Oct. 18.....	57	54	6	3.60	1,270	19								0	740	11	.0	.6		584		300
Oct. 25.....	48	58	5	3.65	1,170	16								0	657	2.0	.0	.3		520		224

LITTLE SCHUYLKILL RIVER AT PORT CLINTON

Oct. 4, 1949.....	83	59	6	3.65	893	14	25	0.84	6.0	64	32	12		0	443	6.0	0.0	4.0	676	445	445	168
Oct. 18.....	64	48	5	3.85	1,040	16								0	575	9.0	.0	1.4		416		246
Oct. 25.....	66	48	3	3.65	1,100	16								0	625	7.0	.0	1.4		508		224

PANTHER CREEK AT TAMAQUA

Oct. 4, 1949.....	21	57	5	3.05	2,090	26	50	6.0	17	156	103	30		0	1,170	6.0	0.0	1.8	1,870	1,140	1,140	488
Oct. 18.....	39	52	5	3.45	1,810	20								0	1,140	6.0	.0	.6		988		324
Oct. 25.....	28	51	4	3.15	2,060	20								0	1,290	6.0	.0	.6		1,040		592

MAIDEN CREEK NEAR TEMPLE

Oct. 4, 1949.....	73	62	5	7.5	231	4.0		0.09		28	9.3	4.0		113	19	3.0	0.0	2.0	132	108	16	
Oct. 18.....	55	53	5	7.6	246	4.9								122	18	3.0	.0	3.6		116		
Oct. 25.....	39	53	5	7.7	267	6.9								143	15	3.0	.0	4.8		125		

DELAWARE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN DELAWARE RIVER BASIN IN PENNSYLVANIA--Continued

Chemical analyses, in parts per million, water year October 1949 to September 1950--Continued

Date of collection	Discharge (second-feet)	Temperature (°F)	Color	pH	Specific conductance (micromhos at 25° C)	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	Hardness as $CaCO_3$ Total	Hardness as $CaCO_3$ Noncarbonate	Total acidity as H_2SO_4
TULPEHOCKEN CREEK AT WEST BRIDGEPORT																						
Oct. 4, 1949	87	62	10	7.6	338	4.0		0.05		44	14	4.0		165	26	5.0	0.0	7.6	198	167	32	
Oct. 18	66	56	7	8.0	348	4.8								176	23	5.5	.0	7.4		168		
Oct. 25	186	52	10	7.8	345	3.6								182	29	4.5	.0	7.6		166		
WYOMISSING CREEK AT WEST READING																						
Oct. 4, 1949	3.8	69	100	7.0	799	7.0		0.27		52	17	79		242	29	116	0.0	0.8	458	200	1	
Oct. 18	3.7	65	100	7.4	551	12								256	20	6.0	.1	.9		145		
Oct. 25	8.8	62	100	7.4	630	11								292	13	3.0	.0	1.0		156		
ANGELICA CREEK AT READING																						
Oct. 4, 1949	2.5	70	150	6.9	1,670	16		1.2		100	20	65		932	14	62	0.2	2.8	615	332	0	
Oct. 18	3.0	64	300	5.5	374	16								124	9.9	19	.1	6.3		145		
Oct. 25	6.8	69	3,500	3.70	2,610	60								0	230	290	.0	57		580		2,480
ANTIETAM CREEK NEAR LORANE																						
Oct. 5, 1949	4.4	62	10	7.0	369	12		0.05		32	16	18		158	32	14	0.1	8.6	214	146	16	
Oct. 19	4.3	54	15	7.5	375	20								170	28	12	.0	7.4		146		
Oct. 26	4.2	53	15	7.1	255	9.6								100	27	10	.0	7.6		94		
MANATAWNY CREEK AT POTTSTOWN																						
Oct. 5, 1949	20	62	10	7.4	232	13		0.04		27	10	5.6		118	17	5.0	0.0	1.6	141	108	12	
Oct. 19	7.0	55	10	7.8	241	14								126	13	4.0	.0	1.1		110		
Oct. 26	15	52	10	7.5	230	8.8								122	21	3.0	.0	2.3		104		
FRENCH CREEK AT PHOENIXVILLE																						
Oct. 5, 1949		63	20	7.1	173	7.5		0.10		19	6.7	7.0		63	20	9.0	0.1	2.7	104	75	23	
Oct. 19		56	10	7.3	177	17								72	14	8.0	.0	1.3		62		
Oct. 26		54	10	7.2	152	13								61	17	7.0	.0	1.3		53		

PERKIOMEN CREEK AT OAKS

Oct. 5, 1949.....	35	65	10	8.0	261	2.0		0.11		28	9.9	11		100	32	13	0.1	1.5	154	111	28
Oct. 19.....	35	58	10	7.7	285	6.8								113	33	12	.0	.4		114	
Oct. 26.....	37	56	5	7.5	284	7.4								118	33	12	.1	.4		110	

WISSAHICKON CREEK AT PHILADELPHIA

Oct. 5, 1949.....	21	61	15	7.8	373	5.0		0.12		34	22	11		163	36	16	0.0	7.2	204	175	42
Oct. 19.....	18	57	8	7.7	411	11								185	39	17	.2	6.0		176	
Oct. 26.....	96	56	15	7.2	227	6.1								84	28	8.0	.0	4.7		85	

WEST BRANCH BRANDYWINE CREEK AT COATESVILLE

Oct. 3, 1949.....	12	--	7	7.8	157	6.8		0.03		14	6.3	4.7		50	14	7.0	0.1	6.8	99	61	20
Nov. 10.....	14	--	7	7.8	154	6.6		.03		14	5.9	5.5		50	15	6.8	.0	6.1	99	59	18
Dec. 16.....	30	--	17	6.0	122	11		.07		10	4.3	5.3		26	20	5.5	.0	5.3	82	43	21
Jan. 19, 1950....	23	--	11	7.2	120	15		.06		11	4.5	3.9		32	15	5.0	.1	6.5	79	46	20
Feb. 25.....	46	33	6	6.9	129	17		.06		11	4.6	4.8		34	15	5.5	.0	6.8	82	46	18
Mar. 25.....	110	--	7	7.1	101	11		.10		8.7	3.5	4.8		19	19	4.1	.1	6.4	73	36	21
May 4.....	63	58	5	7.0	100	11		.08		8.8	3.7	4.6		27	15	3.9	.1	4.4	71	37	15
June 8.....	38	71	9	6.3	116	12		.04		11	4.3	5.8		40	13	5.0	.1	5.2	80	45	12
July 14.....	48	67	13	7.8	109	10		.13		9.6	3.4	3.5		28	13	4.0	.1	4.0	77	38	15
Aug. 17.....	16	73	2	7.5	137	10		.02		12	4.8	5.5		47	10	6.2	.1	4.5	88	50	11
Sept. 22.....	46	61	9	7.6	106	--		--		--	--	5.6		34	12	4.6	--	4.1	--	38	10

SUSQUEHANNA RIVER BASIN

SUSQUEHANNA RIVER AT FALLS, PA.

LOCATION.--At bridge on State Highway 92,400 feet upstream from Buttermilk Creek, Wyoming County, and approximately 17 miles upstream from gaging station at Wilkes-Barre, Luzerne County.
DRAINAGE AREA.--9,440 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1944 to September 1950.
Water temperatures: October 1944 to September 1950.
EXTREMES, 1949-50.--Specific conductance: Maximum, 214 micromhos Oct. 21-31; minimum, 94.0 micromhos Apr. 1-10.
Hardness: Maximum, 91 ppm Oct. 21-31; minimum, 39 ppm Apr. 1-10.
EXTREMES, 1944-50.--Dissolved solids (1944-47): Maximum, 143 ppm Sept. 21-30, 1947; minimum, 58 ppm May 21-31, 1946.
Hardness (1944-47) (1949-50): Maximum, 105 ppm Sept. 11-20, 1946; minimum, 36 ppm May 21-31, 1946.
Specific conductance: Maximum, 282 micromhos Oct. 21-31, 1947; minimum, 88.9 micromhos Jan. 1-10, 1949.
Water temperatures (1944-49): Maximum, 83°F Aug. 27, 1948; minimum, freezing point on many days during winter months.
REMARKS.--Records of specific conductance of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1949 to September 1950 based on records for Susquehanna River at Wilkes-Barre, which are given in Water-Supply Paper 1171.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																	Total	Non-carbonate
Oct. 1-10, 1949	4,882	7	7.3	170	2.8	0.02	28	4.0	5.0		70	18	5.0	0.2	1.2	106	74	16
Oct. 11-20	2,962	7	7.4	199	--	--	--	--	--		80	17	7.5	--	.8	--	80	14
Oct. 21-31	2,645	7	7.6	214	4.1	03	29	4.6	4.7		85	17	9.5	.0	.9	120	91	22
Nov. 1-10	4,110	8	7.7	190	--	--	--	--	--		76	18	6.9	--	1.7	--	78	16
Nov. 11-20	6,781	8	7.6	162	--	--	--	--	--		62	16	5.8	--	2.0	--	65	14
Nov. 21-30	6,601	8	7.5	148	--	--	--	--	--		54	16	4.5	--	1.9	--	60	16
Dec. 1-10	6,137	6	7.6	154	--	--	--	--	--		58	17	4.5	--	1.9	--	64	16
Dec. 11-20	16,490	12	6.9	130	--	--	--	--	--		42	18	5.8	--	3.2	--	50	16
Dec. 21-31	16,670	10	7.0	122	--	--	--	--	--		40	18	4.8	--	2.9	--	49	16
Jan. 1-10, 1950	22,600	11	7.0	117	--	--	--	--	--		38	18	4.8	--	3.0	--	48	17
Jan. 11-20	23,440	12	7.1	114	--	--	--	--	--		35	18	3.8	--	3.0	--	46	17
Jan. 21-31	14,050	13	7.1	138	--	--	--	--	--		51	17	4.8	--	3.2	--	58	16
Feb. 1-10	10,710	8	7.4	140	--	--	--	--	--		53	18	5.0	--	2.0	--	61	18
Feb. 11-20	13,260	9	7.4	138	--	--	--	--	--		53	18	4.4	--	2.6	--	57	14
Feb. 21-28	9,359	9	7.4	147	--	--	--	--	--		50	19	4.8	--	2.8	--	59	18
Mar. 1-10	12,180	12	7.5	160	--	--	--	--	--		54	19	5.2	--	3.6	--	64	20
Mar. 11-20	20,820	8	7.0	117	--	--	--	--	--		37	17	3.8	--	2.8	--	44	14
Mar. 21-31	58,930	8	6.9	104	--	--	--	--	--		32	15	2.9	--	2.5	--	42	16

Apr. 1-10	71,070	20	6.8	94.0	4.1	.05	12	2.1	1.9	30	13	1.9	.1	2.4	62	39	14
Apr. 11-20	22,210	15	7.3	127	--	--	--	--	--	48	15	2.9	--	2.9	--	55	16
Apr. 21-30	24,090	6	7.7	119	--	--	--	--	--	44	13	3.1	--	2.3	--	48	12
May 1-10	18,660	8	7.2	125	--	--	--	--	--	46	15	3.0	--	2.1	--	51	13
May 11-20	10,940	6	7.7	151	--	--	--	--	--	58	16	4.0	--	1.4	--	61	13
May 21-31	10,740	5	6.8	147	--	--	--	--	--	58	16	2.9	--	1.4	--	61	13
June 1-10	18,490	8	6.7	118	--	--	--	--	--	43	13	2.6	--	1.9	--	48	13
June 11-20	6,822	5	6.9	161	--	--	--	--	--	62	16	4.5	--	1.4	--	66	14
June 21-30	4,962	8	7.1	183	--	--	--	--	--	73	15	5.2	--	1.5	--	74	14
July 1-10	3,702	8	7.0	186	--	--	--	--	--	75	16	5.8	--	1.2	--	77	16
July 11-20	4,044	8	7.3	193	--	--	--	--	--	81	17	6.5	--	1.4	--	80	14
July 21-31	4,553	10	6.4	181	--	--	--	--	--	76	16	5.8	--	1.4	--	74	12
Aug. 1-10	3,498	10	7.5	188	--	--	--	--	--	76	18	7.1	--	1.0	--	75	13
Aug. 11-20	3,068	10	7.5	192	--	--	--	--	--	79	19	7.5	--	.8	--	77	12
Aug. 21-31	6,450	12	6.9	159	--	--	--	--	--	61	15	5.4	--	1.7	--	65	15
Sept. 1-10	18,000	10	6.9	135	--	--	--	--	--	53	13	3.6	--	1.9	--	54	11
Sept. 11-20	8,951	10	6.9	167	--	--	--	--	--	66	13	4.6	--	1.8	--	70	16
Sept. 21-30	4,730	8	6.8	190	--	--	--	--	--	82	14	5.4	--	1.4	--	84	17
Average	13,900	9	--	153	--	--	--	--	--	58	16	4.9	--	2.0	--	62	15

SUSQUEHANNA RIVER BASIN--Continued

SUSQUEHANNA RIVER AT FALLS, PA.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	62	53	39	35	36	34	39	53	68	79	80	77
2	61	53	37	38	36	32	41	53	68	78	80	74
3	61	51	39	40	36	32	34	54	66	77	79	73
4	61	49	34	41	35	32	44	56	63	77	78	73
5	63	53	34	45	35	34	44	59	64	--	78	67
6	62	54	35	48	35	34	45	61	64	75	79	68
7	65	48	34	43	34	34	42	61	68	76	80	69
8	66	48	33	36	34	34	42	64	73	77	80	71
9	67	49	33	33	33	33	44	59	74	75	80	71
10	68	48	35	36	34	32	45	58	79	75	--	72
11	69	50	35	--	34	33	46	58	74	75	--	71
12	68	51	35	--	33	33	44	61	74	80	--	70
13	67	51	37	--	34	32	43	61	72	78	--	69
14	66	51	35	--	34	32	41	61	69	76	--	69
15	63	49	34	--	35	34	44	61	65	76	--	67
16	64	48	34	--	35	36	45	62	67	74	77	67
17	61	47	35	--	36	36	44	62	67	78	78	69
18	59	45	35	--	36	31	50	60	66	80	77	65
19	59	44	37	--	36	36	46	56	65	78	77	65
20	60	48	37	--	33	36	46	58	67	75	77	--
21	60	43	39	34	34	35	48	58	68	78	77	66
22	60	38	40	35	33	34	48	59	70	76	69	67
23	58	38	41	36	33	35	45	60	76	75	70	66
24	58	38	34	36	33	35	43	62	78	71	70	66
25	55	37	39	41	33	36	39	62	78	77	77	61
26	55	37	39	42	32	37	50	62	80	77	77	61
27	58	35	40	42	33	37	50	59	76	78	78	61
28	55	38	39	37	32	41	50	59	76	79	77	65
29	53	39	37	40	--	40	53	66	76	79	78	65
30	53	37	38	34	--	39	49	68	74	79	77	66
31	53	--	34	37	--	39	--	68	--	79	77	--
Average	61	46	36	--	34	35	45	59	71	77	--	68

SUSQUEHANNA RIVER AT DANVILLE, PA.

LOCATION.--At gaging station at highway bridge at Danville, Montour County, three-quarters of a mile upstream from Mahoning Creek.
DRAINAGE AREA.--11,220 square miles.
RECORDS AVAILABLE.--Chemical analyses: September 1906 to September 1907, October 1945 to September 1950.
Water temperatures: October 1945 to September 1950.
EXTREMES, 1949-50.--Specific conductance: Maximum, 392 micromhos Aug. 11-20; minimum, 107 micromhos Apr. 1-10.
Hardness: Maximum, 162 ppm Aug. 11-20; minimum, 42 ppm Apr. 1-10.
Water temperatures: Maximum, 77°F Aug. 3; minimum, freezing point on many days in February and March.
EXTREMES, 1945-50.--Dissolved solids (1945-47): Maximum, 334 ppm Sept. 11-20, 1946; minimum, 68 ppm May 21-31, 1946.
Hardness (1945-47) (1949-50): Maximum, 223 ppm Sept. 11-20, 1946; minimum, 42 ppm Apr. 1-10, 1950.
Specific conductance: Maximum, 522 micromhos Oct. 1-10, 1948; minimum, 107 micromhos Apr. 1-10, 1950.
Water temperatures: Maximum, 87°F Aug. 9, 10, 1949; minimum, freezing point on many days during winter months.
REMARKS.--Samples collected daily at midstream 1906-07, and at point 465 feet from north end of bridge, 1945-50. Due to cross-sectional differences in concentration of dissolved solids, water samples also collected three times a month at points 120, 650, 880, and 1180 feet from north end of bridge 1945-50. Records of specific conductance of daily samples, October 1945 to September 1950, available in district office at Philadelphia, Pa. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1171.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																	Total	Noncarbonate
Oct. 1-10, 1949	5,472	5	7.0	257	3.7	0.02	28	8.1	7.1		49	67	5.0	0.1	1.8	156	103	63
Oct. 11-20	3,510	2	6.8	317	--	--	--	--	--		46	90	7.2	--	2.0	--	124	86
Oct. 21-31	3,072	2	7.0	342	2.4	.04	40	11	6.0		48	101	8.2	--	2.5	212	145	57
Nov. 1-10	4,667	6	7.0	305	--	--	--	--	--		54	85	8.2	--	2.1	--	124	80
Nov. 11-20	7,348	7	6.9	239	--	--	--	--	--		50	58	6.2	--	1.9	--	95	54
Nov. 21-30	7,339	9	6.9	206	--	--	--	--	--		42	50	5.1	--	2.2	--	80	46
Dec. 1-10	6,730	6	7.0	214	--	--	--	--	--		44	53	6.8	--	2.6	--	86	50
Dec. 11-20	19,250	5	6.5	169	--	--	--	--	--		31	42	6.8	--	3.6	--	66	41
Dec. 21-31	21,850	8	6.8	150	--	--	--	--	--		30	36	4.8	--	3.4	--	59	34
Jan. 1-10, 1950	29,450	12	6.8	147	--	--	--	--	--		27	36	4.6	--	3.3	--	58	36
Jan. 11-20	29,610	18	7.1	132	4.4	.06	16	3.8	3.5		28	31	3.8	.1	2.8	84	56	33
Jan. 21-31	16,640	7	6.9	181	--	--	--	--	--		38	44	4.2	--	3.5	--	75	44
Feb. 1-10	14,100	7	7.0	182	--	--	--	--	--		38	45	4.0	--	3.3	--	73	42
Feb. 11-20	18,710	7	7.0	179	--	--	--	--	--		35	43	4.4	--	3.4	--	72	43
Feb. 21-28	12,750	8	7.2	198	--	--	--	--	--		31	54	5.0	--	3.3	--	78	53
Mar. 1-9	9,530	5	7.1	240	--	--	--	--	--		34	72	4.8	--	3.6	--	98	70
Mar. 10	46,300	10	7.1	120	--	--	--	--	--		28	30	2.0	--	3.6	--	46	23
Mar. 11-20	26,640	10	7.1	148	--	--	--	--	--		26	37	3.2	--	3.4	--	59	38
Mar. 21-31	67,180	10	6.8	119	--	--	--	--	--		22	29	2.8	--	3.5	--	46	28

SUSQUEHANNA RIVER BASIN--Continued

SUSQUEHANNA RIVER AT DANVILLE, PA.--Continued

Chemical analyses, in parts per million, water year October 1949 to September 1950--Continued

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																	Total	Noncarbonate
Apr. 1-10, 1950	80,880	15	7.0	107	--	--	--	--	--		25	23	1.8	--	3.0	--	42	22
Apr. 11-20	27,030	4	7.7	165	--	--	--	--	--		37	37	2.8	--	3.0	--	69	39
Apr. 21-30	29,080	5	7.2	151	--	--	--	--	--		32	34	2.5	--	2.4	--	60	34
May 1-10	22,880	4	7.5	161	--	--	--	--	--		34	37	2.8	--	2.0	--	64	36
May 11-20	12,560	4	7.0	208	--	--	--	--	--		40	55	3.6	--	1.6	--	85	52
May 21-31	13,620	4	6.8	209	--	--	--	--	--		41	54	3.8	--	1.5	--	85	51
June 1-10	25,620	4	6.8	156	--	--	--	--	--		31	37	2.4	--	1.6	--	61	36
June 11-20	9,248	4	6.6	220	--	--	--	--	--		34	67	4.0	--	1.8	--	88	60
June 21-30	6,428	6	6.8	308	--	--	--	--	--		36	86	5.5	--	2.0	--	112	82
July 1-10	4,708	6	6.7	313	--	--	--	--	--		31	108	5.5	--	2.0	--	128	103
July 11-20	4,930	7	6.8	310	--	--	--	--	--		37	102	6.0	--	1.9	--	128	98
July 21-31	5,305	4	7.0	297	--	--	--	--	--		44	89	6.4	--	1.8	--	113	77
Aug. 1-10	3,997	5	7.1	328	--	--	--	--	--		40	108	6.2	--	1.4	--	130	97
Aug. 11-20	2,702	6	7.4	392	--	--	--	--	--		28	144	7.2	--	1.4	--	162	139
Aug. 21-31	7,941	7	7.0	245	--	--	--	--	--		37	68	5.2	--	2.1	--	98	68
Sept. 1-10	19,450	8	6.8	183	--	--	--	--	--		39	44	3.5	--	1.9	--	76	44
Sept. 11-20	9,974	5	7.0	193	--	--	--	--	--		51	40	4.0	--	2.0	--	84	42
Sept. 21-30	5,320	5	7.1	243	--	--	--	--	--		59	57	4.8	--	1.6	--	104	56
Average	16,720	7	--	218	--	--	--	--	--		37	59	4.7	--	2.5	--	87	54

SUSQUEHANNA RIVER BASIN--Continued

SUSQUEHANNA RIVER AT DANVILLE, PA.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	--	53	38	36	34	32	36	40	65	70	74	70
2	63	53	36	36	34	--	38	42	63	71	--	71
3	62	--	38	36	32	32	40	42	65	72	77	69
4	62	53	38	36	36	32	44	42	65	71	73	68
5	62	52	36	36	36	34	44	42	67	71	75	68
6	60	50	36	36	36	--	46	42	68	70	73	66
7	60	50	--	34	--	--	--	42	70	70	71	66
8	62	--	--	34	36	34	42	42	70	71	74	68
9	62	57	38	--	36	34	40	42	70	71	72	--
10	60	51	38	36	36	34	38	42	69	70	--	69
11	65	--	38	34	38	--	40	42	67	73	76	71
12	60	51	36	34	38	34	38	40	68	74	70	60
13	60	51	36	34	36	34	36	40	68	72	71	57
14	60	52	36	34	34	36	38	42	67	71	68	--
15	60	50	36	34	36	36	38	42	68	71	71	59
16	--	51	35	34	36	36	42	--	68	--	73	54
17	60	47	34	34	38	36	42	--	72	69	74	--
18	60	45	--	34	--	36	42	40	65	--	75	50
19	60	42	34	34	34	36	40	42	65	69	70	--
20	62	43	36	34	32	36	40	--	--	70	--	59
21	--	42	34	34	32	38	40	42	69	66	68	60
22	--	--	36	--	32	--	40	42	70	65	--	--
23	60	41	34	34	32	38	40	42	--	69	69	58
24	60	40	34	36	--	38	--	44	72	70	71	48
25	56	40	34	36	--	38	40	57	74	71	71	56
26	55	38	--	38	32	38	40	60	72	70	72	55
27	54	37	34	36	32	36	38	65	74	68	70	55
28	65	37	34	36	--	--	38	63	--	68	69	55
29	65	37	34	--	--	36	38	63	70	73	--	60
30	68	36	--	34	--	36	40	69	71	76	73	58
31	56	--	36	36	--	--	--	63	--	74	74	--
Average	58	46	36	35	35	--	40	47	69	71	72	61

SUSQUEHANNA RIVER BASIN--Continued

LACKAWANNA RIVER AT OLD FORGE, PA.

LOCATION.--At bridge 600 feet upstream from gaging station which is 150 feet upstream from Delaware, Lackawanna & Western Railroad bridge in Old Forge, Lackawanna County, half a mile upstream from Ascension Brook.
DRAINAGE AREA.--332 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1948 to September 1950.
EXTREMES, 1949-50.--Specific conductance: Maximum, 1,380 micromhos Aug. 21-31; minimum, 368 micromhos Mar. 21-31.
Hardness: Maximum, 585 ppm Aug. 11-20; minimum, 140 ppm Dec. 13, 14, 15, June 4,5.
Water temperatures: Maximum, 80°F June 26; minimum, freezing point Feb. 26.
EXTREMES, 1948-50.--Dissolved solids (1948-49): Maximum, 1,280 ppm Oct. 21-31, 1948; minimum, 123 ppm Jan. 5-10, 1949.
Hardness: Maximum, 984 ppm Oct. 21-31, 1948; minimum, 109 ppm Jan. 5-10, 1949.
Water temperatures: Maximum, 80°F June 26, 1950: minimum, freezing point Feb. 26, 1950.
REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1171.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																	Total	Non-carbonate
Oct. 1-10, 1949	210	4	3.50	923						--	--	475	8.2		0.1		436	436
Oct. 11-20	170	6	3.40	1,130						--	--	655	7.8		.1		532	532
Oct. 21-31	168	5	3.25	1,170						--	--	659	9.0		.3		546	546
Nov. 1-10	280	4	3.90	828						--	--	423	10		.6		356	356
Nov. 11-20	297	4	3.55	895						--	--	449	6.5		.2		370	370
Nov. 21-30	254	6	3.45	1,000						--	--	505	8.8		.2		428	428
Dec. 1-10	224	6	3.40	1,060						--	--	517	11		.2		460	460
Dec. 11-12	234	8	4.6	940						--	4	454	12		.8		402	399
Dec. 13, 14, 15	1,527	17	6.0	356						--	13	146	6.5		.8		140	129
Dec. 16-22	498	6	3.60	651						--	0	290	7.5		.6		256	256
Dec. 23-31	788	6	3.80	473						--	0	201	6.5		1.2		182	182
Jan. 1-5, 1950	527	7	3.75	630						--	0	288	7.5		.7		258	258
Jan. 6-10	1,189	22	3.85	394						--	0	163	6.5		.8		148	148
Jan. 11-20	719	5	3.60	589						--	0	262	7.5		.6		242	242
Jan. 21-31	458	5	3.40	764						--	0	250	7.5		.8		314	314
Feb. 1-10	427	7	3.45	772						--	0	349	12		.7		322	322
Feb. 11-20	520	3	3.50	636						--	0	269	8		.2		232	232
Feb. 21-28	386	6	3.60	915						--	0	428	10		.2		364	364
Mar. 1-8	348	--	3.60	1,039						--	--	--	--		--		--	--
Mar. 9, 10	2,685	--	4.30	177						--	--	--	--		--		--	--
Mar. 11-20	970	2	3.80	576						--	--	245	6.0		.2		210	210
Mar. 21-31	2,445	3	4.00	368						--	--	144	5.0		.2		124	124

Apr. 1-10	2,379	4	3.70	414					--	--	171	4.0		.2		148	148
Apr. 11-20	921	4	3.70	708					--	--	317	6.0		.2		278	278
Apr. 21-31	1,024	3	3.90	593					--	--	258	6.0		.2		226	226
May 1-10	906	4	3.80	610					--	--	266	5.0		.2		236	236
May 11-20	658	3	3.50	838					--	0	385	5.0		.2		330	330
May 21-31	755	3	3.55	675					--	0	294	6.0		.1		260	260
June 1-3, 6-10	680	3	3.50	713					--	0	320	6.0		.1		280	280
June 4-5	1,180	2	3.80	396					--	0	158	3.5		.1		140	140
June 11-20	488	5	3.50	809					--	0	375	7.0		.2		320	320
June 21-30	354	4	3.40	1,020					--	0	491	9.0		.4		425	425
July 1-9	294	20	3.40	1,170					5.4	--	491	7.2		.5		510	510
July 10	222	25	4.6	651					8.2	--	297	6.0		.4		300	300
July 11, 14, 19, 20	394	15	5.1	610					2.9	2	248	7.0		.8		264	262
July 12, 13, 15-18	354	15	3.30	1,090					39	0	513	4.2		.4		455	455
July 21, 25	398	10	3.50	604					25	0	241	9.0		.4		210	210
July 22-24, 26-31	315	10	3.30	1,090					32	--	505	6.0		.5		465	465
Aug. 1-10	237	18	3.30	1,130					39	--	541	7.5		.5		490	490
Aug. 11-20	208	20	3.30	1,320					53	--	660	9.0		.6		585	585
Aug. 21-31	190	4	3.30	1,380					--	--	651	5.1		.5		560	560
Sept. 1-9	170	3	3.40	1,280					--	--	640	4.0		.5		540	540
Sept. 10	270	6	6.7	705					--	0	250	9.0		.3		335	335
Sept. 11	352	4	4.40	512					--	--	220	4.0		.2		215	215
Sept. 12-20	233	4	3.40	1,070					--	--	517	3.9		.2		435	435
Sept. 21-30	149	3	3.40	1,310					--	--	650	5.2		.3		550	550
Average	592	7	--	814					--	--	379	7.1		0.4		347	347

SUSQUEHANNA RIVER BASIN--Continued

LACKAWANNA RIVER AT OLD FORGE, PA.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	56	57	44	42	41	36	63	55	60	76	68	69
2	60	56	46	45	42	38	67	50	67	66	70	68
3	65	57	41	46	39	35	68	53	61	67	74	68
4	58	50	39	50	--	37	49	55	64	69	65	65
5	63	47	41	45	41	44	45	60	59	66	62	60
6	--	46	41	47	42	40	41	56	60	67	64	70
7	62	52	45	40	41	46	44	62	--	63	62	61
8	63	50	40	35	--	46	41	51	64	79	78	75
9	65	60	39	36	42	35	45	60	--	66	73	64
10	63	56	38	41	39	33	44	51	62	68	66	68
11	74	52	44	39	43	39	47	50	--	66	67	61
12	65	56	44	37	--	41	50	55	--	75	65	64
13	60	51	42	42	40	38	44	56	62	69	60	61
14	55	52	39	45	36	41	40	59	61	66	72	60
15	60	51	46	39	--	39	39	60	62	64	65	65
16	61	49	39	42	39	42	40	58	67	65	66	63
17	58	45	38	38	41	40	54	52	65	66	73	55
18	55	47	45	41	41	42	50	57	59	73	69	56
19	59	44	46	39	40	43	60	56	60	70	75	62
20	52	46	45	37	--	41	41	58	58	68	66	62
21	51	45	46	39	36	39	48	57	63	73	62	60
22	60	41	45	43	40	40	51	65	62	70	61	61
23	56	42	44	45	39	41	41	58	64	63	63	58
24	51	43	38	48	41	43	49	59	71	65	65	50
25	54	41	37	46	34	41	47	58	69	73	66	52
26	60	41	44	50	31	42	51	57	80	65	65	55
27	59	39	57	44	34	44	51	59	73	63	67	56
28	60	41	45	42	37	45	50	57	64	65	68	59
29	62	42	41	47	--	46	52	58	63	66	71	60
30	58	45	36	44	--	38	56	60	63	64	68	51
31	59	--	37	48	--	39	--	65	--	66	70	--
Average	59	48	42	43	37	40	49	57	64	68	67	61

WEST BRANCH SUSQUEHANNA RIVER AT LOCK HAVEN, PA.

302255 O - 54 - 8

LOCATION.--In north channel at bridge on northeast side of Great Island, 2 miles downstream from Lock Haven, Clinton County.
DRAINAGE AREA.--3,337 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1950.
Water temperatures: October 1945 to September 1950.
EXTREMES, 1949-50.--Specific conductance: Maximum, 540 micromhos Nov. 1-10; minimum, 113 micromhos Apr. 1-10.
Water temperatures: Maximum, 77°F July 20; minimum, freezing point on several days in December, February, and March.
EXTREMES, 1945-50.--Dissolved solids (1945-47): Maximum, 262 ppm Sept. 21-30, 1946; minimum, 51 ppm Mar. 1-10, 1946.
Hardness (1945-47) (1949-50): Maximum, 177 ppm Sept. 21-30, 1946; minimum, 28 ppm Apr. 1-10, 1950.
Specific conductance: Maximum, 628 micromhos July 11-20, 1949; minimum, 109 micromhos Mar. 21-31, 1948.
Water temperatures: Maximum, 83°F July 5, 1949; minimum, freezing point on many days during winter months.
REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1949 to September 1950 based on records for Susquehanna River at Renova, which are given in Water-Supply Paper 1171.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$ Total	Hardness as $CaCO_3$ Non-carbonate
Oct. 1-10, 1949	547	5	3.30	537							0	190	6	--	0.0		147	147
Oct. 11-20	492	--	3.35	511							0	182	6	--	.0		134	134
Oct. 21-31	375	10	3.25	539							0	198	8	--	.7		145	145
Nov. 1-10	739	5	3.30	540							0	194	7	--	.6		140	140
Nov. 11-20	735	10	3.40	430							0	157	5	--	.6		118	118
Nov. 21-30	896	10	3.60	363							0	130	6	--	.6		100	100
Dec. 1-10	1,774	4	3.80	321							0	109	4	--	.4		88	88
Dec. 11-20	6,293	1	4.05	195							0	66	2	--	.3		56	56
Dec. 21-31	8,547	7	4.6	119							2	41	1	--	.5		38	36
Jan. 1-10, 1950	15,750	2	4.40	119							0	40	3	--	1.5		35	35
Jan. 11-20	16,170	5	3.80	166							0	51	2	--	1.4		39	39
Jan. 21-31	8,338	5	3.90	176							0	53	2	0.0	1.3		38	38
Feb. 1-10	6,880	5	3.90	188							0	59	1	.0	1.4		48	48
Feb. 11-20	14,260	10	3.80	183							0	57	4	.0	1.4		46	46
Feb. 21-28	7,746	5	3.80	207							0	64	2	.0	1.4		60	60
Mar. 1-10	4,684	5	3.70	254							0	80	3	.0	1.3		60	60
Mar. 11-20	7,070	0	3.95	173							0	54	2	--	.9		44	44
Mar. 21-31	22,960	5	4.05	143							0	43	1	--	1.1		40	40
Apr. 1-10	20,970	0	4.20	113							0	33	2	--	.9		28	28
Apr. 11-20	5,854	0	3.90	173							0	52	2	--	1.2		39	39
Apr. 21-30	8,353	0	4.00	176							0	54	0	--	1.2		42	42
May 1-10	8,954	5	4.20	133							0	40	0	--	1.0		35	35
May 11-20	5,214	0	4.05	182							0	57	0	--	.8		44	44
May 21-31	7,834	5	4.10	152							0	45	0	--	.8		36	36

SUSQUEHANNA RIVER BASIN--Continued

WEST BRANCH SUSQUEHANNA RIVER AT LOCK HAVEN, PA.--Continued

Chemical analyses, in parts per million, water year October 1949 to September 1950--Continued

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																	Total	Noncarbonate
June 1-10, 1950	6,944	5	4.20	141							0	43	1	--	0.8		38	38
June 11-20	4,218	5	4.05	188							0	60	2	--	.8		48	48
June 21-30	1,942	5	3.85	262							0	86	2	--	1.4		69	69
July 1-10	1,983	2	3.60	280							0	113	3	--	.7		89	89
July 11-20	2,015	2	3.70	280							0	87	2	--	.7		73	73
July 21-31	2,521	2	3.80	266								87	2	--	.8		71	71
Aug. 1-10	1,822	1	3.70	288							0	101	2	--	1.0		75	75
Aug. 11-20	1,458	1	3.65	339							0	109	3	--	.7		93	93
Aug. 21-31	1,932	1	3.80	255							0	82	3	--	.8		67	67
Sept. 1-10	2,545	1	4.00	251							0	86	2	--	.7		71	71
Sept. 11-20	2,735	2	3.90	257							0	85	2	--	.6		69	69
Sept. 21-30	1,457	2	3.85	278							0	92	3	--	.7		77	77
Average	5,937	4	--	263							0	84	3	--	0.9		68	68

SUSQUEHANNA RIVER BASIN--Continued

WEST BRANCH SUSQUEHANNA RIVER AT LOCK HAVEN, PA.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	56	50	36	37	37	32	40	46	62	73	72	73
2	58	49	37	36	37	32	38	46	63	73	71	72
3	57	48	34	37	37	32	43	51	63	72	73	72
4	60	46	33	42	34	32	43	54	65	72	73	70
5	63	45	33	43	34	31	47	60	65	72	70	70
6	--	42	33	45	35	35	41	63	60	72	70	70
7	62	42	33	43	36	32	42	51	62	72	72	69
8	63	43	32	40	34	32	42	53	65	72	75	68
9	65	45	32	40	35	32	41	51	68	72	72	70
10	66	46	33	38	36	32	41	51	72	74	73	71
11	68	46	33	40	36	33	41	51	66	70	69	70
12	69	47	34	39	38	33	43	50	67	70	70	68
13	57	50	34	39	38	33	37	57	66	75	70	60
14	60	49	33	40	36	33	37	57	68	70	69	68
15	60	46	--	40	37	33	37	60	67	72	73	67
16	57	46	33	38	39	34	40	60	67	75	72	67
17	55	46	33	36	39	--	43	60	68	73	72	66
18	55	43	32	37	39	33	46	60	65	76	73	64
19	56	41	34	36	38	33	46	59	69	76	73	62
20	54	42	34	34	35	31	52	56	67	77	64	61
21	58	41	36	33	32	35	48	56	68	76	64	61
22	55	37	39	33	33	37	47	59	69	75	70	62
23	51	35	41	37	32	35	47	60	70	75	69	61
24	55	35	39	36	33	36	46	60	71	74	69	65
25	52	37	35	41	33	41	45	60	72	70	73	63
26	50	35	35	45	34	37	44	60	74	72	75	64
27	48	34	39	45	33	37	45	62	74	70	74	62
28	42	33	39	40	32	42	47	63	71	71	73	59
29	48	35	39	39	--	42	51	63	72	72	73	59
30	51	35	39	39	--	43	48	64	72	71	74	57
31	52	--	36	39	--	39	--	62	--	72	75	--
Average	57	42	35	39	35	35	44	57	68	73	72	66

SUSQUEHANNA RIVER BASIN--Continued

WEST BRANCH SUSQUEHANNA RIVER AT LEWISBURG, PA.

LOCATION.--At gaging station at Market Street Bridge at Lewisburg, Union County, 560 feet from east bank of river, 0.2 mile downstream from Buffalo Creek, and 7.4 miles upstream from mouth.
DRAINAGE AREA.--6,847 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1944 to September 1950.
Water temperatures: October 1944 to September 1950.
EXTREMES, 1949-50.--Specific conductance: Maximum, 236 micromhos Oct. 11-20; minimum, 74.3 micromhos Apr. 1-10.
Water temperatures: Maximum, 82°F Aug. 5; minimum, 34°F Mar. 2, 3, 4.
EXTREMES, 1944-50.--Dissolved solids (1944-47): Maximum, 219 ppm Oct. 1-10, 1944; minimum, 46 ppm May 1-10, 1945.
Hardness (1944-50): Maximum, 133 ppm Oct. 1-10, 1944; minimum, 26 ppm May 21-31, 1946.
Specific conductance: Maximum, 331 micromhos Oct. 1-10, 1948; minimum, 72.0 micromhos May 21-31, 1946.
Water temperatures: Maximum, 90°F July 28, Aug. 10, 1949; minimum, freezing point on many days during winter months.
REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1949 to September 1950 based on records for Susquehanna River at Renova, which are given in Water-Supply Paper 1171.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																	Total	Non-carbonate
Oct. 1-10, 1949	1,839	--	6.0	213					--		16	69	6		1.2		79	66
Oct. 11-20	1,687	5	6.6	236					--		18	76	8		1.2		89	74
Oct. 21-31	1,401	5	6.7	224					--		19	73	8		1.1		87	71
Nov. 1-10	2,646	5	6.8	198					--		21	60	6		1.4		70	53
Nov. 11-20	2,812	5	6.8	189					--		14	62	6		1.6		68	57
Nov. 21-30	2,454	1	6.9	180					--		15	57	6		1.9		66	54
Dec. 1-10	3,047	1	6.9	199					--		12	67	6		1.6		72	62
Dec. 11-13, 15-16	9,690	5	6.6	170					--		8	58	4		2.6		62	55
Dec. 14, 17-20	11,030	5	6.6	108					--		8	34	2		2.4		38	31
Dec. 21-31	17,900	1	6.7	92.4					--		8	28	2		1.6		32	25
Jan. 1-10, 1950	27,710	1	6.6	87.4					--		8	28	2		1.4		32	25
Jan. 11-20	28,070	5	4.7	107					--		2	39	2		1.2		38	36
Jan. 21-31	12,930	3	5.2	121					--		3	40	4		1.6		50	48
Feb. 1-10	11,570	3	5.7	124					--		4	41	3		1.6		50	47
Feb. 11-20	23,000	3	5.6	122					--		5	42	2		2.0		50	46
Feb. 21-28	13,050	3	4.8	136					--		2	57	2		1.3		56	54
Mar. 1-10	9,024	3	5.9	138					--		5	56	3		1.9		58	54
Mar. 11-20	13,170	3	5.7	113					--		4	40	2		1.5		44	41
Mar. 21-31	41,940	5	6.0	91.1					--		6	31	2		1.6		38	33
Apr. 1-10	46,270	5	5.9	74.3					--		4	27	2		1.4		34	31
Apr. 11-20	13,756	5	6.2	102					--		5	32	2		1.4		38	34
Apr. 21-30	14,640	5	6.5	104					--		4	34	2		1.1		39	37
May 1-10	16,540	5	6.4	88.9					--		5	28	1		1.0		33	29
May 11-20	9,036	0	6.4	113					--		6	37	2		1.0		45	40
May 21-31	13,250	5	6.4	106					--		5	37	2		.6		39	35

June 1-10	15,390	0	6.4	92.1					--	5	28	1		.8		33	29
June 11-20	8,317	0	6.5	115					--	6	37	2		.8		41	36
June 21-30	4,338	0	6.6	144					--	8	47	2		.9		52	45
July 1-10	3,440	0	6.5	192					--	8	60	6		1.1		69	62
July 11-20	3,713	0	6.7	188					--	6	85	3		1.0		68	63
July 21-31	4,080	1	6.6	178					--	11	61	3		1.1		69	60
Aug. 1-10	3,355	1	6.3	165					3.3	7	55	4		.7		63	56
Aug. 11-20	3,660	1	6.4	202					4.2	9	68	5		1.1		77	70
Aug. 21-31	5,976	1	6.1	149					4.2	6	53	3		.9		56	51
Sept. 1-10	4,529	0	6.4	164					4.7	7	57	4		.7		61	55
Sept. 11-20	5,042	1	6.4	157					4.1	7	54	3		1.0		58	52
Sept. 21-30	2,763	1	6.3	169					5.2	7	55	4		.9		58	52
Average	11,230	3	--	144					3.9	8	48	3		1.3		54	47

SUSQUEHANNA RIVER BASIN--Continued

WEST BRANCH SUSQUEHANNA RIVER AT LEWISBURG, PA.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	67	53	40	42	40	38	42	55	65	77	80	73
2	65	55	42	43	39	34	44	55	67	78	78	72
3	65	53	--	44	39	34	44	53	62	78	78	74
4	64	52	40	52	39	34	50	65	64	75	75	72
5	67	50	40	50	38	38	50	66	65	76	82	68
6	64	48	42	53	40	36	52	65	67	74	75	70
7	65	52	42	50	38	36	52	65	69	78	77	70
8	68	54	36	50	38	36	54	60	70	78	75	72
9	65	55	35	46	40	36	55	60	70	80	78	--
10	70	56	36	40	42	36	50	60	72	78	77	70
11	70	57	38	--	45	37	45	60	70	76	75	70
12	70	55	38	38	42	37	48	58	70	78	74	68
13	67	53	40	52	45	38	46	64	71	77	73	65
14	65	53	38	50	45	38	44	62	68	81	75	65
15	63	53	35	50	40	38	46	60	70	72	75	66
16	63	45	38	40	40	36	50	60	70	74	77	66
17	60	48	40	--	42	38	50	61	70	81	75	65
18	60	47	44	50	44	36	50	55	69	78	74	65
19	60	45	40	46	40	38	55	60	70	78	72	63
20	64	47	40	36	38	40	53	60	68	76	70	67
21	--	43	40	38	40	40	50	62	71	76	72	65
22	60	40	52	38	40	38	55	--	70	76	70	63
23	62	40	40	38	38	40	55	60	75	76	70	62
24	57	42	44	40	40	40	53	62	78	70	72	63
25	56	40	40	40	38	40	45	64	80	73	72	62
26	57	40	44	42	38	40	49	64	80	72	75	--
27	55	38	42	40	40	40	50	65	78	76	73	62
28	55	42	42	38	38	--	53	62	75	75	74	60
29	57	40	41	38	--	40	55	64	70	77	76	60
30	55	40	40	38	--	42	53	62	75	78	72	--
31	55	--	40	38	--	42	--	65	--	78	75	--
Average	62	48	40	43	40	38	47	61	71	76	75	67

FRANKSTOWN BRANCH JUNIATA RIVER AT HUNTINGDON, PA.

LOCATION.--At Fourth Street Bridge at Huntingdon, Huntingdon County.
DRAINAGE AREA.--816 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1950.
Water temperatures: October 1947 to September 1950.
EXTREMES, 1949-50.--Specific conductance: Maximum, 418 micromhos Oct. 11-20; minimum, 180 micromhos Mar. 21-31.
Hardness: Maximum, 168 ppm Oct. 11-30; 21-31; minimum, 83 ppm Apr. 1-10.
Water temperatures: Maximum, 76°F July 30, 31, Aug. 1, 2, 30; minimum, freezing point Mar. 11.
EXTREMES, 1947-50.--Dissolved solids (1947-50): Maximum, 241 ppm Oct. 21-31, 1947; minimum, 109 ppm May 1-10, 1948.
Hardness (1947-50): Maximum, 175 ppm Oct. 21-31, 1947; minimum, 77 ppm Mar. 21-31, 1950.
Water temperatures: Maximum, 80°F on several days in June, July, and August, 1949; minimum, freezing point Jan. 23 to Feb. 2,1948, Mar. 11, 1950.
REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Discharge records for gaging station at Huntingdon for water year October 1949 to September 1950 given in Water-Supply Paper 1171.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																	Total	Non-carbonate
Oct. 1-10, 1949	265	9	7.4	415	3.6	0.02	48	9.8	26		155	44	28	0.2	3.3	242	160	33
Oct. 11-20	282	10	7.5	418	--	--	--	--	--		150	33	29	--	1.7	--	168	45
Oct. 21-31	277	11	7.6	417	--	--	--	--	--		151	32	29	--	2.8	--	168	44
Nov. 1-10	320	7	7.4	394	--	--	--	--	--		138	36	28	--	1.5	--	163	50
Nov. 11-20	292	7	7.3	400	--	--	--	--	--		142	36	30	--	1.2	--	165	49
Nov. 21-30	334	8	7.3	407	--	--	--	--	--		138	37	31	--	1.4	--	166	53
Dec. 1-10	391	6	7.2	349	--	--	--	--	--		107	38	24	--	2.0	--	136	48
Dec. 11-20	1,372	7	7.0	256	--	--	--	--	--		73	33	16	--	2.1	--	108	48
Dec. 21-31	1,437	10	7.1	221	--	--	--	--	--		67	32	8.4	--	4.2	--	93	38
Jan. 1-10, 1950	2,242	10	6.9	208	--	--	--	--	--		71	31	6.9	--	4.1	--	87	29
Jan. 11-20	1,899	10	7.2	211	--	--	--	--	--		67	30	7.2	--	3.9	--	90	35
Jan. 21-31	991	10	7.3	258	--	--	--	--	--		85	33	10	--	3.9	--	110	40
Feb. 1-10.....	1,531	7	7.4	221	--	--	--	--	--		72	32	9.5	--	4.5	--	96	37
Feb. 11-20	3,477	9	7.4	198	5.5	04	24	6.2	5.9		65	29	7.5	.1	4.8	118	85	32
Feb. 21-28.....	1,320	9	7.6	253	--	--	--	--	--		90	32	10	--	5.4	--	112	38
Mar. 1-10.....	871	13	7.4	288	--	--	--	--	--		100	32	13	--	6.2	--	124	42
Mar. 11-20.....	1,187	3	7.2	235	--	--	--	--	--		77	30	10	--	5.0	--	100	37
Mar 21-31.....	3,829	4	7.1	180	--	--	--	--	--		58	27	5.2	--	4.5	--	77	29
Apr. 1-10..	2,037	4	7.4	192	--	--	--	--	--		64	27	6.0	--	4.0	--	83	31
Apr. 11-20	947	3	7.5	251	--	--	--	--	--		92	28	10	--	4.1	--	110	35
Apr. 21-30.....	1,162	4	7.2	236	--	--	--	--	--		82	28	9.0	--	3.2	--	101	34
May 1-10.....	1,144	4	7.3	218	--	--	--	--	--		77	26	8.2	--	3.0	--	92	29
May 11-20.....	1,215	9	7.2	213	--	--	--	--	--		77	26	7.6	--	3.2	--	90	27
May 21-31.....	1,290	7	7.1	205	--	--	--	--	--		72	24	7.2	--	2.9	--	86	27

SUSQUEHANNA RIVER BASIN--Continued

FRANKSTOWN BRANCH JUNIATA RIVER AT HUNTINGDON, PA.--Continued

Chemical analyses, in parts per million, water year October 1949 to September 1950--Continued

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																	Total	Non-carbonate
June 1-10, 1950	813	9	6.9	246	--	--	--	--	--		87	26	10	--	4.2	--	102	31
June 11-20	593	8	7.0	284	--	--	--	--	--		102	29	14	--	4.5	--	119	35
June 21-30	440	9	7.2	324	--	--	--	--	--		117	32	17	--	4.7	--	135	39
July 1-10	459	8	7.3	331	--	--	--	--	--		121	32	17	--	4.4	--	137	38
July 11-20	612	9	7.3	292	--	--	--	--	--		101	33	13	--	3.8	--	124	41
July 21-31	407	8	7.3	336	--	--	--	--	--		119	33	19	--	3.0	--	140	42
Aug. 1-10	322	12	7.7	376	--	--	--	--	--		134	34	24	--	2.8	--	154	44
Aug. 11-20	415	11	7.6	374	--	--	--	--	--		131	34	25	--	3.1	--	152	45
Aug. 21-31	338	17	7.5	366	--	--	--	--	--		129	38	20	--	3.6	--	150	44
Sept. 1-10	395	17	7.7	354	--	--	--	--	--		122	39	20	--	4.4	--	144	44
Sept. 11-20	805	16	7.5	309	--	--	--	--	--		104	39	13	--	4.4	--	128	43
Sept. 21-30	439	15	7.7	334	--	--	--	--	--		120	38	16	--	3.8	--	138	40
Average	1,007	9	--	293	--	--	--	--	--		102	32	16	--	3.6	--	122	39

SUSQUEHANNA RIVER BASIN--Continued

FRANKSTOWN BRANCH JUNIATA RIVER AT HUNTINGDON, PA.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	60	54	44	37	--	--	45	51	67	75	76	75
2	60	52	43	37	40	35	46	55	65	74	76	74
3	60	53	41	40	38	34	47	54	65	75	75	74
4	62	47	39	46	49	33	--	57	67	74	74	73
5	62	48	37	45	41	35	46	--	68	73	74	74
6	64	48	39	51	42	38	45	60	69	73	74	73
7	64	54	38	47	44	40	46	63	68	75	75	69
8	64	50	40	40	41	38	47	60	71	74	75	70
9	66	53	39	39	43	43	47	60	73	75	74	--
10	--	55	37	45	40	35	46	60	72	73	73	71
11	--	53	38	41	--	32	43	62	70	74	75	70
12	68	52	39	40	43	40	48	62	70	75	74	68
13	68	50	40	41	44	40	42	--	71	73	71	69
14	68	53	41	43	40	39	41	--	72	74	73	68
15	64	57	39	41	42	41	43	--	72	75	73	70
16	60	46	--	42	40	40	45	64	69	72	73	69
17	60	45	35	42	41	41	45	65	71	71	75	70
18	60	47	38	39	43	34	50	65	69	74	75	70
19	60	45	40	39	40	39	50	58	69	74	71	71
20	60	--	41	40	37	37	47	60	71	73	72	68
21	60	--	42	41	34	41	46	61	71	74	73	67
22	60	43	44	43	39	40	45	60	73	--	74	68
23	58	41	42	43	37	39	44	61	73	--	71	68
24	56	41	43	45	37	41	45	65	74	73	70	65
25	54	43	38	50	34	42	46	63	74	72	73	--
26	52	42	39	51	36	43	44	62	75	73	71	63
27	52	40	44	46	35	41	47	67	75	72	72	64
28	52	42	42	43	34	44	46	65	73	75	75	65
29	52	41	40	49	--	42	48	65	75	75	75	62
30	54	42	39	41	--	44	49	66	73	76	72	60
31	54	--	37	40	--	44	--	67	--	76	76	--
Average	60	48	40	43	33	39	46	61	71	74	74	69

SUSQUEHANNA RIVER BASIN--Continued

JUNIATA RIVER AT NEWPORT, PA.

LOCATION.--At gaging station at highway bridge at Newport, Perry County, 1,000 feet upstream from Little Buffalo Creek, and 230 feet from west bank of river.
DRAINAGE AREA.--3,354 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1944 to September 1950.
Water temperatures: October 1944 to September 1950.
EXTREMES, 1949-50.--Specific conductance: Maximum, 405 micromhos Oct. 11-20; minimum, 116 micromhos Mar. 21-31.
Hardness: Maximum, 152 ppm Oct. 11-20; minimum, 46 ppm Mar. 21-31.
Water temperatures: Maximum, 85°F June 25, 26; minimum 33°F Mar. 3.
EXTREMES, 1944-50.--Dissolved solids (1944-47) (1949-50): Maximum, 282 ppm Oct. 1-10, 1944; minimum, 74 ppm Feb. 11-20, 1950.
Hardness (1944-47) (1949-50): Maximum, 167 ppm Oct. 1-10, 1944; minimum, 46 ppm Mar. 21-31, 1950.
Specific conductance: Maximum, 444 micromhos Oct. 1-10, 1944; minimum, 116 micromhos Mar. 21-31.
Water temperatures: Maximum, 87°F Aug. 29, 1948; minimum, freezing point on many days during winter months.
REMARKS.--Records of specific conductance of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1171.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																	Total	Noncarbonate
Oct. 1-10, 1949	720	5	6.5	382	1.1	0.30	37	12	23		113	70	18	0.1	1.5	260	142	49
Oct. 11-20	735	5	7.6	405	3.3	.04	41	12	20		114	77	15	.1	.7	239	152	58
Oct. 21-31	764	5	7.6	399	--	--	--	--	22		116	74	15	--	1.0	--	146	51
Nov. 1-10	968	7	7.7	344	--	--	--	--	--		106	51	15	--	1.4	--	134	47
Nov. 11-20	830	7	7.7	360	--	--	--	--	--		108	63	15	--	1.6	--	141	52
Nov. 21-30	741	7	7.9	388	--	--	--	--	--		106	74	16	--	2.2	--	142	55
Dec. 1-10	1,375	9	7.3	315	--	--	--	--	18		92	60	14	--	3.3	--	122	47
Dec. 11-20	3,253	10	7.1	222	--	--	--	--	10		60	43	8.5	--	4.7	--	88	39
Dec. 21-31	5,111	10	6.9	174	--	--	--	--	8.3		46	34	6.8	--	4.2	--	68	30
Jan. 1-10, 1950	7,634	13	7.0	159	--	--	--	--	8.3		45	29	6.8	--	4.2	--	62	30
Jan. 11-20	6,555	11	7.2	160	--	--	--	--	8.1		47	29	6.8	--	4.0	--	64	26
Jan. 21-31	2,727	9	7.4	210	--	--	--	--	11		65	37	7.5	--	3.5	--	82	29
Feb. 1-10	5,559	12	7.2	157	--	--	--	--	6.3		51	26	4.0	--	3.9	--	64	22
Feb. 11-20	15,560	16	7.2	121	6.3	.09	14	3.5	3.1		33	20	2.9	.1	4.8	74	49	22
Feb. 21-28	5,275	8	7.4	168	--	--	--	--	--		52	27	3.5	--	5.0	--	70	27
Mar. 1-10	2,987	13	7.6	208	--	--	--	--	--		66	35	5.4	--	5.6	--	86	32
Mar. 11-20	3,560	17	7.6	201	--	--	--	--	--		58	35	5.4	--	4.0	--	80	32
Mar. 21-31	15,960	10	7.2	116	--	--	--	--	2.8		32	19	2.1	--	3.8	--	46	20
Apr. 1-10	7,199	10	7.4	148	--	--	--	--	3.9		45	23	3.0	--	3.0	--	59	22
Apr. 11-20	3,310	4	7.3	185	--	--	--	--	4.7		57	29	4.2	--	2.9	--	75	28
Apr. 21-30	3,824	3	7.4	193	--	--	--	--	6.3		63	30	4.1	--	2.4	--	77	25
May 1-10	4,223	6	7.4	154	--	--	--	--	6.1		49	25	3.8	--	2.2	--	60	20
May 11-20	4,815	7	7.4	164	--	--	--	--	4.4		52	26	3.8	--	1.9	--	67	24
May 21-31	5,907	5	6.8	143	--	--	--	--	4.7		45	23	3.0	--	1.4	--	56	19

June 1-10	3,808	8	7.0	167	--	--	--	--	5.0	52	25	3.9	--	2.3	--	65	22
June 11-20	2,121	8	7.2	219	--	--	--	--	8.6	68	36	5.6	--	1.9	--	84	28
June 21-30	1,457	8	7.2	267	--	--	--	--	--	82	43	7.0	--	1.4	--	99	45
July 1-10	1,206	8	7.3	292	--	--	--	--	12	88	52	6.4	--	1.5	--	110	38
July 11-20	1,685	10	7.5	271	--	--	--	--	14	85	46	8.1	--	2.1	--	100	30
July 21-31	1,191	10	7.7	307	--	--	--	--	17	91	57	9.9	--	1.0	--	112	37
Aug. 1-10	835	5	7.5	331	--	--	--	--	13	95	62	12	--	.8	--	132	54
Aug. 11-18	649	8	7.4	375	--	--	--	--	22	98	75	15	--	.4	--	132	50
Aug. 19	2,280	30	4.8	59.0	--	--	--	--	6.2	14	14	1	--	5.0	--	18	7
Aug. 20	6,500	15	5.8	127	--	--	--	--	6.0	36	22	4	--	3.7	--	48	18
Aug. 21	3,830	16	7.0	159	--	--	--	--	--	47	18	4	--	4.0	--	62	24
Aug. 22-31	1,048	17	7.6	304	--	--	--	--	--	84	61	9.1	--	1.7	--	106	37
Sept. 1-10	1,244	9	7.8	327	--	--	--	--	--	97	59	11	--	1.4	--	122	42
Sept. 11-20	2,492	10	7.4	279	--	--	--	--	--	80	52	7.1	--	2.5	--	108	42
Sept. 21-30	1,772	8	7.6	263	--	--	--	--	--	76	47	6.9	--	2.6	--	99	37
Average	3,626	10	--	236	--	--	--	--	11	70	42	7.7	--	2.7	--	90	34

SUSQUEHANNA RIVER BASIN--Continued

JUNIATA RIVER AT NEWPORT, PA.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	61	53	38	35	40	36	44	54	67	80	83	79
2	62	50	36	--	39	34	45	58	65	79	82	80
3	62	50	37	38	39	33	50	57	65	79	82	77
4	64	50	38	39	57	34	54	62	65	78	79	77
5	66	47	35	46	38	37	53	61	69	77	86	74
6	66	48	37	40	39	37	50	61	72	77	78	73
7	68	50	37	42	39	39	49	66	74	79	79	72
8	66	49	36	39	38	36	48	63	77	80	80	74
9	68	49	36	--	41	36	49	62	79	80	81	73
10	69	50	34	40	38	34	48	61	79	74	76	73
11	73	50	37	39	42	37	50	64	77	78	79	77
12	72	51	38	39	42	39	51	63	75	79	78	71
13	71	53	--	39	41	40	41	64	75	79	78	67
14	65	52	36	40	40	40	41	64	71	80	79	68
15	64	49	36	40	42	41	45	63	71	75	79	68
16	61	47	36	39	42	40	49	63	70	78	80	68
17	61	47	35	39	42	41	49	61	70	80	80	67
18	59	44	--	41	41	40	49	60	70	80	80	67
19	60	46	36	37	41	40	53	58	70	81	70	68
20	59	43	--	36	37	41	52	53	68	78	72	65
21	59	43	37	35	36	40	51	61	75	81	71	67
22	61	39	42	39	38	41	53	63	77	80	70	65
23	60	38	40	39	37	41	54	64	79	79	72	65
24	57	38	39	40	37	40	54	64	80	72	74	59
25	55	40	38	40	36	42	49	64	85	79	76	61
26	52	36	40	42	34	41	50	66	85	77	79	59
27	52	35	40	39	34	41	54	69	83	78	80	59
28	51	36	38	40	34	46	52	64	83	80	82	59
29	53	37	37	40	--	47	56	64	77	82	82	72
30	57	37	36	41	--	44	53	64	73	82	79	60
31	57	--	35	39	--	42	--	65	--	78	74	--
Average	62	45	37	39	39	39	50	62	74	79	78	69

RAYSTOWN BRANCH JUNIATA RIVER NEAR HUNTINGDON, PA.

LOCATION.--At gaging station at highway bridge at Hawn Bridge, a quarter of a mile below Pennsylvania Electric Co. power dam, 6 miles south of Huntingdon, Huntingdon County, and 9 miles upstream from mouth.
DRAINAGE AREA.--957 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1950.
Water temperatures: October 1946 to September 1950.
EXTREMES, 1949-50.--Specific conductance: Maximum, 285 micromhos Oct. 11-20; minimum, 94.3 micromhos Mar. 21-31.
Hardness: Maximum, 132 ppm Oct. 1-10, 11-20; minimum, 36 ppm Mar. 21-31.
Water temperatures: Maximum, 85°F July 29; minimum, freezing point on several days in December, January, and March.
EXTREMES, 1946-50.--Dissolved solids (1946-47): Maximum, 168 ppm Aug. 11-20, 1947; minimum, 64 ppm Apr. 11-20, 1947.
Hardness (1946-47) (1949-50): Maximum, 132 ppm Oct. 1-10, Oct. 11-20, 1950; minimum, 36 ppm Mar. 21-31, 1950.
Specific conductance: Maximum, 299 micromhos Oct. 1-10, 1948; minimum, 81.3 micromhos Apr. 21-30, 1948.
Water temperatures: Maximum, 87°F Aug. 29,1948; minimum, freezing point on many days during winter months.
REMARKS.--Flow is regulated by dam a quarter of a mile upstream from gaging station. Records of specific conductance of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1171.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																	Total	Noncarbonate
Oct. 1-10, 1949	171	5	6.5	275	2.1	0.04	33	12	2.9		94	50	4.6	0.1	2.8	170	132	55
Oct. 11-20	191	5	7.5	285							95	51	3.5	--	2.4		132	54
Oct. 21-31	232	5	7.6	282							100	50	3.5	--	1.7		128	47
Nov. 1-10	263	5	7.3	278							97	49	3.9	--	2.0		128	48
Nov. 11-20	224	5	7.3	265							94	45	4.2	--	2.3		120	42
Nov. 21-30	241	5	7.3	248							85	41	4.9	--	2.6		112	42
Dec. 1-10	486	7	7.3	232							77	41	4.5	--	2.7		105	42
Dec. 11-20	1,081	8	7.1	167							49	29	3.8	--	4.4		72	32
Dec. 21-31	1,507	10	6.9	133							35	25	2.4	--	4.4		54	25
Jan. 1-10, 1950	2,246	8	6.9	109							26	21	1.9	--	3.9		42	21
Jan. 11-20	1,639	8	6.9	118							28	24	2.1	--	3.7		46	23
Jan. 21-31	720	10	7.2	157							41	31	2.5	--	3.9		64	30
Feb. 1-10	2,239	12	7.1	120							33	23	4.8	--	3.8		48	21
Feb. 11-20	4,297	17	7.2	97.0							20	21	3.5	.1	3.4		38	22
Feb. 21-28	1,310	4	7.2	137							34	27	1.9	--	4.2		56	28
Mar. 1-10	695	6	7.4	166							46	32	2.1	--	3.8		72	34
Mar. 11-20	1,049	3	7.2	164							48	31	2.0	--	4.3		71	32
Mar. 21-31	4,185	6	6.8	94.3							21	19	1.8	--	3.6		36	19
Apr. 1-10	1,601	1	7.1	124							32	23	1.8	--	3.1		51	25
Apr. 11-20	708	4	7.2	156							45	28	2.2	--	2.8		67	30
Apr. 21-30	1,280	6	7.2	160							48	28	2.0	--	2.8		67	28

SUSQUEHANNA RIVER BASIN--Continued

RAYSTOWN BRANCH JUNIATA RIVER NEAR HUNTINGDON, PA.--Continued

Chemical analyses, in parts per million, water year October 1949 to September 1950--Continued

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																	Total	Noncarbonate
May 2-10, 1950	1,269	6	7.2	128							38	23	2.1	--	2.3		53	22
May 11-20	1,783	14	7.2	124							36	23	1.9	--	1.7		51	22
May 21-31	1,589	16	7.1	111							28	22	1.8	--	2.1		45	22
June 1-10	698	7	6.8	150							40	28	2.0	--	2.7		58	25
June 11-20	376	8	6.9	174							53	32	2.1	--	2.4		72	29
June 21-30	291	4	7.0	198							62	39	2.1	--	2.5		85	34
July 1-10	277	5	7.0	215							70	43	2.4	--	2.2		94	37
July 11-20	326	6	7.1	227							73	45	2.4	--	2.4		98	38
July 21-31	213	4	7.2	238							78	47	2.6	--	2.3		104	40
Aug. 1-10	152	12	7.5	237							78	44	2.8	--	2.6		105	41
Aug. 11-20	178	4	7.4	260							80	49	2.6	--	2.2		116	50
Aug. 21-31	128	4	7.3	268							86	52	2.5	--	1.9		122	52
Sept. 1-10	273	3	7.3	253							80	53	2.6	--	1.6		120	54
Sept. 11-20	968	7	7.2	198							61	37	2.5	--	3.0		88	38
Sept. 21-30	701	8	7.3	178							55	26	2.5	--	3.8		74	29
Average	991	6	--	187							57	34	2.7	--	2.9		81	34

SUSQUEHANNA RIVER BASIN--Continued

RAYSTOWN BRANCH JUNIATA RIVER NEAR HUNTINGDON, PA.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

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

SUSQUEHANNA RIVER BASIN--Continued

CONESTOGA CREEK AT LANCASTER, PA.

LOCATION.--At raw-water intake for Lancaster, Lancaster County, 500 feet upstream from gaging station at Pennsylvania Railroad bridge, and three-quarters of a mile east of Lancaster.
DRAINAGE AREA.--322 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1950.
Water temperatures: October 1947 to September 1950.
EXTREMES, 1949-50.--Specific conductance: Maximum, 387 micromhos Oct. 11-20; minimum, 242 micromhos May 21-31.
Hardness: Maximum, 182 ppm Oct. 21-31; minimum, 109 ppm May 21-31.
Water temperatures: Maximum, 80°F Aug. 25; minimum, 34°F Dec. 17, Feb. 28, Mar. 4.
EXTREMES, 1947-50.--Dissolved solids (1947-49): Maximum, 276 ppm July 11-20, 1948; minimum, 156 ppm Apr. 11-20, 1948.
Hardness: Maximum, 193 ppm Sept. 1-10, 21-30, 1948; minimum, 109 ppm May 21-31, 1950.
Water temperatures: Maximum, 80°F Aug. 25, 1950; minimum, freezing point on many days during winter months.
REMARKS.--Records of specific conductance of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1171.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																	Total	Non-carbonate
Oct. 1-10, 1949	72	6	7.6	373	7.6	0.12	47	13	8.1		178	22	7.4	0.1	11		171	25
Oct. 11-20	60	6	7.7	387	7.1	--	--	--	--		192	21	7.2	--	11		180	23
Oct. 21-31	73	7	7.8	380	5.8	--	--	--	--		190	22	7.5	--	7.1		182	26
Nov. 1-10	80	6	8.1	357	--	--	--	--	--		165	28	7.4	--	9.8		154	15
Nov. 11-20	78	8	8.1	365	--	--	--	--	--		174	27	7.2	--	11		168	26
Nov. 21-30	66	6	8.0	359	--	--	--	--	--		171	25	7.0	--	14		168	28
Dec. 1-10	75	10	7.8	345	--	--	--	--	--		157	30	6.6	--	13		158	29
Dec. 11-20	176	10	7.4	302	--	--	--	--	--		118	25	6.9	--	12		134	37
Dec. 21-31	303	10	7.4	285	--	--	--	--	--		111	30	6.5	--	12		127	36
Jan. 1-10, 1950	212	10	7.6	311	--	--	--	--	--		126	28	6.1	--	13		141	38
Jan. 11-20	241	10	7.8	299	--	--	--	--	--		123	28	5.8	--	12		136	35
Jan. 21-31	174	8	7.6	335	--	--	--	--	--		150	25	6.5	--	16		158	35
Feb. 1-10	527	18	7.5	279	--	--	--	--	--		112	27	5.8	--	15		126	34
Feb. 11-20	874	18	7.5	274	--	--	--	--	--		107	26	5.4	--	16		123	35
Feb. 21-28	450	8	7.8	334	--	--	--	--	--		145	24	5.9	--	22		157	38
Mar. 1-10	355	8	7.8	342	--	--	--	--	--		154	24	6.4	--	21		162	36
Mar. 11-20	387	4	7.7	298	--	--	--	--	--		131	24	5.5	--	16		141	34
Mar. 21, 22, 24-31	1,158	6	7.7	264	9.6	.04	35	10	2.8		110	23	4.6	.1	17		128	38
Mar. 23	3,930	30	6.3	154	--	--	--	--	--		48	28	3.0	--	12		68	29
Apr. 1-10	641	4	7.6	312	--	--	--	--	--		141	23	5.0	--	20		150	34
Apr. 11-20	413	4	7.8	325	--	--	--	--	--		151	22	5.8	--	20		159	35
Apr. 21-30	359	3	7.7	322	--	--	--	--	--		150	23	5.8	--	17		153	30

May 1-10	351	4	7.7	301	--	--	--	--	--	138	22	5.2	--	14		142	29
May 11-20	502	6	7.5	286	--	--	--	--	--	131	19	4.2	--	12		132	25
May 21-31	715	9	7.3	242	--	--	--	--	--	106	18	3.6	--	9		109	22
June 1-10	734	15	7.3	260	--	--	--	--	--	125	19	5.2	--	13		115	13
June 11-20	366	12	7.5	318	--	--	--	--	--	157	20	5.8	--	16		142	13
June 21-30	253	8	7.4	338	--	--	--	--	--	165	20	6.2	--	17		157	22
July 1-10	224	10	7.4	345	--	--	--	--	--	166	20	6.2	--	16		157	21
July 11-20	358	15	7.4	314	--	--	--	--	--	145	20	5.8	--	16		142	23
July 21-31	169	10	7.7	368	--	--	--	--	--	175	20	6.4	--	18		172	29
Aug. 1-10	130	6	7.6	380	--	--	--	--	--	181	21	5.8	--	16		177	29
Aug. 11-20	112	4	7.7	378	--	--	--	--	--	180	22	6.5	--	16		177	30
Aug. 21-31	98	4	7.7	383	--	--	--	--	--	184	22	6.1	--	15		180	29
Sept. 1-10	106	8	7.6	369	--	--	--	--	--	175	23	6.4	--	14		171	28
Sept. 11-20	317	8	7.4	257	--	--	--	--	--	104	25	4.5	--	10		114	29
Sept. 21-30	121	8	7.7	364	--	--	--	--	--	165	24	6.1	--	16		171	36
Average	338	9	--	324	--	--	--	--	--	146	23	5.9	--	14		148	28

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SUSQUEHANNA RIVER BASIN--Continued

CONESTOGA CREEK AT LANCASTER, PA.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	55	49	42	42	40	38	47	52	62	71	77	76
2	56	52	45	40	39	40	48	54	64	72	77	76
3	55	50	45	41	39	35	48	54	64	71	77	75
4	57	46	40	47	41	34	55	56	64	72	75	72
5	59	46	44	48	41	36	55	59	63	72	74	70
6	58	48	37	50	38	41	50	64	65	70	76	69
7	58	50	36	50	40	40	48	63	67	69	73	67
8	60	--	42	43	39	43	46	60	69	71	72	69
9	62	50	37	38	39	41	46	58	70	73	73	69
10	65	50	35	40	39	37	47	--	74	72	73	70
11	63	54	35	41	42	37	50	61	70	71	73	70
12	64	54	37	40	44	42	50	60	68	72	73	68
13	65	56	43	38	44	41	49	62	67	72	73	66
14	61	54	42	44	40	42	45	65	65	70	73	65
15	60	52	39	43	41	43	46	60	62	70	72	64
16	60	53	36	40	43	42	47	61	64	68	72	65
17	57	49	34	38	43	42	50	62	67	70	73	63
18	54	48	35	40	43	42	54	61	66	73	73	62
19	--	45	36	38	44	43	56	56	65	72	74	63
20	56	44	40	36	38	41	57	55	62	73	75	64
21	54	45	40	36	35	42	54	56	65	74	73	62
22	54	43	42	38	35	42	53	60	67	74	70	62
23	54	40	44	39	39	39	52	60	67	72	78	64
24	54	40	44	42	39	44	50	61	70	69	69	60
25	50	41	43	43	39	46	49	61	72	70	80	55
26	50	40	49	48	38	45	52	63	72	69	74	55
27	49	39	48	47	36	45	56	65	74	70	73	55
28	46	39	47	44	34	53	58	63	72	72	73	55
29	47	38	44	44	--	52	58	60	70	74	75	58
30	48	40	39	43	--	47	56	60	70	74	76	59
31	51	--	37	42	--	46	--	62	--	74	78	--
Average	56	47	41	42	40	42	51	60	67	71	74	65

MISCELLANEOUS ANALYSES OF STREAMS IN SUSQUEHANNA RIVER BASIN IN PENNSYLVANIA

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	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	Hardness as $CaCO_3$		Total acidity as H_2SO_4
																				Total	Non-carbonate	
WAPWALLOPEN CREEK NEAR WAPWALLOPEN																						
Oct. 28, 1949	9.8	82	5	6.6	60.2	6.5		0.01	0.0	5.0	2.1	4.4		16	12	3.0	0.0	1.0	40	21	8	
Dec. 1	16	34	1	7.9	60.6	6.5		.02	.0	5.4	2.0	4.9		14	13	4.5	.0	1.1	44	22	10	
Dec. 22	38	46	4	6.2	58.4	6.3		.01	.0	5.4	2.1	1.3		9	13	2.5	.0	.7	42	22	16	
Jan. 27, 1950	63	43	5	8.2	54.5	5.4		.10	.0	5.0	1.8	1.2		10	9.5	3.0	.0	.2	32	20	12	
Feb. 24	89	41	10	6.0	56.4	6.2		.01	.0	4.4	1.7	1.7	1.0	7	12	1.9	.0	1.5	33	18	12	
Mar. 17	66	33	5	6.6	50.8	5.0		.08	.0	4.1	1.6	3.3		11	12	1.0	.0	1.4	35	17	8	
Apr. 21	158	42	10	6.3	50.1	4.0		.02	.0	4.2	1.7	3.6		12	13	1.0	.0	.7	42	18	8	
May 22	50	52	5	7.1	52.5	4.5		.02	.0	4.4	1.4	4.2		14	11	2.0	.0	.3	36	17	5	
June 23	49	60	4	6.6	47.4	4.9		.02	.0	5.0	1.4	4.0		16	10	2.0	.0	.8	36	18	5	
July 21	29	65	4	6.6	69.2	5.6		.14	.0	4.2	2.5	4.6		20	8.5	3.5	.0	.7	--	21	4	
Aug. 18	6.7	67	3	6.9	46.8	4.9		.01	.0	4.4	1.4	3.8		18	8.8	1.0	.0	1.0	33	17	2	
Sept. 21	9.4	53	4	7.2	56.9	4.5		.16	.1	5.4	1.6	4.7		20	10	2.0	.0	.8	34	20	4	
NESCOPECK CREEK AT NESCOPECK																						
Oct. 28, 1949	78	--	2	3.40	947	16	22	0.47	6.7	38	42	12		0	424	6.0	0.0	0.3	671	268	268	280
Dec. 1	140	35	2	3.75	794	15	21	.45	4.5	29	28	17		0	334	8.0	.0	.2	518	188	188	242
Dec. 22	160	47	3	3.85	777	14	22	.24	3.6	26	26	13		0	308	9.0	.0	3.6	539	172	172	238
Jan. 27, 1950	55	46	3	3.90	704	12	16	.49	3.3	24	26	8.6		0	265	8.5	.0	.2	448	167	167	168
Feb. 25	56	42	5	3.30	583	11	14	.40	4.0	25	20	3.7	1.2	0	223	3.5	.0	2.3	316	145	145	115
Mar. 17	61	36	4	3.50	580	12	15	.43	2.7	20	21	--		0	229	3.5	.0	.7	380	136	136	134
Apr. 21	700	46	2	3.80	314	7.9	6.9	.15	1.5	12	11	2.8		0	123	2.0	.0	.2	193	75	75	73
May 22	345	54	2	3.70	506	10	14	.32	2.6	18	12	11		0	199	3.5	.0	.4	316	94	94	132
June 23	260	62	1	3.90	650	12	18	.29	3.5	24	23	5.3		0	262	4.5	.0	.3	382	154	154	202
July 21	450	69	3	3.85	607	16	21	.90	5.2	30	36	19		0	378	4.0	.0	.1	607	--	--	236
Aug. 18	--	70	1	4.05	1,260	21	33	3.7	8.7	52	55	43		0	625	7.5	.0	2.5	958	356	356	424
Sept. 21	--	63	2	4.00	1,270	20	44	3.6	9.1	56	56	20		0	654	5.0	.0	2.4	947	370	370	374
CATAWISSA CREEK AT CATAWISSA																						
Oct. 28, 1949	780	--	3	3.75	572	15	18	0.09	3.0	23	18	14		0	260	4.5	0.0	0.3	362	131	131	160
Dec. 1	220	39	2	4.15	461	14	14	.11	2.3	19	14	10		0	197	5.0	.0	.3	318	105	105	138
Dec. 22	175	43	3	4.35	345	10	12	.05	1.2	15	9.6	1.1		0	135	5.0	.0	2.3	236	77	77	92
Jan. 27, 1950	26	45	2	4.40	263	9.0	5.8	.07	.7	11	7.0	3.6		0	90	3.5	.0	.1	167	56	56	64

MISCELLANEOUS ANALYSES OF STREAMS IN SUSQUEHANNA RIVER BASIN IN PENNSYLVANIA--Continued

Chemical analyses, in parts per million, water year October 1949 to September 1950--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	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	Hardness as $CaCO_3$		Total acidity as H_2SO_4
																				Total	Noncarbonate	
CATAWISSA CREEK AT CATAWISSA--Continued																						
Feb. 24, 1950	35	38	1	4.00	178	8.0	4.7	0.06	0.55	8.8	5.2	1.7	1.4	0	63	1.8	0.0	2.5	96	43	43	35
Mar. 17	21	35	3	4.05	240	8.2	6.2	.12	.8	9.8	7.0	--		0	87	2.5	.0	.4	148	53	53	56
Apr. 21	2,500	46	3	4.40	146	6.9	3.1	.07	.5	7.2	4.4	1.2		0	53	2.0	.0	.2	89	36	36	32
May 22	350	56	1	4.5	180	7.0	5.2	.07	.5	8.8	4.5	1.5		3	66	1.5	.0	.7	111	40	38	42
June 23	110	66	3	4.5	229	8.4	6.4	.03	.6	10	7.0	2.5		2	85	4.0	.0	.2	133	54	52	76
July 21	74	70	2	4.35	373	11	11	.28	1.8	16	14	16		0	148	--	.0	.2	263	97	97	96
Aug. 18	--	72	2	4.35	718	18	26	.69	3.6	32	23	16		0	342	3.5	.0	1.8	536	174	174	238
Sept. 21	--	64	2	4.40	588	15	24	.56	3.3	26	14	13		0	276	3.0	.0	1.8	408	122	122	182
SHAMOKIN CREEK AT WEIGH SCALE																						
Oct. 27, 1949	27	--	4	3.55	1,670	21	20	0.50	9.4	143	88	47		0	914	8.5	0.0	0.6	1,360	719	719	290
Dec. 1	35	40	5	4.35	1,810	20	7.7	.29	7.3	122	69	157		0	707	177	.0	.8	1,380	588	588	222
Dec. 22	60	55	90	4.6	1,610	19	42	12	6.0	103	71	39		4	726	105	.0	2.8	1,360	549	546	320
Jan. 27, 1950	84	48	4	3.65	1,910	18	22	5.8	8.8	124	85	42		0	846	24	.0	.7	1,440	659	659	352
Feb. 24	130	40	20	2.85	1,760	19	24	19	9.6	102	76	44	6.0	0	815	44	.1	.1	1,160	567	567	276
Mar. 17	102	46	5	3.25	1,700	21	21	5.0	8.4	136	90	15		0	866	9.0	.0	4.8	1,360	709	708	302
Apr. 21	147	53	4	3.70	1,680	20	20	3.8	9.6	114	55	78		0	785	7.5	.0	.8	1,200	511	511	391
May 22	117	57	5	3.70	1,560	20	29	16	10	116	65	32		0	811	10	.0	1.3	1,270	557	557	360
June 23	94	67	40	3.60	2,110	19	26	7.6	8.6	113	80	109		0	825	128	.0	2.0	1,350	611	611	562
July 21	94	66	5	4.25	1,500	20	16	56	7.7	117	90	13		0	874	21	.0	7.7	1,480	662	662	368
Aug. 18	86	65	25	4.20	1,610	19	14	28	8.7	133	81	33		0	852	14	.0	3.7	1,320	665	665	292
Sept. 21	50	67	140	4.9	1,860	20	15	53	8.7	126	70	106		8	802	165	.0	1.4	1,510	602	596	300
MAHANOY CREEK AT DORNSIFE																						
Oct. 27, 1949	--	--	4	3.60	1,760	21	25	0.35	11	147	113	59		0	1,060	20	0.0	1.0	1,580	831	831	427
Dec. 1	92	42	4	3.60	1,990	25	48	.52	13	177	140	12		0	1,260	22	.0	.5	1,940	1,020	1,020	628
Dec. 22	110	45	5	3.95	1,570	20	33	1.3	7.6	135	100	5.2		0	920	5.0	.0	1.0	1,450	748	748	516
Jan. 27, 1950	16	45	3	4.00	1,460	19	24	.68	8.1	108	89	5.8		0	755	12	.0	.5	1,300	635	635	272
Feb. 24	34	39	2	3.25	1,180	14	15	.55	8.8	81	62	8.8	3.7	0	602	3.8	.0	.5	901	457	457	140
Mar. 17	25	38	4	3.55	1,350	17	25	.60	7.6	102	83	2.3		0	730	6.0	.0	1.3	1,140	596	596	310
Apr. 21	400	51	4	4.15	1,160	15	22	.37	6.8	86	47	55		0	634	4.0	.0	.4	972	408	408	316
May 22	130	61	7	4.00	1,300	15	27	1.0	5.5	96	54	58		0	717	6.0	.0	.2	1,120	462	462	372

MAHANOY CREEK AT DORNSIFE--Continued

June 23, 1950	140	70	6	3.90	1,620	18	33	0.73	9.7	121	99	30	0	925	14	0.0	0.5	1,360	709	709	510
July 21	96	78	3	3.90	1,840	21	11	1.6	11	136	132	26	0	1,070	31	.0	.3	1,760	882	882	504
Aug. 18	--	71	5	4.10	2,070	26	42	1.6	12	161	134	51	0	1,260	10	.0	1.0	1,950	953	953	642
Sept. 21	--	66	5	4.05	2,040	23	49	2.2	15	162	109	72	0	1,260	3.0	.0	2.4	1,890	852	852	576

MAHANTANGO CREEK NEAR DALMATIA

Oct. 27, 1949	52	45	4	5.0	228	6.4	--	0.01	1.3	17	9.6	8.9	8	86	3.0	0.0	1.1	141	82	75	13
Dec. 1	52	41	2	5.1	168	7.4	--	.04	.6	14	6.5	5.9	10	57	4.0	.0	1.7	115	62	53	--
Dec. 22	107	43	4	6.0	123	7.1	--	.03	.0	11	4.5	2.3	8	33	4.0	.0	5.6	89	46	39	--
Jan. 27, 1950	130	47	3	4.9	157	7.3	1.4	.07	.5	10	5.3	2.0	8	45	3.0	.0	2.8	102	47	40	12
Feb. 24	265	39	2	4.95	147	7.4	.8	.04	.35	8.6	4.7	1.7 | 0.6	0	42	1.8	.0	4.3	72	41	41	14
Mar. 17	141	36	3	4.40	158	6.8	.8	.06	.4	9.4	5.4	1.1	0	47	2.5	.0	2.5	89	46	46	20
Apr. 21	224	50	5	5.3	136	6.4	--	.07	.6	9.2	5.7	4.1	6	44	2.0	.0	2.2	82	46	42	--
May 22	150	61	3	5.1	121	6.0	--	.03	.3	8.6	4.4	3.5	14	30	2.0	.0	1.9	79	40	28	--
June 23	92	72	3	4.9	179	7.0	1.4	.06	.8	12	7.5	6.9	6	62	4.0	.0	.9	108	61	56	20
July 21	80	78	2	5.9	136	7.3	--	.03	.0	9.4	5.8	6.5	14	41	3.0	.0	3.8	102	47	36	--
Aug. 18	32	73	1	5.2	237	6.8	--	.05	1.3	17	9.0	11	10	88	3.0	.0	.7	144	79	71	--
Sept. 21	72	64	2	5.6	188	7.9	--	.05	1.1	14	7.2	7.8	10	63	3.5	.0	5.8	113	65	56	--

WICONISCO CREEK AT ELIZABETHVILLE

Oct. 27, 1949	26	--	3	7.5	352	8.2		0.01	0.0	30	15	18	38	127	6.5	0.0	4.4	235	137	105	
Dec. 1	24	51	4	7.4	339	10		.02	.0	29	14	18	30	121	9.0	.0	7.6	242	130	105	
Dec. 22	500	44	5	7.0	235	7.9		.03	.0	20	11	5.4	16	83	3.0	.0	3.9	166	95	82	
Jan. 27, 1950	13	46	4	6.9	197	6.8		.11	.0	18	9.2	2.7	18	65	3.0	.0	2.4	145	83	68	
Feb. 24	505	41	5	6.2	163	6.6		.06	.5	14	7.4	3.3 | 2.6	10	58	2.0	.1	2.2	100	65	57	
Mar. 17	10	39	4	7.0	213	6.2		.07	.6	17	9.9	6.9	20	72	3.5	.0	2.3	137	83	67	
Apr. 21	120	49	4	7.1	228	4.9		.05	.7	20	12	8.9	28	87	2.5	.0	2.0	155	99	76	
May 22	120	59	6	7.1	161	5.8		.18	.2	14	6.7	9.5	30	53	2.0	.0	.7	109	62	38	
June 23	90	70	3	6.7	275	6.5		.03	.0	24	14	11	38	100	3.5	.0	2.5	183	117	86	
July 21	29	77	4	6.9	319	7.3		.10	.0	28	16	10	42	111	4.0	.0	2.6	223	136	101	
Aug. 18	--	72	3	7.5	394	6.2		.02	.0	37	20	14	54	148	3.0	.0	3.2	273	175	130	
Sept. 21	--	65	3	7.4	319	6.5		.08	.1	28	15	12	37	114	4.5	.0	2.6	207	132	101	

SUSQUEHANNA RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN SUSQUEHANNA RIVER BASIN IN PENNSYLVANIA--Continued

Chemical analyses, in parts per million, water year October 1949 to September 1950--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	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	Hardness as $CaCO_3$		Total acidity as H_2SO_4
																				Total	Noncarbonate	
SWATARA CREEK AT HARPERS TAVERN																						
Oct. 27, 1949	185	48	2	7.2	271	7.0		0.02	0.0	27	11	8.6		36	92	3.0	0.0	2.3	177	113	83	
Dec. 2	78	34	1	7.5	208	7.0		.02	.0	23	7.7	7.1		36	64	4.0	.0	3.4	145	89	60	
Dec. 22	147	41	4	6.8	158	7.8		.02	.0	15	6.2	4.0		20	44	3.0	.0	6.4	112	63	47	
Jan. 27, 1950	399	46	5	6.7	141	7.3		.11	.0	14	4.8	4.4		18	39	3.5	.0	4.9	90	55	40	
Feb. 24	645	38	3	6.2	123	7.6		.04	.1	11	4.6	1.7	0.9	11	35	2.1	.0	4.8	75	46	37	
Mar. 17	444	40	4	7.2	121	7.1		.10	.2	11	4.9	3.4		17	33	2.0	.0	4.9	81	48	34	
Apr. 19	294	61	5	7.3	128	6.2		.04	.2	12	5.4	5.2		24	37	2.0	.0	3.2	93	52	32	
May 24	1,580	61	30	7.2	89.5	5.8		.39	.0	9.8	3.0	4.1		22	22	2.5	.0	1.6	68	37	19	
June 21	359	67	2	6.9	130	7.1		.03	.0	13	4.8	6.5		32	32	3.0	.0	3.3	87	52	26	
July 19	255	79	2	6.8	130	6.8		.09	.0	12	5.4	6.3		30	33	3.5	.0	2.5	92	52	28	
Aug. 16	68	77	2	7.5	214	6.3		.01	.0	22	8.3	6.5		30	71	2.0	.0	2.4	139	89	64	
Sept. 20	122	66	5	7.3	174	7.4		.08	.1	19	6.5	5.6		37	46	3.0	.0	4.7	113	74	44	

MISCELLANEOUS ANALYSES OF STREAMS IN SUSQUEHANNA RIVER BASIN IN PENNSYLVANIA--Continued

Chemical analyses of cross-section samples, in parts per million, July to September 1950

Date of collection	Sampling point		Time	Temperature (°F)	Color	pH	Specific conductance (micromhos at 25°C)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Total hardness as $CaCO_3$
	Channel	Station										
SUSQUEHANNA RIVER AT HARRISBURG												
July 11, 1950	East	120	11:00 a. m.	72	2	5.0	420	2	174	6	1.8	174
		600	11:00 a. m.	73	2	6.6	312	21	110	8	1.8	127
		1180	11:00 a. m.	73	1	6.6	202	20	0	5	2.1	75
	West	600	11:00 a. m.	73	1	--	260	77	20	6	0.8	74
		1100	11:00 a. m.	71	1	7.5	291	99	42	10	1.9	111
		1320	11:00 a. m.	--	1	7.5	356	185	19	7	7.8	177
July 21	East	120	11:00 a. m.	75	1	6.6	392	7	159	7	1.8	166
		600	11:00 a. m.	75	2	6.8	309	32	99	8	1.9	121
		1180	11:00 a. m.	--	1	6.7	207	23	59	5	1.8	77
	West	600	11:00 a. m.	74	2	7.0	194	31	51	6	1.8	71
		1100	11:00 a. m.	73	1	7.3	268	83	45	9	1.5	101
		1320	11:00 a. m.	72	1	7.6	340	166	17	7	7.5	158
Aug. 14	East	120	11:00 a. m.	70	1	4.9	481	2	205	8	1.4	208
		600	11:00 a. m.	69	2	6.3	354	22	128	7	1.2	144
		1180	11:00 a. m.	68	2	6.6	225	20	69	5	1.1	84
	West	600	11:00 a. m.	66	2	6.7	223	30	63	6	0.8	88
		1100	11:00 a. m.	68	2	6.8	306	89	57	11	0.5	116
		1320	11:00 a. m.	69	2	7.1	318	152	25	10	4.8	152
Sept. 18	East	120	11:00 a. m.	66	3	6.4	275	29	84	6	2.8	113
		600	11:00 a. m.	64	2	7.6	207	53	42	4	2.7	85
		1180	11:00 a. m.	64	2	6.5	160	25	41	4	1.6	60
	West	600	11:00 a. m.	64	3	6.5	164	23	40	4	1.6	60
		1100	11:00 a. m.	65	3	7.1	254	77	41	6	3.1	104
		1320	11:00 a. m.	63	6	6.8	242	101	25	4	5.4	114
Sept. 25	East	120	11:00 a. m.	52	3	6.1	342	24	120	6	2.2	144
		600	11:00 a. m.	54	2	6.5	224	48	61	5	1.6	105
		1180	11:00 a. m.	54	2	6.7	191	29	51	4	1.9	73
	West	600	11:00 a. m.	54	2	7.1	196	37	47	5	1.9	72
		1100	11:00 a. m.	54	4	7.0	257	80	43	7	2.3	103
		1320	11:00 a. m.	54	7	7.2	256	118	16	4	5.4	116

POTOMAC RIVER BASIN

CONOCOCHEAGUE CREEK AT FAIRVIEW, MD.

LOCATION.--At highway bridge 0.7 mile downstream from gaging station at Fairview, Washington County. The water-stage recorder is 2 miles upstream from Rockdale Run and 6½ miles northwest of Hagerstown.
DRAINAGE AREA.--494 square miles.
RECORDS AVAILABLE.--Chemical analyses: April 1948 to September 1950.
Sediment records: April 1948 to September 1950.
REMARKS.--Records of specific conductance and pH of weekly samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1949 to Septembsr 1950 given in Water-Supply Paper 1171.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Discharge (second-feet)	Temperature (°F)	Suspended sediment	Dissolved oxygen	Biochemical oxygen demand (five days at 20°C)	Color	pH	Specific conductance (micromhos at 25°C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$
Oct. 5, 1949	100	63	22	13.6	0.9	--	8.3	328	--	--	--	--	--		186	--	--	--	6.0	--	166
Oct. 12	124	68	2	11.9	1.3	--	8.2	322	--	--	--	--	--		184	--	--	--	4.7	--	160
Oct. 19	104	56	4	9.9	.7	10	8.1	350	3.4	0.04	51	12	7.3		200	14	6.5	0.0	5.8	211	177
Oct. 26	124	49	8	15.0	2.0	--	8.4	337	--	--	--	--	--		190	--	--	--	6.3	--	164
Nov. 2	263	53	22	11.2	6.2	10	7.8	269	--	--	--	--	--		152	--	--	--	10	--	120
Nov. 16	143	44	2	10.4	5.2	20	8.1	306	3.4	.05	44	10	8.9		169	18	6.0	.0	5.4	189	151
Nov. 23	106	35	4	15.5	5.9	10	8.1	319	--	--	--	--	--		177	--	--	--	2.9	--	162
Nov. 30	320	40	30	10.4	4.4	45	7.7	264	--	--	--	--	--		126	--	--	--	9.4	--	118
Dec. 14	555	40	49	10.6	3.1	25	7.4	217	12	.10	28	6.1	9.0		94	25	3.5	.0	8.0	140	95
Jan. 4, 1950	810	47	28	10.3	2.2	8	7.5	239	--	--	--	--	--		119	--	--	--	7.7	--	107
Jan. 11	728	43	12	11.7	2.6	6	7.7	242	--	--	--	--	--		124	--	--	--	7.7	--	113
Jan. 25	341	47	2	11.3	2.1	15	8.0	278	5.9	.08	39	8.3	7.5		142	16	5.5	.0	8.7	165	131
Feb. 8	728	41	8	11.6	1.5	9	7.6	252	--	--	--	--	--		131	--	--	--	9.4	--	118
Feb. 15	3,740	39	246	10.2	2.7	50	7.7	175	9.1	.58	24	4.9	7.8		78	23	2.0	.0	8.0	120	60
Feb. 22	892	39	12	11.8	2.3	7	7.6	259	--	--	--	--	--		142	--	--	--	9.4	--	122
Mar. 15	615	39	10	11.4	2.2	9	7.8	233	6.5	.38	34	6.6	6.9		112	24	3.0	.0	7.4	147	112
Mar. 22	1,320	43	76	9.7	3.4	25	7.6	210	--	--	--	--	--		100	--	--	--	8.0	--	98
Mar. 29	1,660	49	58	9.6	2.1	20	7.8	195	--	--	--	--	--		96	--	--	--	6.7	--	98
Apr. 5	755	51	15	9.4	2.1	5	7.7	240	--	--	--	--	--		123	--	--	--	8.0	--	120
Apr. 12	276	48	10	11.4	1.9	7	7.9	271	--	--	--	--	--		150	--	--	--	8.6	--	132
Apr. 19	373	56	2	13.3	2.2	6	8.3	278	2.9	.05	42	9.3	3.8		153	13	5.0	.0	6.4	172	143
Apr. 26	596	52	8	11.9	2.8	13	7.4	226	--	--	--	--	--		114	--	--	--	6.0	--	110
May 3	1,010	56	34	8.8	1.7	5	7.4	210	--	--	--	--	--		104	--	--	--	6.0	--	97
May 10	495	59	4	8.9	1.2	5	7.3	230	--	--	--	--	--		124	--	--	--	5.2	--	110
May 17	920	63	33	8.0	1.1	4	7.4	190	--	--	--	--	--		94	--	--	--	5.6	--	84
May 24	1,620	60	219	7.7	2.1	25	7.5	187	7.2	.67	25	5.5	8.8		94	17	3.5	.0	5.6	136	85
May 31	1,100	62	37	8.2	.9	8	7.2	224	--	--	--	--	--		114	--	--	--	6.8	--	108

June 7	782	66	24	8.4	1.1	5	7.3	251	--	--	--	--	--	138	--	--	--	9.1	--	130
June 14	459	66	20	8.7	1.4	5	7.5	285	--	--	--	--	--	158	--	--	--	8.8	--	144
June 21	362	67	16	8.7	.3	5	7.8	302	5.5	.03	46	9.7	6.9	172	16	3.0	.0	9.6	190	155
June 28	197	79	6	11.1	1.3	5	8.1	311	--	--	--	--	--	180	--	--	--	7.4	--	158
July 5	169	72	4	10.8	1.9	5	8.2	317	--	--	--	--	--	188	--	--	--	9.1	--	178
July 19	197	73	17	9.5	1.1	7	7.9	282	6.6	.06	43	9.7	1.4	150	16	3.5	.0	7.2	177	147
July 26	167	71	12	8.7	1.0	7	7.9	318	--	--	--	--	--	172	--	--	--	7.7	--	161
Aug. 2	130	78	9	8.8	1.0	5	7.7	336	--	--	--	--	--	178	--	--	--	6.8	--	162
Aug. 9	112	71	5	8.8	.6	5	7.8	350	--	--	--	--	--	188	--	--	--	8.3	--	172
Aug. 16	124	69	6	8.2	1.7	8	7.3	351	1.3	.04	49	13	3.5	188	14	7.5	.0	5.1	217	176
Aug. 23	217	65	22	8.5	1.4	10	7.6	293	--	--	--	--	--	144	--	--	--	9.1	--	158
Aug. 30	118	75	12	10.2	1.4	10	8.0	348	--	--	--	--	--	192	--	--	--	6.3	--	169
Sept. 6	179	63	16	8.8	2.0	5	7.2	294	--	--	--	--	--	150	--	--	--	3.4	--	140
Sept. 13	755	63	100	7.7	2.3	20	7.0	237	--	--	--	--	--	108	--	--	--	6.3	--	108
Sept. 20	257	62	20	8.0	3.8	7	7.7	340	7.1	.09	49	11	7.8	182	19	5.5	.0	9.7	212	168
Sept. 27	394	53	12	10.2	1.4	4	7.5	315	--	--	--	--	--	160	--	--	--	10	--	156
Average	565	57	29	10.2	2.1	12	--	274	--	--	--	--	--	145	--	--	--	7.3	--	134

ANTIETAM CREEK NEAR WAYNESBORO, PA.

LOCATION.--At gaging station on county highway bridge at Rock Forge, Md., 0.5 mile downstream from Maryland-Pennsylvania State line, 0.9 mile downstream from confluence of West and East Branches of Antietam Creek, 1.85 miles northeast of Leitersburg, Md., and 2.5 miles southwest of Waynesboro, Pa.
DRAINAGE AREA.--93.5 square miles.
RECORDS AVAILABLE.--Chemical analyses, April 1948 to September 1950.
Sediment records: April 1948 to September 1950.
REMARKS.--Records of specific conductance and pH of weekly samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1171.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Dnte of collection	Discharge (second-feet)	Tem-pera-ture (°F)	Sus-pended sedi-ment	Dis-solved oxygen	Bio-chemical oxygen demand (five days at 20°C)	Color	pH	Specific conduct-ance (micro-mhos at 25°C)	Silica (SiO_2)	Iron (Fe)	Cal-cium (Ca)	Mag-ne-sium (Mg)	So-dium (Na)	Po-tas-sium (K)	Bicar-bonate (HCO_3)	Sul-fate (SO_4)	Chlo-ride (Cl)	Fluo-ride (F)	Ni-trate (NO_3)	Dis-solved solids	Hardness as $CaCO_3$
Oct. 5, 1949	63	60	13	10.7	0.6	--	7.9	323	--	--	--	--	--	--	176	--	--	--	15	--	162
Oct. 12	63	62	24	10.0	1.6	--	8.0	338	--	--	--	--	--	--	188	--	--	--	11	--	170
Oct. 19	57	54	12	9.8	1.1	5	8.0	336	6.8	0.04	45	15	5.5		190	14	5.5	0.0	10	197	174
Oct. 26	95	52	15	11.2	2.6	--	7.9	258	--	--	--	--	--	--	132	--	--	--	8.6	--	123
Nov. 2	81	48	10	11.0	5.0	15	7.9	289	--	--	--	--	--	--	156	--	--	--	13	--	138
Nov. 16	66	45	8	11.3	6.0	15	7.8	291	6.6	.08	38	12	6.3		158	15	4.5	.0	8.0	170	144
Nov. 23	63	40	8	14.6	4.9	15	8.0	306	--	--	--	--	--	--	166	--	--	--	16	--	152
Nov. 30	74	43	6	12.9	3.7	20	7.9	260	--	--	--	--	--	--	138	--	--	--	12	--	124
Dec. 14	98	41	10	11.9	2.3	20	7.9	241	12	.11	30	9.7	11		124	25	3.5	.0	8.7	163	115
Jan. 4, 1950	139	53	25	10.2	2.6	5	7.5	231	--	--	--	--	--	--	120	--	--	--	10	--	110
Jan. 11	128	43	16	11.5	2.1	5	7.6	250	--	--	--	--	--	--	135	--	--	--	9.8	--	120
Jan. 25	91	48	6	11.7	1.8	10	7.8	274	10	.19	36	12	7.1		149	19	3.5	.0	9.5	171	139
Feb. 8	134	41	14	12.3	2.1	4	7.6	263	--	--	--	--	--	--	140	--	--	--	9.8	--	126
Feb. 15	264	43	54	10.0	1.7	20	7.9	184	8.8	.11	23	7.2	5.9		90	18	2.5	.0	4.7	115	87
Feb. 22	157	38	22	11.5	2.0	3	7.7	253	--	--	--	--	--	--	139	--	--	--	9.4	--	120
Mar. 15	104	41	13	11.9	1.5	5	7.9	273	7.1	.04	35	11	4.6		143	13	3.0	.0	9.5	160	133
Mar. 22	146	43	14	11.5	2.6	8	7.8	229	--	--	--	--	--	--	115	--	--	--	8.4	--	116
Mar. 29	296	49	55	10.7	2.8	10	7.7	174	--	--	--	--	--	--	88	--	--	--	6.3	--	82
Apr. 5	182	48	32	10.1	2.2	8	7.7	229	--	--	--	--	--	--	120	--	--	--	8.0	--	119
Apr. 12	126	48	20	11.1	1.5	5	7.8	258	--	--	--	--	--	--	138	--	--	--	11	--	129
Apr. 19	104	56	16	11.8	1.7	5	8.0	275	6.5	.04	37	12	2.3		147	12	4.0	.0	10	169	142
Apr. 26	130	55	10	12.0	3.7	6	8.2	236	--	--	--	--	--	--	126	--	--	--	8.1	--	122
May 3	178	53	38	9.8	2.1	7	7.2	198	--	--	--	--	--	--	102	--	--	--	7.9	--	95
May 10	123	58	10	10.2	1.1	3	7.5	232	--	--	--	--	--	--	124	--	--	--	9.1	--	112
May 17	157	62	26	8.7	1.2	5	7.6	202	--	--	--	--	--	--	104	--	--	--	7.9	--	94
May 24	187	60	66	8.9	1.7	10	7.4	176	7.2	.20	23	7.9	5.5		98	12	3.0	.0	6.0	117	90
May 31	166	59	52	8.9	.9	4	7.3	204	--	--	--	--	--	--	110	--	--	--	6.8	--	97

June 7	153	73	46	9.2	1.1	4	7.4	224	--	--	--	--	--	121	--	--	--	8.6	--	110
June 14	118	62	24	9.9	1.6	4	7.5	257	--	--	--	--	--	142	--	--	--	9.1	--	126
June 21	110	61	20	8.9	1.1	5	7.8	263	7.5	.05	36	11	5.7	144	15	3.5	.0	11	165	135
June 28	214	74	18	10.8	1.6	4	7.9	306	--	--	--	--	--	176	--	--	--	12	--	154
July 5	74	65	18	10.2	1.5	5	7.5	315	--	--	--	--	--	178	--	--	--	14	--	166
July 19	64	67	29	9.9	1.5	5	7.8	316	8.1	.16	44	14	2.8	175	15	4.0	.0	11	194	167
July 26	144	66	11	10.0	1.7	6	7.7	331	--	--	--	--	--	187	--	--	--	12	--	175
Aug. 2	51	69	10	10.0	1.0	5	7.4	348	--	--	--	--	--	180	--	--	--	11	--	176
Aug. 9	45	71	29	9.7	1.5	7	7.6	358	--	--	--	--	--	190	--	--	--	11	--	181
Aug. 16	41	63	14	9.4	2.2	6	7.8	373	7.3	.05	40	16	13	202	13	5.5	.0	8.3	244	186
Aug. 23	40	61	22	9.7	1.9	5	7.8	355	--	--	--	--	--	186	--	--	--	11	--	180
Aug. 30	34	68	17	10.0	1.8	5	7.8	366	--	--	--	--	--	194	--	--	--	11	--	186
Sept. 6	35	58	22	10.0	1.8	4	7.6	359	--	--	--	--	--	204	--	--	--	8.3	--	182
Sept. 13	70	58	60	8.0	2.2	7	7.2	291	--	--	--	--	--	148	--	--	--	5.8	--	142
Sept. 20	35	60	24	8.6	4.6	5	7.5	364	7.3	.06	48	15	2.7	190	15	4.5	.0	12	214	181
Sept. 27	42	54	8	10.9	1.2	2	7.8	355	--	--	--	--	--	188	--	--	--	11	--	178
Average	110	55	22	10.5	2.1	7	--	278	--	--	--	--	--	149	--	--	--	9.8	--	138

POTOMAC RIVER BASIN--Continued

SOUTH FORK SHENANDOAH RIVER NEAR LURAY, VA.

LOCATION.--At gaging station at highway bridge 2 miles upstream from Mill Creek and 4 miles west of Luray, Page County.
DRAINAGE AREA.--1,377 square miles.
RECORDS AVAILABLE.--Chemical analyses: April 1929 to March 1930, October 1948 to August 1950.
EXTREMES, 1929-30, 1948-49.--Dissolved solids: Maximum, 170 ppm Sept. 21-30, 1929; minimum, 81 ppm May 1-10, 1929.
Hardness: Maximum, 156 ppm Sept. 21-30, 1929; minimum, 66 ppm May 1-10, 1929.
Water temperatures (1948-49): Maximum, 82°F Aug. 10, 1949; minimum, 35°F Dec. 27, 1948.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1171.

Chemical analyses, in parts per million, October 1949 to August 1950

Date of collection	Mean discharge (second-feet)	Temperature (°F)	Oxygen consumed		Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
			Unfiltered	Filtered																Total	Noncarbonate
Oct. 11, 1949	600	--			15	7.4	284	2.1	0.04	38	14	1.7		166	11	4.8	0.0	2.1	160	152	16
Nov. 9	1,310	--			10	6.4	222	5.7	.01	29	9.1	2.3		117	10	4.1	.0	3.2	130	110	14
Dec. 8	650	--			10	8.2	285	1.5	.02	37	13	5.8		164	15	5.1	.1	1.2	160	146	11
Jan. 18, 1950	787	38			5	8.2	250	3.3	.01	33	11	1.9		135	12	5.4	.1	1.0	140	128	17
May 18	2,860	64			10	7.3	168	9.0	.02	22	6.8	3.6		91	11	2.9	.0	.6	107	83	8
Aug. 9	411	76			2	8.4	286	6.8	.0	36	15	4.6		170	15	4.1	.1	.8	167	151	12

MONOCACY RIVER AT BRIDGEPORT, MD.

LOCATION.--At bridge on State Highway 32 at Bridgeport, Carroll County, 60 feet upstream from gaging station which is 0.9 mile upstream from Cattail Branch, 3.4 miles northwest of Taneytown, and 4.8 miles downstream from confluence of Rock and Marsh Creeks at Maryland-Pennsylvania State line.
DRAINAGE AREA.--173 square miles.
RECORDS AVAILABLE.--Chemical analyses: April 1948 to September 1950.
Sediment records: April 1948 to September 1950.
REMARKS.--Records of specific conductance and pH of weekly samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1171.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Discharge (second-feet)	Temperature (°F)	Suspended sediment	Dissolved oxygen	Biochemical oxygen demand (five days at 20°C)	Color	pH	Specific conductance (micromhos at 25°C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$
Oct. 5, 1949	9.1	64	14	7.6	0.8	--	7.5	200	--	--	--	--	--		82	--	--	--	3.3	--	76
Oct. 12	15	68	24	4.6	2.8	--	7.4	219	--	--	--	--	--		78	--	--	--	6.8	--	76
Oct. 19	10	58	13	7.4	1.6	20	7.7	210	7.2	0.04	21	7.0	11		82	27	7.0	0.0	.7	129	81
Oct. 26	6.6	55	8	8.3	1.1	--	7.6	232	--	--	--	--	--		108	--	--	--	.6	--	88
Nov. 2	78	48	26	8.0	2.8	35	7.1	200	--	--	--	--	--		73	--	--	--	6.6	--	76
Nov. 16	41	48	8	9.3	5.4	25	7.4	206	6.0	.12	23	7.1	12		86	31	7.0	.0	1.1	123	87
Nov. 23	18	33	4	12.7	5.8	15	7.5	234	--	--	--	--	--		94	--	--	--	4.1	--	88
Nov. 30	114	39	10	12.6	4.6	15	7.6	198	--	--	--	--	--		81	--	--	--	4.7	--	78
Dec. 14	235	41	32	10.3	3.2	60	7.2	166	12	.34	17	6.2	19		44	58	6.5	.0	5.5	151	68
Jan. 4, 1950	310	49	14	10.4	2.3	18	7.0	179	--	--	--	--	--		47	--	--	--	7.0	--	68
Jan. 11	229	40	4	11.9	3.0	7	7.1	176	--	--	--	--	--		58	--	--	--	4.8	--	70
Jan. 25	74	41	3	12.3	2.4	10	7.7	176	12	.05	18	6.3	12		64	32	5.0	.0	4.0	122	71
Feb. 8	162	38	1	12.2	2.5	9	7.3	161	--	--	--	--	--		51	--	--	--	6.7	--	60
Feb. 15	2,160	--	62	10.8	2.3	80	7.4	115	8.9	.83	12	4.1	7.4		34	26	3.0	.0	4.5	85	47
Feb. 22	148	40	3	13.0	2.0	7	7.2	143	--	--	--	--	--		46	--	--	--	6.0	--	52
Mar. 15	192	39	10	11.3	2.1	45	7.0	147	9.0	.42	15	5.0	1.3		39	19	4.0	.0	4.3	85	58
Mar. 22	376	41	41	10.6	2.3	60	7.3	143	--	--	--	--	--		38	--	--	--	6.3	--	56
Mar. 29	352	51	26	9.6	2.2	65	7.5	131	--	--	--	--	--		47	--	--	--	3.9	--	54
Apr. 5	172	47	8	9.4	1.7	9	7.4	138	--	--	--	--	--		49	--	--	--	3.0	--	57
Apr. 12	86	49	3	13.2	2.4	6	7.7	134	--	--	--	--	--		50	--	--	--	1.8	--	54
Apr. 19	56	58	6	14.4	4.1	8	8.4	139	4.0	.07	15	4.8	6.3		54	18	5.0	.0	1.0	84	57
Apr. 26	213	55	10	11.1	3.9	40	7.5	160	--	--	--	--	--		62	--	--	--	2.0	--	75
May 3	1,190	56	68	9.1	3.4	30	6.6	141	--	--	--	--	--		48	--	--	--	4.1	--	56
May 10	99	63	5	9.2	1.2	5	6.9	145	--	--	--	--	--		58	--	--	--	2.0	--	57
May 17	248	65	16	8.1	1.5	20	6.9	139	--	--	--	--	--		44	--	--	--	3.8	--	53
May 24	402	66	18	6.5	1.2	8	7.4	123	11	.22	12	3.9	8.6		44	21	3.0	.0	3.2	87	46
May 31	210	69	21	8.5	1.1	25	7.1	159	--	--	--	--	--		66	--	--	--	3.6	--	65

POTOMAC RIVER BASIN--Continued

MONOCACY RIVER AT BRIDGEPORT, MD.--Continued

Chemical analyses, in parts per million, water year October 1949 to September 1950--Continued

Date of collection	Discharge (second-feet)	Temperature (°F)	Suspended sediment	Dissolved oxygen	Biochemical oxygen demand (five days at 20°C)	Color	pH	Specific conductance (micromhos at 25°C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$
June 7, 1950	124	74	13	8.4	1.2	10	6.7	145	--	--	--	--	--		55	--	--	--	3.0	--	64
June 14	59	73	6	9.4	1.3	5	6.9	132	--	--	--	--	--		58	--	--	--	1.9	--	62
June 21	402	70	403	5.8	3.5	180	6.9	94.8	4.8	1.1	9.4	4.1	6.2		36	17	1.5	0.0	5.6	100	40
June 28	28	77	18	7.7	1.7	7	7.0	166	--	--	--	--	--		74	--	--	--	1.6	--	72
July 5	119	79	12	7.5	1.0	7	7.1	158	--	--	--	--	--		78	--	--	--	.5	--	74
July 19	56	77	36	6.5	1.5	50	6.9	165	11	.29	19	5.7	4.7		57	24	3.5	.0	5.6	122	71
Jnly 26	29	74	11	8.8	1.8	12	7.2	191	--	--	--	--	--		81	--	--	--	6.3	--	84
Aug. 2	8.8	81	14	5.9	.9	5	6.6	198	--	--	--	--	--		82	--	--	--	.8	--	82
Aug. 9	5.6	76	15	7.0	1.6	5	6.7	213	--	--	--	--	--		88	--	--	--	.7	--	86
Aug. 16	4.8	72	12	6.8	1.4	7	7.3	215	2.6	.04	22	6.9	11		90	23	7.0	.0	.2	133	83
Aug. 23	11	68	18	6.2	1.9	8	7.0	245	--	--	--	--	--		96	--	--	--	1.0	--	102
Aug. 30	5.8	80	16	10.2	2.6	15	7.5	221	--	--	--	--	--		92	--	--	--	.3	--	92
Sept. 6	11	68	18	7.1	1.3	7	6.9	190	--	--	--	--	--		84	--	--	--	1.6	--	76
Sept. 13	20	63	14	7.0	.6	5	6.7	201	--	--	--	--	--		92	--	--	--	.8	--	80
Sept. 20	9.1	65	19	6.5	2.7	15	7.2	193	8.7	.04	20	5.9	12		80	21	6.0	.0	4.5	123	74
Sept. 27	36	55	19	9.7	.9	30	7.0	201	--	--	--	--	--		60	--	--	--	6.0	--	80
Average	187	59	26	9.2	2.2	25	--	173	--	--	--	--	--		66	--	--	--	3.4	--	70

JAMES RIVER BASIN

JAMES RIVER AT RICHMOND, VA.

LOCATION.--At filtration plant of Richmond Waterworks, half a mile west of city limits of Richmond, Henrico County, and 2½ miles downstream from gaging station near Richmond.
DRAINAGE AREA.--6,757 square miles (above gaging station).
RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1950.
Water temperatures: October 1947 to September 1950.
EXTREMES, 1949-50.--Dissolved solids: Maximum, 127 ppm Sept. 1-10; minimum, 63 ppm May 21-31.
Hardness: Maximum, 76 ppm Aug. 1-10; minimum, 36 ppm May 21-31.
Water temperatures: Maximum, 81°F July 21, Aug. 2, 3, Sept. 2, 4; minimum, 40°F Feb. 27, 28, Mar. 2, 5.
EXTREMES, 1947-50.--Dissolved solids: Maximum, 129 ppm Oct. 11-20, 1947; minimum, 58 ppm Apr. 1-10, Dec. 1-10, 1948.
Hardness: Maximum, 76 ppm Sept. 21-30, 1948, Aug. 1-10, 1950; minimum, 35 ppm Apr. 1-10, Dec. 1-10, 1948.
Water temperatures: Maximum, 89°F Aug. 28; minimum, 34°F Jan. 8, 1948.
REMARKS.--Records of specific conductance of daily samples available in district office at Charlottesville, Va. Records of discharge for gaging station near Richmond for water year October 1949 to September 1950 given in Water-Supply Paper 1172. No appreciable inflow between gaging station and sampling point.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (°F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
Oct. 1-10, 1949	2,990		14	6.6	145	9.1	0.04	16	4.0	6.5		52	19	5.5	0.1	0.2	92	56	14
Oct. 11-20	2,041		15	6.9	152	13	.06	16	4.6	7.0		49	24	6.0	.1	.2	100	59	19
Oct. 21-31	2,959		18	7.1	161	12	.12	17	4.7	7.9		55	24	6.0	.1	.2	103	62	17
Nov. 1-10	14,270		60	6.8	118	9.0	.22	14	3.1	3.7		43	14	3.8	.1	.5	80	48	12
Nov. 11-20	4,039		30	7.0	122	13	.26	14	3.2	4.2		44	15	3.6	.1	.3	84	48	12
Nov. 21-30	2,787		25	7.2	146	13	.30	17	3.9	6.3		53	21	4.6	.1	.2	96	58	15
Dec. 1-10	2,538		25	7.3	158	10	.12	18	4.2	5.1		52	22	5.2	.1	.1	98	62	20
Dec. 11-20	6,266		28	7.3	156	11	.17	18	4.1	7.2		54	23	6.2	.1	.2	99	62	18
Dec. 21-31	7,984		30	7.2	116	12	.14	14	3.2	5.3		44	17	3.6	.2	.3	78	48	12
Jan. 1-10, 1950	5,595		35	7.2	106	9.8	.30	13	2.8	5.1		40	16	3.0	.2	.3	70	44	11
Jan. 11-20	4,671		--	7.0	137	10	.27	16	3.6	5.5		47	20	4.9	.1	.4	87	55	16
Jan. 21-31	4,594		--	6.8	137	13	.25	16	3.6	6.2		48	21	4.6	.1	.4	90	55	15
Feb. 1-10	21,820		--	6.2	93.9	9.5	.23	13	2.6	3.3		40	12	3.0	.1	.7	67	43	10
Feb. 11-19	10,830		--	6.6	109	9.6	.29	14	3.1	2.5		42	13	3.2	.1	.6	71	48	13
Feb. 20-28	6,627		--	6.8	115	10	.30	14	3.1	5.5		47	15	3.4	.1	.6	74	48	9
Mar. 1-10	4,806		--	6.5	124	10	.40	14	3.7	5.3		47	16	4.2	.1	.5	82	50	12
Mar. 11-20	5,572		--	6.3	134	10	.33	16	3.9	4.3		48	18	4.8	.1	.3	86	56	17
Mar. 21-31	13,870		--	6.0	95.8	9.1	.34	11	3.0	3.2		35	12	3.5	.1	.3	68	40	11
Apr. 1-10	7,014		15	7.3	118	9.7	.24	14	3.1	4.6		47	13	3.5	.1	.6	72	48	9
Apr. 11-20	3,948		18	7.5	133	10	.20	15	3.6	5.7		51	16	4.2	.0	.4	80	52	10
Apr. 21-30	3,509		16	7.5	140	9.0	.10	15	3.7	6.9		49	19	5.0	.1	.5	83	53	12
May 1-10	9,209		10	7.4	131	10	.05	15	3.5	6.5		51	16	4.8	.1	.7	80	52	10
May 11-20	12,380		25	7.6	109	11	.18	12	2.9	3.9		40	12	3.0	.1	.6	74	42	9
May 21-31	9,309		23	7.5	93.0	10	.06	10	2.7	4.4		36	11	2.5	.1	1.1	63	36	7

JAMES RIVER BASIN--Continued

JAMES RIVER AT RICHMOND, VA.--Continued

Chemical analyses, in parts per million, water year October 1949 to September 1950--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
June 1-10, 1950	11,280		28	7.2	101	10	0.14	12	2.9	4.5		43	11	2.6	0.1	1.3	66	42	7
June 11-20	4,113		8	7.3	126	8.4	.03	14	3.5	6.1		49	16	3.6	.1	.6	76	49	9
June 21-30	2,493		9	7.4	151	8.6	.02	17	4.0	7.6		56	21	4.8	.1	.7	92	59	13
July 1-10	2,265		9	7.5	161	9.1	.02	18	4.3	7.6		58	22	5.5	.1	.8	97	63	15
July 11-20	2,653		5	--	152	10	.02	16	3.8	6.3		48	20	5.8	.1	.8	92	56	16
July 21-31	3,510		15	7.1	143	10	.04	16	4.9	4.4		49	20	5.6	.2	.2	97	60	20
Aug. 1-10	2,210		18	7.4	182	9.0	.02	20	6.4	5.7		63	25	7.4	.1	.5	118	76	25
Aug. 11-20	1,214		18	7.3	165	8.4	.02	18	4.9	7.0		54	26	5.8	.2	.2	117	65	21
Aug. 21-31	2,334		10	7.6	153	6.6	.07	16	5.1	6.5		50	23	6.5	.2	.5	106	61	20
Sept. 1-10	1,587		15	7.1	189	7.1	.10	20	4.9	9.2		56	30	8.4	.1	.8	127	70	24
Sept. 11-20	22,760		50	7.2	112	12	.47	15	2.9	9.0		59	14	3.2	--	1.8	84	49	--
Sept. 21-30	6,038		10	7.4	130	13	.16	17	3.8	5.8		57	17	3.5	--	1.5	88	58	11
Average	6,433		21	--	134	10	0.17	15	3.8	5.7		49	18	4.6	0.1	0.6	87	54	14

JAMES RIVER BASIN--Continued

JAMES RIVER AT RICHMOND, VA.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	62	57	44	43	48	43	52	59	69	78	79	80
2	62	55	44	43	48	40	50	63	68	77	81	81
3	64	55	41	43	46	38	52	63	70	78	81	80
4	64	54	41	45	45	38	54	63	70	77	77	81
5	65	53	45	48	45	40	57	63	68	79	77	78
6	65	51	43	50	45	41	54	64	68	79	77	74
7	66	--	43	50	46	43	51	67	69	77	75	73
8	66	50	43	48	43	42	50	64	70	78	75	72
9	65	50	42	46	45	41	51	64	71	76	75	73
10	68	50	41	47	46	41	54	65	72	75	77	72
11	68	50	41	48	46	41	53	67	76	--	77	73
12	70	51	41	46	45	45	51	66	72	--	75	73
13	70	54	45	45	45	46	54	64	70	--	78	73
14	68	61	41	45	45	45	55	66	72	--	--	73
15	68	59	41	46	48	43	52	66	74	--	77	72
16	66	59	39	45	46	46	49	67	73	--	75	70
17	64	55	39	45	46	42	54	65	75	--	78	68
18	63	54	37	46	43	44	54	64	73	--	77	68
19	80	55	39	45	45	44	49	65	73	--	74	68
20	59	54	41	42	44	45	49	64	75	--	--	69
21	58	48	41	43	41	46	55	63	77	81	76	70
22	59	45	43	43	42	47	54	63	77	77	75	69
23	80	43	43	45	45	46	59	64	77	77	76	69
24	63	48	43	46	43	46	58	59	77	77	75	66
25	63	45	41	48	43	46	57	67	77	76	--	64
26	63	41	45	50	44	47	59	66	80	77	76	63
27	61	43	46	54	40	50	61	66	79	75	76	62
28	59	42	46	50	40	54	62	68	79	77	77	63
29	60	44	45	50	--	54	64	68	78	75	--	--
30	61	45	44	50	--	52	66	70	76	75	78	--
31	80	--	43	50	--	50	--	71	--	77	79	--
Average	64	51	42	47	45	45	55	65	74	--	77	71

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ROANOKE RIVER BASIN

MAYO RIVER NEAR PRICE, N. C.

LOCATION.--At Anglins Bridge just upstream from gaging station, which is half a mile downstream from confluence of North and South Mayo Rivers, three-quarters of a mile downstream from Virginia-North Carolina State line, and 4 miles west of Price, Rockingham County.
DRAINAGE AREA.--260 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1950.
Water temperatures: October 1949 to September 1950
EXTREMES, 1949-50.--Dissolved solids: Maximum, 57 ppm Nov. 11-20; minimum, 36 ppm May 11-20.
Hardness: Maximum, 19 ppm Nov. 11-20, Dec. 1-10; minimum, 14 ppm Mar. 21-31, May 1-10.
Water temperatures: Maximum, 79°F July 18, minimum, freezing point Dec. 17.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1172.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Oxygen consumed		Color	pH	Specific conductance (micromhos at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
		Unfiltered	Filtered																Total	Non-carbonate
Oct. 1-10, 1949	302	6.8	2.8	2	6.3	44.4	16	0.08	3.8	1.6	3.1	0.6	23	2.6	2.1	0.1	0.3	45	16	0
Oct. 11-20	273	3.8	1.9	7	6.6	31.6	17	.03	3.8	1.7	3.2		23	2.6	1.0	.1	.3	44	16	0
Oct. 21-31	399	6.8	2.2	9	6.6	44.5	18	.04	3.6	1.6	3.1		21	2.6	1.5	.0	.3	41	16	0
Nov. 1-10	470	4.4	2.2	8	6.7	43.8	16	.02	3.8	1.6	3.3		21	2.6	2.0	.1	.3	39	16	0
Nov. 11-20.....	288	2.8	2.2	6	7.0	53.0	25	.03	4.4	1.9	4.4		29	2.1	1.6	.0	.1	57	19	0
Nov. 21-30.....	271	4.4	4.1	6	6.7	43.6	16	.06	4.3	1.6	3.8		25	2.3	1.8	.1	.0	43	17	0
Dec. 1-10	249	1.7	1.2	6	6.7	43.9	16	.02	4.3	1.9	1.9		21	2.4	1.9	.1	.1	39	19	1
Dec. 11-20.....	299	2.3	1.7	7	6.6	43.3	15	.03	4.2	1.7	2.3		21	2.3	2.0	.0	.1	38	18	0
Dec. 21-31.....	301	2.2	1.6	3	6.8	44.1	15	.06	3.8	1.5	2.8		20	2.3	1.8	.1	.2	38	16	0
Jan. 1-10, 1950	270	1.7	1.4	3	6.9	45.6	15	.13	3.9	1.4	3.3	.9	22	2.4	1.5	.1	.2	40	16	0
Jan. 11-20	267	1.6	1.6	3	7.0	47.7	16	.05	3.6	1.6	4.0		24	2.2	1.6	.0	.2	42	16	0
Jan. 21-31	323	2.6	1.6	5	6.9	45.2	15	.02	3.6	1.5	3.8		23	2.2	1.5	.0	.2	39	15	0
Feb. 1-10	389	2.7	1.5	4	7.0	42.1	15	.03	3.5	1.5	3.1		20	2.6	1.6	.0	.3	39	15	0
Feb. 11-19	354	2.5	1.5	3	7.0	43.6	15	.05	3.8	1.6	3.0		22	2.3	1.4	.0	.2	39	16	0
Feb. 20-28.....	295	2.0	1.4	8	6.9	44.2	15	.08	3.8	1.5	3.3		22	1.8	1.8	.1	.2	39	16	0
Mar. 1-10	254	1.8	1.6	5	7.1	45.5	16	.01	4.0	1.6	3.4		24	1.8	1.5	.1	.3	40	17	0
Mar. 11-20	294	1.6	1.6	5	7.0	44.3	15	.01	3.8	1.5	3.1		22	1.8	1.5	.1	.2	38	16	0
Mar. 21-31	383	2.9	1.4	6	6.9	43.1	14	.05	3.5	1.3	3.6		21	2.3	1.4	.1	.2	38	14	0
Apr. 1-10	315	3.3	2.0	2	7.0	43.4	14	.13	3.6	1.5	2.8	.8	22	2.3	1.2	.0	.3	39	15	0
Apr. 11-20	256	1.6	1.2	6	7.0	44.7	14	.03	3.8	1.6	3.4		24	1.9	1.2	.0	.2	39	16	0
Apr. 21-30	239	1.9	1.4	6	7.0	46.3	14	.02	3.9	1.6	3.6		24	2.2	1.5	.0	.2	40	16	0
May 1-10	354	4.2	1.8	7	6.9	45.4	13	.02	3.0	1.6	3.2		20	2.6	1.2	.0	.4	40	14	0
May 11-20	677	10	2.5	4	6.6	40.4	12	.06	3.6	1.4	1.9		16	3.0	1.2	.1	.8	36	15	2
May 21-31	493	12	2.7	3	6.7	43.8	13	.03	3.7	1.4	3.4		21	2.8	1.1	.1	.7	37	15	0

June 1-10	427	4.0	2.2	8	6.8	48.5	14	.10	4.2	1.4	5.9		24	3.5	3.8	.1	.3	44	16	0
June 11-20	284	2.8	1.8	8	7.0	48.6	15	.07	4.0	1.6	5.3		24	2.9	3.5	.1	.4	44	17	0
June 21-30	356	7.8	2.1	6	6.7	46.7	14	.04	3.6	1.5	3.7		22	2.8	1.5	.0	.3	39	15	0
July 1-10	282	5.6	2.4	4	6.8	46.7	15	.06	3.7	1.5	3.4	1.0	24	2.5	1.5	.1	.7	41	15	0
July 11-20	227	2.6	1.8	3	6.9	48.2	18	.03	3.8	1.6	4.3		25	2.2	1.5	.1	.4	44	16	0
July 21-31	271	5.1	2.0	3	6.7	48.0	16	.03	3.8	1.4	4.0		23	2.8	1.4	.0	.4	41	15	0
Aug. 1-10	196	3.0	1.6	4	6.8	50.2	16	.06	4.0	1.7	4.2		25	2.1	2.0	.1	.4	44	17	0
Aug. 11-20	203	3.7	1.6	4	6.8	48.4	17	.08	4.0	1.4	4.2		24	2.1	1.2	.1	.3	41	16	0
Aug. 21-31	370	6.1	2.2	5	6.6	45.2	15	.02	3.9	1.3	3.3		21	2.4	1.5	.1	.3	41	15	0
Sept. 1-10	350	9.6	2.1	5	6.8	47.7	14	.04	3.8	1.4	3.6		22	2.1	1.6	.1	.5	41	15	0
Sept. 11-20	360	5.8	2.0	4	7.0	46.3	14	.07	4.1	1.5	3.8		24	2.2	1.5	.1	.4	42	16	0
Sept. 21-30	238	2.6	2.1	8	7.1	61.9	18	.02	4.4	1.8	3.1	1.0	27	2.1	1.2	.2	.2	45	18	0
Average	322	4.0	1.9	5	--	45.7	15	0.05	3.8	1.6	3.6		23	2.4	1.6	0.1	0.3	41	16	0

ROANOKE RIVER BASIN--Continued

MAYO RIVER NEAR PRICE, N. C.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	60	58	40	48	51	44	46	61	67	76	75	75
2	58	51	41	43	49	38	45	64	70	76	76	77
3	58	50	38	48	47	35	50	63	69	74	76	75
4	60	48	36	51	41	34	57	66	68	75	76	75
5	61	48	36	53	39	35	57	70	66	74	69	74
6	63	45	34	51	41	40	49	64	65	73	67	65
7	65	45	39	52	46	45	43	65	70	72	68	65
8	68	45	38	44	42	43	47	64	71	70	72	64
9	68	46	35	37	45	38	52	60	68	68	77	67
10	64	48	36	42	47	39	52	62	70	69	75	69
11	64	48	39	47	46	39	52	65	71	70	75	69
12	65	51	42	42	46	47	53	67	73	73	70	70
13	66	48	50	43	46	52	51	60	70	76	70	67
14	62	46	48	48	47	52	45	61	72	74	71	70
15	62	47	40	45	47	43	43	60	74	74	68	69
16	62	48	36	46	45	46	45	61	70	72	69	65
17	61	46	32	44	42	40	47	61	74	77	70	64
18	61	44	38	42	37	48	45	64	74	79	70	65
19	60	40	44	47	40	45	55	61	75	77	76	67
20	57	47	46	43	39	44	59	63	75	74	73	71
21	55	43	--	37	37	42	53	59	74	76	73	72
22	58	40	51	40	41	47	59	60	76	75	68	70
23	59	35	53	45	45	44	62	62	73	73	71	65
24	55	38	42	57	41	44	59	65	73	74	69	63
25	57	43	35	52	40	49	58	65	76	74	71	55
26	56	40	39	55	42	55	63	69	78	74	73	57
27	54	39	45	56	36	52	63	71	77	70	75	55
28	53	40	47	47	35	58	65	69	78	76	77	56
29	58	46	40	45	--	55	65	65	71	71	78	63
30	54	44	37	50	--	47	68	68	73	73	73	61
31	59	--	36	49	--	44	--	67	--	75	75	--
Average	60	45	40	47	43	45	54	64	72	74	72	67

SMITH RIVER AT SPRAY, N. C.

LOCATION.--At gaging station, 0.9 mile south of Virginia-North Carolina State line, 1 mile downstream from Stuart Creek, and 1 mile north of Spray, Rockingham County.
DRAINAGE AREA.--538 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1950.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1172.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																	Total	Noncarbonate
Oct. 15, 1949	697	3	6.9	67.1	16	0.04	5.1	2.0	4.8	0.9	30	4.2	3.5	0.1	0.2	50	21	0
Nov. 15	566	6	6.8	58.6	15	.07	4.8	2.0	4.8		28	3.1	2.8	.1	.3	49	20	0
Dec. 15	626	8	6.7	63.1	15	.05	5.0	2.4	3.6		26	4.0	2.8	.1	.7	50	22	1
Jan. 15, 1950	484	2	7.0	58.4	15	.07	4.8	1.9	4.0	1.0	26	3.5	2.2	.1	.5	46	20	0
Feb. 16	954	3	7.7	59.3	16	.08	4.9	2.0	3.7		26	3.3	2.0	.1	.8	50	20	0
Mar. 15	490	7	6.6	62.9	14	.03	6.2	1.6	3.9		26	3.4	3.2	.1	1.1	48	22	1
Apr. 16	414	3	7.1	62.2	14	.03	5.4	2.1	3.8	1.1	32	2.9	2.0	.0	.2	47	22	0
May 17	1,100	5	6.2	57.7	15	.16	4.5	1.7	4.1		22	4.2	2.6	.0	1.4	46	18	0
June 15	508	4	7.0	70.5	15	.08	5.2	2.0	5.9		30	3.5	3.6	.1	.4	51	21	0
July 16	470	8	6.9	73.7	16	.04	6.2	2.2	4.7	1.3	33	3.5	3.1	.1	.7	53	24	0
Aug. 19	306	4	6.8	88.4	13	.03	6.2	2.2	7.8		32	4.2	7.0	.1	1.1	57	24	0
Sept. 17	512	5	7.0	72.6	17	.19	6.0	2.3	5.0	1.6	33	4.4	3.2	.1	.8	55	24	0

PAMLICO RIVER BASIN

TAR RIVER NEAR NASHVILLE, N. C.

LOCATION.--At gaging station at Cockrell Bridge on State Highway 58, 5 miles upstream from Sapony Creek, and 10 miles south of Nashville, Nash County.
DRAINAGE AREA.--701 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1950.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1172.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																	Total	Noncarbonate
Oct. 15, 1949	232	6	6.8	69.3	22	0.48	4.1	1.8	6.5	1.4	33	2.1	4.6	0.0	0.2	62	18	0
Nov. 15	365	10	6.7	65.7	17	.48	3.9	1.8	7.7		28	3.7	4.8	.1	.2	62	17	0
Dec. 15	1,210	16	6.5	63.1	17	.21	3.2	1.6	7.4		24	3.0	5.2	.1	.4	56	15	0
Jan. 15, 1950	449	6	6.9	68.6	18	.03	4.5	1.9	6.8	1.5	29	3.0	4.9	.1	.2	56	19	0
Feb. 15	839	8	6.8	79.0	17	.33	4.8	2.1	6.4		26	5.1	5.4	.1	.2	62	21	0
Mar. 15	485	7	6.9	67.4	15	.37	4.3	1.8	7.8		32	2.5	4.2	.1	.1	54	18	0
Apr. 15	303	5	7.1	68.1	15	.04	4.6	1.9	6.3	.8	31	2.5	4.4	.0	.2	54	19	0
May 15	1,060	12	6.1	66.9	15	.03	4.6	2.0	5.1		25	3.7	3.8	.1	1.0	55	20	0
June 15	228	8	6.8	69.5	20	.33	4.8	2.0	6.3		30	2.8	4.0	.0	.8	60	20	0
July 15	1,470	35	6.2	42.8	10	.06	3.1	1.2	3.5	1.3	14	3.6	2.6	.1	1.2	45	13	1
Aug. 16	148	7	6.8	71.0	20	.07	5.3	2.0	7.1		34	2.4	4.0	.2	.3	60	21	0
Sept. 15	1,580	40	6.2	61.2	12	.06	3.6	1.5	3.4	1.2	16	4.7	2.9	.1	.4	50	15	2

NEUSE RIVER AT KINSTON, N. C.

LOCATION.--At bridge on State Highway 11, about a quarter of a mile upstream from gaging station at Kinston, Lenoir County.
DRAINAGE AREA.--2,690 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1950.
Water temperatures: October 1949 to September 1950.
EXTREMES, 1949-50.--Dissolved solids: Maximum, 84 ppm Mar. 21-31; minimum, 52 ppm Mar. 11-20.
Hardness: Maximum, 30 ppm Apr. 21-30; minimum, 14 ppm July 11-20, 21-31.
Water temperatures: Maximum, 85°F Aug. 29-31; minimum, 44°F Dec. 10.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1172.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Oxygen consumed		Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
		Unfiltered	Filtered																Total	Noncarbonate
Oct. 1-10, 1949	1,232	8.0	4.4	16	6.5	78.2	15	0.26	4.6	1.7	7.4	1.3	23	5.5	7.8	0.1	1.7	63	18	0
Oct. 11-20	1,228	6.8	4.8	19	6.4	85.6	15	.03	4.7	1.6	8.6		23	5.6	7.8	.1	1.5	64	18	0
Oct. 21-31	919	5.6	4.8	17	6.4	88.2	15	.12	5.0	1.7	8.7		24	5.5	8.1	.3	1.0	65	20	0
Nov. 1-10	4,084	10	7.6	38	6.2	62.2	13	.15	4.2	1.6	5.2		15	7.0	5.8	.1	.4	57	17	5
Nov. 11-20	2,382	6.1	5.7	22	6.5	73.4	15	.20	4.6	1.7	7.1		21	5.2	7.4	.2	.3	62	18	1
Nov. 21-30	1,483	5.2	4.5	18	6.5	75.4	16	.11	4.6	1.7	7.6		22	5.1	7.5	.1	.9	60	18	0
Dec. 1-10	1,533	6.7	5.4	17	6.5	73.7	15	.13	5.1	1.7	7.6		22	6.2	7.8	.0	1.0	61	20	2
Dec. 11-20	1,951	9.1	8.6	18	6.4	74.4	14	.03	4.6	1.7	7.5		21	5.4	8.0	.1	.5	57	18	1
Dec. 21-31	1,817	5.8	4.7	17	6.7	85.6	15	.08	6.6	1.7	7.5		23	7.9	8.0	.1	1.3	66	23	5
Jan. 1-10, 1950	1,364	5.2	3.9	11	6.7	91.6	14	.04	6.2	1.7	8.4	1.8	24	6.8	8.4	.2	1.6	65	22	3
Jan. 11-20	1,531	5.6	4.1	13	6.6	75.4	14	.03	4.2	1.6	7.7		20	5.2	7.9	.0	1.1	58	17	1
Jan. 21-31	3,235	7.0	5.0	17	6.6	71.1	13	.02	4.6	1.6	7.5		21	6.0	7.2	.1	.7	56	18	1
Feb. 1-10	1,919	6.2	4.1	14	6.6	83.6	15	.03	5.8	2.0	7.4		25	6.0	7.6	.1	1.2	65	23	2
Feb. 11-19	1,911	6.4	3.9	18	6.8	87.8	15	.04	6.4	1.8	7.6		28	5.8	7.2	.1	.6	63	23	0
Feb. 20-28	1,813	5.6	4.6	13	6.6	78.1	14	.08	4.7	1.8	6.6		21	4.9	7.1	.1	1.1	55	19	2
Mar. 1-10	1,684	5.2	4.8	17	6.9	76.8	13	.12	5.0	1.9	6.8		22	5.1	7.4	.0	1.5	57	20	2
Mar. 11-20	1,514	5.1	4.3	13	6.7	74.8	11	.06	4.4	1.6	7.0		21	4.6	6.8	.1	1.1	52	18	0
Mar. 21-31	2,911	10	4.5	17	7.2	122	13	.10	5.4	1.7	18		54	5.1	6.1	.1	.6	64	20	0
Apr. 1-10	1,811	7.9	5.2	13	6.7	74.0	12	.32	4.3	1.7	7.6	1.3	21	4.8	7.2	.1	1.2	59	18	1
Apr. 11-20	1,140	4.8	4.0	10	6.9	80.0	10	.34	4.6	1.7	8.3		26	4.9	6.5	.0	1.3	56	18	0
Apr. 21-30	936	5.2	3.7	27	7.3	97.2	7.0	.08	8.0	2.4	8.2		38	5.0	7.6	.1	.3	60	30	0
May 1-10	2,457	8.5	8.0	32	6.6	87.2	9.9	.08	6.0	2.0	8.1		25	6.5	9.0	.0	1.0	66	23	3
May 11-20	2,522	13	11	50	6.5	64.6	11	.33	5.4	1.5	5.9		18	8.7	5.1	.1	1.4	67	20	5
May 21-31	2,209	6.6	5.2	16	6.7	78.6	13	.31	6.2	1.7	7.4		25	7.1	6.1	.1	2.1	63	22	2

NEUSE RIVER BASIN--Continued

NEUSE RIVER AT KINSTON, N. C.--Continued

Chemical analyses, in parts per million, water year October 1949 to September 1950--Continued

Date of collection	Mean discharge (second-feet)	Oxygen consumed		Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chlorides (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
		Unfiltered	Filtered																Total	Noncarbonate
June 1-10, 1950	2,440	8.7	7.2	22	6.8	97.1	11	0.18	6.0	1.7	11		26	12	8.0	0.1	1.6	75	22	1
June 11-20	1,179	6.4	5.0	18	6.7	94.9	11	.19	5.9	1.9	11		28	8.6	8.5	.1	1.6	68	22	0
June 21-30	1,170	8.8	6.1	20	6.6	74.1	12	.04	5.5	1.8	7.0		23	7.8	5.5	.0	2.1	59	21	2
July 1-10	3,137	9.0	7.5	22	6.5	62.8	12	.07	4.0	1.6	5.2	1.9	19	6.5	4.1	.1	1.2	55	17	1
July 11-26	6,661	13	11	50	6.3	52.1	10	.11	3.6	1.2	4.0		14	5.0	4.1	.0	.4	57	14	2
July 21-31	5,045	12	11	50	6.3	50.1	8.4	.31	3.6	1.1	4.3		13	5.2	4.1	.0	1.3	54	14	3
Aug. 1-10	2,502	6.2	4.7	17	6.6	93.8	13	.42	5.9	1.7	9.3		25	7.2	8.5	.1	2.0	69	22	1
Aug. 11-20	840	5.6	4.2	17	6.7	100	12	.20	6.0	2.0	13		29	9.5	11	.1	1.8	82	23	0
Aug. 21-31	734	4.9	3.8	17	6.7	123	5.3	.08	7.2	2.2	14		38	6.8	13	.1	.7	70	27	0
Sept. 1-10	681	6.5	4.2	14	6.7	107	10	.14	6.8	2.0	11		28	9.8	9.9	.2	2.4	79	25	2
Sept. 11-20	1,124	5.3	4.7	17	6.7	92.8	13	.11	5.5	1.6	9.3		21	7.9	9.1	.1	2.6	74	20	3
Sept. 21-30	619	8.5	4.3	18	6.8	136	14	.31	6.6	1.9	9.3	2.1	26	9.0	8.9	.1	1.6	70	24	3
Average	2,002	7.2	5.6	21	--	84.0	12	0.15	5.3	1.7	8.4		24	6.5	7.5	0.1	1.2	64	20	1

NEUSE RIVER BASIN--Continued

NEUSE RIVER AT KINSTON, N. C.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	69	63	48	49	56	48	57	73	71	78	75	81
2	68	61	47	50	56	48	58	73	70	79	75	80
3	68	59	47	50	55	46	61	74	72	80	76	79
4	69	57	47	51	54	47	63	74	73	79	75	78
5	69	55	45	54	52	47	65	73	75	78	78	76
6	69	53	45	58	53	48	57	73	75	78	79	74
7	71	54	47	56	54	48	59	74	75	75	79	75
8	72	54	47	54	54	49	60	75	76	74	80	75
9	74	54	45	52	53	49	61	75	76	73	80	76
10	74	55	44	53	53	49	62	75	76	73	81	77
11	73	56	50	53	56	49	62	74	76	74	79	77
12	73	56	51	52	56	50	63	74	76	74	78	77
13	73	57	50	53	57	50	60	72	75	75	78	78
14	72	58	49	55	57	51	58	72	77	76	76	78
15	71	57	46	55	51	51	59	70	77	77	77	78
16	70	57	45	54	52	52	59	70	78	78	78	77
17	68	52	47	53	52	50	60	69	77	78	76	77
18	68	50	48	53	51	54	62	68	78	78	77	76
19	65	50	48	53	52	54	61	66	79	80	77	76
20	64	51	49	52	52	55	63	66	79	80	78	75
21	64	50	51	53	51	57	66	69	76	73	81	76
22	66	48	53	54	50	58	66	70	76	74	81	75
23	68	49	--	54	50	58	68	71	78	75	83	74
24	66	49	50	53	49	56	68	70	77	74	82	70
25	67	47	--	53	48	57	69	72	78	75	84	68
26	67	46	48	54	48	55	71	73	79	76	64	70
27	65	48	47	53	47	54	71	74	78	76	83	69
28	64	49	48	55	49	53	73	73	79	75	64	69
29	65	50	48	57	--	54	74	74	79	76	85	69
30	66	51	49	58	--	55	75	75	79	77	85	68
31	66	--	48	58	--	55	--	76	--	77	65	--
Average	69	53	48	54	52	52	64	72	76	76	80	75

NEUSE RIVER BASIN--Continued

CONTENTNEA CREEK AT HOOKERTON, N.C.

LOCATION.--At bridge on State Highway 123, about 2¼ miles upstream from Wheat Swamp Creek, and about 1,000 feet downstream from gaging station at Hookerton, Greene County.
DRAINAGE AREA.--789 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1950.
Water temperatures: October 1949 to September 1950.
EXTREMES, 1949-50.--Dissolved solids: Maximum, 63 ppm June 11-20; minimum, 45 ppm Apr. 21-30.
Hardness: Maximum, 17 ppm Nov. 1-10, 21-30, May 21-31; minimum, 12 ppm Mar. 21-31, Aug. 21-31, Sept. 1-10.
Water temperatures: Maximum, 84°F June 27, 28; minimum, 45°F Dec. 6-10.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1172.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Oxygen consumed		Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
		Unfiltered	Filtered																Total	Noncarbonate
Oct. 1-10, 1949	322	8.6	6.0	16	6.3	65.3	13	0.13	3.7	1.4	6.6	0.9	17	6.3	7.4	0.0	1.1	57	15	1
Oct. 11-20	236	8.0	6.3	28	6.4	67.6	12	.10	3.8	1.3	6.6		14	5.8	6.9	.4	1.0	55	15	3
Oct. 21-31	175	6.7	5.6	25	6.3	71.1	12	.09	3.9	1.3	7.1		15	6.4	7.1	.2	1.3	56	15	3
Nov. 1-10	1,054	11	7.8	45	5.8	59.9	12	.14	4.3	1.6	4.0		10	6.9	6.9	.1	.7	58	17	9
Nov. 11-20	339	7.4	2.6	27	6.4	68.7	12	.08	3.8	1.3	6.7		13	6.5	7.8	.3	.3	56	15	4
Nov. 21-30	342	7.1	5.8	27	6.4	63.5	14	.06	4.1	1.6	6.8		17	5.6	7.6	.4	.1	56	17	3
Dec. 1-10	356	8.3	5.5	19	6.4	63.2	12	.08	3.8	1.6	5.9		13	5.6	7.6	.4	.8	50	16	5
Dec. 11-20	464	6.8	5.5	18	6.3	64.3	12	.12	4.2	1.4	6.3		13	6.5	7.9	.2	.9	52	16	6
Dec. 21-31	391	7.7	7.1	18	6.5	61.9	11	.06	3.6	1.1	6.4		11	5.8	7.8	.3	.7	50	13	4
Jan. 1-10, 1950	274	6.4	5.0	15	6.6	62.4	11	.13	3.8	1.1	7.0	1.2	14	5.5	7.1	.2	.5	48	14	3
Jan. 11-20	412	6.0	4.7	17	6.5	62.1	10	.08	3.7	1.2	6.0		13	5.0	7.4	.1	.8	49	14	4
Jan. 21-31	979	8.7	7.5	22	6.2	59.1	10	.08	3.2	1.2	5.8		10	6.2	7.2	.1	.7	52	13	5
Feb. 1-10	526	7.4	5.7	20	6.3	59.9	12	.04	3.6	1.2	5.7		12	5.2	7.2	.1	.8	52	14	4
Feb. 11-19	473	7.0	5.4	33	6.3	59.7	11	.08	3.4	1.1	6.8		14	4.7	7.1	.2	1.2	48	13	2
Feb. 20-28	461	7.6	5.0	27	6.4	60.2	11	.06	3.5	1.3	6.6		14	5.1	7.4	.2	1.0	50	14	3
Mar. 1-10	437	7.0	5.8	18	6.5	56.6	10	.08	3.2	1.3	5.8		13	4.7	6.6	.1	1.1	47	13	3
Mar. 11-20	380	6.4	6.3	18	6.4	60.8	10	.02	3.7	1.3	6.1		15	4.4	6.9	.1	1.1	47	15	2
Mar. 21-31	655	8.7	6.3	25	6.3	58.9	9.2	.07	3.2	1.1	6.0		12	4.8	6.8	.1	.9	48	12	3
Apr. 1-10	428	12	7.6	25	6.4	59.0	9.1	.42	3.6	1.3	5.7	1.2	14	4.8	6.6	.1	.7	53	14	3
Apr. 11-20	246	10	5.3	18	6.3	64.3	7.4	.25	3.4	1.2	6.0		12	5.3	6.5	.3	1.6	49	13	4
Apr. 21-30	185	5.8	4.3	18	6.6	64.7	6.0	.12	3.7	1.3	7.6		18	5.0	6.8	.3	1.0	45	15	0
May 1-10	845	12	8.6	40	6.1	63.9	7.3	.06	4.2	1.4	5.4		14	6.4	5.5	.3	1.8	53	16	5
May 11-20	734	12	9.7	45	6.1	77.5	9.3	.31	4.0	1.2	4.7		11	6.1	6.1	.1	1.1	57	15	6
May 21-31	245	9.7	8.5	28	6.3	64.6	11	.15	4.4	1.4	5.3		14	6.3	6.4	.1	1.3	56	17	5

June 1-10	463	9.8	7.4	27	6.1	62.4	8.7	.01	3.4	1.2	7.6		12	7.2	7.5	.1	2.3	58	13	4
June 11-20	144	7.4	7.2	23	6.5	72.8	9.7	.25	4.3	1.3	9.1		16	8.3	9.2	.1	1.3	63	16	3
June 21-30	149	6.8	6.1	18	6.6	65.6	8.3	.60	3.8	1.5	8.2		19	6.5	6.9	.1	1.4	53	16	0
July 1-10	516	13	7.2	23	6.2	56.5	10	.05	3.6	1.2	5.6	1.4	13	7.3	4.6	.1	1.3	51	14	3
July 11-20	1,290	12	8.3	32	6.0	56.3	11	.06	3.8	1.0	6.0		12	7.7	5.0	.1	1.9	60	14	4
July 21-31	1,175	12	10	40	6.1	53.1	9.3	.14	3.4	1.1	5.3		13	5.1	5.2	.1	1.2	54	13	2
Aug. 1-10	518	10	7.6	28	6.1	57.8	9.3	.11	3.4	1.4	6.0		14	5.7	6.0	.2	1.0	50	14	3
Aug. 11-20	229	9.7	6.9	25	6.3	59.1	10	.20	3.7	1.1	6.2		14	6.5	5.6	.1	1.1	54	14	2
Aug. 21-31	276	9.4	5.8	27	6.1	55.4	9.5	.05	3.2	1.0	6.5		13	6.1	5.4	.4	.7	48	12	1
Sept. 1-10	210	9.1	6.5	32	6.0	64.3	12	.20	3.0	1.0	5.8		9	7.0	5.5	.3	1.2	57	12	4
Sept. 11-20	448	9.4	6.6	28	6.2	56.4	10	.14	3.5	1.0	5.8		11	6.6	5.8	.3	.8	55	13	4
Sept. 21-30	152	6.1	5.4	15	6.6	64.8	12	.03	4.0	1.1	4.3	1.6	14	6.5	5.9	.1	1.5	49	14	3
Average	461	8.7	6.5	25	--	62.3	10	0.13	3.7	1.3	6.3		13	6.0	6.7	0.2	1.1	53	15	4

NEUSE RIVER BASIN--Continued

CONTENTNEA CREEK AT HOOKERTON, N. C.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	66	64	47	51	57	47	55	73	72	82	80	79
2	66	60	47	51	57	48	55	72	72	82	78	79
3	66	57	47	53	56	47	56	71	71	82	79	79
4	67	59	46	54	54	47	57	71	71	82	79	80
5	68	59	46	54	52	47	57	71	71	82	79	78
6	69	56	45	54	51	48	58	71	71	82	80	78
7	70	55	45	53	51	47	58	72	71	80	79	77
8	70	54	45	53	52	49	57	72	72	78	78	79
9	70	54	45	51	52	48	56	72	73	76	78	78
10	70	55	45	49	53	48	55	72	73	76	78	80
11	71	57	50	51	53	49	55	72	75	74	79	78
12	71	58	50	51	54	50	55	72	75	74	79	79
13	71	58	50	50	55	51	56	70	76	75	79	78
14	70	58	50	50	56	53	56	68	78	75	79	77
15	70	58	50	52	56	54	56	68	78	75	78	76
16	68	57	50	53	55	54	56	66	78	76	78	76
17	66	57	49	54	54	53	57	67	79	76	78	75
18	66	55	49	52	54	54	58	65	79	76	78	75
19	64	53	50	50	53	52	59	68	81	77	79	76
20	64	52	50	49	51	52	59	68	81	78	78	76
21	63	51	49	49	49	52	57	68	82	80	79	75
22	64	51	49	49	48	52	60	68	82	79	79	75
23	64	51	50	50	48	52	63	68	83	80	78	75
24	64	50	51	52	49	53	67	69	83	80	78	75
25	65	49	51	54	48	53	69	70	83	79	78	75
26	65	49	52	54	48	55	69	70	83	79	79	70
27	64	49	53	54	48	56	69	71	84	78	79	71
28	64	49	53	53	48	58	73	71	64	79	79	71
29	64	49	53	53	--	58	74	73	83	78	80	69
30	65	49	54	54	--	57	74	74	81	78	79	70
31	68	--	51	56	--	56	--	73	--	--	79	--
Average	67	54	49	52	52	52	60	70	78	78	79	76

NEW RIVER NEAR GUM BRANCH, N.C.

LOCATION.--At gaging station at highway bridge, half a mile downstream from Jenkins Swamp, 1¾ miles southwest of the town of Gum Branch, Onslow County, and 3¾ miles southeast of Richlands.
DRAINAGE AREA.--74.5 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1950.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1172.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																	Total	Noncarbonate
Oct. 15, 1949	33	56	6.9	180	7.3	0.10	29	1.5	5.1	0.8	89	6.0	7.0	0.2	0.8	120	78	6
Nov. 15	40	90	6.7	154	8.4	.09	23	1.7	5.2		74	5.6	5.4	.3	.9	107	64	4
Dec. 15	68	45	6.8	155	7.5	.13	24	1.4	6.2		74	5.0	8.5	.3	.6	101	66	5
Jan. 15, 1950	60	55	7.1	129	6.9	.10	20	1.2	5.0	.9	56	5.4	7.2	.1	.6	89	55	9
Feb. 15	111	47	6.7	114	6.8	.29	15	1.2	5.6		48	4.8	6.9	.0	.6	83	42	3
Mar. 16	62	75	6.9	124	6.2	.06	18	1.1	4.3		54	4.5	6.8	.0	.3	88	49	5
Apr. 15	26	47	7.4	175	4.4	.05	30	1.4	5.0	.9	88	5.6	6.4	.1	.7	111	81	8
May 17	138	110	6.4	90.6	9.3	.15	12	.9	3.4		33	4.0	6.4	.0	.9	78	34	7
June 15	31	150	6.9	150	10	.53	24	1.2	3.1		68	5.5	6.2	.0	1.8	111	65	9
July 15	297	110	6.8	102	8.0	.18	15	1.1	4.3	.8	42	4.9	5.5	.1	1.4	85	42	8
Aug. 17	22	22	7.0	239	9.9	.11	41	1.6	5.6		124	8.0	6.0	.0	3.2	147	109	7
Sept. 19	34	90	7.1	193	8.7	.34	29	1.3	4.3	1.0	84	6.6	5.5	.1	1.6	114	78	9

PEE DEE RIVER BASIN

THIRD CREEK AT CLEVELAND, N. C.

LOCATION.--At county road bridge 200 feet upstream from gaging station, which is three-quarters of a mile north of Cleveland, Rowan County, and 7 miles upstream from Fourth Creek.
DRAINAGE AREA.--87.4 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1950.
Water temperatures: October 1949 to September 1950.
EXTREMES, 1949-50.--Dissolved solids: Maximum, 70 ppm Oct. 21-31, Apr. 21-30; minimum, 50 ppm Mar. 11-20.
Hardness: Maximum, 34 ppm Apr. 21-30; minimum, 21 ppm June 1-10, July 21-31.
Water temperatures: Maximum, 77°F July 18; minimum, 34°F Dec. 17.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1172.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Oxygen consumed		Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
		Unfiltered	Filtered																Total	Noncarbonate
Oct. 1-10, 1949	57	2.8	1.7	2	6.7	79.1	25	0.08	6.0	2.6	4.7	1.2	37	3.5	2.9	0.1	0.3	65	26	0
Oct. 11-20	52	2.6	1.8	8	6.8	80.1	22	.04	6.6	2.7	5.2		37	3.1	2.9	.4	.3	63	28	0
Oct. 21-31	153	4.2	2.4	12	6.9	80.0	26	.02	6.6	2.9	5.1		39	2.8	3.0	.0	.5	70	28	0
Nov. 1-10	190	5.0	2.3	7	6.5	70.8	18	.14	5.7	2.3	4.8		29	3.9	3.8	.1	.9	58	24	0
Nov. 11-20	67	2.2	1.6	7	6.8	75.8	23	.03	6.2	2.6	5.4		36	3.0	3.2	.2	.4	62	26	0
Nov. 21-30	64	2.0	1.7	8	6.9	75.8	23	.05	6.2	2.7	4.5		35	3.0	2.6	.2	.4	62	27	0
Dec. 1-10	60	2.0	1.4	6	6.8	71.7	22	.06	6.8	2.7	4.3		37	3.0	2.6	.0	.3	63	28	0
Dec. 11-20	67	2.3	1.6	6	6.9	72.7	21	.05	7.3	2.4	5.0		37	3.6	3.1	.1	.3	59	28	0
Dec. 21-31	62	1.8	1.5	6	6.8	75.7	21	.08	6.7	2.6	4.7		37	2.8	2.9	.0	.5	58	27	0
Jan. 1-10, 1950	60	1.8	1.4	3	6.9	74.6	21	.02	6.6	2.8	4.4	1.5	37	3.1	2.4	.0	.4	58	28	0
Jan. 11-20	71	2.3	1.4	4	6.8	71.7	20	.16	6.4	2.8	3.8		34	3.6	2.4	.1	.6	60	27	0
Jan. 21-31	80	2.4	1.4	3	6.9	70.5	20	.23	5.8	2.3	5.3		34	3.7	2.2	.1	.5	58	24	0
Feb. 1-10	78	2.6	1.3	3	7.0	85.9	20	.08	5.6	2.4	7.5		35	3.4	5.0	.1	.6	62	24	0
Feb. 11-19	84	2.6	1.6	4	7.0	79.0	19	.06	6.0	2.4	6.6		34	3.4	5.0	.1	.5	60	25	0
Feb. 20-28	76	7.0	1.4	8	6.8	75.5	20	.03	6.1	2.4	5.5		35	3.2	3.0	.1	.5	57	25	0
Mar. 1-10	65	1.9	1.1	10	6.9	74.3	20	.04	6.5	2.5	4.8		36	2.6	2.9	.1	.5	57	26	0
Mar. 11-20	139	5.0	1.6	9	6.8	63.6	17	.02	5.5	2.2	3.9		28	3.4	2.9	.1	.4	50	23	0
Mar. 21-31	114	3.4	1.6	5	7.0	68.8	18	.03	5.6	2.1	5.4		32	3.6	2.5	.1	.7	53	23	0
Apr. 1-10	82	--	--	--	--	--	--	--	--	--	--		--	--	--	--	--	--	--	--
Apr. 11-20	64	1.8	1.6	3	7.1	74.5	20	.13	6.7	2.6	5.3		38	2.9	2.8	.1	.8	64	27	0
Apr. 21-30	62	2.8	1.7	3	7.0	79.5	20	.10	8.8	2.9	4.4		36	8.4	3.0	.1	.8	70	34	4
May 1-10	195	11	3.0	4	6.7	65.4	16	.98	6.0	2.3	3.4		27	4.9	2.5	.1	1.0	54	24	2
May 11-20	252	11	2.3	3	6.7	63.5	16	.12	5.8	2.2	3.7		26	5.0	2.8	.1	.9	54	24	2
May 21-31	148	9.4	1.8	3	6.7	57.0	15	.06	5.3	2.2	5.2		28	4.8	3.4	.1	.7	53	22	0

June 1-10	131	6.6	2.0	4	6.8	65.7	16	.02	4.8	2.1	5.2	28	3.9	3.0	.1	.6	53	21	0
June 11-20	89	7.5	2.0	6	6.9	77.4	22	.03	6.1	2.5	5.6	35	4.0	2.8	.1	.7	60	26	0
June 21-30	98	9.6	1.8	5	6.8	69.2	19	.05	6.0	2.2	4.2	30	3.9	2.5	.1	.9	54	24	0
July 1-10	81	10	1.8	2	6.8	65.5	18	.03	5.3	2.1	3.9 - 1.6	30	3.3	2.2	.1	.9	52	22	0
July 11-20	74	6.8	1.6	3	6.7	70.1	20	.03	5.6	2.3	5.5	34	2.7	2.9	.0	.6	59	23	0
July 21-31	115	9.6	1.3	4	6.7	65.9	17	.05	5.2	2.0	4.8	29	3.3	2.6	.1	.7	52	21	0
Aug. 1-10	86	5.6	1.4	4	6.8	69.9	18	.02	5.5	2.1	5.4	34	3.5	1.2	.1	.7	54	22	0
Aug. 11-20	55	3.3	1.4	4	6.8	72.6	21	.03	5.8	2.5	5.5	36	2.7	2.6	.1	.7	60	25	0
Aug. 21-31	63	6.9	1.4	4	6.8	68.8	19	.04	5.8	2.3	5.1	33	2.9	2.8	.1	.8	57	24	0
Sept. 1-10	56	6.3	2.6	5	7.0	74.7	21	.06	6.2	2.4	5.2	35	2.8	3.1	.1	.6	62	25	0
Sept. 11-20	79	6.9	2.2	4	7.0	71.9	20	.04	6.1	2.4	5.5	35	3.2	2.8	.1	.8	58	25	0
Sept. 21-30	48	2.3	1.4	3	7.1	78.2	23	.09	6.7	2.5	4.0 - 1.0	36	2.5	2.6	.2	.6	60	27	0
Average	92.4	4.9	1.7	5	--	72.4	20	0.06	6.1	2.4	5.0	34	3.5	2.9	0.1	0.6	59	25	0

PEE DEE RIVER BASIN--Continued

THIRD CREEK AT CLEVELAND, N. C.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	54	--	38	41	57	46	47	62	65	68	72	74
2	54	--	46	39	47	46	48	64	65	68	71	73
3	56	--	49	43	51	36	54	64	65	69	74	72
4	59	--	52	38	42	35	58	63	66	69	70	72
5	61	--	52	38	39	40	59	64	66	73	67	69
6	63	--	52	36	39	45	48	65	62	73	66	61
7	65	--	56	42	42	45	44	65	63	69	64	61
8	66	--	41	42	49	47	45	63	65	68	74	63
9	68	--	39	35	50	44	51	59	65	66	74	66
10	64	--	45	39	49	43	53	62	68	66	72	66
11	64	48	41	50	50	49	55	65	67	69	69	70
12	64	48	44	46	50	53	56	65	65	71	73	69
13	64	50	51	44	56	50	51	63	63	71	73	66
14	63	52	47	46	56	52	44	64	67	72	68	66
15	63	47	44	48	55	50	43	63	69	69	67	68
16	63	49	39	52	46	49	43	61	70	69	66	68
17	60	47	34	46	41	42	48	63	69	70	67	68
18	60	43	40	46	38	46	54	64	70	77	73	65
19	52	40	44	51	41	47	55	62	70	71	74	65
20	52	43	47	47	40	46	58	63	73	72	71	66
21	54	43	49	41	39	43	55	59	73	74	71	66
22	54	42	52	43	44	49	51	62	71	70	67	67
23	52	38	54	47	48	45	49	60	74	71	67	64
24	54	38	41	53	41	45	58	63	72	70	67	61
25	52	46	36	55	43	50	61	66	73	73	67	55
26	54	41	41	54	44	50	61	63	73	72	68	51
27	54	39	46	58	38	54	62	65	73	73	69	53
28	54	42	46	47	38	58	63	65	70	70	68	57
29	54	49	40	46	--	56	64	65	69	70	70	59
30	59	45	39	52	--	45	66	65	69	70	70	60
31	61	--	36	52	--	43	--	67	--	69	72	--
Average	59	--	45	46	45	47	53	63	66	70	70	65

SOUTH FORK CATAWBA RIVER AT LOWELL, N. C.

302255 O - 54 - 11

LOCATION.--At gaging station on county highway just downstream from Housers Creek, 1 mile north of Lowell, Gaston County.
DRAINAGE AREA.--630 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1950.
Water temperatures: October 1949 to September 1950.
EXTREMES, 1949-50.--Dissolved solids: Maximum, 64 ppm Oct. 1-10; minimum, 39 ppm Mar. 21-31.
Hardness: Maximum, 22 ppm Oct. 1-10; minimum, 12 ppm Sept. 11-20.
Water temperatures: Maximum, 81°F June 26, 27; minimum, 40°F Dec. 17.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1172.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Oxygen consumed		Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
		Unfiltered	Filtered																Total	Non-carbonate
Oct. 1-10, 1949	2,303	9.8	2.8	6	6.7	72.3	18	0.13	5.0	2.2	4.9	1.3	33	4.9	4.0	0.0	0.9	64	22	0
Oct. 11-20	778	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Oct. 21-31	1,501	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nov. 1-10	1,906	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nov. 11-20	708	2.7	2.0	8	6.8	55.8	18	.02	4.2	1.7	5.5		24	4.1	3.8	.0	.4	52	18	0
Nov. 21-30	640	2.0	1.9	5	6.9	55.4	15	.04	4.6	1.7	5.2		26	2.9	3.8	.1	.0	46	18	0
Dec. 1-10	583	1.8	1.7	4	6.9	57.0	16	.02	4.0	1.7	5.5		23	3.1	4.2	.2	.4	46	17	0
Dec. 11-20	669	2.2	1.9	8	6.6	55.8	14	.04	4.6	1.7	2.8		18	3.2	4.0	.1	.7	43	18	4
Dec. 21-31	568	1.8	1.3	4	6.8	54.0	14	.04	4.4	1.5	5.4		23	3.4	4.0	.1	.6	44	17	0
Jan. 1-10, 1950	602	1.6	1.5	2	6.9	53.7	14	.02	4.0	1.6	4.5	1.3	21	2.9	3.4	.1	.4	42	17	0
Jan. 11-20	720	2.6	1.8	4	6.8	59.0	13	.03	4.8	1.7	4.5		22	3.9	3.8	.2	.9	45	19	1
Jan. 21-31	764	2.0	1.3	3	6.8	53.7	13	.04	3.9	1.4	5.2		22	3.1	3.4	.1	.6	43	16	0
Feb. 1-10	666	1.6	1.3	5	6.9	54.0	14	.02	3.9	1.5	5.2		22	3.0	3.6	.1	.8	43	16	0
Feb. 11-19	757	2.0	1.2	8	6.9	53.6	14	.02	4.0	1.5	4.5		22	2.4	3.4	.1	.4	41	16	0
Feb. 20-28	643	1.7	1.3	8	6.8	53.4	14	.02	4.0	1.5	4.5		22	2.4	3.4	.1	.5	41	16	0
Mar. 1-10	593	1.7	1.4	5	7.0	59.0	14	.01	4.2	1.7	5.0		23	2.8	3.9	.1	1.0	45	18	0
Mar. 11-20	1,145	4.0	1.5	5	6.7	53.4	12	.03	3.6	1.3	4.6		18	3.7	3.2	.1	1.2	40	14	0
Mar. 21-31	1,119	3.0	1.4	6	6.7	49.4	12	.02	3.5	1.3	4.2		18	3.3	2.9	.1	.8	39	14	0
Apr. 1-10	874	3.2	2.1	3	6.8	51.3	13	.03	4.0	1.4	4.0	.9	21	3.2	2.9	.1	.8	42	16	0
Apr. 11-20	638	1.6	1.4	4	6.9	52.3	13	.10	4.0	1.6	4.7		22	3.1	3.2	.1	.9	44	17	0
Apr. 21-30	567	2.2	1.6	5	6.8	54.3	14	.05	4.6	1.6	4.0		22	3.0	3.4	.0	.9	42	18	0
May 1-10	680	3.2	1.8	3	6.7	53.6	14	.07	4.4	1.7	4.4		22	3.7	3.2	.1	1.1	46	18	0
May 11-20	672	5.1	2.0	3	6.7	58.5	14	.06	4.4	1.5	5.1		22	3.4	3.6	.1	1.5	48	17	0
May 21-31	646	6.1	2.0	3	6.7	58.6	14	.04	4.5	1.6	4.7		22	3.5	3.5	.1	1.5	46	18	0

SANTEE RIVER BASIN--Continued

SOUTH FORK CATAWBA RIVER AT LOWELL, N. C.--Continued

Chemical analyses, in parts per million, water year October 1949 to September 1950--Continued

Date of collection	Mean discharge (second-feet)	Oxygen consumed		Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
		Unfiltered	Filtered																Total	Noncarbonate
June 1-10, 1950	708	5.7	2.1	4	6.6	58.6	13	0.03	4.5	1.6	5.8		22	4.0	5.0	0.1	1.2	48	18	0
June 11-20	822	8.9	1.8	5	6.7	55.5	16	.05	3.9	1.6	5.2		22	3.7	3.1	.1	1.3	46	16	0
June 21-30	501	3.4	1.8	4	6.8	60.0	15	.04	4.0	1.6	5.1		21	3.5	3.9	.1	1.4	46	17	0
July 1-10	444	5.2	2.0	3	6.6	54.6	13	.04	3.9	1.5	4.2	1.2	21	3.1	2.8	.1	2.0	44	16	0
July 11-20	448	4.4	1.8	3	6.7	58.8	16	.03	4.0	1.5	5.0		22	2.9	3.6	.0	1.1	50	16	0
July 21-31	366	3.1	1.9	4	6.7	61.3	14	.03	4.0	1.5	5.5		22	2.8	4.4	.1	.8	49	16	0
Aug. 1-10	252	2.0	1.5	8	6.9	51.9	14	.04	4.0	1.6	6.0		26	2.8	3.1	.1	1.0	50	16	0
Aug. 11-20	300	3.2	2.0	4	6.6	72.9	14	.04	4.2	1.5	8.3		24	3.7	7.0	.1	1.3	51	17	0
Aug. 21-31	463	5.7	2.0	5	6.5	58.7	16	.04	3.4	1.4	5.6		20	3.0	4.1	.1	1.2	52	14	0
Sept. 1-10	456	4.4	1.8	4	6.8	63.4	13	.04	4.1	1.4	6.4		23	3.0	5.0	.1	.9	51	16	0
Sept. 11-20	564	5.0	2.4	4	6.7	51.0	12	.05	3.1	1.1	5.6		18	3.3	3.6	.1	1.0	43	12	0
Sept. 21-30	342	2.6	1.6	3	7.0	68.8	15	.02	4.4	1.7	5.9	1.5	25	3.2	5.2	.1	.9	50	18	0
Average	737	3.5	1.7	4	--	57.1	14	0.04	4.1	1.6	5.2		22	3.3	3.8	0.1	0.9	46	17	0

SANTEE RIVER BASIN--Continued

SOUTH FORK CATAWBA RIVER AT LOWELL, N. C.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	65	--	47	43	58	48	51	69	70	76	79	78
2	66	--	47	56	57	45	54	71	71	77	80	79
3	66	--	45	49	56	43	57	73	71	77	80	78
4	66	--	44	52	52	42	59	68	68	79	78	78
5	66	--	43	55	48	44	59	72	68	78	76	74
6	69	--	45	56	47	46	54	74	68	78	75	74
7	70	--	44	55	49	48	57	74	69	76	74	66
8	70	--	45	50	50	48	52	71	71	75	74	66
9	70	--	42	47	49	44	54	68	71	72	75	68
10	70	--	42	47	50	45	57	68	72	73	76	70
11	--	--	43	49	50	46	59	70	71	75	75	70
12	--	--	45	49	51	51	59	72	71	76	76	73
13	--	--	50	48	50	56	58	71	71	76	75	72
14	--	--	50	51	54	52	55	70	73	76	74	72
15	--	56	48	52	53	51	53	67	75	73	72	72
16	--	53	43	54	51	50	53	68	75	74	73	70
17	--	51	40	49	48	49	54	70	76	76	75	70
18	--	48	43	48	46	52	58	71	77	77	75	69
19	--	47	45	54	47	51	60	71	78	78	77	71
20	--	48	47	50	46	48	61	67	78	78	74	71
21	--	48	50	47	45	57	59	66	79	78	73	71
22	--	46	52	48	46	49	58	65	79	76	73	72
23	--	45	53	50	48	50	60	66	77	75	72	75
24	--	44	47	52	47	51	63	69	80	76	73	68
25	--	46	44	55	47	54	65	70	80	77	74	64
26	--	44	44	57	49	55	66	70	81	78	74	62
27	--	46	51	58	45	59	68	68	81	76	74	60
28	--	46	49	53	45	61	69	69	78	76	75	60
29	--	49	46	51	--	60	71	69	78	76	76	61
30	--	50	45	52	--	55	70	71	77	77	76	62
31	--	--	44	57	--	52	--	70	--	78	78	--
Average	--	--	46	51	49	50	59	70	74	76	75	70

SANTEE RIVER BASIN--Continued

BROAD RIVER NEAR GAFFNEY, S. C.

LOCATION.--At gaging station at bridge on U. S. Highway 29, 0.3 mile upstream from Cherokee Creek, 4.4 miles downstream from Gaston Shoals Dam, and 4.5 miles east of Gaffney, Cherokee County.
DRAINAGE AREA.--1,490 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1950.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1172.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Oxygen consumed		Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
			Unfiltered	Filtered																Total	Noncarbonate
Oct. 15, 1949	3,120	67	3.0	1.9	8	6.5	42.4	12	0.14	2.6	1.1	3.8	0.8	17	3.3	2.4	0.1	0.5	36	11	0
Nov. 15	2,600	--	2.0	1.0	7	6.5	51.0	12	.04	3.2	1.2		4.0	19	2.3	2.5	.0	.2	35	13	0
Dec. 15	2,500	48	2.2	1.1	8	6.3	40.2	15	.01	2.8	1.1		4.0	16	2.2	3.0	.1	.4	39	12	0
Jan. 14, 1950	2,300	52	2.1	1.7	7	7.0	38.7	14	.07	2.7	1.1	4.5	1.1	16	2.8	3.0	.2	.5	37	11	0
Feb. 15	3,650	56	2.4	1.7	14	7.0	36.0	14	.02	2.4	1.0		3.3	14	2.0	2.2	.1	.4	33	10	0
Mar. 15	5,240	48	4.0	6.7	7	6.2	31.3	10	.03	2.4	.9		3.1	14	2.6	1.6	.0	.1	32	10	0
Apr. 15	2,040	53	2.0	1.8	8	6.9	44.2	12	.02	2.6	1.0	3.9	.8	18	1.9	2.6	.0	.4	34	11	0
May 15	3,960	68	17	1.6	3	6.0	48.3	8.6	.02	3.0	1.2		3.9	12	5.6	2.6	.1	1.6	36	12	3
June 16	2,880	76	8.9	1.5	2	5.9	47.7	11	.04	3.1	1.3		4.3	16	4.3	2.1	.1	1.9	41	13	0
July 15	3,810	75	11	2.0	3	6.4	48.5	13	.04	2.4	.9	4.2	1.4	14	3.0	3.8	.1	.7	38	10	0
Aug. 15	1,720	73	3.1	1.2	4	6.8	52.7	16	.06	3.0	1.3		6.0	22	2.3	3.4	.1	.4	43	13	0
Sept. 15	2,600	73	4.5	1.4	4	6.6	43.8	13	.02	2.5	.9	4.5	1.5	16	3.0	2.6	.1	.5	37	10	0

EDISTO RIVER NEAR BRANCHVILLE, S. C.

LOCATION.--At gaging station 400 feet downstream from bridge on U. S. Highway 21, 4.7 miles downstream from Brier Branch, and 5.2 miles south of Branchville, Orangeburg County.
DRAINAGE AREA.--1,720 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1950.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1172.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Oxygen consumed		Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
			Unfiltered	Filtered																Total	Noncarbonate
Oct. 16, 1949	1,850	68	15	9.5	45	5.9	29.8	8.6	0.13	2.2	0.7	2.9	0.6	8	1.9	3.8	0.1	0.2	38	8	2
Nov. 16	1,540	57	6.9	5.0	22	5.9	25.7	8.0	.06	2.2	.6		2.4	8	1.5	3.5	.0	.1	27	8	1
Dec. 15	1,540	51	6.5	4.5	17	6.3	26.7	9.0	.05	1.9	.6		3.1	8	1.6	3.9	.0	.3	28	7	1
Jan. 17, 1950	1,610	58	8.7	6.3	29	6.4	29.7	6.2	.07	2.4	.7	2.8	.7	8	1.8	4.0	.1	.5	29	9	2
Feb. 20	1,540	49	8.2	6.1	33	6.4	25.1	6.2	.07	1.7	.5		2.5	6	1.4	3.6	.1	.1	26	6	1
Mar. 19	2,160	56	11	6.9	28	5.9	28.5	3.2	.05	2.3	.6		3.1	10	1.8	3.5	.0	.0	27	8	0
Apr. 19	1,300	58	9.0	5.9	20	6.1	25.7	3.8	.07	2.0	.5	2.7	.5	9	1.7	3.1	.0	.4	25	7	0
May 18	915	72	6.0	3.5	12	5.9	28.5	5.4	.07	2.0	.5		3.3	8	2.1	3.0	.0	1.6	26	7	1
June 14	1,300	74	9.1	6.5	27	5.9	28.6	6.4	.23	2.1	.5		2.6	7	2.1	3.2	.0	.7	34	7	2
July 19	1,340	79	11	8.4	40	5.7	37.0	10	.27	2.9	.8	3.0	.5	8	3.7	4.0	.1	.7	43	11	4
Aug. 15	720	76	4.1	2.7	17	6.0	25.2	8.4	.07	2.0	.7		2.6	8	1.7	2.8	.1	1.2	26	8	1
Sept. 21	1,560	73	12	10	50	5.9	30.5	7.6	.16	2.4	.5	3.1	.6	8	1.9	4.4	.0	.2	41	8	2

SAVANNAH RIVER BASIN

SAVANNAH RIVER AT AUGUSTA, GA.

LOCATION.--At gaging station at New Savannah Bluff lock and dam, 0.2 mile upstream from Butler Creek, and 12 miles downstream from Augusta, Richmond County.
DRAINAGE AREA.--7,508 square miles, including that of Butler Creek.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1950.
REMARKS.--Records of diacharge for water year October 1949 to September 1950 given in Water-Supply Paper 1172.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Oxygen consumed		Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
			Unfiltered	Filtered																Total	Noncarbonate
Oct. 15, 1949	8,510	74	3.8	2.7	13	6.4	40.5	12	0.05	3.2	1.0	3.7	0.9	17	2.6	2.1	0.1	0.3	36	12	0
Nov. 15	8,270	57	2.0	1.5	8	6.6	39.1	13	.10	3.0	1.1	4.9		18	2.8	3.2	.1	.3	36	12	0
Dec. 15	11,600	48	3.0	1.4	8	6.7	48.0	16	.03	3.2	1.4	4.8		21	2.3	2.9	.1	.3	41	14	0
Jan. 16, 1950	7,430	55	2.4	1.6	6	6.9	45.9	14	.04	3.4	1.0	4.9	1.2	20	2.4	3.0	.1	.4	40	13	0
Feb. 15	8,510	55	2.9	2.4	14	6.8	51.1	17	.15	3.6	1.5	4.9		22	2.7	3.1	.1	.4	47	15	0
Mar. 16	20,200	54	5.0	2.4	7	6.6	54.1	15	.05	3.7	1.5	5.2		23	2.8	3.1	.1	.4	45	15	0
Apr. 18	6,330	58	2.4	2.1	8	6.8	45.7	16	.03	3.1	1.2	4.4	1.0	22	2.1	2.5	.0	.1	42	13	0
May 16	6,130	76	2.0	1.4	2	6.7	49.2	13	.02	3.2	1.3	4.9		21	2.5	2.4	.1	.7	38	13	0
June 15	6,730	80	3.4	2.0	3	6.3	40.1	11	.02	2.7	1.1	3.9		16	3.3	1.9	.1	.4	34	11	0
July 17	18,800	78	6.4	2.0	3	6.5	36.6	12	.03	2.6	1.0	3.7	1.0	16	2.0	2.4	.1	.5	33	11	0
Aug. 15	3,490	84	1.9	1.2	3	6.7	43.4	14	.09	3.0	1.2	4.6		20	2.0	2.2	.2	.4	40	12	0
Sept. 15	6,830	68	2.6	1.7	5	6.4	34.1	11	.05	2.2	.7	3.7	.9	14	2.0	1.9	.1	.5	31	8	0

MISCELLANEOUS ANALYSES OF STREAMS IN NORTH CAROLINA

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micromhos at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																	Total	Non-carbonate
CAPE FEAR RIVER BASIN; CAPE FEAR RIVER AT KINGS BLUFF NEAR KELLY																		
Apr. 11, 1950	2,980	8	6.2	70.1	9.1	0.20	3.2	1.5	9.1		22	6.1	5.9	0.2	0.8	48	14	0
CAPE FEAR RIVER BASIN; ROCKFISH CREEK NEAR RAEFORD																		
Aug. 22, 1950	82.0	9	5.3	18.2	6.5	0.07	1.6	0.4	1.4		4	1.8	2.4	0.0	0.3	20	6	2
CAPE FEAR RIVER BASIN; BLACK RIVER NEAR ATKINSON																		
Oct. 5, 1949	493	45	5.8	42.1	8.8	0.10	1.7	0.7	6.3		10	3.7	5.8	0.1	0.4	47	7	0
CHOWAN RIVER BASIN; MEHERRIN RIVER NEAR SEVERN																		
Oct. 19, 1949	222	10	6.6	76.0	18	0.07	5.8	2.3	7.1		37	2.8	4.2	0.0	0.3	60	24	0
Jan. 17, 1950	678	5	6.5	71.8	16	.07	4.2	1.9	7.1		28	3.5	4.8	.0	.4	54	18	0
Mar. 8	515	8	6.2	71.0	15	.11	4.8	2.0	6.6		29	3.7	4.5	.1	.3	54	20	0
SANTEE RIVER BASIN; LOWER LITTLE RIVER NEAR TAYLORSVILLE																		
Oct. 5, 1949	69.4	8	7.4	28.4	11	0.08	2.3	0.9	2.9		14	1.9	1.5	0.0	0.2	28	9	0
SANTEE RIVER BASIN; JACOB FORK NEAR STARTOWN																		
Nov. 18, 1949	121	5	6.7	40.5	9.5	0.02	2.0	1.1	4.0		12	2.5	3.8	0.1	0.1	31	10	0
SANTEE RIVER BASIN; SECOND BROAD RIVER NEAR LOGAN																		
Sept. 19, 1950	38.4	6	7.1	48.4	19	0.16	3.8	1.4	4.9		26	1.8	1.8	0.0	0.1	46	15	0
SANTEE RIVER BASIN; FIRST BROAD RIVER NEAR CASAR																		
Mar. 2, 1950	79.8	4	6.3	36.6	14	0.03	2.7	1.2	3.2		18	2.0	1.2	0.0	0.1	35	12	0
SANTEE RIVER BASIN; NORTH PACOLET RIVER NEAR TRYON																		
Mar. 3, 1950	81.7	4	6.6	62.1	14	0.03	3.0	1.2	8.6		31	3.2	1.6	0.0	0.3	45	12	0

SOUTH ATLANTIC SLOPE AND EASTERN GULF OF MEXICO BASINS--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN SOUTH CAROLINA

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Discharge (second-feet)	Color	pH	Specific conductance (micromhos at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																	Total	Noncarbonate
PEE DEE RIVER BASIN; LYNCHES RIVER AT EFFINGHAM																		
Apr. 28, 1950.....	a469	5	6.0	42.1	7.9	0.09	2.9	1.0	3.6		12	2.8	4.0	0.1	0.6	31	11	2
PEE DEE RIVER BASIN; PEE DEE RIVER AT SOCIETY HILL																		
Mar. 2, 1950.....	6,870	9	6.7	65.1	11	0.08	4.2	1.8	6.2		25	3.7	4.6	0.0	0.6	47	18	0
PEE DEE RIVER BASIN; ROCKY RIVER NEAR CALHOUN FALLS																		
Feb. 10, 1950	270	9	7.3	54.5	16	0.05	3.5	1.4	5.6		22	2.7	3.2	0.1	1.3	45	14	0
SANTEE RIVER BASIN; CONGAREE CREEK NEAR CAYCE																		
Nov. 23, 1949.....	242	10	5.9	13.1	6.5	0.02	1.0	0.8	1.4		5	1.4	2.2	0.0	0.2	20	6	2
SANTEE RIVER BASIN; SANDY RIVER NEAR LEEDS																		
May 4, 1950.....	82.3	10	6.7	121	20	0.06	9.0	4.7	8.0		57	5.2	4.2	0.2	0.8	81	42	0
SANTEE RIVER BASIN; TYGER RIVER NEAR DELTA																		
May 10, 1950.....	609	3	6.6	92.9	16	0.05	5.2	2.1	10		35	5.1	5.4	0.5	1.6	65	22	0
SANTEE RIVER BASIN; TYGER RIVER NEAR WOODRUFF																		
May 12, 1950.....	a368	7	6.5	183	15	0.06	2.8	1.1	35		67	11	15	0.1	0.8	116	12	0
SANTEE RIVER BASIN; SALKEHATCHIE RIVER NEAR HAMPTON																		
Jan. 25, 1950	250	28	6.7	63.6	9.8	0.04	8.0	0.9	2.9		28	1.5	3.8	0.0	0.2	46	24	1
EDISTO RIVER BASIN; NORTH FORK EDISTO RIVER NEAR NORTH																		
June 14, 1950	384	7	5.4	22.7	8.1	0.04	1.2	0.4	3.7		9	1.2	2.4	0.1	0.5	23	5	0
EDISTO RIVER BASIN; SHAW CREEK NEAR EUREKA																		
Apr. 24, 1950.....	29.7	5	6.0	27.4	8.6	0.06	1.6	0.5	3.7		8	1.2	3.5	0.1	1.3	26	6	0

a Mean discharge.

WEST PALM BEACH CANAL AT 20-MILE BEND, NEAR LOXAHATCHEE, FLA.

LOCATION.--Just below junction with Cross Canal at bridge on State Highway 80 at 20-mile bend, 7.2 miles west of Loxahatchee, Fla.
RECORDS AVAILABLE.--Chemical analyses: July to September 1950.
EXTREMES, 1950.--Dissolved solids: Maximum, 676 ppm Sept. 6, 7; minimum, 235 ppm Aug. 2-11.
Hardness: Maximum, 269 ppm July 11, 12; minimum, 122 ppm Sept. 8-17.
REMARKS.--Records of specific conductance of daily samples available in district office at Ocala, Fla. Values reported for dissolved solids are residue on avaporation at 180°C. No discharge records available for this station.

Chemical analyses, in parts per million, July to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (°F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Non-carbonate
July 4-10, 1950			250	7.6	625	25	0.15	68	21	34	2.5	213	54	62	0.1	6.0	464	256	81
July 11-12			300	7.8	885	34	--	70	23	101	3.6	290	64	121	--	.9	--	269	32
July 13-19			200	7.5	455	13	.12	44	7.2	42	1.9	151	32	54	.0	1.5	298	139	16
July 21-30			100	7.4	398	14	.15	42	12	29	1.4	140	35	42	.1	2.6	262	154	79
Aug. 2-11			25	7.7	389	11	.09	37	12	27	1.5	141	35	34	.3	1.6	235	142	26
Aug. 12, 13			15	8.1	644	17	.10	40	18	65	--	202	36	81	.3	1.2	406	174	8
Aug. 14-23			30	7.8	464	14	.08	38	15	33	1.5	155	30	47	.3	1.4	283	156	29
Sept. 6-7			100	7.9	1,000	35	.15	67	22	110	4.0	294	48	144	.6	3.0	676	258	16
Sept. 8-17			100	7.6	442	23	.12	26	14	38	2.5	152	22	43	.2	2.2	283	122	0
Average			124	7.7	589	21	0.12	48	16	53	2.4	193	40	70	0.2	2.3	363	186	32

LAKE OKEECHOBEE AND THE EVERGLADES--Continued

HILLSBORO CANAL AT SHAWANO, FLA.

LOCATION.--At end of State Highway 198, 7 miles southeast from its junction with State Highway 25, and 13½ miles southeast of Belle Glade, Palm Beach County.
RECORDS AVAILABLE.--Chemical analyses: July to September 1950.
EXTREMES, 1950.--Dissolved solids: Maximum, 792 ppm Sept. 1-10; minimum, 284 ppm Aug. 1-11.
Hardness: Maximum, 423 ppm Aug. 30-31; minimum, 162 ppm Aug. 1-11.
REMARKS.--Records of specific conductance of daily samples available in district office at Ocala, Fla. Values reported for dissolved solids are residue on evaporation at 180°C. No discharge records available for this station.

Chemical analyses, in parts per million, July to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Non-carbonate
July 1-4, 6-7, 1950...			100	7.4	499	18	0.08	50	16	37	1.9	178	52	48	0.0	2.4	338	191	45
July 5, 8-10			140	7.3	861	32	.20	80	13	90	3.2	296	89	90	.1	2.4	598	253	10
July 11, 13			160	7.7	925	36	--	85	34	70	3.5	328	92	99	--	1.6	--	352	83
July 12, 14-20			100	7.2	514	17	.10	50	17	30	1.7	180	42	51	.1	1.5	354	195	47
July 21-31.....			160	7.2	437	14	.05	48	14	27	1.5	164	45	40	.0	1.4	299	177	43
Aug. 1-11			35	7.6	443	19	.00	45	12	29	1.6	161	32	38	.2	2.6	284	162	30
Aug. 12-20			120	7.5	740	17	.00	70	22	49	2.9	252	63	72	.4	2.4	493	265	59
Aug. 21-29			100	7.5	642	19	.00	60	17	46	2.7	239	37	61	.3	1.1	420	220	24
Aug. 30-31			280	7.5	1,170	--	--	--	--	97		403	113	130	.0	3.4	--	423	93
Sept. 1-10.....			200	7.7	1,150	34	.00	104	29	111	4.6	390	113	124	.7	3.2	792	378	59
Sept. 11-20.....			120	7.5	826	20	.00	62	18	90	3.0	265	56	104	.3	1.4	518	228	12
Sept. 21-30.....			110	7.5	763	16	.00	58	15	71	2.7	234	41	100	.2	1.0	463	206	14
Average.....			135	7.5	748	22	0.04	65	19	62	2.7	258	65	80	0.3	1.9	456	254	43

LAKE OKEECHOBEE AND THE EVERGLADES--Continued

NORTH NEW RIVER CANAL AT 20-MILE BEND, NEAR FORT LAUDERDALE, FLA.

LOCATION.--Approximately 18 miles west of Fort Lauderdale, Broward County.
RECORDS AVAILABLE.--Chemical analyses: July 1950 to January 1951.
EXTREMES, July 1950 to January 1951.--Dissolved solids: Maximum, 667 ppm Sept. 1-10; minimum, 350 ppm Oct. 1-10.
Hardness: Maximum, 379 ppm Sept. 1-10; minimum, 181 ppm Oct. 1-10.
REMARKS.--Records of specific conductance of daily samples available in district office at Ocala, Fla. No discharge records available for this station.

Chemical analyses, in parts per million, July 1950 to January 1951

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
July 6-10, 1950			80	7.3	605	25	0.08	68	21	36	1.9	214	68	54	0.0	3.8	430	256	81
July 11-21			180	7.1	619	24	.07	69	21	38	1.8	236	67	54	.1	2.0	443	258	65
Aug. 2-4, 6-8, 10-13			120	7.5	632	15	.20	61	18	43	4.8	248	49	53	.1	.6	414	226	23
Sept. 1-10			200	7.8	958	25	.08	96	34	62	5.0	354	108	78	.5	1.1	667	379	89
Sept. 11, 15-17, 19-20			140	7.6	745	15	.14	68	22	53	5.0	276	54	69	.5	.8	488	260	34
Sept. 21-30			150	7.5	627	14	.18	56	19	44	3.8	233	41	58	.3	1.2	398	218	27
Oct. 1-10			150	7.5	537	10	.12	46	16	45	1.8	198	41	49	.3	1.1	350	181	18
Oct. 11-24			500	7.3	736	14	.10	67	26	42	2.3	252	81	51	.4	7.8	530	274	68
Nov. 1-3, 5-10			500	7.6	777	16	.09	66	26	56	7.2	296	61	69	.4	1.8	556	272	29
Nov. 11-20			450	7.6	775	13	.13	70	25	57	7.4	308	55	72	.5	2.2	559	277	25
Nov. 21-23, 25-30			400	7.7	842	15	.05	70	27	68	8.5	324	52	87	.5	2.2	591	286	20
Dec. 1-9			175	7.6	757	14	.10	68	24	56	2.1	282	54	72	.4	2.2	498	268	37
Dec. 11-20			55	7.6	740	14	.08	75	22	54	3.1	273	56	74	.4	2.5	482	278	54
Dec. 21-31			65	7.5	625	12	.05	66	19	37	2.4	242	46	59	.3	2.5	401	243	44
Jan. 3-8, 1951			85	7.8	662	15	.00	61	15	48	1.9	247	40	66	.4	1.6	422	214	11
Average			217	7.5	709	16	0.10	67	22	49	3.9	266	58	64	0.3	2.2	482	259	42

LAKE OKEECHOBEE 5 MILES NORTH OF CLEWISTON, FLA.

LOCATION.--At raw-water intake at U. S. Sugar Corporation water plant, 5 miles north of Clewiston, Hendry, County.
RECORDS AVAILABLE.--Chemical analyses: July to September 1950.

Chemical analyses, in parts per million, July to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
July 11, 1950			30	7.7	337	22	0.04	38	8.1	17	0.4	124	26	24	0.0	2.5	218	128	26
Aug. 2			25	8.0	337	15	.04	39	8.3	18	.4	128	25	27	.1	1.6	215	131	27
Sept. 6			30	7.8	340	17	.04	39	8.2	18	.4	130	24	28	.0	1.5	214	131	24
Sept. 26			15	7.2	370	7.0	.12	43	8.9	23	1.1	142	30	30	.2	.7	229	144	28

LAKE OKEECHOBEE AND THE EVERGLADES--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN LAKE OKEECHOBEE AND THE EVERGLADES IN FLORIDA

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
WEST PALM BEACH CANAL AT CANAL POINT																			
Sept. 26, 1950	315		27	7.7	348			31	14	31		137	45	30		1.3		135	23
BIG MOUND CANAL AT WEST PALM BEACH CANAL NEAR CANAL POINT																			
Sept. 26, 1950			130	7.2	805			40	12	143		154	114	150		5.7		149	23
LATERAL FROM NORTH AT WEST PALM BEACH CANAL, ABOVE CONTROL, LOXAHATCHEE																			
Sept. 26, 1950			38	7.4	528			77	8.5	30		250	30	39		1.5		227	22
RANGELINE CANAL AT WEST PALM BEACH CANAL, ABOVE CONTROL, NEAR WEST PALM BEACH																			
Sept. 26, 1950			170	6.6	124			21	0.9	13		51	27	9.0		1.2		56	14
WEST PALM BEACH CANAL ABOVE CONTROL AT WEST PALM BEACH																			
Sept. 26, 1950	724		80	7.2	494			48	7.6	56		157	51	64		1.7		151	22
LAKE OKEECHOBEE AT HURRICANE GATE STRUCTURE 4, NEAR BELLE GLADE																			
Sept. 26, 1950			17	7.6	394			39	13	38		139	60	40		1.1		151	37
HILLSBORO CANAL AT BELLE GLADE																			
Sept. 26, 1950	180		17	7.6	416			35	15	39		141	59	39		1.2		149	34
CROSS CANAL AT BEND NEAR BELLE GLADE																			
Sept. 26, 1950			140	7.6	2,110			62	46	348		485	95	428		1.4		344	0
BOLLES CANAL AT HILLSBORO CANAL, NEAR BELLE GLADE																			
Sept. 26, 1950			44	7.2	1,230			80	42	167		416	102	162		3.5		372	31
INDIAN RUN AT HILLSBORO CANAL NEAR DEERFIELD BEACH																			
Sept. 28, 1950			180	6.6	533			23	5.5	89		72	28	129		3.2		80	21

RANGELINE CANAL AT HILLSBORO CANAL NEAR DEERFIELD BEACH, ABOVE CONTROL

Sept. 28, 1950			90	7.4	865			69	19	108	273	81	123		4.4		250	15

HILLSBORO CANAL NEAR DEERFIELD BEACH, ABOVE CONTROL

Sept. 28, 1950	165		95	7.5	821			73	16	90	271	63	108		4.0		248	26

NORTH NEW RIVER CANAL AT SOUTH BAY

Sept. 26, 1950	281		34	7.8	453			41	13	36	130	60	45		1.3		156	49

NORTH NEW RIVER CANAL AT BEND 4 MILES SOUTH OF OKEELANTA

Sept. 27, 1950			23	7.6	511			45	18	50	171	76	50		1.4		186	46

NORTH NEW RIVER CANAL LATERAL FROM WEST, 10.0 MILES SOUTH OF OKEELANTA

Sept. 27, 1950			380	7.4	1,040			126	44	65	421	160	86		4.5		496	150

DIKE C BORROW PIT AT NORTH NEW RIVER CANAL AT BROWARD-PALM BEACH COUNTY LINE

Sept. 27, 1950			64	7.1	548			75	17	38	246	94	28		1.8		257	56

DIKE E BORROW PIT AT NORTH NEW RIVER CANAL NEAR FORT LAUDERDALE

Sept. 27, 1950			160	6.7	352			44	6.1	31	143	37	31		4.1		135	18

HOLLOWAY LATERAL AT NORTH NEW RIVER CANAL NEAR FORT LAUDERDALE

Sept. 28, 1950			98	7.3	409			59	11	25	225	30	20		2.9		192	8

SNAKE CREEK CANAL AT SOUTH NEW RIVER CANAL, NEAR DAVIE

Sept. 28, 1950			76	7.3	644			118	10	23	338	74	20		3.7		336	59

SOUTH NEW RIVER CANAL AT DAVIE, ABOVE CONTROL

Sept. 28, 1950			85	7.4	565			87	13	24	281	46	29		3.1		270	40

LAKE OKEECHOBEE AND THE EVERGLADES--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN LAKE OKEECHOBEE AND THE EVERGLADES IN FLORIDA--Continued

Chemical analyses, in parts per million, water year October 1949 to September 1950--Continued

Date of collection	Mean discharge (second-feet)	Temperature (°F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
MIAMI CANAL AT LAKE HARBOR																			
Sept. 27, 1950			11	7.7	401			39	12	35		140	52	37		1.2		147	32
MIAMI CANAL AT JUNCTION WITH SOUTH NEW RIVER CANAL																			
Sept. 28, 1950			55	7.2	535			66	20	29		298	26	26		2.4		247	3
PENNSUCO LATERAL AT PENNSUCO																			
Sept. 27, 1950			78	7.1	555			103	8.8	37		332	75	15		3.1		293	21
MIAMI CANAL AT WATER PLANT, HIALEAH																			
Dec. 22, 1949	1,050		80	7.3	465		0.08	80	6.9	17		278	15	15		1.1		228	0
Mar. 23, 1950	20		60	7.3	469		.03	82	7.5	9.2		270	11	16		.7		236	14
June 20	150		65	7.3	499		.06	90	6.9	11		292	11	17		1.7		253	14
Sept. 27	204		53	7.4	507		--	86	8.4	44		286	39	17		1.8		249	15
TAMIAMI CANAL AT FOOTBRIDGE NEAR CORAL GABLES																			
Dec. 23, 1949			55	7.1	429		0.50	78	5.4	13		250	17	15		1.4		217	12
Mar. 31, 1950			50	7.3	435		.06	79	4.9	12		252	12	16		1.2		217	11
June 16			50	7.2	460		.06	84	5.5	8.7		268	7.8	16		1.3		232	12
Sept. 29			27	7.3	466		--	87	4.4	15		268	23	16		1.7		235	16
TAMIAMI CANAL AT BRIDGE 45, 27 MILES WEST OF MIAMI																			
Sept. 29, 1950			190	7.2	381			48	13	26		203	38	15		3.3		173	7
TAMIAMI CANAL AT BRIDGE 115, 46 MILES WEST OF MIAMI																			
Sept. 29, 1950			23	7.2	221			38	2.7	19		124	33	7.0		1.0		106	4
TAMIAMI CANAL AT BRIDGE 96, MONROE																			
Sept. 29, 1950			43	7.3	247			41	3.5	21		157	19	10		1.0		117	0

WITHLACOOCHEE RIVER NEAR HOLDER, FLA.

LOCATION.--At gaging station at bridge on State Highway 200, 4½ miles northeast of Holder, Citrus County.
DRAINAGE AREA.--1,590 square miles.
RECORDS AVAILABLE.--Chemical analyses: January to September 1950.
Water temperatures: January to September 1950.
EXTREMES, 1950.--Dissolved solids: Maximum, 275 ppm July 11-20; minimum, 119 ppm Sept. 21-30.
Hardness: Maximum, 191 ppm July 11-20; minimum, 63 ppm Sept. 21-30.
Water temperatures: Maximum, 92°F July 17; minimum, 63°F Feb. 18-19, Mar. 3, Apr. 6.
REMARKS.--Records of specific conductance of daily samples available in district office at Ocala, Fla. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1172. Values reported for dissolved solids are residue on evaporation at 180°C.

Chemical analyses, in parts per million, calendar year January to December 1950

Date of collection	Mean discharge (second-feet)	Temperature (°F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
Jan. 1-10, 1950 ...	1,154	66	40	6.6	291	4.6	0.06	50	4.1	6.0	0.4	144	17	8.5	0.1	0.8	176	142	24
Jan. 11-20	1,091	70	40	6.5	282	5.1	.06	48	4.2	5.2	--	137	18	9.0	.0	1.0	173	137	25
Jan. 21-31	9,977	71	40	6.5	282	4.3	.07	45	4.2	6.2	--	137	17	8.8	.0	.9	171	130	17
Feb. 1-10	783.3	72	10	7.8	291	8.3	.02	49	3.8	6.5	.7	144	20	9.5	.0	.8	187	138	20
Feb. 11-20	750.9	69	10	7.8	299	7.1	.01	50	3.7	6.4	.7	148	19	8.8	.0	.8	190	140	19
Feb. 21-28	706.6	64	10	7.9	302	7.7	.01	43	8.0	6.0	.4	151	22	8.0	.0	.3	190	140	16
Mar. 1-10	714.3	68	25	7.6	316	13	.02	53	4.5	6.6	.5	154	24	7.0	.0	.4	193	151	25
Mar. 11-20	757.8	72	25	7.6	328	7.9	.05	55	4.6	5.7	.4	155	29	9.0	.0	.4	195	156	29
Mar. 21-31	668.8	72	30	7.3	317	9.0	.03	54	4.8	5.7	.5	154	24	9.0	.0	.7	186	154	28
Apr. 1-10	557.2	70	20	7.8	314	9.0	.04	54	5.1	5.3	.5	154	24	9.0	.0	.7	184	156	30
Apr. 11-20	485.5	72	25	7.7	314	12	.03	51	5.0	5.3	.4	152	21	10	.0	.7	185	148	23
Apr. 21-22, 25-30..	475.0	79	25	7.8	308	10	.03	52	5.0	5.4	.5	156	19	8.0	.0	.7	180	150	22
May 1-10	457.0	85	25	7.7	300	10	.10	51	3.7	5.3	.4	148	18	9.0	.0	.8	175	142	21
May 11-20	412.0	81	30	7.6	292	10	.03	49	4.9	5.1	.4	143	20	9.0	.0	.7	173	142	25
May 21-31	387.8	83	25	7.5	287	10	.03	48	5.1	4.9	.4	141	21	8.0	.0	.7	168	141	25
June 1-10	356.4	85	25	7.7	285	10	.04	47	5.0	4.8	.3	140	20	8.0	.0	.6	166	138	23
June 11-20	334.2	86	30	7.7	278	12	.04	44	5.0	4.4	.3	134	20	7.0	.0	.6	162	130	21
June 21-29	384.8	86	25	7.7	275	12	.04	45	5.0	4.6	.3	131	23	7.0	.0	.6	163	133	26
July 1-10	514.2	82	10	7.5	376	12	.04	61	5.8	5.2	.7	122	74	7.0	.1	.6	243	176	76
July 11-20	518.6	86	15	7.3	410	11	.04	68	5.2	4.7	.7	121	92	7.2	.1	.5	275	191	92
July 21-31	463.0	86	15	7.7	347	13	.05	57	5.7	4.8	1.5	135	52	7.2	.1	.4	227	166	55
Aug. 1-10	5,080	84	15	7.7	330	10	.05	54	6.1	4.3	1.5	129	50	7.0	.1	.5	214	160	54
Aug. 11-20	585.9	85	20	7.6	364	11	.07	58	6.3	3.8	1.5	128	60	7.0	.1	.5	241	171	66
Aug. 21-31	570.2	84	25	7.7	344	13	.01	58	5.4	4.2	.4	128	59	7.0	.1	.5	222	167	62
Sept. 1-5	698.2	80	35	7.6	328	22	.01	53	5.6	4.1	.4	124	51	6.0	.1	.6	220	155	54
Sept. 6-10	3,316	75	120	7.4	195	8.0	.02	29	3.1	2.6	.4	51	41	4.0	.2	1.1	172	85	43
Sept. 11-20	3,743	83	200	6.9	201	7.0	.01	31	3.1	2.9	.9	68	30	4.0	.2	3.7	153	90	34
Sept. 21-30	4,903	80	200	6.9	144	5.0	.02	23	1.4	3.2	.9	60	11	4.0	.1	5.0	119	63	14

WITHLACOOCHEE RIVER BASIN--Continued

WITHLACOOCHEE RIVER NEAR HOLDER, FLA.--Continued

Temperature (°F) of water, January to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1				67	73	66	68	84	68	83	83	83
2				66	73	66	70	84	85	83	84	84
3				68	73	63	73	88	86	84	85	81
4				69	72	67	74	85	85	88	85	80
5				69	69	68	73	66	85	82	85	72
6				70	70	70	63	86	84	82	83	73
7				69	70	72	67	86	85	80	84	75
8				67	71	70	68	85	85	79	82	76
9				67	72	67	70	--	84	80	83	77
10				67	72	66	74	83	85	78	84	76
11				68	73	68	73	83	90	78	85	80
12				69	72	72	74	83	84	86	84	82
13				70	74	74	74	84	86	86	85	82
14				70	74	74	72	82	85	85	85	83
15				70	70	74	70	80	88	85	66	84
16				71	68	73	68	80	83	85	86	84
17				71	65	72	70	78	66	92	86	84
18				71	63	69	72	80	87	87	65	84
19				71	63	70	75	82	69	87	85	84
20				71	64	72	77	82	87	88	85	82
21				69	85	75	74	82	83	88	85	82
22				69	65	73	75	82	87	86	85	82
23				69	68	70	--	80	85	87	85	82
24				70	65	70	--	82	87	87	86	82
25				71	65	72	78	84	87	87	82	80
26				72	67	75	78	83	88	88	85	80
27				72	67	72	80	82	87	88	84	79
28				72	68	74	80	84	87	87	84	79
29				72	--	74	82	86	82	85	82	79
30				72	--	72	83	84	82	83	82	79
31				73	--	68	--	82	--	85	82	--
Average				70	69	71	73	83	86	85	84	80

ALLEGHENY RIVER AT KITTANNING, PA.

302255 O - 54 - 12

LOCATION.--At city raw-water intake, about 1,000 feet upstream from bridge on U. S. Highway 422 at Kittanning, Armstrong County, and about 1,500 feet downstream from gaging station.
DRAINAGE AREA.--8,973 square miles (above gaging station).
RECORDS AVAILABLE.--Chemical analyses: September 1906 to September 1907, October 1944 to September 1950.
Water temperatures: October 1944 to September 1950 (unpublished).
EXTREMES, 1949-50.--Specific conductance: Maximum, 457 micromhos Nov. 11-20; minimum, 98.0 micromhos Apr. 1-10.
Hardness: Maximum, 128 ppm Nov. 11-20; minimum, 40 ppm Jan. 11-20.
Water temperatures: Maximum, 75°F July 22, Aug. 4, 5, 6, 7; minimum, 34°F on several days in February and March.
EXTREMES, 1906-07, 1944-50.--Dissolved solids (1906-07) (1944-47): Maximum, 304 ppm Oct. 11-20, 1946; minimum, 54 ppm Jan. 7-15, 1907.
Hardness (1906-07) (1944-50): Maximum, 135 ppm Oct. 1-20, 1946; minimum, 29 ppm Jan. 7-15, 1907.
Specific conductance (1944-50): Maximum, 521 micromhos Oct. 11-20, 1946; minimum, 98.0 micromhos Apr. 1-10, 1950.
REMARKS.--Records of specific conductance and temperature of daily samples available in district office at Philadelphia, Pa. Temperature records not published because temperature at water plant may be influenced by travel distance in pipeline to plant. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (°F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
Oct. 1-10, 1949	2,247		5	7.0	413						--	68	49	60		0.4		112	56
Oct. 11-20	1,829		5	7.1	397						--	74	51	42		.5		110	49
Oct. 21-31	1,473		10	7.0	411						--	74	51	52		.8		116	55
Nov. 1-10	1,443		7	7.1	431						--	76	55	54		.6		122	60
Nov. 11-20	2,305		5	7.2	457						--	78	57	60		.3		128	64
Nov. 21-30	4,944		5	7.1	401						--	72	42	57		.7		112	53
Dec. 1-10	8,048		10	6.9	283						--	46	41	32		1.3		84	46
Dec. 11-14	18,078		20	7.1	328						--	40	46	46		1.4		106	73
Dec. 15-20	20,700		15	7.3	203						--	24	36	22		1.6		62	42
Dec. 21-31	19,882		10	7.1	182						--	27	36	18		1.5		58	36
Jan. 1-10, 1950	40,580		10	6.9	159						--	20	32	14		1.6		50	34
Jan. 11-20	51,780		20	6.8	124						5.9	12	27	10		1.0		40	30
Jan. 21-31	29,818		25	6.9	146						6.5	17	33	12		1.2		52	38
Feb. 1-10	16,570		1	7.0	180						--	20	39	14		1.6		60	44
Feb. 11-20	45,530		5	6.6	141						--	16	33	10		1.5		51	38
Feb. 21-28	27,163		1	6.7	144						--	14	34	9.0		1.4		51	39
Mar. 1-10	18,815		3	6.9	176						--	23	37	14		1.5		58	39
Mar. 11-20	27,680		7	6.8	143						--	18	31	12		1.4		49	34
Mar. 21-31	57,691		5	6.7	130						--	16	30	9.0		1.1		45	32
Apr. 1-10	64,880		5	6.7	98.0						--	14	20	7.0		1.4		37	26
Apr. 11-20	19,570		5	6.9	148						--	22	29	11		1.6		58	40
Apr. 21-30	23,530		5	7.0	165						--	24	32	15		1.6		66	46

OHIO RIVER MAIN STEM--Continued

ALLEGHENY RIVER AT KITTANNING, PA.--Continued

Chemical analyses, in parts per million, water year October 1949 to September 1950--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
May 1-10, 1950	22,210		5	7.1	147						--	26	30	12		0.8		57	36
May 11-20	16,600		5	7.1	164						--	25	28	16		.7		57	36
May 21-31	12,660		5	7.2	178						--	26	31	18		.6		64	43
June 1-10	16,727		15	6.9	178						--	27	29	17		1.1		56	34
June 11-20	9,746		5	6.9	185						--	26	31	17		.9		62	41
June 21-30	4,297		5	6.9	236						--	31	43	24		.8		71	46
July 1-10	4,338		10	6.9	276						--	39	48	30		1.1		85	53
July 11-20	4,318		10	7.0	295						--	42	46	36		.8		89	55
July 21-31	9,820		10	7.1	250						--	39	36	29		1.0		77	45
Aug. 1-10	5,972		10	7.2	223						--	35	35	23		.6		69	40
Aug. 11-20	2,921		2	7.1	254					18		44	38	27		.5		75	39
Aug. 21-31	3,743		2	6.8	285					19		36	52	28		.5		83	54
Sept. 1-10	7,546		5	6.8	266					19		42	37	32		.7		78	44
Sept. 11-20	7,627		3	6.9	254					17		39	41	26		.6		75	43
Sept. 21-30	3,993		5	7.0	233					15		40	36	24		.6		71	38
Average	17,110		8	7.0	235					15		35	38	25		1.0		73	44

ALLEGHENY RIVER NEAR WARREN, PA.

LOCATION.--At bridge on U. S. Highway 6, Warren County, approximately 9½ miles downstream from gaging station near Kinzua.
DRAINAGE AREA.--2,233 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1948 to September 1950.
Water temperatures: October 1948 to September 1950.
EXTREMES, 1949-50.--Specific conductance: Maximum, 864 micromhos Nov. 1-10; minimum, 85.8 micromhos Mar. 28-31.
Hardness: Maximum, 172 ppm Oct. 21-31; minimum, 28 ppm Apr. 1-10.
Water temperatures: Maximum, 79°F June 26, Aug. 17; minimum, freezing point on several days during December to March.
EXTREMES, 1948-50.--Dissolved solids (1948-49): Maximum, 573 ppm Sept. 11-20, 1949; minimum, 100 ppm July 11-20, 1949.
Hardness: Maximum, 180 ppm Oct. 1-10, 1948; minimum, 28 ppm Apr. 1-10, 1950.
Specific conductance: Maximum, 896 micromhos Oct. 1-10, 1948; minimum, 85.8 micromhos Mar. 28-31, 1950.
Water temperatures: Maximum, 84°F July 13, 14, 1949; minimum, freezing point on several days during winter months.
REMARKS.--Records of specific conductance, pH, and chloride of daily samples available in district office at Philadelphia, Pa. Discharge records for gaging station near Kinzua for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (°F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Non-carbonate
Oct. 1-10, 1949	370		5	7.3	793	2.9	--	--	--	84		75	30	172	--	0.8	--	153	92
Oct. 11-20	333		5	7.7	846	2.3	--	--	--	89		78	31	185	--	1.0	--	164	100
Oct. 21-31	321		5	7.5	806	1.9	0.15	49	12	76		80	30	170	0.1	1.0	456	172	106
Nov. 1-10	340		5	7.6	864	5.0	--	--	--	93		80	30	195	--	1.1	--	170	104
Nov. 11-20	620		5	7.5	778	2.9	--	--	--	86		76	29	175	--	.8	--	153	91
Nov. 21-30	1,206		5	7.3	565	3.6	--	--	--	60		58	28	118	--	1.2	--	113	65
Dec. 1-10	1,473		8	6.9	433	--	--	--	--	--		42	21	92	--	1.9	--	92	58
Dec. 11-20	5,972		20	6.6	227	--	--	--	--	--		23	16	43	--	2.0	--	52	33
Dec. 21-31	4,770		13	6.7	229	--	--	--	--	--		20	15	46	--	1.7	--	54	38
Jan. 1-10, 1950	8,781		21	7.2	186	--	--	--	--	--		23	15	32	--	1.7	--	44	25
Jan. 11-20	10,901		17	6.8	144	4.8	04	11	2.8	11		16	13	24	.1	1.7	82	39	26
Jan. 21-31	6,250		8	7.0	195	--	--	--	--	--		22	15	36	--	1.6	--	46	28
Feb. 1-10	3,020		8	7.0	261	--	--	--	--	--		30	16	50	--	1.7	--	60	35
Feb. 11-20	5,219		8	6.9	207	--	--	--	--	--		23	15	38	--	1.4	--	46	27
Feb. 21-28	3,063		8	7.3	247	--	--	--	--	--		28	16	47	--	1.4	--	57	34
Mar. 1-10	3,775		9	7.1	263	--	--	--	--	--		30	17	51	--	1.3	--	60	35
Mar. 11-15, 17-20	4,920		3	6.8	214	--	--	--	--	20		27	15	38	--	1.6	--	49	27
Mar. 16	3,760		3	3.40	348	--	--	--	--	30		--	59	40	--	1.7	--	53	53
Mar. 21, 22	4,165		4	7.0	247	--	--	--	--	23		30	15	46	--	1.6	--	57	32
Mar. 23-27	7,770		4	6.7	165	--	--	--	--	15		22	14	28	--	1.6	--	40	22
Mar. 28-31	29,550		17	6.4	85.8	3.9	.10	6.9	1.8	8.9		12	12	14	.1	2.0	63	25	15
Apr. 1-10	22,470		7	6.5	102	--	--	--	--	8.4		15	11	15	--	1.7	--	28	16
Apr. 11-20	5,262		4	7.0	187	--	--	--	--	16		27	13	31	--	1.5	--	46	24
Apr. 21-30	5,578		4	7.0	184	--	--	--	--	17		24	12	33	--	.5	--	42	22

OHIO RIVER MAIN STEM--Continued

ALLEGHENY RIVER NEAR WARREN, PA.--Continued

Chemical analyses, in parts per million, water year October 1949 to September 1950--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
May 1-10, 1950	5,589		3	6.9	180	--	--	--	--	16		26	11	32	--	0.6	--	44	23
May 11-20	4,639		3	6.9	215	--	--	--	--	20		28	12	39	--	.6	--	48	25
May 21-31	3,030		3	7.1	244	--	--	--	--	23		35	11	46	--	.5	--	55	26
June 1-10	2,950		4	7.1	259	--	--	--	--	25		36	12	49	--	.5	--	58	28
June 11-20	1,533		8	7.0	368	--	--	--	--	38		44	15	74	--	.5	--	74	38
June 21-30	755		7	7.1	495	--	--	--	--	53		64	18	102	--	.7	--	101	49
July 1-10	787		16	7.1	539	--	--	--	--	60		63	18	117	--	.7	--	106	54
July 11-20	999		16	7.1	554	--	--	--	--	63		56	18	125	--	.5	--	104	58
July 21-31	1,793		13	7.3	382	--	--	--	--	44		49	15	81	--	.6	--	74	34
Aug. 1-10	827		9	7.3	481	--	--	--	--	49		52	16	103	--	.4	--	99	56
Aug. 11-20	442		8	7.5	674	--	--	--	--	72		70	21	152	--	.2	--	137	80
Aug. 21-31	496		9	7.4	698	--	--	--	--	75		63	20	161	--	.3	--	136	84
Sept. 1-10	1,050		10	7.4	515	--	--	--	--	53		54	18	111	--	.7	--	104	60
Sept. 11-20	1,193		5	7.3	447	--	--	--	--	--	--	44	17	99	--	.2	--	86	50
Sept. 21-30	574		4	7.7	565	--	--	--	--	--	--	60	18	125	--	.1	--	111	62
Average	3,802		8	7.0	390	--	--	--	--	40		43	19	80	--	1.1	--	81	46

OHIO RIVER MAIN STEM--Continued

ALLEGHENY RIVER NEAR WARREN, PA.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	62	48	35	35	36	32	39	46	61	69	73	73
2	62	48	35	39	35	32	40	50	61	70	74	71
3	64	47	32	42	33	32	41	54	59	72	72	69
4	64	44	33	47	33	32	45	58	57	72	68	70
5	65	43	33	44	32	33	44	60	62	71	70	70
6	60	41	33	41	34	33	44	58	65	70	71	69
7	62	44	32	38	35	34	42	57	69	72	74	67
8	62	48	32	36	33	35	40	54	72	71	76	67
9	68	49	32	35	35	33	40	53	70	71	74	71
10	71	49	34	36	36	32	42	57	69	72	75	71
11	66	50	--	37	38	33	44	53	66	74	74	73
12	66	50	36	36	37	33	40	58	68	75	74	70
13	63	51	37	38	35	33	39	54	68	73	73	66
14	61	50	33	39	--	34	40	55	67	72	73	63
15	59	46	34	40	35	34	42	60	71	71	76	60
16	57	42	32	34	35	35	44	62	68	70	74	58
17	53	41	33	36	35	34	44	58	68	70	79	61
18	57	40	35	35	35	33	47	57	65	69	76	61
19	49	39	34	34	35	33	49	55	66	69	73	61
20	54	38	35	32	32	35	49	55	67	69	72	65
21	60	38	47	32	32	38	47	57	68	68	72	61
22	59	36	45	34	32	38	46	62	71	68	72	60
23	57	34	41	36	32	38	44	60	75	69	73	58
24	52	33	37	42	32	37	44	64	75	69	73	55
25	49	32	36	45	32	37	46	64	76	68	74	51
26	50	32	36	48	32	37	44	64	79	71	75	51
27	49	32	41	42	32	41	48	63	72	75	75	59
28	49	33	38	38	32	39	47	61	70	72	76	60
29	48	34	36	40	--	38	46	61	69	69	75	60
30	48	36	34	38	--	37	46	66	70	72	75	61
31	51	--	34	36	--	39	--	65	--	74	74	--
Average	58	42	36	38	34	35	44	58	68	71	74	64

OHIO RIVER AT AMBRIDGE, PA.

LOCATION.--At bridge on State Highway 930 at Ambridge, Beaver County, 1.2 miles downstream from Sewickley Creek, and approximately 5 miles below gaging station at Sewickley, Allegheny County.
DRAINAGE AREA.--19,560 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1950.
Water temperatures: October 1945 to September 1950.
EXTREMES, 1949-50.--Specific conductance: Maximum, 596 micromhos Oct. 21-31; minimum, 125 micromhos Apr. 1-10.
Hardness: Maximum, 163 ppm Oct. 21-31; minimum, 44 ppm Apr. 1-10.
Water temperatures: Maximum, 81°F Aug. 31, Sept. 1, 2; minimum, 33°F Mar. 3.
EXTREMES, 1945-50.--Dissolved solids (1945-47): Maximum, 600 ppm Oct. 1-10, 1946; minimum, 79 ppm Apr. 1-10, 1947.
Hardness (1947-47) (1949-50): Maximum, 302 ppm Oct. 1-10, 1946; minimum, 43 ppm Apr. 1-10, 1947.
Specific conductance: Maximum, 921 micromhos Oct. 1-10, 1946; minimum, 125 micromhos Apr. 1-10, 1950.
Water temperatures: Maximum, 86°F Aug. 20, 21, 1947; minimum, freezing point on many days during winter months.
REMARKS.--Samples collected daily from highway bridge at point 400 feet from east bank of river. Due to cross-sectional differences in concentration of dissolved solids water samples also collected once a month at points, 340, 625, 870, 1,090, and 1,380 feet from east bank of river. Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1949 to September 1950 based on records for Ohio River at Sewickley, which are given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (°F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
Oct. 1-10, 1949	5,608		5	5.6	536					--		5	179	35		4.4		153	149
Oct. 11-20	6,065		5	5.9	535					--		6	178	35		4.0		155	150
Oct. 21-31	5,243		5	4.40	596					--		0	207	31		4.7		163	163
Nov. 1-10	13,704		1	4.6	461					--		2	166	18		2.2		136	134
Nov. 11-20	8,962		3	4.8	401					--		3	141	20		2.6		120	118
Nov. 21-30	15,005		1	6.1	410					--		10	126	30		4.5		124	116
Dec. 1-10	26,300		1	6.4	276					--		16	74	21		2.8		84	71
Dec. 11-20	50,820		4	6.3	261					--		12	70	18		3.1		84	74
Dec. 21-31	49,645		10	6.4	219					--		12	67	16		2.4		72	62
Jan. 1-10, 1950	87,920		1	6.1	189					--		13	53	12		3.0		64	53
Jan. 11-20	91,840		1	6.2	157					--		10	46	8		2.3		52	44
Jan. 21-31	59,882		5	6.3	192					--		6	61	11		2.0		65	60
Feb. 1-10	84,870		5	6.2	206					--		5	68	9		2.0		71	61
Feb. 11-20	91,430		5	6.1	168					--		6	48	10		2.2		58	53
Feb. 21-28	56,225		0	6.3	187					--		4	57	10		2.3		64	61
Mar. 1-10	35,950		0	5.1	266					--		4	92	12		2.2		88	85
Mar. 11-20	68,580		5	6.2	181					--		6	56	9		2.6		52	47
Mar. 21-31	115,382		5	6.2	166					--		7	50	10		2.2		48	42
Apr. 1-10	93,090		5	6.0	125					--		10	33	8		.7		44	36
Apr. 11-20	31,340		5	6.2	194					--		9	58	10		2.6		64	55
Apr. 21-30	51,070		5	6.1	247					--		7	84	12		2.4		82	76

May 1-10	48,870		5	5.9	192				--	10	60	10		1.8		63	55
May 11-20	32,080		5	5.6	227				--	8	74	12		1.8		71	64
May 21-31	30,400		0	5.6	256				--	5	86	12		2.0		81	77
June 1-10	42,830		0	6.3	225				--	9	65	12		2.1		71	64
June 11-20	21,950		0	6.0	239				--	6	75	12		2.3		73	68
June 21-30	27,120		0	5.4	303				--	2	105	10		2.6		94	92
July 1-10	20,180		0	5.8	303				--	2	102	11		2.6		97	95
July 11-20	14,570		0	5.7	385				--	3	132	15		7.0		122	120
July 21-31	19,887		2	6.0	371				--	9	119	20		2.6		112	105
Aug. 1-10	11,343		1	5.8	352				21	6	118	20		4.3		114	109
Aug. 11-20	8,851		1	4.7	427				29	2	156	20		6.3		134	132
Aug. 21-31	7,058		1	4.05	513				32	0	192	21		4.1		160	160
Sept. 1-10	15,769		1	5.1	489				31	2	175	25		2.8		153	151
Sept. 11-20	19,731		1	5.6	393				22	4	138	17		2.8		126	123
Sept. 21-30	23,150		1	6.1	306				16	10	98	14		3.4		97	89
Average	38,640		3	5.8	304				--	6	100	16		2.9		98	89

OHIO RIVER MAIN STEM--Continued

OHIO RIVER AT AMBRIDGE, PA.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	68	58	44	41	43	35	41	53	70	75	80	81
2	68	56	43	41	43	34	41	54	72	74	80	81
3	68	55	43	43	43	33	43	55	71	75	79	80
4	68	53	42	43	42	38	45	56	69	74	78	79
5	69	54	44	44	40	37	46	59	69	74	77	76
6	69	54	43	42	40	37	46	61	69	71	78	75
7	69	53	41	40	40	37	47	61	69	70	77	76
8	71	53	41	43	40	38	46	59	69	72	78	75
9	70	54	41	41	40	36	44	61	70	73	78	75
10	70	54	41	41	41	35	45	61	72	74	78	75
11	71	55	41	41	40	35	45	61	70	74	78	75
12	70	51	42	40	39	36	45	62	72	76	78	76
13	70	51	43	42	40	36	44	62	72	77	77	76
14	69	55	40	42	41	36	43	62	72	75	78	75
15	69	54	--	42	40	37	45	63	73	77	78	74
16	69	53	38	41	39	37	44	63	75	77	79	72
17	68	53	38	40	39	37	45	64	73	78	81	71
18	68	53	38	40	39	38	46	65	72	79	81	70
19	69	52	38	38	39	37	48	64	72	78	78	70
20	65	51	38	37	37	39	49	65	72	78	77	70
21	67	54	39	37	38	39	50	64	74	69	79	70
22	66	49	41	38	38	39	53	64	73	78	79	70
23	64	48	41	38	37	39	53	65	76	77	79	68
24	64	46	41	40	37	41	53	67	77	77	79	67
25	62	45	41	42	36	41	54	68	77	78	79	64
26	62	45	41	42	35	40	52	68	78	77	79	63
27	61	45	42	43	34	42	52	68	75	78	80	68
28	60	45	40	44	36	43	52	68	74	77	80	66
29	60	46	40	46	--	43	54	69	74	77	80	65
30	60	46	41	45	--	42	54	69	73	77	80	66
31	60	--	41	43	--	41	--	68	--	78	81	--
Average	67	51	41	41	39	38	46	63	72	76	79	72

MISCELLANEOUS ANALYSES OF STREAMS IN OHIO RIVER MAIN STEM

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (°F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
ALLEGHENY RIVER AT LOCK 2, AT NADINE, PA.																			
Sept. 18-23, 1950.....	10,600		7	7.5	277	4.8	0.10	25	6.3	16	2.0	36	70	26	0.1	0.8	177	89	60
Sept. 24-29.....	5,980		4	6.8	314	6.7	.12	29	7.8	15	3.4	19	102	18	.2	1.5	199	104	68
OHIO RIVER AT SEWICKLEY, PA.																			
Sept. 18-23, 1950.....	26,000		3	6.7	327	5.9	0.04	30	8.8	19	3.0	16	116	19	0.2	1.2	221	112	99
Sept. 24-29.....	19,400		4	7.4	296	6.8	.08	27	7.3	13	5.2	15	103	12	.2	1.2	194	98	86
OHIO RIVER BELOW MONTGOMERY ALLEN DAM, AT MIDLAND, PA.																			
Sept. 18-23, 1950.....	28,500		3	7.1	378	7.0	0.06	36	9.2	20	3.6	21	136	19	0.3	1.5	256	127	110
Sept. 24-29.....	21,200		3	7.1	298	6.4	.08	29	7.3	13	3.2	18	106	12	.2	1.5	197	102	87
OHIO RIVER AT SHORT CREEK, W. VA.																			
Sept. 18-23, 1950.....	29,800		3	7.4	419	7.1	0.04	38	10	23	3.4	20	154	17	0.3	1.5	274	139	123
Sept. 24-29.....	22,100		3	7.1	311	6.7	.04	30	8.3	14	2.0	24	112	10	.2	2.0	207	110	90
OHIO RIVER AT DAM 13, AT McMECHEN, W. VA.																			
Sept. 18-20, 22-23, 1950.....	32,600		2	7.3	396	6.9	0.05	39	10	21	2.8	25	143	18	0.2	1.8	267	140	120
Sept. 24-29.....	22,300		1	7.1	320	6.6	.04	32	7.5	16	2.8	24	111	12	.3	2.0	214	111	91
OHIO RIVER AT DAM 17, NEAR WAVERLY, W. VA.																			
Sept. 18-23, 1950.....	31,000		3	7.8	435	7.5	0.04	40	9.7	25	3.0	12	158	19	0.2	2.7	287	141	131
Sept. 24-25, 27-29 ...	24,200		4	7.3	373	7.0	.06	36	8.0	20	2.8	22	122	20	.4	3.7	239	122	104
OHIO RIVER AT DAM 18, AT VIENNA, W. VA.																			
Sept. 18-23, 1950.....	34,800		3	7.2	549	6.2	0.05	55	11	35	3.4	41	151	56	0.4	2.0	379	180	146
Sept. 24-29.....	26,900		1	7.3	548	4.7	.04	55	9.2	37	3.2	46	115	75	.3	2.2	354	174	136
OHIO RIVER AT DAM 19, NEAR LUBECK, W. VA.																			
Sept. 18-19, 21-23, 1950	41,400		5	7.5	474	6.9	0.08	45	11	30	3.4	30	147	39	0.3	2.2	314	159	134
Sept. 24-29.....	29,600		3	7.3	479	5.6	.04	46	9.0	30	3.0	38	109	56	.4	2.0	301	152	121

OHIO RIVER MAIN STEM--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN OHIO RIVER MAIN STEM--Continued

Chemical analyses, in parts per million, water year October 1949 to September 1950--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Non-carbonate
OHIO RIVER ABOVE KANAWHA RIVER, NEAR POINT PLEASANT, W. VA.																			
Sept. 18-23, 1950	37,400		3	7.8	519	6.2	0.05	48	10	33	3.4	20	159	39	0.2	2.6	338	163	147
Sept. 24-29	29,900		2	7.1	386	6.7	.04	38	8.5	22	2.8	32	114	28	.3	2.7	251	130	104
OHIO RIVER AT GALLIPOLIS DAM, NEAR HOGSETT, W. VA.																			
Sept. 18-21, 1950	35,200		2	7.3	462	7.2	0.05	41	9.7	30	3.2	28	133	33	0.3	3.5	290	143	120
Sept. 22-29	69,200		3	7.1	277	6.4	.04	26	6.8	13	2.2	30	75	18	.2	2.2	171	92	67
OHIO RIVER AT DAM 27, NEAR PROCTORVILLE, OHIO																			
Sept. 18-21, 1950	34,200		2	7.3	459	7.2	0.06	42	9.2	30	3.8	26	134	36	0.4	5.3	298	144	123
Sept. 22-29	70,900		4	7.2	302	7.5	.06	29	6.3	19	2.5	27	85	20	.4	3.4	184	98	76
OHIO RIVER AT DAM 28, NEAR CHESAPEAKE, OHIO																			
Sept. 18-21, 1950	41,400		3	7.3	442	7.3	0.07	40	9.0	30	3.8	27	127	34	0.4	5.3	283	137	115
Sept. 22-29	84,600		6	7.3	276	6.9	.06	26	6.1	15	2.0	26	76	17	.4	3.2	169	91	70
OHIO RIVER AT DAM 29, AT SHERIDAN, OHIO																			
Sept. 18-20, 1950	37,600		6	7.3	409	7.3	0.04	36	8.9	30	7.0	28	116	30	0.4	5.1	255	126	103
Sept. 21-23	150,000		30	7.3	181	7.6	.25	15	2.9	12	2.4	24	30	22	.3	1.7	114	49	29
Sept. 24-29	70,600		10	7.3	214	9.1	.07	18	5.1	10	3.2	30	56	12	.3	2.3	135	66	41
OHIO RIVER AT DAM 30, NEAR HAVERHILL, OHIO																			
Sept. 18-20, 1950	37,000		6	7.2	443	7.0	0.05	39	9.5	30	3.6	29	124	35	0.4	5.6	302	137	113
Sept. 21-24	172,000		17	7.4	136	6.7	.07	12	3.4	5.6	1.4	21	30	8.0	.4	2.1	86	43	26
Sept. 25-29	59,500		--	8.0	256	--	--	22	5.8	14	2.8	26	69	13	--	--	166	80	59
OHIO RIVER AT DAM 31, NEAR PORTSMOUTH, OHIO																			
Sept. 18-21, 1950	55,200		7	7.4	430	7.1	0.07	40	7.8	27	3.2	32	115	33	0.3	5.7	262	132	106
Sept. 22-24	213,000		18	7.5	193	6.6	.23	17	4.4	12	2.6	30	42	12	.3	4.4	116	61	36
Sept. 25-29	77,800		9	7.2	253	7.9	.09	23	5.6	12	2.2	25	60	12	.2	3.8	153	81	61

OHIO RIVER AT DAM 36, NEAR FORT THOMAS, KY.

Sept. 18-20, 1950.....	40,600		3	7.6	496	6.5	0.05	45	13	30	3.4	50	125	42	0.3	9.8	313	164	123
Sept. 21-29.....	129,000		8	7.8	267	7.0	.20	28	5.6	12	2.6	48	64	16	.2	3.2	169	94	55

OHIO RIVER AT DAM 38, AT BELLVIEW, KY.

Sept. 18-23, 1950.....	94,300		13	7.8	382	6.0	0.08	39	7.8	20	3.2	60	88	26	0.2	3.0	236	130	81
Sept. 24-29.....	179,000		15	7.7	233	7.6	.08	23	8.0	10	3.2	51	50	12	.3	2.0	148	91	49

OHIO RIVER AT DAM 39, NEAR WARSAW, KY.

Sept. 18-23, 1950.....	91,800		15	7.6	376	6.8	0.06	39	9.0	19	3.8	68	83	25	0.4	2.0	230	134	78
Sept. 24-29.....	184,000		15	7.6	246	8.9	.06	26	6.3	10	3.4	57	55	12	.5	2.0	157	92	45

OHIO RIVER AT MADISON, IND.

Sept. 18-23, 1950.....	98,500		7	7.7	383	6.5	0.06	43	9.7	18	2.8	97	81	26	0.2	4.8	260	147	68
Sept. 24-28.....	187,000		17	7.8	232	7.0	.26	27	4.9	7.2	3.0	72	31	10	.4	.6	145	88	29

OHIO RIVER AT LOUISVILLE, KY.

Sept. 18-23, 1950.....	98,000		7	7.8	380	5.0	0.04	38	9.2	19	3.4	65	88	25	0.3	2.9	232	132	79
Sept. 24-29.....	192,000		18	7.8	257	6.7	.20	28	6.3	10	2.8	60	44	14	.4	3.1	149	95	46

OHIO RIVER AT DAM 43, NEAR WEST POINT, KY.

Sept. 18-23, 1950.....	87,700		7	7.8	397	4.8	0.04	40	9.0	20	3.2	66	91	28	0.2	3.0	245	138	82
Sept. 24-29.....	202,000		15	7.7	256	6.6	.30	30	4.4	9.2	3.0	60	50	12	.3	1.6	158	94	45

OHIO RIVER AT DAM 47, AT NEWBURG, IND.

Sept. 18-23, 1950.....	80,500		5	7.7	362	5.0	0.05	39	8.8	17	3.2	82	67	26	0.2	2.6	228	134	67
Sept. 24-29.....	218,000		12	7.6	313	6.6	.06	33	7.8	14	3.0	67	62	18	.4	2.0	190	115	60

OHIO RIVER AT DAM 48, NEAR RAHM, IND.

Sept. 18-23, 1950.....	83,300		5	7.8	339	6.0	0.03	37	7.8	14	3.6	82	60	21	0.3	2.9	211	125	58
Sept. 24-29.....	215,000		10	7.7	319	6.8	.04	36	6.8	14	3.2	76	63	20	.4	2.0	196	118	56

OHIO RIVER MAIN STEM--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN OHIO RIVER MAIN STEM--Continued

Chemical analyses, in parts per million, water year October 1949 to September 1950--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
OHIO RIVER AT DAM 49, NEAR MOUNT VERNON, IND.																			
Sept. 18-23, 1950	83,300		3	7.8	329	6.5	0.03	37	7.8	14	3.4	83	59	22	0.3	2.6	204	124	56
Sept. 24-29	210,000		8	7.7	327	6.7	.05	36	8.0	14	3.2	76	64	18	.4	2.0	199	122	60
OHIO RIVER NEAR SHAWNEETOWN, ILL.																			
Sept. 18-23, 1950	96,700		4	7.9	354	5.8	0.04	40	9.2	12	2.6	107	58	20	0.3	2.0	215	139	51
Sept. 24-29	248,000		8	7.7	327	6.6	.05	37	8.8	12	2.6	93	57	17	.4	2.0	199	129	53
OHIO RIVER AT DAM 51, AT GOLCONDA, ILL.																			
Sept. 18-23, 1950	96,800		5	7.9	346	5.6	0.04	39	10	12	1.8	95	61	21	0.3	2.0	211	140	62
Sept. 24-29	232,000		8	7.7	344	6.1	.05	40	9.0	13	3.0	93	59	19	.3	2.0	190	136	60
OHIO RIVER AT DAM 52, AT BROOKPORT, ILL.																			
Sept. 18-23, 1950	178,000		6	7.8	333	6.0	0.04	38	9.2	11	2.4	93	62	20	0.2	2.0	205	132	56
Sept. 24-29	299,000		8	7.8	358	6.1	.06	40	9.5	14	2.8	95	67	20	.4	2.0	216	140	62
OHIO RIVER AT DAM 53, NEAR OLMSTEAD, ILL.																			
Sept. 18-23, 1950	182,000		7	7.9	305	5.8	0.04	36	7.8	10	2.0	88	51	17	0.4	2.0	190	121	49
Sept. 24-29	285,000		8	7.8	349	6.1	.06	41	9.0	15	3.2	96	65	19	.4	2.0	214	139	60

CLARION RIVER NEAR PINEY, PA.

LOCATION.--At hydroelectric plant of Pennsylvania Electric Co. 2½ miles from Piney, Clarion County, and a quarter of a mile upstream from gaging station.
DRAINAGE AREA.--951 square miles (above gaging station).
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1950.
Water temperatures: October 1949 to September 1950.
EXTREMES, 1949-50.--Specific conductance: Maximum, 668 micromhos Nov. 21-30; minimum, 94.6 micromhos Apr. 1-10.
Hardness: Maximum, 220 ppm Nov. 21-30; minimum, 32 ppm Apr. 1-10.
EXTREMES, 1946-50.--Dissolved solids (1946-47): Maximum, 317 ppm Sept. 11-20, 1947; minimum, 59 ppm Apr. 1-10, 1947.
Hardness (1946-47) (1949-50): Maximum, 220 ppm Nov. 21-30, 1949; minimum, 28 ppm Apr. 1-10, 1947.
Specific conductance : Maximum, 668 micromhos Nov. 21-30, 1950; minimum, 94.6 micromhos Apr. 1-10, 1950.
REMARKS.--Samples collected by Pennsylvania Electric Co. Records of specific conductance of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
Oct. 1-10, 1949	50		120	6.9	536					41		54	96	74		0.6		159	115
Oct. 11-20	32		120	6.9	555					46		56	96	79		.4		158	112
Oct. 21-31	39		120	6.7	513					40		50	92	70		.8		150	109
Nov. 1-10	40		120	6.5	528					47		58	97	78		1.8		158	110
Nov. 11-20	47		120	6.8	642					53		74	109	94		1.9		192	130
Nov. 21-30	161		13	6.9	668					44		76	112	96		2.1		220	158
Dec. 1-10	356		110	6.9	632					50		72	107	94		2.1		196	107
Dec. 11-14	2,207		110	7.1	571					--		71	96	82		1.4		174	116
Dec. 15-20	1,620		35	7.0	284					--		32	55	32		1.1		92	66
Dec. 21-31	1,974		30	6.7	197					--		22	42	20		.8		62	44
Jan. 1-10, 1950	5,774		30	6.6	147					--		18	37	12		1.0		48	33
Jan. 11-20	5,605		10	5.8	119					--		4	34	6		.9		36	33
Jan. 21-31	3,467		20	6.7	128					--		3	37	9		.8		45	43
Feb. 1-10	1,874		25	6.4	139					--		11	40	12		.8		47	38
Feb. 11-20	5,577		15	5.6	126					--		4	37	7		.6		41	33
Feb. 21-28	3,573		10	5.5	119					--		3	35	7		.6		39	37
Mar. 1-10	2,021		7	6.0	132					--		5	36	10		.6		42	38
Mar. 11-20	2,632		20	5.6	141					--		6	36	10		.4		45	40
Mar. 21-31	7,126		20	5.5	120					--		4	32	10		.3		39	36
Apr. 1-10	6,577		15	5.7	94.6					--		2	26	5		.7		32	30
Apr. 11-20	1,702		20	6.1	122					--		5	32	8		.5		39	35
Apr. 21-30	2,226		20	6.3	166					--		8	43	13		.3		53	46
May 1-10	3,119		20	6.3	119					--		6	30	10		.4		39	34
May 11-20	2,343		15	6.3	134					--		8	34	12		.2		43	36
May 21-31	1,557		25	6.8	142					--		11	30	12		.4		43	34

ALLEGHENY RIVER TRIBUTARIES--Continued

CLARION RIVER NEAR PINEY, PA.--Continued

Chemical analyses, in parts per million, water year October 1949 to September 1950--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
June 1-10, 1950	1,825		25	6.5	170					--		11	38	14		0.6		52	43
June 11-20	1,345		25	6.4	161					--		10	37	11		.6		48	40
June 21-30	610		30	6.4	177					--		11	44	14		.7		55	46
July 1-10	605		40	6.3	220					--		12	53	19		.7		67	57
July 11-20	538		60	6.4	298					--		24	66	29		1.0		91	71
July 21-31	1,163		50	6.4	286					--		22	60	27		.9		88	70
Aug. 1-10	1,014		30	6.3	195					--		12	45	16		.6		62	52
Aug. 11-20	580		20	6.1	161					--		10	39	12		.8		52	44
Aug. 21-31	461		5	6.1	191					--		7	51	15		.6		58	46
Sept. 1-10	985		35	6.4	264					--		16	63	26		.4		81	68
Sept. 11-20	919		35	6.5	231					--		17	55	22		.7		72	58
Sept. 21-30	530		35	6.5	231					--		19	48	24		.5		68	52
Average	1,950		42	6.4	259					--		23	55	29		0.8		79	61

ALLEGHENY RIVER TRIBUTARIES--Continued

CLARION RIVER NEAR PINEY, PA.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	64	--	--	38	40	34	--	50	--	70	71	73
2	66	58	50	40	40	34	--	--	--	65	69	74
3	66	61	49	36	38	34	--	--	--	72	70	74
4	63	58	48	38	--	--	41	--	--	68	69	72
5	64	56	44	36	--	--	--	--	--	68	70	72
6	64	54	43	38	--	--	--	--	--	68	70	70
7	64	54	42	--	38	--	--	--	--	68	69	70
8	62	--	43	--	--	--	43	59	--	68	69	70
9	64	56	--	--	--	--	--	60	--	70	69	66
10	63	54	--	38	--	--	43	59	68	68	68	68
11	64	58	--	--	39	38	42	58	68	68	69	68
12	62	--	--	--	39	35	42	57	68	68	--	70
13	60	--	--	--	38	38	42	58	--	72	--	70
14	66	--	--	39	36	34	44	57	69	70	--	66
15	--	56	--	38	38	38	44	57	67	70	--	68
16	--	--	--	40	38	38	48	58	66	--	--	--
17	--	--	35	40	38	38	42	58	66	68	--	--
18	62	--	37	39	38	38	44	59	60	72	--	--
19	--	55	35	39	40	37	44	60	64	68	--	65
20	--	52	38	37	38	37	43	60	69	69	--	--
21	--	50	33	40	38	36	42	58	74	68	--	--
22	58	50	34	40	38	36	42	56	64	--	--	--
23	60	50	32	36	36	36	46	58	67	--	--	64
24	60	50	38	34	34	36	44	60	--	--	--	64
25	60	51	38	36	34	40	48	62	--	--	--	63
26	60	54	44	38	36	--	46	--	--	--	69	62
27	59	56	38	44	35	38	46	--	--	--	68	61
28	58	52	40	46	36	38	--	--	--	--	71	62
29	59	51	36	46	--	42	--	--	--	--	72	60
30	63	50	40	42	--	40	--	64	--	--	69	62
31	62	--	36	44	--	38	--	--	--	68	69	--
Average	--	--	--	--	--	--	--	--	--	--	--	--

ALLEGHENY RIVER TRIBUTARIES--Continued

KISKIMINETAS RIVER AT LEECHBURG, PA.

LOCATION.--At raw-water intake of West Leechburg plant of Allegheny-Ludlum Steel Corp., 0.2 mile below Brady Run, Armstrong County.
DRAINAGE AREA.--1,860 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1950.
Water temperatures: October 1946 to September 1950.
EXTREMES, 1949-50.--Specific conductance: Maximum, 1,910 micromhos Oct. 11-20; minimum, 275 micromhos Dec. 14-18.
Hardness: Maximum, 393 ppm Oct. 11-20; minimum, 96 ppm Jan. 1-10.
Water temperatures: Maximum, 90°F July 25; minimum, freezing point Dec. 24.
EXTREMES, 1946-50.--Dissolved solids (1946-47): Maximum, 786 ppm Oct. 1-10, 1946; minimum, 183 ppm Jan. 1-10, 1947.
Hardness (1946-47) (1949-50): Maximum, 514 ppm Oct. 1-10, 1946; minimum, 76 ppm Dec. 14-18, 1950.
Specific conductance: Maximum, 2,200 micromhos Oct. 1-10, 1948; minimum, 178 micromhos July 22, 23, 1950.
Water temperatures: Maximum 90°F July 25, 1950; minimum, freezing point on many days during winter months.
REMARKS.--Chemical quality fluctuates rapidly due to presence of industrial wastes. Samples collected by Allegheny-Ludlum Steel Corp. Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1949 to September 1950 based on records for Kiskiminetas River at Vandergrift, which are given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (°F)	Color	pH	Specific conductance (micromhos at 25° C)	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	Hardness as $CaCO_3$		Total acidity as H_2SO_4
																				Total	Noncarbonate	
Oct. 1-10, 1949	404		5	2.80	1,790	21	15	12	6.8	97	27	56	2.3	0	626	12	12	22	949	353	353	252
Oct. 11-20	431		5	2.70	1,910	23	15	12	6.0	100	35	56	1.3	0	692	14	8.0	21	984	393	393	286
Oct. 21-31	380		5	2.75	1,780	21	16	22	4.6	84	26	62	1.1	0	613	14	14	22	927	317	317	298
Nov. 1-14	810		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nov. 15-20	850		5	2.70	1,700	--	--	--	--	--	--	--	--	0	560	14	22	11	--	224	224	380
Nov. 21-29	879		10	2.85	1,410	--	--	--	--	--	--	--	--	0	445	14	11	11	--	224	224	209
Nov. 30	4,270		--	3.60	613	--	--	--	--	--	--	--	--	0	226	7	--	4.7	--	176	176	68
Dec. 1-3	2,833		10	3.50	503	--	--	--	--	--	--	--	--	0	158	6	3.0	8.8	--	116	116	61
Dec. 4-10	1,450		10	3.00	863	--	--	--	--	--	--	--	--	0	240	8	10	10	--	144	144	124
Dec. 11-13, 19-20	5,640		5	3.30	534	--	--	--	--	--	--	--	--	0	192	7	3.0	9.2	--	128	128	82
Dec. 14-18	6,724		5	3.90	275	--	--	--	--	--	--	--	--	0	92	4	1.0	5.0	--	76	76	29
Dec. 21-27, 31	3,528		4	3.30	582	--	--	--	--	--	--	--	--	0	170	6	3.0	8.6	--	116	116	70
Dec. 28-30	6,740		4	3.90	296	--	--	--	--	--	--	--	--	0	102	4	1.0	5.0	--	84	84	29
Jan. 1-10, 1950	9,432		10	3.50	385	--	--	--	--	--	--	--	--	0	117	4	.5	6.6	--	96	96	48
Jan. 11-20	6,594		10	3.40	464	--	--	--	--	--	--	--	--	0	154	2	.8	7.2	--	112	112	62
Jan. 21-31	3,964		10	3.20	663	--	--	--	--	--	--	--	--	0	200	7	3.2	12	--	146	146	97
Feb. 1-10	7,502		5	3.65	366	--	--	--	--	--	--	--	--	0	123	1	.2	4.5	--	98	98	46
Feb. 11-20	8,208		5	3.65	370	--	--	--	--	--	--	--	--	0	125	3.0	.2	4.6	--	100	100	48
Feb. 21-28	5,200		5	3.30	520	--	--	--	--	--	--	--	--	0	165	4.0	--	11	--	116	116	67
Mar. 1-13	3,128		5	3.00	810	--	--	--	--	--	--	--	--	0	233	4.0	--	6.6	--	152	152	87
Mar. 14-20	6,420		5	3.50	399	--	--	--	--	--	--	--	--	0	128	4.0	--	3.9	--	94	94	55
Mar. 21-31	11,001		5	3.80	302	--	--	--	--	--	--	--	--	0	99	4.0	--	3.0	--	86	86	37

Apr. 1-10	5,081		5	3.30	514	--	--	--	--	--	--	--	--	0	164	4.0	--	5.4	--	116	116	64
Apr. 11-20	2,300		5	3.00	1,090	--	--	--	--	--	--	--	--	0	297	7.0	--	32	--	160	160	169
Apr. 21-30	4,042		5	3.10	766	--	--	--	--	--	--	--	--	0	214	6.0	--	18	--	132	132	106
May 1-10	3,033		5	3.15	741	--	--	--	--	--	--	--	--	0	213	6.5	--	17	--	127	127	109
May 11-20	2,214		5	3.00	1,020	--	--	--	--	--	--	--	--	0	288	8.0	--	32	--	157	157	170
May 21-31	3,866		5	3.20	665	--	--	--	--	--	--	--	--	0	195	5.0	--	32	--	111	111	96
June 1-10	4,215		5	3.25	614	--	--	--	--	--	--	--	--	0	165	4.0	--	13	--	113	113	77
June 11-20	1,558		10	2.95	1,170	--	--	--	--	--	--	--	--	0	310	7.0	--	42	--	179	179	178
June 21-30	1,639		10	2.95	1,190	--	--	--	--	--	--	--	--	0	328	7.0	--	7.5	--	187	187	185
July 1-10	3,218		10	3.05	1,010	--	--	--	--	--	--	--	--	0	280	7.0	--	45	--	146	146	185
July 11-20	2,292		10	2.75	1,480	--	--	--	--	--	--	--	--	0	340	6.0	--	70	--	148	148	297
July 21, 24-31	1,051		0	2.70	1,360	--	--	--	--	--	--	--	--	0	400	11	24	67	--	238	238	286
July 22, 23	1,050		2	6.6	178	--	--	--	--	--	--	--	--	14	53	5.0	.5	3.2	--	63	52	--
Aug. 1-10	754		0	2.70	1,640	--	--	--	--	--	--	--	--	0	542	11	27	68	--	290	290	310
Aug. 11-20	898		0	2.70	1,620	--	--	--	--	--	--	--	--	0	472	13	28	63	--	286	286	334
Aug. 21-31, Sept. 1-2	894		0	2.80	1,340	--	--	--	--	--	--	--	--	--	360	13	19	37	--	246	246	216
Sept. 3-7	1,946		0	3.05	860	--	--	--	--	--	--	--	--	--	274	7.0	8.6	15	--	169	169	114
Sept. 8-14, 16-20	1,749		0	2.80	1,140	--	--	--	--	--	--	--	--	0	306	8.0	21	43	--	179	179	199
Sept. 15	5,110		--	4.10	371	--	--	--	--	--	--	--	--	--	135	6.0	9.6	5.4	--	121	121	36
Sept. 21-30	1,632		0	2.80	1,070	--	--	--	--	--	--	--	--	--	302	8.0	16	42	--	139	139	177
Average	3,322		5	3.35	912	--	--	--	--	--	--	--	--	--	280	7.0	--	21	--	166	166	144

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ALLEGHENY RIVER TRIBUTARIES--Continued

KISKIMINETAS RIVER AT LEECHBURG, PA.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	65	--	43	--	41	35	45	63	72	73	88	80
2	65	--	41	--	41	33	46	64	70	76	84	83
3	67	--	45	46	40	34	48	60	70	--	83	85
4	61	--	--	48	--	--	50	73	60	--	84	81
5	60	--	46	46	--	--	54	76	70	80	81	70
6	63	--	42	48	39	45	50	76	68	74	77	70
7	65	--	40	50	41	42	50	77	70	74	83	68
8	--	--	39	45	40	44	50	70	74	75	83	--
9	--	--	37	45	40	42	50	75	78	80	82	75
10	75	--	40	--	41	38	48	76	81	79	83	--
11	72	--	43	46	43	36	50	77	78	80	78	72
12	74	--	43	45	45	38	51	77	76	78	--	77
13	69	--	41	40	43	40	48	80	77	80	--	75
14	60	--	40	43	41	40	45	75	79	80	77	75
15	62	43	39	50	42	39	47	76	80	75	78	75
16	62	54	38	42	40	39	48	72	83	80	83	67
17	60	48	--	40	42	40	51	76	78	80	82	66
18	59	47	--	41	41	46	55	71	--	82	82	68
19	58	45	40	39	36	42	59	68	76	80	79	70
20	57	48	40	37	--	40	60	66	78	82	77	76
21	58	43	43	37	--	--	58	63	--	79	--	70
22	65	43	47	42	39	40	57	66	81	78	74	68
23	65	41	45	45	40	40	--	68	82	79	74	--
24	59	40	30	40	39	40	58	--	--	80	75	--
25	54	40	--	49	45	40	60	70	75	90	77	60
26	55	47	--	52	--	41	62	72	80	83	79	60
27	53	40	43	48	34	40	62	--	72	82	80	60
28	52	43	43	43	35	45	63	65	75	85	80	59
29	60	--	46	44	--	45	65	70	78	81	80	60
30	57	45	40	44	--	41	60	--	75	--	--	70
31	51	--	--	49	--	43	--	72	--	85	80	--
Average	61	--	--	43	40	40	53	71	75	80	80	71

MONONGAHELA RIVER AT CHARLEROI, PA.

LOCATION.--At Mercantile Bridge Co. toll bridge, approximately 1¼ miles downstream from gaging station at Charleroi, Washington County, and 1 mile downstream from lock 4.
DRAINAGE AREA.--5,213 square miles (above gaging station).
RECORDS AVAILABLE.--Chemical analyses: October 1944 to September 1950.
Water temperatures: October 1944 to September 1950
EXTREMES, 1949-50.--Specific conductance: Maximum, 687 micromhos; Aug. 21, 23-31; minimum, 149 micromhos Dec. 1-10.
Hardness: Maximum, 153 ppm Oct. 11-20; minimum, 44 ppm Dec. 1-10.
Water temperatures: Maximum, 78°F Aug. 30 to Sept. 3; minimum, 33°F Mar. 6.
EXTREMES, 1944-50.--Dissolved solids (1944-47): Maximum, 749 ppm Sept. 11-20, 1946; minimum, 99 ppm Feb. 11-20, 1946.
Hardness (1944-50): Maximum, 399 ppm Sept. 11-20, 1946; minimum, 44 ppm Dec. 1-10, 1949.
Specific conductance: Maximum, 1,210 micromhos Sept. 11-20, 1946; minimum, 149 micromhos Dec. 1-10, 1949.
Water temperatures: Maximum, 86°F Sept. 1, 1948; minimum, freezing point on many days during winter months.
REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Discharge records for gaging station at Charleroi for water year October 1949 to September 1950 given in Water-Supply Paper 1173. No appreciable inflow between gaging station and sampling point except during periods of heavy local rains.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (°F)	Color	pH	Specific conductance (micromhos at 25° C)	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	Hardness as $CaCO_3$		Total acidity as H_2SO_4
																				Total	Noncarbonate	
Oct. 1-10, 1949	1,225		5	3.70	586									0	228	12		1.8		141	141	32
Oct. 11-20	2,435		5	3.65	649									0	258	12		1.1		153	153	43
Oct. 21-31	2,026		5	3.70	580									0	223	12		1.2		139	139	35
Nov. 1	9,380		10	3.75	575									0	219	10		--		--	--	--
Nov. 2-6	11,124		5	4.00	273									0	93	6		1.8		66	66	16
Nov. 7-10	5,965		5	5.0	175									1	58	2		1.6		47	46	--
Nov. 11-13	3,503		5	4.6	183									1	62	5		1.8		52	51	--
Nov. 14-20	4,303		5	4.25	230									0	78	4		1.8		62	62	8
Nov. 21, 22, 30	12,103		2	4.15	207									0	66	5		1.8		53	53	11
Nov. 23-29	5,094		1	3.65	321									0	118	6		1.9		88	88	15
Dec. 1-10	10,690		1	5.2	149									4	52	3		2.6		44	41	--
Dec. 11-20	18,278		2	4.9	174									4	61	4		2.4		56	53	--
Dec. 21-31	17,318		1	4.8	177									4	62	4		1.6		57	54	--
Jan. 1-10, 1950	24,395		1	4.6	203									2	76	4		2.3		66	64	--
Jan. 11-20	19,370		1	4.00	259									0	93	4		2.2		70	70	22
Jan. 21-31	17,615		15	4.10	281									0	77	4		1.8		81	81	29
Feb. 1-10	42,400		0	4.05	224									0	76	1		2.7		76	76	35
Feb. 11-20	20,910		5	4.05	251									0	89	2		2.3		90	90	30
Feb. 21-28	11,088		0	3.85	300									0	109	3		1.9		102	102	42

MONONGAHELA RIVER BASIN--Continued

MONONGAHELA RIVER AT CHARLEROI, PA.--Continued

Chemical analyses, in parts per million, water year October 1949 to September 1950--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	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	Hardness as $CaCO_3$		Total acidity as H_2SO_4
																				Total	Noncarbonate	
Mar. 1-10, 1950.	8,880		5	3.65	376									0	133	3		1.6		127	127	43
Mar. 11-20	22,300		5	4.15	219									0	77	5		3.2		67	67	19
Mar. 21-31	30,100		5	4.30	204									0	68	2		3.3		61	61	14
Apr. 1-10	10,089		5	4.00	270									0	95	3		3.5		75	75	25
Apr. 11-20	4,142		5	3.80	441									0	165	6		3.3		120	120	32
Apr. 21-26	13,847		0	3.70	441									0	158	6		3.1		102	102	44
Apr. 27-30	14,850		0	4.35	230									0	86	5		1.8		76	76	13
May 1-10	15,045		0	4.45	203									0	72	5		1.7		59	59	16
May 11-20.....	8,525		0	4.05	285									0	100	4		2.0		67	67	26
May 21-31	8,473		5	4.10	295									0	108	3		2.2		78	78	21
June 1-5	15,588		0	4.15	271									0	97	3		2.0		70	70	20
June 6-10	14,782		5	4.6	180									4	63	2		1.6		52	49	--
June 11-20	6,735		0	4.10	280									0	101	2		1.8		74	74	23
June 21-26	12,550		0	4.10	325									0	126	3		1.8		85	85	25
June 27-30	22,225		5	4.8	166									2	55	2		2.1		48	46	--
July 1-10	4,164		5	5.9	213									3	76	4		2.1		65	63	--
July 11-20	4,782		5	4.20	386									0	154	5		2.3		110	110	34
July 21-31	7,239		5	4.00	325									0	112	4		2.0		89	89	24
Aug. 1-10	2,105		5	4.25	351									0	134	5		1.0		92	92	22
Aug. 11-20	2,606		1	3.60	511									0	213	6		.8		128	128	61
Aug. 21, 23-31 ..	1,446		1	3.95	687									0	305	6		.8		196	196	56
Aug. 22	1,800		1	4.15	362									0	141	6		1.9		99	99	19
Sept. 1-7	5,234		1	3.75	554									0	218	8		.9		144	144	47
Sept. 8	4,070		1	4.00	285									0	110	3		.7		76	76	25
Sept. 10-11, 13 .	4,552		1	3.80	578									0	238	7		.8		159	159	48
Sept. 14, 16-20..	5,551		1	5.0	252									2	100	3		.9		84	82	--
Sept. 21-30	10,834		1	6.2	276									8	104	4		1.3		95	88	--
Average	11,490		3	4.24	314									--	120	4		1.8		87	87	--

MONONGAHELA RIVER BASIN--Continued

MONONGAHELA RIVER AT CHARLEROI, PA.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	63	56	--	44	43	37	47	56	69	71	77	78
2	--	56	41	44	44	36	47	57	69	72	77	78
3	64	54	41	45	44	35	48	58	68	73	77	77
4	64	54	40	44	43	35	50	59	67	73	76	--
5	61	52	40	44	43	37	50	62	67	73	--	75
6	64	51	40	43	44	33	50	--	67	73	75	73
7	66	52	40	43	43	37	49	60	--	72	75	--
8	66	51	40	43	44	37	--	60	69	73	76	72
9	66	52	40	41	44	36	47	61	70	74	75	--
10	66	51	40	41	43	36	48	62	70	72	76	74
11	65	51	40	41	43	36	48	62	70	73	75	75
12	67	52	42	41	43	37	48	61	70	73	73	--
13	66	51	41	41	43	36	47	60	70	--	74	74
14	65	51	40	44	--	37	47	66	--	--	75	74
15	65	50	40	45	44	39	47	63	69	74	75	--
16	65	49	40	45	40	40	47	64	70	--	75	73
17	63	48	39	45	43	40	48	64	70	76	76	70
18	63	48	40	44	43	39	49	64	71	76	76	70
19	63	47	40	44	42	41	50	63	71	76	75	70
20	63	46	41	45	41	41	50	--	72	75	75	75
21	63	46	40	41	41	42	50	64	72	74	75	69
22	63	45	42	--	41	41	51	64	72	75	75	67
23	61	44	42	42	41	41	52	64	73	74	75	67
24	60	44	40	43	40	42	52	66	74	74	75	64
25	60	42	40	44	40	41	53	66	74	75	76	62
26	59	43	40	45	38	42	55	66	73	--	77	63
27	57	42	40	43	37	44	55	67	73	75	76	62
28	57	42	41	44	37	46	56	66	73	75	77	63
29	57	44	40	44	--	45	57	66	72	75	77	63
30	57	44	40	45	--	47	57	68	72	76	78	63
31	57	--	42	44	--	--	--	66	--	76	78	--
Average	63	49	40	43	42	39	50	63	71	74	76	70

MONONGAHELA RIVER BASIN--Continued

YOUGHIOGHENY RIVER AT SUTERSVILLE, PA.

LOCATION.--At highway bridge, approximately 2 miles downstream from Sewickley Creek, Westmoreland County, and 500 feet downstream from gaging station at Sutersville.
DRAINAGE AREA.--1,715 square miles (above gaging station).
RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1950.
EXTREMES, 1949-50.--Specific conductance: Maximum, 325 micromhos Aug. 23-25; minimum, 113 micromhos Feb. 1-10.
Hardness: Maximum, 74 ppm Sept. 1-10, 11-20; minimum, 40 ppm Feb. 1-10.
Water temperatures: Maximum, 75°F Aug. 28; minimum, freezing point Mar. 3.
EXTREMES, 1947-50.--Dissolved solids (1947-48): Maximum, 563 ppm Oct. 11-20, 1947; minimum, 68 ppm May 4-10, 1948.
Hardness (1947-50): Maximum, 302 ppm Oct. 1-10, 1947; minimum, 38 ppm May 4-10, 1948.
Specific conductance: Maximum, 1,060 micromhos Oct. 11-20, 1947; minimum, 108 micromhos May 4-10, 1948.
Water temperatures: Maximum, 84°F July 16, 1948; minimum, freezing point on many days during winter months.
REMARKS.--Samples collected from point about 75 feet from left bank. Some differences in quality in cross section owing to influence at Sewickley Creek. Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (°F)	Color	pH	Specific conductance (micromhos at 25°C)	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	Hardness as $CaCO_3$		Total acidity as H_2SO_4
																				Total	Noncarbonate	
Oct. 1-10, 1949	1,169		3	4.00	218							--		0	76	3		0.6		56	56	9
Oct. 11-20	1,093		3	4.10	247							--		0	85	3		1.1		66	66	15
Oct. 21, 22, 24-29	1,144		3	4.10	237							--		0	82	2		1.1		62	62	23
Oct. 23, 30, 31, Nov. 3, 7, 8, 10, 14	1,434		5	4.9	177							--		2	68	4		1.2		54	52	--
Nov. 1, 2, 4-6, 9	1,895		5	4.5	198							--		1	74	3		1.4		59	58	--
Nov. 12, 13, 15-20, 24, 26	1,641		2	4.30	225							--		0	82	1		1.0		63	63	13
Nov. 21-23, 25, 27-30	2,468		5	5.5	161							--		3	57	4		1.4		50	48	--
Dec. 1-10	2,430		5	5.4	154							--		4	54	2		1.9		48	45	--
Dec. 11-20	4,612		5	6.0	172							--		8	48	10		2.0		58	51	--
Dec. 21-31	4,298		5	6.2	138							--		5	46	3		1.8		47	43	--
Jan. 1-10, 1950.	7,451		1	6.1	138							--		11	47	3		3.5		50	41	--
Jan. 11-20	4,797		2	5.9	136							--		4	48	2		3.2		46	43	--
Jan. 21-31	4,474		5	6.1	150							--		4	52	2		1.6		51	43	--
Feb. 1-10	10,139		5	6.0	113							--		4	38	2		1.3		40	37	--
Feb. 11-20	6,429		5	5.3	139							--		2	48	2		1.6		42	40	--
Feb. 21-28	5,044		5	4.9	149							--		1	52	1		1.4		48	47	--
Mar. 1-10	3,012		5	4.5	160							--		0	54	2		1.1		48	48	12
Mar. 11-20	6,668		5	5.0	118							--		2	41	1		3.2		41	39	--
Mar. 21-31	8,735		5	5.4	121							--		4	40	1		3.4		46	43	--

Apr. 1-10	3,835		5	4.8	171						--	1	60	2		3.4		61	60	--
Apr. 11-14, 17-24	1,849		--	4.20	273						--	0	99	2		2.8		74	74	17
Apr. 15-16	1,640		--	5.5	115						--	4	38	1		3.7		42	39	--
Apr. 25-28	8,060		--	5.5	5.5						--	4	39	2		3.4		42	39	--
Apr. 29, 30	4,110		5	4.00	226						--	0	82	4		2.8		66	66	19
May 1-10	4,122		2	4.6	144						--	4	51	3		2.0		41	38	--
May 11-20	2,780		3	4.20	191						--	0	73	2		3.1		54	54	12
May 21	2,340		--	3.65	273						--	0	101	3		4.1		75	75	21
May 22-31	2,858		1	4.35	168						--	0	61	2		3.1		52	52	8
June 1-10	3,955		2	4.9	144						--	4	52	3		1.9		46	43	--
June 11, 15, 16, 19, 20	2,054		2	4.30	219						--	0	78	2		2.2		65	65	11
June 12, 13, 14, 17, 18	2,100		5	4.9	141						--	2	51	1		2.0		46	44	--
June 21-23, 27-30	1,854		5	4.35	202						--	0	72	2		2.1		60	60	7
June 24-26	2,740		10	5.8	120						--	4	40	2		2.5		40	37	--
July 1	1,900		--	4.6	129						--	1	48	1		1.7		44	43	--
July 2-10	1,957		5	4.45	216						--	0	78	1		2.4		65	65	7
July 11-20	1,948		5	4.8	223						--	2	80	3		2.3		69	67	--
July 21-31	1,432		5	4.45	238						--	0	85	2		2.0		69	69	10
Aug. 1-10	1,529		1	4.25	231						11	0	83	1		1.6		63	63	10
Aug. 11-20	1,355		1	4.20	228						11	0	83	1		1.4		63	63	11
Aug. 21, 22, 26-31	1,095		1	4.25	241						11	0	87	1		1.5		67	67	19
Aug. 23-25	1,033		1	3.90	325						19	0	117	2		1.4		79	79	24
Sept. 1-10	1,124		0	4.25	272						--	0	102	3		1.7		74	74	8
Sept. 11-20	1,422		0	4.05	289						--	0	107	4		1.7		74	74	12
Sept. 21, 23, 24, 26-30	3,124		0	4.30	254						--	0	93	4		2.3		69	69	9
Sept. 22, 25 ...	6,945		--	6.2	160						--	8	53	2		2.2		53	46	--
Average	3,359		4	4.8	188						--	2	67	2		2.1		56	54	12

MONONGAHELA RIVER BASIN--Continued

YOUGHIOGHENY RIVER AT SUTERSVILLE, PA.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	60	50	41	41	42	36	42	53	65	69	73	74
2	60	48	41	--	42	34	42	50	63	68	74	72
3	60	48	40	45	40	32	45	54	68	66	71	71
4	62	46	--	49	40	34	45	56	57	70	67	--
5	65	45	35	49	39	35	52	58	58	72	66	65
6	65	43	33	47	39	38	46	59	58	65	65	62
7	65	43	36	45	42	38	41	58	59	65	65	63
8	65	44	32	35	39	40	41	56	60	63	67	65
9	--	41	34	34	42	36	--	51	61	67	67	67
10	67	46	36	41	41	34	43	54	59	67	67	68
11	68	48	38	44	41	39	47	54	58	65	68	70
12	67	50	41	41	41	40	45	54	57	64	67	71
13	62	52	44	42	41	40	41	53	61	70	67	70
14	60	51	41	41	43	38	37	55	64	67	65	68
15	60	47	36	42	43	38	38	55	65	68	67	66
16	59	45	33	41	41	38	39	56	68	70	69	64
17	59	43	34	38	39	37	42	60	65	71	71	64
18	56	42	36	44	37	38	43	60	60	73	73	62
19	55	41	39	33	37	37	50	59	61	70	70	65
20	50	41	41	33	36	36	51	57	62	70	68	66
21	50	42	42	37	35	39	--	56	65	70	64	67
22	51	38	39	39	39	41	--	57	66	71	65	63
23	50	36	44	39	39	40	--	61	68	70	68	62
24	50	38	42	44	37	38	--	60	68	70	69	57
25	52	40	--	46	36	39	52	64	--	69	71	53
26	52	39	--	50	35	39	51	65	66	69	73	58
27	48	--	41	44	35	41	51	64	70	66	73	54
28	48	36	42	44	33	49	51	60	67	69	75	56
29	52	42	39	44	--	45	51	59	67	70	71	58
30	55	42	38	44	--	40	51	--	69	70	74	--
31	56	--	38	43	--	40	--	65	--	72	72	--
Average	58	44	38	42	39	37	45	57	63	69	69	64

YOUGHIOGHENY RIVER BASIN STUDY IN PENNSYLVANIA

Analyses of water samples collected during period of low flow, August 1950

Date of collection	Discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Aluminum (Al)	Iron (Fe)	Manganese (Ma)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$		Total acidity as H_2SO_4
																				Total	Noncarbonate	
SEWICKLEY CREEK NEAR YOUNGWOOD																						
Aug. 11, 1950....	29.8	63	3	2.85	2,590	20	24	4.6	6.0	199	81	40		0	1,210	9	0.1	0.5	1,780	1,070	1,070	294
JACKS RUN AT YOUNGWOOD																						
Aug. 11, 1950....	10.6	65	6	3.70	3,750	18	219	112	10	233	146	40		0	2,600	77	0.1	0.3	4,180	2,730	2,730	1,550
LITTLE SEWICKLEY CREEK NEAR HERMINIE																						
Aug. 11, 1950....	5.0	66	2	7.6	668	5.8		0.01		84	25	15		101	237	8.9	0.3	2.5	465	312	230	
SEWICKLEY CREEK NEAR SUTERSVILLE																						
Aug. 9, 1950	46.2	69	4	2.70	3,080	20	11	9.1	5.0	193	84	228	9.5	0	1,500	31	0.1	0.7	2,380	1,040	1,040	596
YOUGHIOGHENY RIVER AT SUTERSVILLE																						
Aug. 11, 1950....	1,560	69	3	4.6	225	3.9	0.5	0.03	0.50	17	5.2	14		0	91	1.9	0.1	1.4	138	68	68	14
YOUGHIOGHENY RIVER AT McKEESPORT																						
Aug. 9, 1950.....	1,250	71	3	4.00	455	8.2	0.6	0.07	1.0	37	10	21	3.4	0	170	7.4	0.1	0.6	277	144	144	44
BIG PINEY RUN, NEAR SALISBURY																						
Aug. 9, 1950.....	5.2	71	13	6.8	72.5	3.9		0.16		8.2	2.5	1.5	1.6	24	11	2.0	0.1	1.4	49	31	11	
TUB MILL RUN AT WEST SALISBURY																						
Aug. 11, 1950....	12.3	66	8	6.9	93.6	3.9		0.21		11	2.6	2.4		17	24	1.8	0.1	2.1	63	38	24	
CASSELMAN RIVER NEAR SALISBURY																						
Aug. 9, 1950.....	19.4	68	4	6.5	137	3.3		0.06		16	3.7	1.6	1.4	14	44	2.2	0.1	1.8	86	55	44	
FLAUGHERTY CREEK AT MEYERSDALE																						
Aug. 11, 1950 ...	6.8	67	10	6.7	147	4.2		0.10		16	4.1	2.5		15	42	2.5	0.2	2.5	94	57	44	

MONONGAHELA RIVER BASIN--Continued

YOUGHIOGHENY RIVER BASIN STUDY IN PENNSYLVANIA--Continued

Analyses of water samples collected during period of low flow, August 1950--Continued

Date of collection	Discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	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	Hardness as $CaCO_3$		Total acidity as H_2SO_4
																				Total	Noncarbonate	
BLUE LICK CREEK NEAR MEYERSDALE																						
Aug. 11, 1950 ...	17.3	68	4	3.50	665									0	264	3		0.3	--	33	33	51
BUFFALO CREEK AT GARRETT																						
Aug. 9, 1950	5.6	76	2	3.75	582	8.1	1.4	0.12	1.0	61	21	6.2	5.0	0	242	6.0	0.2	3.9	368	258	258	60
COXES CREEK AT ROCKWOOD																						
Aug. 10, 1950....	48	65	2	6.2	376	2.1		0.03		35	8.7	19	3.6	10	112	28	0.1	5.2	233	123	115	
EAST BRANCH COXES CREEK NEAR EDGEWOOD																						
Aug. 11, 1950....	11.1	68	5	6.7	256	6.1		0.01		28	6.1	9.4		34	68	7.4	0.3	6.8	163	95	67	
WEST BRANCH COXES CREEK NEAR EDGEWOOD																						
Aug. 11, 1950....	2.3	70	8	7.8	130	2.6		0.12		14	3.4	6.6		51	13	4.1	0.1	2.4	79	49	77	
MIDDLE CREEK NEAR CASSELMAN																						
Aug. 11, 1950....	6.8	69	4	7.7	102	3.3		0.08		12	3.2	2.7		41	10	2.2	0.1	1.9	62	43	10	
ISERS RUN AT MARKLETON																						
Aug. 11, 1950 ...	11.8	62	7	4.50	49.7									1	10	2		1.0		10	9	
McCLINTOCK RUN AT FORT HILL SCHOOL																						
Aug. 11, 1950....	12.2	62	5	6.8	50.4	4.4		0.09		6.5	1.0	1.8		14	9.6	1.0	0.1	1.4	35	20	9	
WHITES CREEK NEAR HARNEDSVILLE																						
Aug. 11, 1950....	28.9	65	3	7.0	89.2	4.8		0.10		10	2.2	2.3		9	27	1.2	0.1	1.9	60	34	27	
LAUREL HILL CREEK NEAR BAKERSVILLE																						
Aug. 11, 1950....	10.3	68	4	7.3	68.1	3.9		0.08		8.4	1.7	3.0		26	8.1	1.8	0.2	2.1	42	28	7	

LAUREL HILL CREEK AT URSINA

Aug. 10, 1950 ...	86	69	8	6.5	46.6	2.8		0.15		5.3	1.4	1.0	12	8.7	1.5	0.1	1.2	32	19	9

CASSELMAN RIVER AT HARNEDSVILLE

Aug. 11, 1950 ...	95	72	2	4.20	310	4.8	1.2	0.08	4.0	26	9.0	1.2	0	112	2.6	0.1	1.5	182	119	119	56

YOUGHIOGHENY RIVER AT CONFLUENCE

Aug. 10, 1950....	1,100	61	4	5.7	51.2	3.2		0.05		5.0	1.5	2.0	1.0	5	16	1.2	0.1	1.6	35	19	15

BIG MEADOW RUN AT OHIOPYLE

Aug. 10, 1950....	15.0	65	7	7.0	54.0	3.5		0.11		7.0	1.4	1.0	.9	19	7.4	1.4	0.1	0.9	36	23	8

INDIAN CREEK NEAR MILL RUN

Aug. 9, 1950.....	14.6	73	3	6.3	102	4.2		0.03		12	2.2	1.1	1.4	12	30	1.6	0.1	2.5	64	41	31

INDIAN CREEK AT CHAMPION

Aug. 11, 1950....	7.4	63	4	7.7	84.3	3.9		0.08		12	2.0	0.6		28	12	1.2	0.1	2.4	53	38	15

DUNBAR CREEK NEAR CONNELLSVILLE

Aug. 9, 1950.....	7.1	68	2	6.9	240	7.3		0.02		31	4.8	4.0	3.2	28	72	4.0	0.1	7.9	157	97	74

CONNELL RUN AT CONNELLSVILLE

Aug. 11, 1950....	0.9	71	3	7.5	358	9.2		0.02		34	5.4	31		135	43	10	0.3	3.9	214	107	0

WHITES RUN NEAR CONNELLSVILLE

Aug. 11, 1950....	4.2	67	6	7.8	162	4.2		0.01		23	3.5	2.6		60	20	3.9	0.1	2.3	94	72	23

MOUNTS CREEK NEAR CONNELLSVILLE

Aug. 11, 1950....	3.7	68	5	7.7	159	3.9		0.01		19	4.4	4.3		49	25	4.5	0.2	2.1	93	66	25

Analyses of water samples collected during period of low flow, August 1950--Continued

Date of collection	Discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	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	Hardness as $CaCO_3$		Total acidity as H_2SO_4
																				Total	Noncarbonate	
JACOBS CREEK AT JACOBS CREEK																						
Aug. 9, 1950.....	10.6	69	2	5.3	423	9.5		0.03		50	13	7.5	5.4	3	174	8	0.1	7.1	300	178	176	

CASSELMAN RIVER AT HARNEDSVILLE, PA.

LOCATION.--At highway bridge on route 53, Harnedsville, Somerset County, approximately 3 miles upstream from Confluence, Pa.
DRAINAGE AREA.--382 square miles (above gaging station).
RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1950.
Water temperatures: October 1949 to September 1950.
EXTREMES, 1949-50.--Dissolved solids: Maximum, 233 ppm Oct. 1-10; minimum, 71 ppm Jan 1-12.
Hardness: Maximum, 143 ppm Oct. 1-10; minimum 40 ppm Dec. 11-20, 21-31.
Specific conductance: Maximum, 369 micromhos Oct. 1-10; minimum, 114 micromhos Dec. 11-20.
Water temperatures: Maximum, 76°F Aug. 17; minimum, freezing point many days during winter months.
REMARKS.--Discharge records for gaging station at Markelton for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (°F)	Color	pH	Specific conductance (micromhos at 25° C)	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	Hardness as $CaCO_3$		Total acidity as H_2SO_4
																				Total	Non-carbonate	
Oct. 1-10, 1949	68		5	4.10	369	7.3	2.5	0.05	1.0	34	9.4	4.2	2.1	0	144	3.8	0.2	1.9	233	143	143	28
Oct. 11-20	112		5	4.20	306	6.8	2.0	.03	.8	29	9.2	4.3	2.4	0	119	2.9	.2	1.1	193	126	126	21
Oct. 21-31	133		5	4.35	270	6.8	1.6	.02	.9	25	9.0	3.4	1.8	0	104	2.2	.1	1.3	170	111	111	17
Nov. 1-10	330		5	5.0	148	7.0	--	.03	.35	14	4.5	2.3	1.7	2	50	2.0	.0	2.0	95	53	52	--
Nov. 11-20	220		5	4.5	176	6.8	--	.02	.40	16	5.5	2.4	1.4	0	61	1.5	.0	1.7	108	62	62	7
Nov. 21-30	541		5	4.5	158	6.5	--	.02	.30	14	4.6	2.0	1.3	0	52	2.2	.0	2.6	94	54	54	6
Dec. 1-10	567		5	5.1	120	6.6	--	.02	.30	11	3.5	1.6	1.1	2	38	1.5	.0	2.9	74	42	40	--
Dec. 11-20	1,101		5	5.2	114	6.6	--	.07	--	10	3.7	1.4	1.1	1	38	1.5	.0	3.2	72	40	39	--
Dec. 21-31	1,172		5	5.5	116	8.1	--	.07	.15	10	3.7	1.8	.9	2	37	1.2	.0	3.6	76	40	38	--
Jan. 1-12, 1950	1,675		5	4.8	120	6.0	.3	.04	.2	11	3.7	1.6	.6	4	40	2.0	.0	2.3	71	43	39	--
Jan. 13-20	829		5	4.10	184	6.5	1.4	.05	.4	14	5.4	2.0	1.2	0	63	1.0	.1	3.3	93	57	57	19
Jan. 21-30	602		1	4.10	192	6.2	1.6	.07	.5	14	5.4	1.7	1.2	0	60	1.0	.0	2.5	101	57	57	18
Jan. 31, Feb. 1-3	3,666		5	5.5	93.1	--	--	--	--	--	--	1.9		2	28	2.0	--	3.2	--	32	30	--
Feb. 4-10	1,780		25	4.05	170	6.5	1.6	.06	.4	11	2.7	1.8	.7	0	50	1.0	.0	3.5	83	39	39	22
Feb. 11-20	1,626		5	4.05	170	6.5	1.3	.05	.4	12	2.8	1.5	1.0	0	51	.5	.0	3.2	84	41	41	19
Feb. 21-28	946		3	3.80	216	7.0	1.7	.06	.4	13	4.0	2.2	1.4	0	65	.8	.1	4.3	104	49	49	27
Mar. 1-10	606		1	3.70	238	7.3	.8	.04	.6	15	5.2	1.8	1.0	0	71	.8	.1	3.1	109	59	59	27
Mar. 11-12, 15-20	1,163		1	3.80	183	7.3	.7	.04	.5	12	4.0	1.8	.8	0	55	.6	.1	4.0	85	46	46	19
Mar. 13-14	3,456		5	4.7	92.4	--	--	--	--	--	--	2.4		1	32	2.0	--	1.6	--	33	32	--
Mar. 21-31	2,615		1	4.00	147	6.2	.6	.04	.5	11	3.5	1.1	1.5	0	45	.9	.1	3.2	72	42	42	15
Apr. 1-10	920		1	3.70	230	7.0	.6	.06	.4	14	4.8	1.1	.9	0	68	.5	.1	2.1	104	55	55	27
Apr. 11-20	443		1	3.60	262	7.0	2.5	.29	.7	16	3.8	1.2	.9	0	81	2.0	.1	1.8	122	56	56	33
Apr. 21-24, 28-30	806		1	3.70	211	7.9	2.0	.06	.6	14	2.8	3.2		0	67	3.0	.1	2.2	103	46	46	24
Apr. 25-27	2,768		5	4.7	99.1	--	--	--	--	--	--	2.2		1	31	2.0	--	2.4	--	33	32	--
May 1-10	858		5	4.10	165	7.2	.5	.21	.3	13	3.4	1.3	1.1	0	54	1.8	.1	2.2	90	46	46	19
May 11-20	648		5	4.00	190	7.4	.7	.21	.5	14	3.8	1.4	1.0	0	60	1.8	.1	1.8	98	51	51	20
May 21-31	1,065		5	4.35	136	7.2	.3	.20	.3	12	3.0	1.2	1.0	0	44	1.8	.1	1.9	77	42	42	12

MONONGAHELA RIVER BASIN--Continued

CASSELMAN RIVER AT HARNEDSVILLE, PA.--Continued

Chemical analyses, in parts per million, water year October 1949 to September 1950--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	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	Hardness as $CaCO_3$		Total acidity as H_2SO_4
																				Total	Noncarbonate	
June 1-10, 1950 ...	593		5	4.20	176	7.6	0.6	0.19	0.5	14	3.8	1.2	0.9	0	58	1.5	0.0	1.8	95	51	51	16
June 11-20	432		5	4.10	206	7.8	.7	.16	.6	16	4.3	1.3	1.1	0	66	1.8	.0	4.1	110	58	58	21
June 21-30	365		30	4.05	191	7.8	.6	.04	--	16	5.9	1.2	1.2	0	67	1.4	.0	2.2	117	64	64	20
July 1-10	177		40	3.60	320	8.3	3.5	.06	--	23	4.9	2.4	1.2	0	107	1.5	.0	2.0	163	78	78	39
July 11	432		--	3.70	297	5.4	2.6	--	--	21	7.1	1.2	2.2	--	99	3.0	--	3.0	--	82	82	36
July 12-20	296		0	4.20	192	5.2	1.2	.02	--	17	5.6	1.9	1.5	0	73	2.9	.1	3.0	115	65	65	16
July 21-31	172		0	4.40	234	11	1.4	.01	.60	22	6.9	2.8	1.4	--	89	4.1	.1	2.0	147	83	83	18
Aug. 1-10	176		0	4.10	220	5.2	1.5	.02	.90	19	6.5	1.9	1.4	--	85	2.8	.1	2.2	133	74	74	22
Aug. 11-20	110		0	3.80	320	5.6	2.6	.04	1.0	28	9.7	3.1	1.5	--	127	3.5	.1	2.4	193	110	110	29
Aug. 21-31	107		0	3.80	314	5.7	1.1	.07	1.5	26	8.3	2.6	1.9	--	116	3.5	.1	2.2	185	99	99	28
Sept. 1-10	116		0	4.10	299	6.2	2.0	.03	.95	28	9.5	3.4	2.0	--	120	3.4	.2	2.4	185	109	109	26
Sept. 11-21	145		0	3.80	353	5.5	2.5	.02	1.2	31	10	3.5	1.8	--	135	4.2	.2	2.2	210	118	118	33
Sept. 22-24	2,708		0	5.2	93.9	5.1	.3	.08	.08	9.0	2.8	.8	1.9	2	37	2.2	.0	2.9	66	34	32	--
Sept. 25-30	349		0	4.10	191	6.2	1.6	.03	.02	17	5.7	1.2	1.3	0	74	2.4	.1	2.7	110	66	66	20
Average	692		5	4.25	200	6.8	1.3	0.07	0.5	17	5.5	2.0	1.3	--	70	2.0	0.1	2.5	121	65	63	22

MONONGAHELA RIVER BASIN--Continued

CASSELMAN RIVER AT HARNEDSVILLE, PA.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	58	49	38	36	37	33	38	48	63	70	71	75
2	59	43	36	30	35	31	41	50	63	72	75	74
3	60	45	34	45	36	32	42	53	63	71	71	73
4	60	43	31	49	34	32	42	55	62	69	69	70
5	62	40	32	48	34	33	47	59	64	70	66	64
6	64	40	32	46	37	35	40	60	64	70	67	64
7	67	43	34	42	38	36	39	59	67	69	69	65
8	69	46	33	36	36	38	40	55	69	71	69	65
9	70	48	31	35	38	31	41	55	72	69	71	67
10	69	46	31	45	38	31	42	57	71	65	69	68
11	68	47	--	48	38	31	44	59	64	67	71	70
12	66	48	38	36	37	35	42	56	63	71	67	70
13	64	52	41	38	39	37	39	57	64	69	67	68
14	59	50	35	44	38	34	36	61	66	68	68	68
15	59	45	32	37	39	36	34	58	68	--	67	65
16	59	42	31	38	37	36	40	58	66	70	70	62
17	57	39	31	33	35	34	45	60	67	70	76	63
18	58	37	33	37	36	32	50	60	65	71	74	63
19	55	36	39	34	35	33	53	55	63	70	69	68
20	53	41	39	31	31	37	51	54	65	71	72	64
21	54	38	40	32	31	33	76	55	68	69	70	63
22	58	33	41	34	34	36	50	58	68	70	68	60
23	54	33	40	39	34	33	49	60	73	70	69	60
24	52	33	33	42	35	38	51	61	75	68	73	53
25	49	35	32	46	32	35	48	61	70	70	74	50
26	51	32	35	48	31	37	48	57	70	67	75	51
27	47	32	40	43	31	40	50	58	72	70	75	54
28	48	34	39	35	31	42	52	58	69	71	75	56
29	53	41	37	38	--	40	55	59	68	70	73	57
30	52	40	34	42	--	36	53	60	70	73	72	60
31	52	--	33	38	--	38	--	62	--	75	74	--
Average	58	41	35	39	35	35	46	57	67	70	71	64

MONONGAHELA RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN MONONGAHELA RIVER BASIN IN PENNSYLVANIA

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
MONONGAHELA RIVER NEAR HAYES STATION																			
Sept. 18-23, 1950...	14,200		3	6.1	318	6.7	0.05	29	8.0	16	2.6	9	129	10	0.2	1.2	218	106	99
Sept. 24-29.....	11,800		2	6.8	270	6.6	.05	26	6.8	11	2.4	26	86	8.0	.3	1.2	180	92	71

BEAVER RIVER BASIN

MAHONING RIVER AT LEAVITTSBURG, OHIO

LOCATION.--At gaging station at Leavittsburg, Trumbull County, 350 feet downstream from Duck Creek and 1¼ miles downstream from Eagle Creek.
DRAINAGE AREA.--580 square miles.
RECORDS AVAILABLE.--Water temperatures: April 1943 to December 1945, October 1946 to September 1950.
EXTREMES, 1949-50.--Water temperatures: Maximum, 77°F Aug. 31; minimum, freezing point on several days in November, December, February, and March.
EXTREMES, 1943-45, 1946-50.--Water temperatures: Maximum, 86°F July 2, 1949; minimum, freezing point on many days during winter months of some years.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Temperature (°F) of water, water year October 1949 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	58	50	37	35	34	35	42	50	66	71	75	75
2	58	48	37	37	34	34	40	52	66	71	76	75
3	57	50	35	37	33	34	44	52	68	73	72	72
4	58	48	35	47	33	32	46	60	64	74	72	72
5	58	48	35	46	34	34	46	62	64	74	72	70
6	60	45	35	36	38	34	45	64	65	74	73	68
7	62	45	35	34	40	34	38	64	68	72	70	67
8	62	45	34	33	34	38	46	60	70	72	70	68
9	64	45	34	34	40	34	34	60	72	72	72	70
10	64	45	34	40	37	33	44	60	72	74	72	71
11	66	49	34	35	37	34	45	61	68	76	73	72
12	66	50	38	34	36	36	44	61	64	74	72	72
13	63	52	34	40	38	35	40	60	67	74	70	73
14	61	52	32	42	38	34	35	61	68	74	68	72
15	60	49	32	34	40	34	34	62	70	72	68	70
16	58	47	32	34	37	34	34	62	72	74	70	68
17	58	46	32	34	36	34	45	62	70	74	73	66
18	58	44	34	34	34	34	48	62	68	75	74	64
19	56	42	34	33	35	33	50	62	66	74	74	66
20	55	42	34	33	34	34	48	60	60	74	72	64
21	57	42	38	33	32	38	48	62	70	72	70	66
22	60	36	42	36	34	38	48	62	71	72	68	64
23	56	34	36	36	34	40	50	62	75	72	66	64
24	57	34	36	42	34	40	50	64	75	72	68	62
25	55	37	36	45	34	40	48	66	76	72	70	60
26	55	35	38	50	34	40	48	68	74	74	72	60
27	45	32	40	34	34	40	52	68	72	72	74	60
28	50	32	34	34	35	45	52	66	70	72	75	60
29	50	38	36	44	--	44	50	64	70	72	76	62
30	50	37	32	34	--	37	50	66	69	73	76	62
31	50	--	32	34	--	37	--	66	--	74	77	--
Average	58	43	35	37	35	36	45	62	69	73	72	67

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BEAVER RIVER BASIN--Continued

MAHONING RIVER AT NILES, OHIO

LOCATION.--At Belmont Street Bridge in Niles, Trumbull County, 0.3 mile downstream from Meander Creek, 0.7 mile downstream from Mosquito Creek, and 7.7 miles upstream from gaging station at Youngstown.
DRAINAGE AREA.--899 square miles (above gaging station at Youngstown.)
RECORDS AVAILABLE.--Water temperatures: April 1943 to December 1945 (incomplete), October 1949 to September 1950.
EXTREMES, 1949-50.--Water temperatures: Maximum, 83°F Aug. 2; minimum, 33°F Jan. 8, Feb. 22, 23, 26.
EXTREMES, 1943-45, 1949-50.--Water temperatures: Maximum, 92°F June 28, 1943; minimum, freezing point on several days during winter months of some years.
REMARKS.--Daily water temperatures reported in the table are averages of twice-daily measurements. Data reported under extremes are the maximum and minimum measurements and do not appear in the table below. Discharge records for gaging station at Youngstown for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Temperature (°F) of water, water year October 1949 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	62	54	56	49	42	38	42	51	77	78	81	80
2	62	55	55	50	42	34	42	55	76	74	82	78
3	61	56	54	58	42	34	45	58	73	74	82	77
4	64	53	54	59	40	36	48	62	69	76	78	76
5	66	52	51	48	40	36	48	65	71	--	77	73
6	66	52	54	48	41	38	45	65	72	--	76	72
7	68	50	54	42	42	38	44	60	74	76	76	74
8	69	52	52	34	41	36	43	61	76	76	76	72
9	71	56	48	40	42	35	42	62	76	76	78	72
10	70	56	52	40	41	36	45	64	75	76	78	74
11	72	61	55	38	41	38	45	62	--	77	77	76
12	72	62	60	36	40	37	44	62	73	78	76	77
13	69	65	56	42	40	36	42	64	72	78	75	76
14	67	62	52	44	39	36	42	65	72	77	76	76
15	66	62	45	41	40	38	46	67	74	77	77	74
16	65	60	46	37	39	38	48	70	74	77	--	73
17	62	62	48	35	--	38	51	--	73	77	--	72
18	62	62	55	36	38	37	56	--	69	77	--	72
19	64	60	55	38	36	36	62	65	71	77	--	74
20	64	58	59	--	36	38	60	--	75	79	75	74
21	66	52	59	--	36	38	58	65	76	78	74	74
22	68	50	60	--	34	37	59	68	77	78	77	73
23	64	53	50	--	34	37	58	71	78	77	76	68
24	60	56	48	--	34	37	52	72	80	78	76	64
25	56	52	48	--	34	39	48	74	80	78	76	65
26	59	49	49	52	33	38	49	74	81	79	79	67
27	55	50	50	46	34	40	54	72	79	78	80	71
28	57	51	50	43	36	56	54	70	76	79	80	72
29	58	58	52	43	--	48	55	71	76	78	80	70
30	59	59	52	42	--	45	52	74	77	78	80	70
31	56	--	52	42	--	44	--	76	--	79	80	--
Average	64	56	53	43	38	38	49	66	75	77	78	73

BEAVER RIVER BASIN--Continued

MAHONING RIVER AT LOWELLVILLE, OHIO

LOCATION.--At gaging station 300 feet upstream from Washington Street Bridge in Lowellville, Mahoning County, 1 mile upstream from Ohio-Pennsylvania State line, and 3 miles downstream from Yellow creek.
DRAINAGE AREA.--1,076 square miles.
RECORDS AVAILABLE.--Water temperatures: October 1943 to November 1944 (incomplete), October 1949 to September 1950.
EXTREMES, 1949-50.--Water temperatures: Maximum, 109°F Aug. 17; minimum, 33°F Mar. 3.
REMARKS.--Daily water temperatures reported in the table are daily averages of continuous recorder measurements. Data reported under extremes are maximum and minimum measurements and do not appear in the table below. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Temperature (°F) of water, water year October 1949 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	82	57	88	89	59	42	51	56	97	90	101	92
2	73	58	86	91	57	38	48	57	98	88	102	92
3	70	56	83	91	53	36	53	63	96	88	100	92
4	71	53	82	88	53	38	57	73	73	88	96	91
5	70	52	81	71	51	46	54	79	69	89	96	90
6	69	51	81	60	55	48	--	79	76	88	95	90
7	72	54	81	52	55	46	50	74	86	91	97	92
8	68	56	80	46	56	45	52	71	93	92	98	94
9	74	57	80	50	52	39	--	77	96	91	98	94
10	75	58	60	56	49	42	--	71	86	90	97	94
11	75	62	82	47	50	46	54	72	78	90	98	93
12	72	67	89	47	51	48	52	76	76	96	94	90
13	68	68	85	55	51	42	52	80	81	95	94	92
14	67	68	81	55	43	41	53	82	82	92	96	92
15	68	74	80	49	42	44	61	79	85	94	97	91
16	67	78	81	45	42	46	64	84	84	96	99	90
17	65	79	83	40	45	47	70	85	83	96	102	88
18	66	78	86	46	47	43	75	85	83	96	102	88
19	65	79	85	50	43	42	77	81	87	97	96	91
20	64	76	90	57	39	47	78	77	91	96	93	90
21	64	76	92	64	40	45	76	81	92	98	96	92
22	67	76	93	70	41	43	76	82	99	98	94	90
23	64	78	85	75	37	39	79	79	98	94	95	89
24	62	78	80	70	37	39	58	84	98	94	98	82
25	58	77	76	61	35	40	50	89	96	94	99	82
26	59	78	80	61	34	41	50	89	97	97	100	88
27	56	76	87	55	37	43	53	88	92	100	98	90
28	56	78	86	51	40	47	59	86	86	100	101	94
29	58	84	87	56	--	49	63	89	88	99	97	94
30	59	90	85	56	--	49	61	93	88	100	96	92
31	58	--	85	57	--	51	--	98	--	99	96	--
Average	67	69	84	60	46	44	60	79	68	94	97	91

BEAVER RIVER BASIN--Continued

BEAVER RIVER AT NEW BRIGHTON, PA.

LOCATION.--At head of intake canal of Beaver Falls Municipal Authority, 3 miles upstream from mouth, and 2.5 miles downstream from gaging station at Beaver Falls, Beaver County.
DRAINAGE AREA.--3,112 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1950.
Water temperatures: October 1945 to September 1950.
EXTREMES, 1949-50.--Specific conductance: Maximum 648 micromhos Dec. 1-10; minimum, 216 micromhos Mar. 21-31.
Hardness: Maximum, 236 ppm Dec. 1-10; minimum, 88 ppm Mar. 21-31.
Water temperatures: Maximum, 82°F Aug. 29, Sept. 2; minimum, 34°F Mar. 3.
EXTREMES, 1945-50.--Dissolved solids (1945-47): Maximum, 362 ppm Nov. 21-30, 1946; minimum, 136 ppm Apr. 1-10, 1947.
Hardness: Maximum, 236 ppm Dec. 1-10, 1949; minimum, 85 ppm Mar. 1-10, 1946.
Specific conductance: Maximum, 665 micromhos;Feb. 1-10, 1948; minimum, 210 micromhos June 1-10, 1947, Feb. 15-20, 1948.
Water temperatures: Maximum, 88°F July 6, 1949; minimum, freezing point Feb. 7, 11, 1947, Dec. 27, 1948.
REMARKS.--Intake canal located on east bank of river. Samples collected by Beaver Falls Municipal Authority. Records of specific conductance of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1949 to September 1950 based on records for Beaver River at Beaver Falls, which are given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (°F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Non-carbonate
Oct. 1-10, 1949	610		15	7.0	509							53	146	27		4.2		181	138
Oct. 11-20	516		20	7.0	472							81	115	24		4.0		172	106
Oct. 21-31.....	389		20	7.1	505							86	121	29		4.9		186	116
Nov. 1-10	383		2	7.0	558							98	124	36		7.2		204	124
Nov. 11-20	716		2	7.0	574							104	125	39		6.1		208	123
Nov. 21-30	784		1	6.7	628							76	158	41		6.8		226	164
Dec. 1-10	931		5	6.4	648							65	187	43		7.3		236	183
Dec. 11-20	1,668		5	6.9	555							43	148	38		7.0		187	152
Dec. 21-31	1,899		3	6.8	434							38	115	28		6.4		154	123
Jan. 1-10, 1950	9,179		12	6.7	343							44	94	19		4.4		128	92
Jan. 11-20	12,380		18	6.7	249							38	67	8		3.2		96	65
Jan. 21-31	6,760		20	6.7	276							25	80	13		5.2		107	86
Feb. 1-10	5,486		10	6.5	315							27	92	16		3.2		118	96
Feb. 11-20	15,400		40	7.1	261							38	79	9		2.0		104	73
Feb. 21-28	9,876		5	6.9	281							28	80	12		2.4		107	84
Mar. 1-10	5,352		5	6.7	301							30	85	12		2.8		114	89
Mar. 11-20	7,171		10	6.7	251							24	65	10		2.4		98	78
Mar. 21-31	17,520		5	6.7	216							32	58	6.0		3.9		88	62

Apr. 1-10	10,130		5	6.5	239						30	66	9.0		3.4		95	74
Apr. 11-20	4,136		5	6.4	286						33	82	12		4.1		112	85
Apr. 21-30	11,220		50	6.4	276						35	75	11		4.0		103	74
May 1-10	5,813		10	6.4	272						33	74	10		3.7		104	77
May 11-20	3,548		10	6.5	321						40	91	14		3.9		126	93
May 21-31	3,169		1	6.5	335						42	87	16		6.0		127	93
June 1-10	4,036		40	6.2	302						40	77	12		6.0		114	81
June 11-20	3,047		20	6.3	326						40	85	14		6.3		123	90
June 21-30	2,016		10	6.7	406						11	112	21		9.2		150	141
July 1-10	2,119		10	6.8	397						43	110	18		4.2		147	112
July 11-20	1,803		5	6.8	414						37	114	18		7.0		152	122
July 21-31	1,643		5	6.6	417						23	116	20		6.6		148	129
Aug. 1-10	1,526		5	6.2	428						17	125	21		7.2		150	136
Aug. 11-20	1,795		5	6.2	424						15	125	21		7.7		143	127
Aug. 21-31	1,552		3	6.2	399						17	123	17		6.1		139	125
Sept. 1-10	1,865		4	6.5	395						25	118	19		5.7		145	124
Sept. 11-20	2,044		5	6.3	389						21	116	18		5.8		140	123
Sept. 21-30	1,472		4	6.4	424						19	144	23		6.3		151	135
Average	4,419		11	6.6	395						40	105	19		5.2		141	108

BEAVER RIVER BASIN--Continued

BEAVER RIVER AT NEW BRIGHTON, PA.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	65	52	44	42	42	38	46	54	71	78	80	80
2	64	50	45	44	42	37	46	53	72	80	80	82
3	64	52	44	46	42	34	48	56	--	79	81	75
4	64	49	44	51	41	35	50	60	71	80	78	76
5	66	49	44	--	40	37	50	64	66	80	76	77
6	66	49	42	--	40	38	47	69	66	78	74	72
7	67	--	43	43	42	41	44	66	70	78	74	70
8	66	50	42	40	42	42	46	64	71	76	72	72
9	68	48	42	40	42	40	45	62	74	78	76	74
10	70	48	40	40	42	38	46	63	78	80	78	76
11	70	50	44	42	41	38	50	64	77	78	80	76
12	70	50	46	40	42	38	48	61	72	76	77	78
13	67	--	44	42	42	40	46	61	71	78	77	78
14	66	54	44	45	46	38	44	61	72	77	77	76
15	64	51	40	44	41	38	44	64	74	77	78	78
16	63	52	38	42	40	40	46	66	74	78	78	69
17	63	52	37	40	40	40	48	66	75	78	78	68
18	62	48	--	40	40	39	45	68	74	80	78	68
19	60	52	40	38	41	40	53	68	72	78	78	70
20	60	49	43	38	35	40	54	67	71	80	72	70
21	60	47	42	37	38	42	52	66	71	78	70	70
22	61	46	46	37	40	42	52	68	72	79	69	70
23	59	45	46	40	38	42	54	68	78	78	70	68
24	59	45	45	42	37	40	56	68	78	78	72	66
25	57	44	44	48	36	40	50	68	81	74	74	64
26	56	42	42	51	36	41	50	68	79	78	78	61
27	45	42	44	50	37	42	50	70	78	76	79	61
28	46	42	44	45	36	46	54	71	79	76	80	62
29	54	44	44	44	--	48	54	70	79	77	82	64
30	54	45	42	45	--	44	56	70	79	80	80	65
31	54	--	41	44	--	44	--	72	--	80	80	--
Average	62	48	43	43	40	40	49	65	74	78	77	71

BEAVER RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN BEAVER RIVER BASIN IN PENNSYLVANIA

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Non-carbonate
BEAVER RIVER AT EASTVALE																			
Sept. 18-23, 1950.....	1,680		4	7.2	382	6.2	0.05	39	9.2	16	5.2	35	122	21	0.4	2.1	256	136	107
Sept. 24-29.....	1,410		5	7.1	432	5.9	.08	45	9.7	19	6.0	38	139	24	.7	2.2	282	153	122

MUSKINGUM RIVER BASIN

MUSKINGUM RIVER ABOVE LICKING RIVER, AT ZANESVILLE, OHIO

LOCATION.--At Monroe Street Bridge in Zanesville, Muskingum County, 1 mile upstream from Licking River, and 1¼ miles upstream from gaging station at Sixth Street Bridge in Zanesville.
DRAINAGE AREA.--6,059 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1950.
REMARKS.--Chemical analyses of the Muskingum River at Zanesville for September 1906 to September 1907 published in Water-Supply Paper 236. It is not known whether these samples were collected above or below the Licking River. Discharge records for gaging station at Zanesville for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
Oct. 15, 1949		--	15	7.4	2,010	3.0	0.07	210	21	156		141	126	495	0.8	2.4	1,230	610	495
Nov. 16		46	18	7.5	2,110	2.0	.10	232	22	156		154	134	525	.4	1.2	1,290	669	543
Dec. 15		37	7	7.2	1,820	5.0	.07	190	17	147		110	128	450	.8	4.3	1,170	544	454
Jan. 17, 1950		42	10	7.9	307	6.8	.05	35	7.3	9.7		54	60	20	.1	4.0	193	117	73
Feb. 16		45	10	7.7	235	6.2	.11	26	6.1	10		44	55	11	.4	3.2	140	90	54
Mar. 17		38	7	7.7	466	6.4	.08	53	10	13		73	67	49	.2	3.1	281	173	114
Apr. 21		51	2	7.7	671	6.4	.07	78	13	31		110	87	94	.4	2.5	448	248	158
May 16		--	3	7.2	708	5.2	.06	79	14	37		120	89	100	.5	2.1	453	255	156
June 19		68	8	8.0	1,050	5.5	.12	115	15	68		134	94	202	.4	3.2	642	349	239
July 21		--	8	8.1	918	4.5	.14	105	16	53		144	94	159	.4	1.8	588	328	210
Aug. 16		--	8	8.2	1,770	1.0	.18	190	17	137		a124	130	425	.8	3.4	1,150	544	442
Sept. 12		--	6	7.4	1,110	1.9	.80	114	22	69		112	112	223	.6	1.5	666	375	283

a Includes equivalent of 5 parts per million of carbonate (CO_3).

LITTLE KANAWHA RIVER BASIN

MISCELLANEOUS ANALYSES OF STREAMS IN LITTLE KANAWHA RIVER BASIN IN WEST VIRGINIA

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
LITTLE KANAWHA RIVER AT PARKERSBURG																			
Sept. 18-23, 1950	2,860		13	7.8	130	6.4	0.06	9.6	2.9	8.6	2.0	32	25	7.0	0.1	1.2	83	36	10
Sept. 24-29	2,670		15	7.2	113	6.3	.04	9.2	3.2	7.4	2.6	34	19	5.5	.2	1.0	77	34	8

SOUTH FORK NEW RIVER NEAR JEFFERSON, N. C.

LOCATION.--At bridge on State Highway 16, 400 feet downstream from gaging station, which is a quarter of a mile downstream from Bear Creek, and 4 miles southeast of Jefferson, Ashe County.
DRAINAGE AREA.--207 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1950.
Water temperatures: October 1949 to September 1950.
EXTREMES, 1949-50.--Dissolved solids: Maximum, 36 ppm Oct. 1-10; minimum, 26 ppm Mar. 1-10.
Hardness: Maximum, 16 ppm Nov. 21-30; minimum, 10 ppm Jan. 21-31, Feb. 20-28, Mar. 1-10, 21-31, Sept. 1-10.
Water temperatures: Maximum, 81°F June 26; minimum, freezing point on several days in February and March.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Oxygen consumed		Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
		Unfiltered	Filtered																Total	Non-carbonate
Oct. 1-10, 1949	527	2.6	1.8	3	6.4	38.8	13	0.03	2.6	1.3	2.6	0.6	17	2.5	1.8	0.0	0.6	36	12	0
Oct. 11-20	522	2.8	2.2	8	6.5	32.2	9.7	.04	3.2	1.2		2.9	17	2.2	1.5	.1	.8	31	13	0
Oct. 21-31	583	2.9	1.6	8	6.6	32.6	12	.03	2.8	1.2		2.6	15	1.7	1.8	.1	1.0	31	12	0
Nov. 1-10	942	4.0	2.3	7	6.5	32.0	11	.02	3.0	1.2		1.7	14	1.9	1.4	.0	.9	31	12	1
Nov. 11-20	461	2.0	1.7	6	6.7	34.3	11	.03	3.2	1.2		2.6	15	2.2	2.1	.1	1.1	32	13	1
Nov. 21-30	424	3.0	1.8	6	6.7	35.7	11	.07	3.8	1.6		1.7	16	3.1	2.0	.0	.8	33	16	3
Dec. 1-10	366	2.2	1.6	5	6.6	30.8	9.8	.05	2.9	1.3		2.0	14	2.3	1.9	.0	.4	28	13	1
Dec. 11-20	410	2.3	1.8	4	6.6	31.8	10	.07	3.1	.9		2.5	14	1.9	2.0	.1	.5	28	11	0
Dec. 21-31	584	2.6	1.8	8	6.7	33.0	9.5	.05	3.0	1.1		1.8	12	2.2	2.1	.1	.8	28	12	2
Jan. 1-10, 1950	412	2.0	1.6	3	6.8	33.1	9.4	.03	2.9	1.0	2.5	.9	14	1.7	1.8	.1	.7	27	11	0
Jan. 11-20	406	2.0	1.6	5	6.9	31.7	9.5	.07	2.9	1.0		2.5	14	2.3	1.4	.1	1.0	29	11	0
Jan. 21-31	412	2.2	1.3	4	6.7	31.6	9.6	.04	2.5	1.0		3.1	13	3.1	1.4	.1	1.1	31	10	0
Feb. 1-10	511	2.8	1.6	3	6.8	31.8	9.1	.09	2.8	1.0		3.2	13	4.2	1.4	.1	1.2	28	11	0
Feb. 11-19	746	3.6	1.6	7	6.7	29.4	9.8	.05	2.6	1.0		2.0	12	2.1	1.2	.1	1.2	27	11	1
Feb. 20-28	447	2.0	1.6	4	6.7	30.3	10	.04	2.4	1.0		2.7	13	2.0	1.5	.1	1.0	27	10	0
Mar. 1-10	435	2.4	1.7	5	7.1	29.7	9.2	.04	2.4	1.0		2.3	13	1.6	1.2	.1	1.0	26	10	0
Mar. 11-20	476	5.4	2.1	3	6.6	31.7	9.1	.05	2.8	1.1		2.8	14	3.0	1.2	.0	1.6	31	12	0
Mar. 21-31	604	2.2	1.4	7	6.5	30.7	9.3	.01	2.4	.9		2.5	13	1.8	1.1	.1	.9	27	10	0
Apr. 1-10	450	3.1	1.8	4	6.8	32.6	9.3	.04	2.6	1.0	2.0	.8	13	2.3	1.4	.1	1.0	29	11	0
Apr. 11-20	347	2.0	1.6	3	6.7	32.0	10	.04	2.9	1.2		2.3	14	3.0	1.5	.0	.8	29	12	1
Apr. 21-30	306	2.0	1.6	3	6.8	30.1	9.6	.05	3.0	1.2		1.7	14	2.1	1.5	.0	.6	27	12	1
May 1-10	367	4.3	2.1	4	6.5	30.1	8.7	.06	3.1	1.2		1.5	14	2.0	1.2	.0	1.0	28	13	1
May 11-20	695	4.8	2.5	7	6.6	40.9	9.1	.11	3.5	1.1		2.6	15	2.8	1.8	.1	1.1	32	13	1
May 21-31	465	8.5	2.4	6	6.5	36.4	9.0	.05	3.2	1.1		2.1	14	2.9	1.0	.1	1.3	30	12	1

KANAWHA RIVER BASIN--Continued

SOUTH FORK NEW RIVER NEAR JEFFERSON, N. C.--Continued.

Chemical analyses, in parts per million, water year October 1949 to September 1950--Continued

Date of collection	Mean discharge (second-feet)	Oxygen consumed		Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
		Unfiltered	Filtered																Total	Noncarbonate
June 1-10, 1950 ..	521	5.4	2.1	6	6.5	33.2	9.4	0.05	3.0	1.1	3.6		14	3.3	2.8	0.1	0.8	31	12	1
June 11-20	384	6.7	2.2	9	6.5	39.2	12	.06	3.5	1.1	2.8		14	3.7	1.8	.1	1.6	35	13	2
June 21-30	391	4.0	2.2	8	6.5	35.3	9.5	.08	2.8	1.2	2.9		16	2.2	1.4	.0	1.2	29	12	0
July 1-10.....	343	3.6	2.1	8	6.8	39.3	9.3	.10	2.8	1.2	3.0	1.0	16	1.7	1.5	.2	.9	30	12	0
July 11-20	407	4.3	2.4	5	6.6	36.1	11	.02	3.0	1.0	3.0		16	1.8	1.4	.0	1.4	35	12	0
July 21-31	401	3.3	1.9	5	6.6	38.5	11	.09	3.0	1.0	4.0		17	2.0	2.2	.1	1.0	35	12	0
Aug. 1-10.....	284	2.2	1.8	4	6.8	34.5	10	.10	3.1	.9	4.3		18	2.1	2.4	.1	.3	34	11	0
Aug. 11-20	271	4.4	1.8	7	6.5	44.0	10	.04	3.0	1.2	3.6		18	1.7	2.0	.1	.8	34	12	0
Aug. 21-31	558	6.9	2.6	9	6.4	36.0	9.5	.09	2.8	1.1	4.0		17	2.3	2.0	.1	1.1	35	12	0
Sept. 1-10	1,150	5.2	1.9	6	6.6	32.8	8.4	.02	2.8	.8	3.2		14	1.9	1.9	.1	1.2	28	10	0
Sept. 11-20	603	3.7	1.6	5	6.3	31.5	11	.02	2.8	.9	3.3		16	1.7	1.8	.1	.4	32	11	0
Sept. 21-30	392	2.6	1.7	4	6.8	36.4	13	.04	2.9	1.2	3.1	.8	18	2.0	1.5	.1	.6	33	12	0
Average	489	3.5	1.9	6	--	33.9	10	0.05	2.9	1.1	2.8		15	2.3	1.7	0.1	0.9	30	12	0

KANAWHA RIVER BASIN--Continued

SOUTH FORK NEW RIVER NEAR JEFFERSON, N. C.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	60	54	42	40	54	32	45	54	64	75	72	74
2	54	49	40	42	49	31	54	58	64	77	68	74
3	57	43	36	47	48	32	50	56	64	77	72	70
4	55	43	34	49	48	34	56	58	63	77	70	75
5	60	45	35	53	47	40	53	68	65	76	75	70
6	54	41	36	50	47	40	50	69	65	72	72	69
7	60	43	36	46	48	40	56	63	68	72	71	61
8	62	44	38	47	49	40	53	64	70	72	73	60
9	62	44	34	46	49	31	54	62	68	72	72	60
10	63	46	35	38	46	41	54	63	65	72	68	69
11	64	46	46	45	42	39	54	64	70	75	75	68
12	61	56	46	44	42	38	54	62	63	75	75	67
13	60	41	50	41	44	38	50	62	70	75	70	66
14	61	42	45	48	48	38	50	58	70	70	70	67
15	61	45	41	55	--	38	48	62	--	75	68	67
16	61	42	33	53	41	38	51	65	74	75	70	67
17	58	38	45	44	46	34	56	68	77	75	75	69
18	57	38	44	44	44	34	50	68	77	75	73	69
19	56	36	42	46	48	37	51	64	75	78	75	69
20	55	40	40	47	34	37	45	61	75	80	75	71
21	56	--	38	45	48	41	50	60	69	76	69	69
22	56	--	44	44	38	40	50	60	73	70	69	62
23	57	40	46	45	35	41	57	69	77	72	69	60
24	55	40	44	46	32	43	56	68	60	73	67	58
25	53	42	42	48	38	43	58	64	60	75	72	61
26	55	42	43	48	36	40	60	69	81	75	72	--
27	52	--	43	49	31	44	56	64	79	75	75	--
28	50	42	39	47	31	46	64	65	76	75	72	--
29	48	44	43	53	--	48	64	65	74	75	73	--
30	55	45	43	51	--	44	63	64	75	78	69	--
31	56	--	40	53	--	45	--	64	--	74	--	--
Average	57	43	41	47	43	39	54	63	71	75	72	67

KANAWHA RIVER BASIN--Continued

NEW RIVER NEAR GALAX, VA.

LOCATION.--At gaging station at highway bridge, 500 feet downstream from Meadow Creek, 1 1/8 miles southwest of Old Town, and 3 miles southwest of GALAX, Carroll County.
DRAINAGE AREA.--1,131 square miles.
RECORDS AVAILABLE.--Chemical analyses: April 1930 to March 1931, October to December 1949.
EXTREMES, 1930-31.--Dissolved solids: Maximum, 38 ppm Aug. 1-10; minimum, 27 ppm Apr. 1-10, Mar. 1-10.
Hardness: Maximum, 18 ppm July 21-31; minimum, 11 ppm Jan. 11-20, 21-31.
REMARKS.--Records of specific conductance of daily samples for October to September 1949 available in district office at Charlottesville, Va. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, October to December 1949

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																	Total	Non-carbonate
Oct. 1-10, 1949	1,614	15	6.1	39.2	11	--	--	--	2.7	0.9	20	1.8	1.9	0.0	0.2	35	--	--
Oct. 11-20	1,532	--	--	--	--	--	--	--	--	--	24	6.6	--	--	--	40	--	--
Oct. 21-31	2,130	20	6.9	44.1	--	--	--	--	--	--	16	2.5	2.2	--	--	--	--	--
Nov. 1-10	4,446	10	6.5	39.0	11	0.07	3.6	1.3	2.1		17	2.1	1.5	.1	.6	36	14	0
Nov. 11-20	1,688	15	6.5	42.9	12	.07	3.4	1.3	2.5		17	1.7	2.2	.0	.5	38	14	0
Nov. 21-30	1,831	20	6.6	38.8	12	.08	3.4	1.4	1.5		16	1.5	1.5	.1	.6	38	14	1
Dec. 1-10.....	1,750	20	6.9	39.0	14	.11	3.4	1.3	1.9		17	1.7	1.2	.1	.5	38	14	0
Dec. 11-20	1,700	10	6.9	40.0	12	.04	3.6	1.2	2.8		17	2.9	1.6	.1	.6	38	14	0
Dec. 21-31	2,452	25	6.8	41.7	14	.04	3.6	1.6	2.6		17	3.7	2.0	.1	.6	43	16	2

NEW RIVER AT IVANHOE, VA.

LOCATION.--At gaging station at Ivanhoe, Wythe County, 2½ miles upstream from Cripple Creek.
DRAINAGE AREA.--1,340 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1950.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Oxygen consumed		Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
			Unfiltered	Filtered																Total	Noncarbonate
Oct. 6, 1949	1,710	--			10	6.1	39.3	8.5	0.12	3.8	1.3	2.4		18	3.3	1.2	0.0	0.2	32	15	0
Nov. 10	2,130	--			18	6.8	35.3	9.2	.14	3.5	1.3	1.0		12	3.7	1.5	.1	.4	32	14	0
Dec. 8	1,700	40			15	6.8	34.5	10	.17	3.4	1.5	.8		14	2.9	1.2	.0	.4	33	15	0
Feb. 2, 1950	2,000	42			8	7.0	40.5	8.5	.10	3.7	1.9	1.9		16	3.1	1.8	.1	2.5	34	17	4
Mar. 11	1,800	38			10	6.9	38.9	10	.15	3.7	1.9	1.6		16	3.2	2.0	.0	1.7	34	17	4
Apr. 21	1,500	53			12	7.5	40.5	9.9	.09	3.7	1.2	2.8		18	3.0	1.0	.1	1.0	31	14	0
May 26	2,080	68			8	7.4	37.2	11	.06	3.4	1.1	2.7		17	2.5	.8	.1	1.1	32	13	0
June 26	2,290	80			10	--	34.5	11	.14	3.9	1.8	.7		14	3.7	1.0	.2	1.7	31	17	6
July 19	1,820	75			7	8.0	41.5	11	.10	3.7	1.7	4.0		23	3.3	.8	.1	1.5	33	16	0
Aug. 24	2,660	73			20	6.7	41.9	--	.11	4.2	1.7	1.4		16	3.4	1.2	.1	2.4	35	18	4
Sept. 12	3,850	62			18	7.6	36.7	8.6	.18	3.6	1.8	1.9		14	5.1	1.2	.2	1.8	30	16	5

NEW RIVER AT ALLISONIA, VA.

LOCATION.--At gaging station a quarter of a mils downstream from Big Reed Island Creek and half a mile upstream from Allisonia, Pulaski County.
DRAINAGE AREA.--2,202 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1950.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Oxygen consumed		Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
			Unfiltered	Filtered																Total	Noncarbonate
Oct. 3, 1949	2,300	--			10	6.5	77.8	8.3	0.08	8.2	3.5	2.3		41	4.1	1.2	0.0	0.3	49	35	1
Dec. 24	3,860	44			10	7.1	80.6	9.2	.08	8.4	3.5	1.7		38	4.7	1.6	.1	.5	49	35	4
Jan. 9, 1950	2,570	42			10	7.2	81.9	9.0	.05	8.7	3.7	1.6		41	3.8	1.5	.1	.6	50	37	3
Feb. 21	2,920	36			3	7.7	86.0	10	.05	10	3.8	2.1		45	4.4	1.2	.1	2.1	58	41	4
May 31	4,220	42			15	7.0	83.0	8.8	.05	8.9	4.0	2.4		40	5.4	2.0	.1	2.9	55	39	6
Apr. 20	2,200	53			10	7.3	96.8	8.1	.06	10	5.2	3.1		54	5.4	1.5	.0	1.5	59	46	2
May 17	6,480	68			3	--	75.1	10	.05	9.0	4.3	1.7		40	7.5	1.1	.0	1.8	--	40	7
June 27	3,040	78			5	7.8	77.0	9.9	.06	8.5	3.5	2.0		40	3.8	1.0	.1	2.0	50	36	3
July 26	2,160	73			5	8.3	98.2	10	.02	11	4.6	3.6		57	4.3	1.2	.1	1.2	62	46	0
Aug. 17	2,080	70			18	8.0	142	2.3	.13	18	6.8	4.3		82	10	1.9	.1	2.7	88	73	6
Sept. 25	2,340	58			9	7.2	56.7	--	.07	6.0	2.3	9.5		48	2.9	1.4	.1	.7	43	24	0

NEW RIVER AT RADFORD, VA.

LOCATION.--At gaging station at Radford, Montgomery County, 2,000 feet downstream from bridge on U. S. Highway 11, 5 miles downstream from Little River, and 5½ miles downstream from Claytor Dam.
DRAINAGE AREA.--2,748 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1950.
Water temperatures: October 1949 to September 1950.
EXTREMES, 1949-50.--Dissolved solids: Maximum, 64 ppm Jan. 11-20; minimum, 51 ppm Nov. 11-20.
Hardness: Maximum, 51 ppm Mar. 1-10, 11-20; minimum, 36 ppm Oct. 11-20, Nov. 1-10.
Water temperatures: Maximum, 78°F July 18; minimum, 41°F Dec. 9, 10, 16.
REMARKS.--Records of specific conductance of daily samples available in district office at Charlottesville, Va. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																	Total	Noncarbonate
Oct. 1-10, 1949	3,093	8	6.7	85.4	8.0	0.06	9.5	3.9	2.4	1.0	43	4.9	1.8	0.1	0.3	54	40	4
Oct. 11-20	2,971	15	6.6	81.0	9.3	.06	8.7	3.5	2.8	1.1	42	4.6	1.6	.1	.3	53	36	2
Oct. 21-31	3,962	5	7.2	81.5	8.8	.06	9.0	3.9	2.2	.8	41	5.5	1.8	.0	.3	52	38	5
Nov. 1-10	7,524	15	7.2	75.1	9.4	.15	8.3	3.6	2.0	1.1	36	6.7	2.0	.1	.3	52	38	6
Nov. 11-20	3,089	8	7.0	78.4	9.2	.08	8.8	3.8	1.2		38	5.6	1.8	.1	.5	51	38	6
Nov. 21-30	3,491	12	7.1	78.6	8.3	.07	9.3	4.0	1.8		41	6.3	1.9	.1	.5	53	40	6
Dec. 1-10	3,484	10	7.3	78.8	12	.08	8.6	3.9	1.2		39	5.2	1.6	.1	.4	52	38	6
Dec. 11-20	4,231	8	7.4	79.4	13	.08	9.0	3.8	2.1		42	5.2	1.6	.1	.5	56	38	4
Dec. 21-31	4,501	8	7.3	82.3	11	.09	8.8	4.0	2.7		42	6.7	1.6	.1	.5	56	38	4
Jan. 1-10, 1950	3,691	10	7.2	89.9	12	.08	9.7	4.1	2.1		44	6.0	1.9	.1	.5	60	41	5
Jan. 11-20	3,861	10	7.4	92.1	14	.06	9.6	4.2	2.2		44	6.6	1.8	.1	.3	64	41	5
Jan. 21-31	4,673	10	7.7	91.9	12	.07	9.6	4.2	1.7		44	5.6	1.8	.1	.3	58	41	5
Feb. 1-10	8,500	10	7.5	87.1	10	.09	9.6	4.2	1.3		42	5.7	1.8	.1	1.0	57	41	7
Feb. 11-19	6,167	10	7.5	88.5	10	.08	9.6	4.0	1.4		42	5.5	1.5	.2	.8	55	40	6
Feb. 20-28	3,609	2	6.0	95.8	10	.08	12	4.5	.5		48	5.3	1.6	.2	1.7	63	48	9
Mar. 1-10	3,198	2	6.1	90.7	9.6	.08	12	5.1	--		44	4.8	1.6	.1	1.5	58	51	15
Mar. 11-20	3,434	2	6.2	93.4	11	.07	12	5.1	--		47	5.5	1.9	.1	1.6	62	51	12
Mar. 21-31	5,617	3	6.3	84.2	11	.10	11	4.5	--		43	4.7	1.4	.1	1.0	56	46	11
Apr. 1-10	3,655	5	7.5	87.0	8.5	.09	8.8	4.0	3.5		46	4.7	1.8	.0	1.2	54	38	1
Apr. 11-20	3,206	6	7.6	89.7	9.0	.10	9.1	4.2	2.5		45	4.7	1.8	.0	1.3	56	40	3
Apr. 21-30	2,543	5	7.5	92.9	7.1	.08	9.7	4.2	3.5		48	5.6	1.9	.0	1.4	56	41	2
May 1-10	3,815	6	7.5	91.8	8.4	.13	9.8	4.2	3.0		47	5.6	1.8	.1	1.4	57	42	3
May 11-20	5,639	8	7.6	92.4	7.6	.11	9.6	4.4	2.1		46	5.4	1.5	.1	1.3	57	42	4
May 21-31	5,810	25	7.3	88.8	11	.14	9.5	4.2	2.2		46	5.0	1.1	.1	1.3	58	41	3

KANAWHA RIVER BASIN--Continued

NEW RIVER AT RADFORD, VA.--Continued

Chemical analyses, in parts per million, water year October 1949 to September 1950--Continued

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																	Total	Noncarbonate
June 1-10, 1950	5,767	27	7.4	83.3	11	0.17	8.8	3.9	2.1		43	4.4	1.1	0.1	1.2	55	38	3
June 11-20	3,412	29	7.4	87.0	11	.21	9.2	4.0	2.1		44	5.2	.9	.1	1.3	57	39	3
June 21-30	3,686	23	7.3	86.1	10	.18	9.3	3.9	2.5		45	4.6	1.2	.1	1.3	55	39	2
July 1-10	3,292	25	7.4	84.6	10	.13	9.1	4.0	2.1		44	4.8	1.2	.1	1.0	55	39	3
July 11-20	3,298	5	--	96.1	8.8	.12	9.6	4.4	2.0		46	6.1	1.0	.1	.8	59	42	4
July 21-31	4,242	8	--	95.8	9.6	.15	10	4.1	2.9		44	9.1	1.2	.1	1.1	60	42	6
Aug. 1-10	2,625	5	7.7	92.9	9.7	.04	10	4.4	4.2		52	5.9	1.6	.1	1.2	60	43	0
Aug. 11-20	2,171	3	7.6	90.0	9.5	.02	9.9	4.4	2.9		49	5.5	1.4	.1	1.1	58	43	3
Aug. 21-31	3,587	4	8.0	95.2	9.5	.03	11	4.2	3.0		52	5.2	1.4	.1	1.2	61	45	2
Sept. 1-10	4,418	5	7.6	90.2	9.4	.08	10	4.2	2.8		48	5.5	1.4	.1	1.2	58	42	3
Sept. 11-20	4,194	8	7.3	81.0	9.8	.13	8.9	3.6	2.4		41	5.0	1.4	.2	1.2	55	37	3
Sept. 21-30	4,084	--	--	--	--	--	--	--	--		--	--	--	--	--	--	--	--
Average	4,084	10	--	87.4	10	0.10	9.6	4.1	2.4		44	5.5	1.6	0.1	0.9	57	41	5

KANAWHA RIVER BASIN--Continued

NEW RIVER AT RADFORD, VA.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	62	59	46	45	52	46	50	60	66	74	76	74
2	63	54	47	--	52	46	54	60	68	74	76	--
3	64	55	46	48	52	45	54	62	70	74	76	76
4	64	55	43	44	50	46	54	63	70	75	75	76
5	63	54	44	46	50	45	56	64	70	75	74	74
6	64	55	43	50	50	47	52	64	70	74	74	72
7	64	58	44	51	50	48	53	64	71	--	74	72
8	65	58	43	48	50	48	54	64	71	75	74	72
9	65	59	41	45	--	48	52	66	71	75	76	70
10	65	53	41	48	50	48	54	65	72	75	76	70
11	--	51	42	46	52	48	54	64	72	76	76	70
12	--	53	42	45	50	48	56	63	71	76	75	70
13	--	53	46	46	53	48	52	63	72	76	75	70
14	--	53	46	48	52	49	40	62	72	75	75	70
15	--	52	45	49	52	49	52	62	74	--	75	68
16	--	52	41	49	50	46	54	65	72	--	74	68
17	--	53	43	48	52	48	54	66	74	76	75	68
18	--	50	44	48	48	48	54	65	74	78	77	68
19	--	50	46	48	48	48	54	62	74	76	77	68
20	--	51	44	46	49	47	56	66	74	77	77	68
21	62	48	46	46	48	50	56	66	74	76	76	--
22	64	48	45	48	50	47	54	66	74	76	76	--
23	62	48	45	48	48	46	59	66	74	76	77	--
24	62	47	44	48	45	46	60	67	74	76	74	--
25	61	46	47	49	46	49	58	66	74	74	74	--
26	60	46	44	42	44	50	48	66	74	74	74	--
27	61	47	46	50	47	49	49	70	74	74	76	--
28	62	46	46	50	45	52	50	70	74	74	76	--
29	60	43	46	50	--	52	60	70	75	74	76	--
30	61	44	43	--	--	50	60	71	75	76	75	--
31	60	--	48	50	--	50	--	68	--	76	75	--
Average	--	51	44	48	49	48	55	65	72	75	75	--

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KANAWHA RIVER BASIN--Continued

NEW RIVER AT EGGLESTON, VA.

LOCATION.--At gaging station at highway bridge at Egglsston, Giles County, 2 miles downstream from Spruce Run.
DRAINAGE AREA.--2,941 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1950.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Oxygen consumed		Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
			Unfiltered	Filtered																Total	Noncarbonate
Oct. 3, 1949	2,840	--			5	6.6	118	6.6	0.02	13	5.3	2.3		58	6.9	2.0	0.1	1.9	70	54	7
Nov. 18	3,500	--			10	7.4	122	7.6	.04	14	5.3	3.3		64	7.8	1.9	.1	.5	73	57	4
Dec. 17	2,930	38			5	6.8	103	8.3	.04	11	4.6	2.6		49	7.4	2.4	.1	.7	62	46	6
Jan. 9, 1950	3,890	--			8	7.0	122	8.4	.04	13	5.4	1.1		55	7.9	2.1	.1	.8	69	55	10
Feb. 21	4,500	40			5	7.5	118	12	.10	14	5.4	1.0		59	6.2	1.9	.1	2.0	77	57	9
Mar. 30	7,070	47			4	7.1	106	8.3	.02	13	5.0	.7		55	5.7	1.7	.1	1.2	67	53	8
Apr. 20	3,020	45			3	7.2	102	8.1	.05	12	5.0	1.0		51	6.2	1.9	.1	1.8	67	50	9
May 24	3,560	64			7	7.5	111	9.5	.02	13	5.4	2.0		58	7.5	1.5	.1	1.5	70	55	7
June 28	2,660	72			4	7.9	106	7.6	.05	12	5.0	2.4		54	6.7	1.5	.1	2.7	71	51	6
July 24	2,210	75			3	7.9	118	9.6	.01	14	6.0	1.5		63	7.7	1.2	.1	1.7	73	60	8
Aug. 18	2,080	76			6	7.9	113	8.9	.01	14	5.9	2.8		62	11	1.5	.0	1.2	70	59	8
Sept. 25	2,800	62			0	7.7	109	8.9	.01	13	5.3	3.2		60	8.0	1.9	.0	1.1	68	54	5

NEW RIVER AT GLENLYN, VA.

LOCATION.--At gaging station at highway bridge and power plant at Glenlyn, Giles County, a third of a mile upstream from East River.
DRAINAGE AREA.--3,768 square miles.
RECORDS AVAILABLE.--Chemical analyses: April 1930 to March 1931, October 1949 to September 1950.
EXTREMES, 1930-31.--Dissolved solids: Maximum, 94 ppm Oct. 21-31; minimum, 58 ppm Mar. 21-31.
Hardness: Maximum, 80 ppm July 11-20, 21-31; minimum, 42 ppm Dec. 11-20.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
Oct. 4, 1949	3,860	--	8	6.5	113	7.1	0.02	13	5.1	0.9		55	6.8	1.8	0.0	0.8	67	53	8
Nov. 17	3,990	--	10	7.4	140	8.0	.06	16	6.4	2.6		74	7.1	2.2	.1	.7	81	66	6
Dec. 17	5,350	--	5	7.7	111	7.9	.06	14	4.5	1.4		57	7.0	1.6	.0	.4	67	53	7
Jan. 14, 1950	5,040	42	10	7.4	116	7.8	.04	13	5.0	2.1		56	7.6	2.1	.1	.6	67	53	7
Feb. 21	5,760	42	8	7.2	121	7.7	.05	14	5.7	2.8		61	8.3	2.8	.1	2.0	72	58	8
Mar. 30	9,290	46	3	7.0	97.4	8.4	.05	12	4.5	.6		48	6.1	1.6	.1	2.0	61	48	9
Apr. 20	3,490	46	3	7.1	123	8.2	.02	16	5.5	1.7		65	7.9	2.1	.1	1.8	78	62	9
May 23	4,830	66	9	7.2	119	9.1	.03	14	5.2	2.1		62	7.0	1.2	.0	1.5	70	56	6
June 28	4,150	73	6	7.9	118	6.2	.03	14	5.8	1.7		61	7.5	1.8	.1	2.5	79	59	9
July 24	2,570	74	3	8.4	129	12	.01	15	6.1	3.1		69	9.6	1.0	.1	1.4	79	63	6
Aug. 16	2,640	74	0	8.2	126	7.7	.01	16	6.4	3.3		72	10	1.9	.1	1.2	80	66	7
Sept. 25	2,630	62	2	7.4	129	6.8	.04	15	6.7	1.9		68	10	1.5	.1	.8	74	65	9

KANAWHA RIVER BASIN--Continued

CHESTNUT CREEK AT GALAX, VA.

LOCATION.--At gaging station in Grayson County, 400 feet upstream from bridge on State Highway 89, 0.6 mile south of Galax, Carroll County, and 1.7 miles downstream from Wards Mill Branch.
DRAINAGE AREA.--39 square miles.
RECORDS AVAILABLE.--Chemical analyses: January to September 1950.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, January to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
Jan. 16, 1950	58	48	12	6.8	29.1	--	--	2.6	1.1	1.1		11	2.1	1.2	0.0	0.5	25	11	2
Feb. 14	165	48	25	7.6	33.5	8.7	0.17	3.2	1.5	1.6		15	2.8	1.2	.1	.5	29	14	2
Mar. 11	49	40	8	6.4	26.3	--	--	2.6	.9	1.5		12	1.8	1.0	.0	.4	25	10	0
Apr. 21	43	48	6	7.3	28.9	11	.10	2.4	1.0	2.6		15	1.3	.9	.1	.6	26	10	0
May 9	43	59	9	7.6	33.6	9.7	.10	2.8	1.9	2.1		18	2.8	1.0	.0	.3	30	15	0
June 26	49	72	7	--	30.6	10	.13	3.0	2.3	.6		15	3.1	1.2	.1	.6	28	17	4
July 19	41	78	4	7.2	31.7	11	.08	2.8	1.4	2.8		18	2.1	.8	.1	.5	28	13	0
Aug. 9	43	65	2	7.0	29.8	4.9	.06	2.6	1.6	1.7		16	2.1	.8	.0	.5	27	13	0
Sept. 19	55	63	3	7.8	29.6	7.8	.08	2.2	1.7	2.3		16	2.2	.9	.1	.6	28	12	0

MISCELLANEOUS ANALYSES OF STREAMS IN KANAWHA RIVER BASIN

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
REED CREEK AT GRAHAMS FORGE, VA.																			
Jan. 11, 1950	219	--	--	7.7	271	4.9	0.03	36	14	0.5		162	9.3	2.4	0.1	2.8	151	147	15
Apr. 20	170	56	5	7.9	274	4.8	.06	35	15	1.6		168	10	1.8	.1	2.0	147	149	11
July 28	1,520	67	20	7.3	150	8.3	.18	20	6.4	5.9		94	6.9	1.2	.0	3.7	99	76	0
Sept. 12	190	68	5	8.1	274	14	.01	39	15	2.7		178	12	2.9	.1	2.7	159	159	13
BIG REED ISLAND CREEK NEAR ALLISONIA, VA.																			
Jan. 11, 1950	382	42	12	6.3	31.7	9.8	0.02	2.6	1.2	2.1		15	1.7	1.1	0.1	0.2	26	11	0
Mar. 30	434	45	13	7.4	33.2	--	--	3.1	1.2	1.9		14	3.1	1.2	.1	.3	31	13	1
July 2	308	72	5	7.1	35.0	8.4	.07	3.4	1.8	1.6		18	2.7	.9	.1	.5	30	16	1
Sept. 25	216	52	35	6.8	37.3	--	.09	3.5	1.6	2.0		19	1.8	1.4	.0	.4	32	15	0
LITTLE RIVER AT GRAYSONTON, VA.																			
Jan. 11, 1950	327	--	--	7.5	47.1	12	0.02	4.3	2.1	2.1		23	3.1	1.2	0.0	0.4	37	19	1
Apr. 20	273	56	9	7.4	49.0	11	.03	4.8	2.4	2.2		25	3.9	1.0	.1	.6	38	22	1
July 2	273	73	5	6.5	53.2	12	.02	5.4	2.7	2.3		28	4.0	1.2	.1	.7	40	25	2
Sept. 25	261	56	25	6.8	53.2	--	.18	5.0	2.5	2.0		26	2.9	1.5	.1	.7	33	23	2
WALKER CREEK AT BANE, VA.																			
Jan. 11, 1950	221	42	5	7.5	172	4.1	0.04	22	8.3	0.9		103	4.2	1.2	0.0	0.6	92	89	5
Apr. 20	152	40	6	7.6	192	5.1	.02	25	9.4	1.2		117	5.7	.8	.0	1.0	104	101	5
July 24	104	74	4	7.7	177	6.3	.01	25	9.0	.9		115	4.4	1.0	.0	1.5	106	99	5
Sept. 25	200	60	10	8.1	159	6.5	.04	22	7.5	2.4		102	4.7	1.0	.1	1.1	95	86	2
WOLF CREEK NEAR NARROWS, VA.																			
Jan. 10, 1950	182	--	--	7.7	138	5.4	0.03	20	4.8	1.4		80	4.6	0.9	0.0	1.4	78	70	4
Apr. 20	160	46	5	7.9	135	6.3	.02	20	4.3	2.0		78	5.1	1.0	.1	1.2	80	67	4
July 24	102	68	4	7.6	159	5.8	.01	23	6.9	1.9		99	4.7	1.4	.0	2.4	96	86	5
Sept. 25	90	59	4	7.8	176	3.6	.02	26	7.4	.9		108	6.0	.8	.1	1.3	102	95	7
KANAWHA RIVER AT POINT PLEASANT, W. VA.																			
Sept. 18-23, 1950	26,200		8	7.6	180	7.5	0.04	18	5.6	6.4	2.0	50	30	11	0.1	1.1	115	68	27
Sept. 24-29	14,200		7	7.4	103	6.8	.04	8.8	3.9	2.8	2.0	24	19	7.5	.1	1.2	69	38	18

BIG SANDY RIVER BASIN

BIG SANDY RIVER AT LOUISA, KY.

LOCATION.--At gaging station at Louisa, Lawrence County, 400 feet downstream from lower lock wall at lock and dam 3, and 0.8 mile downstream from confluence of Levisa and Tug Forks.
DRAINAGE AREA.--3,870 square miles.
RECORDS AVAILABLE.--Chemical analyses: September 1949 to September 1950.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, September 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
Sept. 16, 1949	200		5	7.8	374	5.8	0.03	25	11	33		76	75	27	0.2	0.1	225	108	45
Oct. 27	520		5	7.7	359	6.0	.02	27	12	29		73	86	20	.1	1.6	223	117	57
Dec. 2	6,860		11	7.6	112	7.2	.10	8.4	3.8	5.7		16	26	5.2	.2	1.2	70	37	23
Jan. 5, 1950	7,240		9	7.4	154	5.0	.04	12	5.0	10		28	40	4.5	.3	1.9	98	50	28
Feb. 16	6,980		3	7.2	165	7.4	.05	12	5.9	9.3		24	44	5.4	.1	1.5	100	54	35
Mar. 23	8,020		2	7.9	192	5.6	.02	13	6.3	14		23	53	9.5	.1	.9	115	58	40
May 5	8,760		5	7.1	147	5.6	.16	10	4.9	10		24	38	4.9	.2	1.2	88	45	25
June 8	3,190		3	8.0	319	7.6	.10	23	11	23		69	83	6.5	.1	1.3	190	103	46
July 16	1,400		5	7.7	389	6.7	.05	28	13	32		84	108	7.4	.2	1.2	246	123	54
Aug. 16	876		5	8.0	390	6.2	.05	27	12	36		80	95	20	.1	1.3	239	117	51
Sept. 27	3,190		6	7.2	170	8.7	.08	12	5.1	14		36	33	11	.2	1.7	106	51	21

LEVISA FORK NEAR GRUNDY, VA.

LOCATION.--At gaging station at wooden bridge to Appalachian Electric Power Co.'s substation, 2 miles northwest of Grundy, Buchanan County, 2½ miles upstream from Poplar Creek, and 2½ miles downstream from Slate Creek.
DRAINAGE AREA.--235 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1950.
Water temperatures: October 1949 to September 1950.
EXTREMES, 1949-50.--Dissolved solids: Maximum, 300 ppm Oct. 1-10; minimum, 79 ppm Jan. 11-20.
Hardness: Maximum, 181 ppm Oct. 1-10; minimum, 43 ppm Jan. 11-20.
Water temperatures: Maximum, 82°F Aug. 26-28; minimum, 34°F Mar. 2-4.
REMARKS.--Records of specific conductance of daily samples available in district office at Charlottesville, Va. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (°F)	Color	pH	Specific conductance (micromhos at 25° C)	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	Hardness as $CaCO_3$		Total acidity as H_2SO_4
																				Calcium, magnesium	Noncarbonate	
Oct. 1-10, 1949...	24.0		5	5.7	443	8.6		0.03	0.60	38	21	9.6	3.4	5	180	11	0.2	0.4	300	181	177	--
Oct. 11-20	50.1		5	6.7	369	8.2		.03	.40	33	18	8.0	3.2	10	149	10	.1	.6	252	156	148	--
Oct. 21-31.....	164		5	6.4	248	7.7		.03	--	22	12	7.0	2.6	10	96	7.5	.1	1.9	169	104	96	--
Nov. 1-10	300		5	6.1	192	7.5		.02	.28	15	8.8	5.0		4	69	4.8	.0	3.2	130	74	70	--
Nov. 11-20	54.2		14	6.1	280	8.0		.02	.56	24	14	6.3		5	109	8.0	.1	2.4	195	117	113	--
Nov. 21-30	355		10	6.1	198	7.6		.03	.32	16	9.1	5.5		5	72	5.5	.1	2.6	133	77	73	--
Dec. 1-10	170		8	6.0	198	7.7		.02	.38	16	9.3	4.9		3	74	5.0	.1	2.5	134	78	76	--
Dec. 11-20	750		8	5.9	140	8.4		.03	.18	11	6.2	4.3		4	50	3.0	.1	3.0	95	53	50	--
Dec. 21-31	503		8	5.7	149	7.7		.01	.30	12	6.6	5.8		3	58	3.5	.0	2.4	101	57	55	--
Jan. 1-10, 1950...	206		5	5.6	203	8.4		.01	.40	17	9.0	7.5		3	82	4.0	.1	2.2	138	79	77	--
Jan. 11-20	964		7	5.9	118	8.7		.02	--	9.4	4.8	4.4		3	44	2.0	.0	2.2	79	43	41	--
Jan. 21-31	1,097		8	5.7	165	8.5		.01	.30	14	7.2	5.5		3	66	2.5	.0	2.2	112	65	62	--
Feb. 1-10	2,059		5	4.8	242	8.9		.01	.50	20	11	7.5		0	102	2.2	.1	2.5	164	95	95	24
Feb. 11-19	380		2	4.4	222	9.2		.04	.30	18	10	6.9		0	94	3.0	--	.8	154	86	86	20
Feb. 20-28	145		3	4.1	272	10		.04	.40	27	12	2.0		0	117	2.5	--	.7	191	117	117	32
Mar. 1-10.....	177		2	4.4	189	7.8		.05	.25	18	--	--		0	73	4.5	--	.7	128	--	--	--
Mar. 11-20.....	390		3	4.7	157	7.8		.04	.15	14	--	--		2	61	2.5	.1	.8	107	--	--	--
Mar. 21-31.....	625		2	4.9	130	8.1		.05	.05	12	--	--		4	48	2.0	.1	.8	91	--	--	--
Apr. 1-10	406		3	5.1	164	8.2		.03	.10	15	7.6	1.8		3	64	2.0	.1	.7	116	69	66	--
Apr. 11-20	174		3	6.0	221	8.7		.02	.40	18	9.6	8.0		2	91	3.2	.0	1.2	155	84	83	--
Apr. 21-30	128		4	6.1	160	8.5		.02	.20	19	9.9	7.3		4	91	3.5	.1	1.0	160	88	85	--
May 1-10.....	391		4	6.6	140	9.1		.02	.05	11	5.6	5.6		8	50	2.2	.1	.8	95	50	44	--
May 11-20	1,073		6	6.5	150	9.8		.05	.20	12	6.2	4.7		5	55	2.0	.1	1.6	104	55	51	--
May 21-31	240		5	6.1	238	9.7		.02	.40	20	10	7.9		2	97	3.0	.1	1.3	166	91	89	--

BIG SANDY RIVER BASIN--Continued

LEVISA FORK NEAR GRUNDY, VA.--Continued

Chemical analyses, in parts per million, water year October 1949 to September 1950--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	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	Hardness as $CaCO_3$		Total acidity as H_2SO_4
																				Calcium, magnesium	Noncarbonate	
June 1-10, 1950...	166		4	6.5	233	9.4		0.02	0.30	19	10	7.5		5	91	3.5	0.1	1.0	159	88	84	--
June 11-20	110		5	6.6	281	9.7		.02	.10	25	12	8.6		7	113	4.5	.1	.6	191	112	106	--
June 21-30	442		5	--	190	9.0		.06	--	15	7.7	6.9		8	68	3.6	.1	1.5	125	69	62	--
July 1-10.....	86.1		5	--	315	9.2		.04	--	27	12	20		6	142	4.6	.1	.8	238	117	112	--
July 11-19	55.6		5	--	356	7.8		.14	--	30	16	4.1		9	127	6.5	.2	.8	215	141	134	--
July 20-31	504		8	--	175	8.5		.08	--	14	6.8	4.9		7	60	3.0	.0	1.4	114	63	57	--
Aug. 1-10	76.6		5	6.3	323	9.0		.03	.30	27	17	3.0		3	127	5.0	.1	.7	217	136	134	--
Aug. 11-20	317		7	6.0	242	9.0		.06	--	20	11	4.2		5	90	3.2	.1	.8	158	94	90	--
Aug. 21-31	85.4		5	6.1	309	8.9		.04	.10	26	14	5.4		4	119	4.8	.1	.8	201	123	120	--
Sept. 1-10.....	137		3	6.5	190	7.2		.04	--	16	9.1	3.2		4	73	3.0	.1	.8	114	77	74	--
Sept. 11-20.....	78.2		5	6.3	288	9.0		.03	--	24	13	13		8	120	5.8	.1	.6	216	112	105	--
Sept. 21-30.....	272		5	6.3	206	9.4		.05	.20	17	8.2	6.7		12	71	4.2	.1	.8	140	76	66	--
Average.....	368		5	--	225	8.4		0.04	--	19	10	6.6		5	89	4.2	0.1	1.4	154	92	88	--

BIG SANDY RIVER BASIN--Continued

LEVISA FORK NEAR GRUNDY, VA.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	--	64	42	--	50	38	50	68	72	--	--	--
2	--	64	48	46	52	34	50	68	--	78	76	--
3	68	56	44	45	50	34	54	70	68	80	78	--
4	70	48	46	47	--	34	56	66	68	78	79	78
5	70	42	42	50	52	38	52	68	64	76	76	74
6	72	--	42	50	52	40	50	68	68	79	74	72
7	72	48	42	--	50	44	50	66	70	--	76	70
8	--	49	44	48	50	--	50	68	72	--	76	--
9	72	49	40	46	50	44	52	68	74	76	78	--
10	72	--	--	48	49	48	52	70	74	76	76	68
11	74	48	--	48	51	48	54	69	72	78	--	72
12	74	49	50	50	52	50	50	66	72	76	80	71
13	70	52	54	49	--	50	48	64	73	76	78	70
14	--	52	54	52	52	48	46	66	74	74	79	72
15	72	45	48	52	--	50	46	62	74	78	74	68
16	--	42	46	50	46	50	--	62	74	78	73	68
17	--	40	42	48	42	50	48	64	75	78	78	70
18	72	40	--	--	42	48	52	65	76	76	78	72
19	70	--	42	46	42	52	58	64	78	80	80	72
20	68	46	--	44	42	52	56	68	75	74	80	74
21	68	40	42	44	42	52	54	68	72	--	78	74
22	68	--	46	43	42	52	52	66	70	76	77	70
23	--	40	44	47	--	50	53	68	70	78	80	70
24	68	47	--	50	44	52	56	66	--	79	81	68
25	--	46	44	52	38	54	62	68	75	78	78	64
26	68	46	--	54	40	54	56	70	78	72	82	62
27	68	--	50	50	38	54	80	70	78	72	82	64
28	66	45	49	48	44	52	68	70	80	74	82	62
29	66	--	48	46	--	50	70	72	--	72	79	62
30	--	48	44	43	--	48	70	72	78	79	78	64
31	66	--	44	48	--	48	--	70	--	80	76	--
Average	--	48	45	48	46	47	54	67	73	77	78	69

LEVISA FORK AT PAINTSVILLE, KY.

LOCATION.--At gaging station at bridge on State Highway 40 at Paintsville, Johnson County, 700 feet downstream from Paint Creek.
DREAINAGE AREA.--2,143 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1950.
Water temperatures: October to September 1950.
EXTREMES,1949-50.--Dissolved solids: Maximum, 257 ppm Oct. 11-20; minimum, 78 ppm Jan. 11-20.
Hardness: Maximum, 112 ppm Oct. 11-20; minimum, 42 ppm Feb. 11-20, Mar. 21-31.
Water temperatures: Maximum, 83°F July 19, 20; minimum, 38°F Dec. 6, 16, 17.
REMARKS.--Daily water temperatures reported in the table are averages of twice-daily measurements. The data reported under "Extremes" are the individual maximum and minimum measurements. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
Oct. 1-10, 1949	239		5	7.4	352	3.2	0.05	26	11	26	3.4	68	88	18	0.2	0.6	215	110	54
Oct. 11-20	558		8	7.4	445	3.4	.08	25	12	46		65	85	48	.3	.6	257	112	58
Oct. 21-31	1,242		15	7.3	225	6.2	.08	18	7.2	14		45	47	13	.1	1.1	134	74	38
Nov. 1-10	3,367		6	7.3	136	8.5	.09	10	5.5	10		25	31	10	.2	2.7	91	48	27
Nov. 11-20	543		8	7.3	221	7.3	.18	16	7.3	19		44	49	16	.1	1.6	140	70	34
Nov. 21-30	1,522		12	7.4	249	8.9	.27	16	7.3	21		44	54	15	.1	1.6	150	70	34
Dec. 1-10	1,832		6	7.9	144	6.0	.13	11	4.5	11		28	33	7.0	.2	1.8	91	46	23
Dec. 11-20	7,216		7	8.0	141	5.5	.13	9.7	4.9	9.4	3.3	24	34	6.5	.2	2.7	89	44	25
Dec. 21-31	3,552		5	7.9	149	5.5	.09	10	5.2	10		23	38	6.0	.2	2.1	91	46	28
Jan. 1-10, 1950	3,802		6	7.9	151	6.0	.10	11	5.1	8.4	2.3	24	38	7.5	.2	1.7	94	48	29
Jan. 11-20	9,976		5	7.7	127	6.6	.06	13	6.2	2.2		27	31	4.5	.3	1.6	78	58	36
Jan. 21-31	7,394		5	7.8	138	8.2	.05	10	4.9	11		23	42	4.0	.1	1.8	92	45	26
Feb. 1-10	22,660		5	7.7	146	8.6	.04	11	5.0	5.2		20	35	3.2	.1	2.0	86	48	32
Feb. 11-20	3,936		4	7.8	174	6.8	.04	9.8	4.3	15		22	48	3.8	.2	2.0	106	42	24
Feb. 21-28	1,381		3	7.8	243	9.5	.12	17	8.3	15	3.1	39	65	8.6	.1	1.4	152	77	45
Mar. 1-10	1,291		2	7.9	257	13	.14	17	8.3	16	6.0	41	67	10.0	.1	1.7	159	77	43
Mar. 11-20	3,575		4	7.9	184	13	.13	12	6.3	11	4.1	33	45	7.2	.1	.8	114	56	29
Mar. 21-31	5,018		4	7.9	139	9.9	.04	9.2	4.6	7.7	3.9	24	35	4.8	.1	.6	85	42	22
Apr. 1-10	3,126		3	7.8	154	8.1	.05	10	5.5	8.5	3.8	25	41	4.9	.1	.7	92	48	27
Apr. 11-20	1,463		4	7.4	188	8.0	.07	14	6.5	13		34	47	8.2	.1	.8	117	62	34
Apr. 21-30	891		2	8.3	266	7.0	.04	16	8.2	23		43	66	14	.1	.8	162	74	38
May 1-10	2,616		3	8.1	176	8.5	.06	12	5.8	14		33	43	7.6	.3	1.0	109	54	27
May 11-20	8,923		4	8.1	129	9.1	.03	10	4.5	7.8		26	30	4.4	.3	1.0	81	43	22
May 21-31	2,579		4	7.9	217	8.6	.06	15	7.3	16		39	57	7.2	.1	1.7	132	67	36

June 1-10	2,846		5	7.8	191	8.6	.08	14	6.2	13	36	47	6.2	.1	.9	117	60	31
June 11-20	1,828		3	7.9	247	9.3	.02	17	7.7	19	48	58	10	.4	1.6	148	74	35
June 21-30	3,830		9	7.7	163	9.5	.14	9.6	4.7	15	35	36	5.5	.3	2.0	99	43	15
July 1-10	680		4	7.8	264	9.1	.06	13	7.9	32	52	66	15	.3	.8	168	65	22
July 11-20	690		5	7.9	292	7.6	.07	16	8.4	29	55	69	14	.4	.6	172	74	29
July 21-31	4,496		5	7.8	170	12	.04	12	5.4	13	39	37	5.9	.1	1.9	103	52	20
Aug. 1-10	780		4	7.6	244	14	.04	18	7.2	19	53	53	12	.1	1.3	149	74	31
Aug. 11-20	865		4	7.8	289	8.7	.02	19	8.5	26	52	69	16	.1	1.0	174	82	40
Aug. 21-31	507		4	7.5	257	8.7	.14	18	7.7	20	46	59	14	.1	1.5	155	77	39
Sept. 1-10	2,136		7	7.6	213	9.5	.14	16	7.1	16	43	50	10	.1	1.6	131	69	34
Sept. 11-20	1,615		6	7.8	248	10	.20	17	7.6	20	55	50	14	.1	1.2	148	74	29
Sept. 21-30	4,274		6	7.6	159	8.4	.09	12	5.4	10	36	33	6.2	.1	1.7	100	52	23
Average	3,429		5	--	208	8.4	0.09	14	6.7	16	38	49	10	0.2	1.4	127	62	31

BIG SANDY RIVER BASIN--Continued

LEVISA FORK AT PAINTSVILLE, KY.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	62	57	46	44	52	42	48	67	67	76	78	76
2	64	56	46	45	50	40	46	68	68	77	78	76
3	65	52	44	46	50	40	48	66	70	78	76	76
4	88	52	46	49	48	40	51	66	70	80	76	75
5	66	50	41	47	46	42	54	68	68	79	77	74
6	70	49	39	48	44	42	52	69	70	78	76	72
7	72	49	42	47	45	44	50	68	71	78	78	70
8	74	49	41	46	47	44	50	67	72	79	78	70
9	77	50	40	44	48	42	52	68	75	79	78	71
10	76	48	42	46	48	42	52	70	74	80	78	72
11	74	50	42	46	46	46	56	70	73	80	79	76
12	72	54	46	46	47	48	56	68	72	79	78	75
13	70	54	46	47	48	48	54	67	72	78	75	74
14	70	52	46	47	52	44	52	62	72	78	78	74
15	69	50	42	48	49	46	48	62	74	78	78	73
16	67	48	40	46	48	44	50	62	75	77	79	74
17	68	46	38	46	47	44	50	62	77	78	79	72
18	68	46	42	46	45	46	56	66	78	80	76	72
19	70	46	42	44	46	46	56	67	75	81	77	72
20	87	48	43	44	42	48	55	66	76	82	76	71
21	88	46	46	43	42	49	54	66	76	77	76	72
22	68	44	48	44	43	48	55	68	70	76	76	70
23	68	45	48	46	42	48	58	66	73	76	76	70
24	63	44	42	48	44	50	62	68	74	76	77	66
25	60	44	40	51	43	50	65	68	77	76	78	64
26	60	44	42	52	42	52	63	70	78	76	79	64
27	58	44	44	52	40	55	62	71	78	72	80	64
28	59	42	43	48	42	55	65	72	78	72	78	66
29	82	46	42	50	--	54	68	71	78	72	79	65
30	60	45	42	50	--	50	68	71	78	76	79	65
31	60	--	40	50	--	52	--	70	--	77	78	--
Average	67	48	43	47	46	46	55	67	74	77	78	71

RUSSELL FORK AT HAYSI, VA.

LOCATION.--At gaging station 180 feet downstream from highway bridge at Haysi, Dickenson County, and 700 feet downstream from McClure River.
DRAINAGE AREA.--286 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to August 1950.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, October 1949 to August 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
Oct. 4, 1949	16	--	20	7.1	250	4.1	0.04	21	10	15		51	76	3.4	0.1	0.2	160	94	52
Nov. 8	174	--	20	7.5	66.3	6.7	.15	5.5	2.4	3.8		18	14	1.6	.0	.3	44	24	9
Dec. 6	156	34	20	7.1	51.5	6.9	.12	5.7	2.1	2.4		17	11	1.5	.1	.3	38	23	9
Jan. 5, 1950	178	48	8	6.8	71.7	6.6	.06	5.0	2.6	4.7		18	15	1.6	.1	.3	44	23	8
Feb. 16	287	42	20	7.0	50.4	7.2	.15	4.4	2.1	2.3		12	12	1.2	.1	.4	37	20	10
Mar. 25	287	53	8	7.5	53.5	6.8	.12	4.3	2.0	2.6		,12	12	1.0	.1	.7	38	19	9
Apr. 24	88	59	6	7.2	102	4.0	.04	7.1	3.9	7.9		29	24	1.2	.1	.3	62	34	10
May 13	2,520	70	37	7.8	41.8	8.0	.10	4.0	1.5	1.1		8	8.9	.6	.2	1.7	35	16	10
June 28	104	78	--	7.7	63.0	6.5	.10	6.9	3.3	12		48	15	1.5	.0	.6	56	31	0
July 10	30	76	10	7.6	79.8	7.9	.02	6.7	3.3	4.9		28	14	1.6	.1	.6	50	30	7
Aug. 2	56	78	9	7.3	59.6	6.5	.14	5.7	2.9	3.3		25	10	1.2	.1	.5	41	26	6

BIG SANDY RIVER BASIN--Continued

POUND RIVER NEAR HAYSI, VA.

LOCATION.--At gaging station a quarter of a mile downstream from Cranesnest River, half a mile upstream from Twin Branch, and 5 miles west of Haysi, Dickenson County.
DRAINAGE AREA.--212 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to August 1950.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, October 1949 to August 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
Oct. 4, 1949	21	--	20	7.0	248	3.5	0.06	20	8.6	19		79	54	4.0	0.1	0.1	150	85	20
Nov. 8	210	--	10	7.3	94.2	6.1	.16	6.8	3.1	4.1		23	16	1.8	.1	.4	54	30	12
Dec. 6	178	--	25	6.8	100	7.8	.11	7.0	3.8	6.3		25	22	1.9	.1	.5	65	33	13
Jan. 5, 1950	229	52	4	7.0	126	13	.04	9.0	4.2	6.8		34	27	1.8	.1	.1	74	40	12
Feb. 16	335	42	15	7.2	98.3	8.3	.12	8.3	3.6	7.1		27	25	1.6	.1	.3	67	36	13
Mar. 25	418	52	7	7.0	66.7	7.9	.07	5.0	2.4	3.9		16	15	1.1	.1	.5	45	22	9
Apr. 24	126	64	8	7.2	113	5.6	.03	7.1	3.5	9.8		29	19	6.6	.1	.4	69	32	8
May 12	4,230	57	25	6.0	46.1	8.0	.04	3.8	1.7	2.6		10	10	1.0	.1	2.4	39	16	8
June 28	113	82	22	--	123	7.7	.33	9.7	5.1	8.6		38	24	3.6	.1	2.8	82	45	14
July 11	25	76	11	7.6	196	12	.01	14	6.3	17		66	35	4.1	.2	1.8	119	61	7
Aug. 2	53	76	5	6.9	139	6.5	.04	12	5.2	10		47	27	4.0	.1	.7	84	51	13
Sept. 7	63	64	10	8.4	140	4.3	.11	12	5.5	9.2		48	26	3.8	.1	.6	88	53	13

MISCELLANEOUS ANALYSES OF STREAMS IN BIG SANDY RIVER BASIN IN KENTUCKY

Chemical analyses, in parts per million, September 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Non-carbonate
LEVISA FORK AT PIKEVILLE																			
Sept. 16, 1949.....	67		7	7.4	229	3.8	0.06	16	8.2	19		58	53	7.8	0.1	0.1	138	74	26
Feb. 14, 1950.....	2,390		5	7.6	153	7.8	.09	12	5.7	9.5		24	47	2.6	.2	1.5	97	53	34
JOHNS CREEK NEAR VAN LEAR																			
Oct. 26, 1949	22		10	7.4	167	6.7	0.03	12	5.1	14		43	17	19	0.2	1.6	102	51	16
Feb. 15, 1950.....	350		5	7.3	73.3	7.6	.05	5.8	2.6	4.8		20	12	2.6	.1	3.5	48	25	9
BLAINE CREEK AT YATESVILLE																			
Oct. 27, 1949	2.9		15	7.2	221	4.2	0.06	14	5.8	20		49	4.6	40	0.2	0.2	127	59	19
Feb. 16, 1950.....	232		9	7.4	135	7.6	.18	7.2	3.3	14		18	13	24	.1	.7	81	32	17
May 3	123		3	7.8	137	7.6	.05	7.5	3.7	13		22	16	19	.0	.0	81	34	16

LITTLE SANDY RIVER BASIN

MISCELLANEOUS ANALYSES OF STREAMS IN LITTLE SANDY RIVER BASIN IN KENTUCKY

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
LITTLE SANDY RIVER NEAR GRAYSON																			
Nov. 8, 1949	42		12	7.3	193	6.1	0.10	19	5.7	10		54	23	16	0.2	1.5	113	71	27
Jan. 31, 1950	11,700		16	7.3	46.8	4.9	.06	4.0	1.6	3.4		12	10	1.9	.2	.6	35	17	7

TYGARTS CREEK BASIN

MISCELLANEOUS ANALYSES OF STREAMS IN TYGARTS CREEK BASIN IN KENTUCKY

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
TYGARTS CREEK NEAR GREENUP																			
Nov. 8, 1949	17		10	7.7	309	4.0	0.04	48	6.9	7.2		154	22	10	0.2	0.1	179	148	22
Jan. 31, 1950	5,060		17	7.6	88.6	5.2	.12	12	2.3	3.5		38	12	1.6	.2	.7	60	39	8

SCIOTO RIVER BASIN

OLENTANGY RIVER AT DELAWARE, OHIO

LOCATION.--At Stone Mill Bridge, three-quarters of a mile north of Delaware, Delaware County, and 3 miles downstream from gaging station near Delaware.
DRAINAGE AREA.--387 square miles (above gaging station).
RECORDS AVAILABLE.--Water temperatures: June 1946 to September 1950.
EXTREMES, 1949-50.--Water temperatures: Maximum, 84°F June 26; minimum, 33°F on many days in November, December, February, and March.
EXTREMES, 1946-50.--Water temperatures: Maximum, 88°F Aug. 27, 1948; minimum, freezing point on many days during winter months of 1946-47, 1947-48, 1948-49.
REMARKS.--Discharge records for gaging station near Delaware for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Temperature (°F) of water, water year October 1949 to September 1950

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

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SCIOTO RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN SCIOTO RIVER BASIN IN OHIO

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
SCIOTO RIVER AT PORTSMOUTH																			
Sept. 18-20, 1950	1,140		11	7.7	562	6.1	0.05	63	23	20	4.4	234	75	20	0.7	2.0	340	249	57
Sept. 21-24.....	8,860		22	7.4	432	7.5	.28	32	9.7	38	3.4	106	39	53	.6	.3	248	120	33
Sept. 25-29.....	2,320		17	7.3	424	9.2	.06	51	16	7.6	3.0	184	55	10	.6	5.2	256	194	43

LICKING RIVER BASIN

LICKING RIVER AT FARMERS, KY.

LOCATION.--At gaging station at bridge on U. S. Highway 60, 300 feet upstream from Chesapeake & Ohio Railway bridge, three-quarters of a mile west of Farmers, Rowan County, and 1.1 miles upstream from Triplett Creek.
DRAINAGE AREA.--826 square miles.
RECORDS AVAILABLE.--Chemical analyses: September 1949 to August 1950.
Water temperatures: October 1949 to September 1950.
EXTREMES, 1949-50.--Water temperatures: Maximum, 78°F Aug. 17; minimum, freezing point Dec. 24.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, September 1949 to August 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
Sept. 15, 1949 ...	--	--	5	7.7	130	4.4	0.07	14	3.7	6.4		58	6.6	6.6	0.1	0.1	75	50	3
Oct. 12	22	70	17	7.5	146	4.3	.12	16	4.5	5.6	3.1	62	6.8	9.2	.1	.1	86	58	8
Nov. 6	169	50	12	7.8	144	7.4	.16	12	4.5	9.7		34	17	15	.2	2.7	91	48	21
Dec. 13	7,560	--	20	6.8	82.3	5.6	.09	7.8	2.3	4.3		20	12	4.5	.4	2.3	56	29	12
Jan. 23, 1950	1,650	--	2	7.5	81.6	5.9	.06	8.1	2.6	4.7		24	12	5.0	.4	1.2	50	31	11
Feb. 27.....	845	--	5	7.1	80.9	6.4	.05	7.6	2.6	4.9		28	11	3.5	.2	.4	48	30	7
Apr. 3.....	1,140	--	8	8.0	73.3	6.8	.08	7.0	2.4	3.9		22	12	3.2	.1	.6	49	27	9
May 9	352	--	8	7.3	109	6.0	.25	10	3.0	6.4		40	13	6.1	.2	.1	67	37	4
June 14	980	--	5	7.2	79.4	8.1	.13	7.8	3.4	2.5		29	10	2.5	.2	.8	55	33	10
July 21	3,240	--	9	8.0	69.8	8.6	.02	3.6	1.3	10		27	8.9	2.2	.3	1.0	51	14	0
Aug. 23	155	--	10	7.5	114	8.1	.12	13	3.7	6.8		54	9.3	5.2	.1	1.0	71	48	3

LICKING RIVER BASIN--Continued

LICKING RIVER AT FARMERS, KY.--Continued

Temperature (°F) of water, water year October 1949 to September 1950
(Mean of twice-daily measurements at approximately 7 a. m. and 4 p. m.)

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	58	54	41	40	44	39	46	62	66	72	72	72
2	60	52	42	42	46	36	46	61	64	72	72	72
3	60	50	38	47	44	36	49	62	65	73	70	72
4	62	48	42	50	43	36	52	64	64	73	70	71
5	63	50	38	45	42	38	50	68	64	70	70	70
6	66	48	38	48	42	40	46	67	64	68	70	68
7	68	52	42	44	45	44	46	66	66	68	70	66
8	68	45	40	44	44	44	46	65	66	69	70	66
9	70	50	34	46	48	41	46	66	68	70	71	66
10	70	48	38	45	46	38	50	66	68	70	72	66
11	70	52	40	44	44	42	52	66	68	72	73	67
12	69	54	46	44	45	44	52	64	66	72	72	68
13	66	53	47	46	46	44	49	62	66	72	72	68
14	64	51	44	46	49	44	47	--	68	72	72	68
15	64	50	42	48	47	42	48	--	70	71	74	68
16	62	44	40	44	46	42	48	--	71	72	74	66
17	63	45	38	44	43	42	50	--	72	72	76	66
18	64	44	40	45	42	42	52	--	72	72	75	68
19	64	44	41	44	42	43	52	--	69	74	74	67
20	64	46	40	41	40	44	52	--	68	74	72	68
21	64	44	44	44	40	45	52	66	68	70	70	66
22	62	42	48	42	44	46	54	66	67	69	70	67
23	60	40	44	44	42	45	58	66	69	70	70	66
24	58	42	36	46	42	46	60	66	71	70	71	64
25	57	41	41	52	41	46	60	66	72	72	72	62
26	56	42	40	53	36	50	60	67	74	70	72	59
27	54	40	42	50	38	52	59	68	75	67	74	60
28	57	40	40	46	38	53	60	68	74	68	74	60
29	59	44	40	48	--	50	62	68	73	70	73	61
30	54	41	40	46	--	48	62	68	71	71	72	63
31	56	--	38	44	--	46	--	68	--	71	72	--
Average	62	47	41	46	43	43	52	--	69	71	72	66

LICKING RIVER BASIN--Continued

LICKING RIVER AT BUTLER, KY.

LOCATION.--At bridge on old U. S. Highway 27 at Butler, Pendleton County, 0.3 mile downstream from Lick Creek, 4.4 miles upstream from Grassy Creek, and 12.8 miles downstream from gaging station at Catawba.
DRAINAGE AREA.--3,330 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1950.
Water temperatures: October 1949 to September 1950.
EXTREMES, 1949-50.--Dissolved solids: Maximum, 160 ppm May 1-10; minimum, 78 ppm Feb. 1-10.
Hardness: Maximum, 127 ppm May 11-20; minimum, 54 ppm Feb. 1-10.
Water temperatures: Maximum, 78°F July 19-20, Aug. 18; minimum, 32°F Mar. 2-4.
REMARKS.--Discharge records for gaging station at Catawba for water year October 1949 to September 1950 given in Water-Supply Paper 1173. Some inflow between gaging station and sampling station.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (°F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
Oct. 1-10, 1949	40.8		8	7.6	252	3.2	0.04	39	5.7	3.8	2.1	134	15	3.5	0.2	0.5	150	121	11
Oct. 11-20	33.3		9	7.5	249	2.5	.09	40	5.9	3.1		132	15	4.2	.3	.5	145	124	16
Oct. 21-31	71.5		7	7.7	253	2.0	.04	40	6.3	3.3		136	14	4.2	.3	.1	148	126	14
Nov. 1-10	392		7	7.7	207	4.3	.04	26	6.3	16		112	14	12	.2	2.7	139	91	0
Nov. 11-20	206		22	7.7	186	6.0	.21	26	5.5	5.5		87	13	9.0	.3	1.3	123	87	16
Nov. 21-30	814		15	7.6	215	4.2	.03	25	5.0	8.1	2.3	78	18	16	.2	2.1	133	83	19
Dec. 1-10	932		9	7.6	200	5.0	.02	28	5.2	3.3	3.1	89	19	6.0	.2	5.0	125	91	18
Dec. 11-20	17,870		13	7.6	176	3.5	.02	25	4.1	3.3	1.8	78	17	3.5	.3	5.8	114	79	15
Dec. 21-31	3,785		7	7.6	234	4.9	.07	35	5.3	4.4	1.1	108	21	4.0	.2	5.7	149	109	21
Jan. 1-10, 1950	32,180		15	7.7	180	3.3	.06	28	4.1	5.5	.9	94	15	2.5	.2	4.9	116	87	10
Jan. 11-20	28,480		11	7.4	151	5.0	.06	22	4.5	2.2		70	13	2.5	.2	4.0	94	73	16
Jan. 21-31	13,760		10	7.7	189	6.0	.04	29	4.1	4.3		90	17	2.2	.2	4.2	114	89	15
Feb. 1-10	33,980		11	7.7	126	4.6	.06	18	2.1	5.6		60	11	1.8	.2	2.6	78	54	4
Feb. 11-20	9,653		12	7.9	211	5.6	.06	31	6.0	3.7		104	17	2.2	.3	4.1	127	102	17
Feb. 21-28	5,194		10	8.0	232	5.0	.05	36	5.6	5.0		114	21	3.0	.3	4.1	141	113	19
Mar. 1-10	2,107		4	7.4	268	6.4	.06	40	6.3	6.0		125	27	3.6	.1	3.4	158	126	23
Mar. 11-20	9,895		5	7.9	199	8.0	.05	30	5.5	2.6		94	18	2.5	.2	4.1	122	97	20
Mar. 21-31	6,742		12	7.5	209	6.2	.03	33	5.5	2.9		104	19	2.8	.2	2.3	133	105	20
Apr. 1-10	8,006		8	8.1	202	6.4	.05	32	5.0	2.1		98	17	2.5	.1	4.0	129	100	20
Apr. 11-20	1,951		5	7.8	242	6.6	.05	37	6.7	2.1		116	23	3.0	.2	.9	149	120	25
Apr. 21-30	964		3	8.0	250	4.4	.05	37	8.2	1.3		116	27	3.5	.1	.5	155	126	31
May 1-10	4,398		17	7.9	241	5.4	.04	37	6.5	1.8		114	22	3.5	.3	1.9	160	119	26
May 11-20	4,275		7	8.4	261	6.5	.04	41	6.1	3.1		a 132	18	3.2	.2	2.5	156	127	19
May 21-31	2,943		7	8.3	206	6.1	.04	30	4.8	5.1		97	19	2.8	.2	2.4	122	95	15

a Includes equivalent of 6 parts per million of carbonate (CO_3).

June 1-10	8,334		14	8.1	182	7.0	.03	26	4.8	3.7	85	16	2.2	.2	3.4	112	85	15
June 11-20	10,360		7	7.9	186	8.3	.03	20	3.9	13	87	15	2.5	.3	2.8	109	66	0
June 21-30	19,790		7	7.7	187	9.5	.07	27	4.2	4.1	85	14	4.5	.2	3.0	114	85	15
July 1-10	3,069		6	8.1	212	10	.07	30	5.3	5.8	104	17	2.5	.1	3.1	127	97	11
July 11-20	1,276		6	8.2	203	11	.10	29	5.1	6.0	100	17	3.0	.2	2.2	122	93	11
July 21-31	6,101		8	7.9	172	9.5	.05	23	4.1	7.1	82	13	4.5	.2	2.4	104	74	7
Aug. 1-10	2,301		7	7.6	189	9.3	.05	27	4.6	4.9	96	13	2.8	.2	.1	113	86	8
Aug. 11-20	346		9	7.6	199	8.6	.03	31	5.2	5.8	110	15	3.5	.1	.6	124	99	9
Aug. 21-31	334		6	7.7	218	6.3	.04	32	4.9	6.4	116	12	4.0	.1	.6	128	100	5
Sept. 1-10	2,794		9	7.9	217	12	.02	29	5.7	6.0	110	12	3.5	.2	1.0	128	96	6
Sept. 11-20	3,957		15	7.6	194	10	.03	30	4.8	5.5	106	12	3.0	.2	3.0	124	95	8
Sept. 21-30	15,680		19	7.9	152	7.5	.03	22	3.7	3.2	76	9.9	1.9	.1	1.8	93	70	8
Average	7,270		10	--	207	6.4	0.05	30	5.2	5.1	101	17	3.9	0.2	2.6	127	96	14

LICKING RIVER BASIN--Continued

LICKING RIVER AT BUTLER, KY.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	58	46	44	42	44	38	49	62	67	74	72	73
2	57	46	42	44	44	32	48	60	67	74	73	72
3	60	48	34	46	40	32	50	57	66	75	72	76
4	63	48	40	52	40	32	54	60	65	77	70	74
5	64	47	38	46	40	37	50	65	68	76	74	71
6	65	45	34	45	44	38	47	66	65	75	74	65
7	64	45	40	44	48	42	46	63	65	74	73	68
8	66	45	38	44	44	45	47	62	66	--	73	68
9	68	46	36	44	47	38	46	62	68	70	74	67
10	69	46	35	50	46	38	48	64	70	75	74	67
11	70	50	40	45	46	42	54	62	68	76	74	68
12	71	54	45	45	47	44	49	61	68	75	73	67
13	60	55	48	46	45	42	47	56	68	77	73	67
14	60	55	46	46	48	42	45	60	70	76	72	67
15	58	48	44	46	48	43	45	60	70	74	75	67
16	60	47	40	44	46	44	46	64	72	75	76	65
17	64	47	38	46	43	42	48	65	74	76	77	65
18	66	44	44	46	42	44	52	64	70	77	78	66
19	64	44	44	49	42	42	46	65	72	78	76	68
20	64	45	46	42	40	44	52	65	68	78	74	68
21	60	44	42	40	38	44	51	64	68	74	70	66
22	66	40	48	48	42	46	51	66	70	72	70	66
23	54	40	44	44	41	45	58	65	70	73	70	67
24	58	42	38	50	43	45	66	67	72	73	72	65
25	52	40	40	48	41	46	63	66	74	72	73	63
26	54	40	44	52	35	47	57	70	74	74	72	62
27	52	38	44	48	35	54	58	74	74	74	74	62
28	58	36	42	45	37	54	57	68	74	77	75	62
29	54	42	40	46	--	52	58	66	74	70	76	62
30	54	42	40	46	--	48	64	66	74	69	71	64
31	54	--	38	47	--	47	--	68	--	72	73	--
Average	61	45	41	46	43	43	52	64	69	74	73	67

LICKING RIVER BASIN--Continued

SOUTH FORK LICKING RIVER AT CYNTHIANA, KY.

LOCATION.--At gaging station at bridge on State Highways 32 and 36 at Cynthiana, Harrison County, in pool formed by old mill dam 2.6 miles downstream, 0.4 mile downstream from Grays Run, and 48 miles upstream from mouth.
DRAINAGE AREA.--615 square miles.
RECORDS AVAILABLE.--Water temperatures: October 1949 to September 1950.
EXTREMES, 1949-50.--Water temperatures: Maximum, 80°F July 20; minimum, 35°F Mar. 3.

Temperature (°F) of water, water year October 1949 to September 1950
(Mean of twice-daily measurements at approximately 6:30 a. m. and 6 p. m.)

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	60	52	44	45	43	39	48	62	68	76	76	76
2	62	50	42	45	44	36	50	60	69	76	76	76
3	62	48	42	48	43	36	53	64	69	75	74	76
4	63	48	42	49	43	38	52	66	66	76	72	75
5	64	46	40	44	43	40	51	68	66	75	74	72
6	66	47	38	42	47	42	48	66	66	74	73	68
7	66	47	40	40	48	46	47	65	68	74	74	68
8	68	50	39	38	46	44	50	62	70	74	74	68
9	64	50	38	42	48	42	50	64	72	74	74	67
10	70	52	41	44	47	44	54	65	72	74	74	68
11	72	54	46	42	47	46	55	62	72	76	76	68
12	69	56	52	44	48	47	52	60	71	78	76	68
13	66	56	48	47	49	46	49	60	69	77	76	68
14	64	54	46	46	50	43	46	61	69	76	76	68
15	64	50	43	46	50	44	48	63	70	76	76	68
16	64	48	40	44	46	44	50	66	72	76	76	67
17	64	46	40	44	42	45	52	67	71	76	76	68
18	64	45	43	46	42	46	56	66	72	78	78	68
19	65	46	46	44	42	46	56	68	71	78	76	69
20	66	48	48	41	41	46	54	68	70	79	74	71
21	66	45	50	41	42	47	52	68	70	76	70	72
22	64	42	50	46	42	47	54	68	70	74	68	70
23	61	42	42	50	42	44	60	70	71	74	67	68
24	58	44	42	49	42	49	63	70	73	76	72	63
25	56	42	42	50	40	51	64	72	75	76	72	60
26	56	40	46	49	38	52	62	73	77	74	74	60
27	55	41	48	49	38	52	62	73	77	70	74	61
28	56	42	44	48	40	54	63	74	76	70	75	62
29	57	44	44	49	--	52	63	73	76	71	76	65
30	58	46	44	48	--	49	64	72	76	73	75	66
31	55	--	44	47	--	48	--	69	--	74	74	--
Average	63	47	44	45	44	45	54	67	71	75	74	68

LICKING RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN LICKING RIVER BASIN IN KENTUCKY

Chemical analyses, in parts per million, September 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
LICKING RIVER AT McKINNEYSBURG																			
Sept. 15, 1949.....	29		8	8.0	222	4.3	0.03	34	5.2	4.1		118	13	3.0	0.2	0.1	131	106	10
Jan. 31, 1950	23,800		11	7.7	130	4.2	.02	19	3.0	4.7		64	11	1.8	.6	2.4	81	60	7
LICKING RIVER AT COVINGTON																			
Sept. 18-20, 1949...	1,300		8	7.8	460	5.8	0.05	43	11	24	3.2	53	112	32	0.2	7.8	285	153	110
Sept. 21-23.....	15,900		13	7.9	301	5.4	.05	32	7.1	14	2.8	52	70	17	.2	2.5	187	109	66
Sept. 24-29.....	19,200		9	7.5	245	7.7	.12	26	5.6	10	3.2	53	55	12	.2	2.5	153	88	53
SOUTH FORK LICKING RIVER AT CYNTHIANA																			
Sept. 14, 1949.....	9.2		14	7.6	330	4.4	0.03	54	5.6	8.5		182	18	5.2	0.3	0.1	202	158	9
Jan. 31, 1950	14,500		8	7.7	155	2.4	.10	27	2.3	1.8		76	9.7	1.8	.4	5.8	94	77	14

NORTH FORK KENTUCKY RIVER AT HAZARD, KY.

LOCATION.--At gaging station at Woodland Park Bridge at Hazard, Perry County, 150 feet upstream from City Waterworks dam, and 4.0 miles upstream from Lots Creek.
DRAINAGE AREA.--465 square miles.
RECORDS AVAILABLE.--Chemical analyses: November 1949 to August 1950.
Water temperatures: October 1949 to September 1950.
EXTREMES, 1949-50.--Water temperatures: Maximum, 84°F June 18, July 13, 19, 20, Aug. 1; minimum, 35°F Dec. 16.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, August 1949 to August 1950

Date of collection	Mean discharge (second-feet)	Temperature (°F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
Aug. 16, 1949 ...	2,090		6	7.4	290	13	0.05	24	10	18		47	88	5.8	0.2	1.0	181	101	62
Nov. 3	794		6	7.8	166	8.9	.02	14	6.9	8.3		20	53	4.8	.1	3.5	108	63	47
Dec. 8	207		23	8.0	249	7.6	.08	21	10	11		32	80	4.5	.1	2.5	161	94	67
Jan. 12, 1950	1,160		4	7.8	155	5.6	.06	13	5.8	7.9		21	48	3.2	.2	1.5	96	56	39
Feb. 23	410		3	7.5	303	8.0	.04	25	14	22		43	119	3.8	.2	2.4	218	120	85
Mar. 29	1,840		3	8.0	115	7.8	.02	8.7	4.3	6.1		16	35	1.5	.1	1.0	71	39	26
May 8	989		9	7.1	175	6.8	.21	15	7.3	7.8		30	53	2.2	.2	1.2	111	67	43
June 14	120		3	7.4	327	5.6	.08	26	13	17		44	107	5.2	.2	1.1	219	118	82
July 19	135		4	7.7	309	8.0	.05	25	12	16		38	103	4.8	.2	2.3	201	112	81
Aug. 23	53		4	7.5	313	4.0	.10	26	13	16		60	89	6.8	.1	2.2	197	118	69

KENTUCKY RIVER BASIN--Continued

NORTH FORK KENTUCKY RIVER AT HAZARD, KY.--Continued

Temperature (°F) of water, water year October 1949 to September 1950
/Mean of twice-daily measurements at approximately 7 a. m. and 5 p. m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	--	56	47	41	52	42	46	66	70	75	80	76
2	--	52	45	44	53	40	49	64	70	80	78	76
3	--	52	43	48	50	39	48	63	72	78	76	76
4	--	50	41	52	45	40	49	65	70	79	72	74
5	--	50	40	54	44	42	47	68	70	78	72	72
6	--	48	41	54	46	46	46	68	67	76	73	74
7	--	48	44	50	48	50	47	64	68	76	74	74
8	--	49	41	44	49	50	49	66	72	76	76	75
9	--	48	40	43	50	44	52	66	74	76	76	74
10	--	50	41	46	50	46	58	67	73	80	78	74
11	--	50	44	49	49	49	61	68	73	80	79	75
12	--	52	50	47	49	46	59	66	72	80	76	75
13	--	52	50	50	50	49	54	59	74	81	76	73
14	68	54	48	52	54	46	47	59	75	77	80	72
15	66	52	44	49	54	46	45	59	76	73	79	69
16	66	50	38	50	46	47	48	62	76	76	78	70
17	65	50	38	46	42	46	52	64	78	77	80	69
18	66	46	41	48	42	46	56	66	80	79	78	70
19	65	46	47	48	42	47	57	66	79	80	78	72
20	66	47	49	44	42	48	58	66	76	81	78	74
21	65	48	50	44	42	50	56	67	68	76	75	74
22	67	46	49	46	46	52	54	68	68	74	76	71
23	64	46	46	48	46	48	57	67	70	75	76	69
24	62	43	40	54	45	47	63	68	74	75	78	66
25	60	44	40	56	45	51	63	69	76	76	80	65
26	60	44	42	58	42	54	63	70	78	76	78	64
27	60	43	45	53	41	58	64	72	77	74	78	66
28	58	46	50	48	42	55	66	73	72	74	79	67
29	58	50	44	52	--	50	68	72	75	74	79	67
30	60	50	42	52	--	47	68	71	76	76	78	67
31	60	--	39	51	--	46	--	70	--	79	76	--
Average	--	49	44	49	47	47	55	66	73	77	77	71

KENTUCKY RIVER AT LOCK 4, AT FRANKFORT, KY.

LOCATION.--At gaging station at Broadway Street Highway bridge, at Frankfort, Franklin County, 300 feet upstream from Benson Creek, and 0.9 mile upstream from lock 4.
DRAINAGE AREA.--5,430 square miles, including that of Benson Creek.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1950.
Water temperatures: October 1949 to September 1950.
EXTREMES, 1949-50.--Dissolved solids: Maximum, 224 ppm Nov. 21-30; minimum, 78 ppm May 21-31.
Hardness: Maximum, 121 ppm Nov. 21-31; minimum, 55 ppm May 21-31.
Water temperatures: Maximum, 78°F Aug. 16-18, Sept. 2; minimum, 42°F, Mar. 3, 4, 8, 9.
REMARKS.--Daily water temperatures reported in the table are averages of twice-daily measurements. The data reported under extremes are the individual maximum and minimum measurements. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, August 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (°F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Non-carbonate
Aug. 17, 1949 a	2,020		6	8.0	261	7.2	0.02	31	6.2	12		93	30	15	0.1	0.7	154	103	27
Oct. 1-10	602		5	7.5	216	.4	.02	30	5.8	5.7	2.2	96	20	7.0	.3	1.7	125	99	20
Oct. 11-20	692		5	7.6	217	.2	.04	32	6.1	3.1		102	18	4.8	.3	2.1	124	105	21
Oct. 21-31	930		6	7.6	222	.5	.06	33	6.0	3.9		108	17	4.8	.3	2.1	126	107	18
Nov. 1-10	3,529		2	7.7	212	5.3	.12	24	6.9	10		78	26	12	.2	2.0	127	88	24
Nov. 11-20	1,014		2	7.6	293	5.8	.04	25	7.3	23		65	27	42	.2	1.8	166	92	39
Nov. 21-30	1,410		5	7.5	376	4.6	.04	33	9.3	26		80	43	46	.2	1.8	224	121	55
Dec. 1-10	2,625		11	7.5	237	5.9	.14	24	6.7	12		64	37	14	.4	2.2	138	87	35
Dec. 11-20	24,360		10	7.7	175	10	.07	21	4.3	7.3		64	19	7.0	.3	3.9	107	70	18
Dec. 21-31	8,441		9	7.8	194	4.9	.10	24	5.2	7.0		74	22	6.5	.2	4.0	120	81	21
Jan. 1-10, 1950	37,770		7	7.3	170	5.4	.06	24	4.1	3.4		70	17	4.2	.2	3.2	104	77	19
Jan. 11-20	40,960		6	7.5	149	5.0	.04	20	3.6	3.3		60	15	3.0	.2	2.8	89	65	16
Jan. 21-31	23,920		5	7.9	149	5.6	.05	20	3.5	4.2		60	17	3.0	.2	2.3	90	64	15
Feb. 1-10	56,970		5	7.9	132	5.0	.06	18	3.4	2.7		52	16	2.5	.1	2.1	80	59	16
Feb. 11-20	16,960		6	8.0	144	5.2	.06	22	4.2	3.3		62	21	3.0	.2	2.3	99	72	21
Feb. 21-28	7,145		12	7.9	186	6.2	.21	25	5.3	3.2		76	20	4.4	.1	2.1	117	84	22
Mar. 1-10	3,836		2	8.2	207	4.4	.04	27	5.6	5.9		80	25	6.8	.2	1.8	126	90	25
Mar. 11-20	15,220		7	7.9	186	4.2	.10	24	4.9	6.6		75	22	5.9	.1	1.8	113	80	19
Mar. 21-31	11,500		7	7.9	169	4.4	.15	22	4.9	4.6		68	20	5.0	.0	2.0	104	75	19
Apr. 1-10	11,160		6	7.6	167	3.6	.10	22	4.5	4.9		69	19	4.4	.1	1.6	100	73	17
Apr. 11-20	3,841		4	8.1	184	7.9	.06	23	5.3	6.5		73	22	6.2	.1	2.0	110	79	19
Apr. 21-30	2,141		2	8.1	180	6.6	.06	23	5.4	5.9		70	24	5.9	.1	2.0	107	80	22
May 1-10	5,275		4	8.1	208	6.3	.06	26	5.6	8.3		84	25	8.2	.1	1.8	123	88	19
May 11-20	15,120		4	8.1	168	6.6	.07	19	5.0	6.7		56	24	7.3	.1	1.4	99	68	22
May 21-31	4,370		5	8.0	129	7.0	.04	15	4.2	4.2		44	20	3.9	.1	1.6	78	55	19

a Not included in average.

KENTUCKY RIVER BASIN--Continued

KENTUCKY RIVER AT LOCK 4, AT FRANKFORT, KY.--Continued

Chemical analyses, in parts per million, August 1949 to September 1950--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
June 1-10, 1950	12,990		7	8.0	173	6.5	0.06	21	5.1	6.0		66	20	6.5	0.2	2.2	104	73	19
June 11-20	7,672		12	8.0	168	8.4	.06	20	4.9	6.5		74	16	4.2	.2	.6	101	70	9
June 21-30	16,600		9	7.6	153	7.5	.08	19	4.2	5.2		62	17	3.4	.3	2.2	92	65	14
July 1-10	5,272		6	8.0	165	7.4	.03	21	4.3	5.4		70	15	3.9	.2	3.6	97	70	13
July 11-20	5,160		10	8.1	188	8.2	.12	24	4.9	5.9		84	14	4.8	.3	2.5	113	80	11
July 21-31	15,360		7	7.6	205	7.7	.10	27	5.0	8.1		90	17	7.5	.1	3.9	118	88	14
Aug. 1-10	3,971		16	7.8	179	9.0	.17	25	4.3	5.3		84	14	3.6	.2	3.3	107	80	11
Aug. 11-20	1,634		5	7.6	189	7.9	.03	26	4.7	5.3		89	14	4.0	.1	2.7	108	84	11
Aug. 21-31	1,615		8	7.9	192	7.4	.03	27	4.7	5.2		91	14	4.6	.1	2.6	109	87	12
Sept. 1-10	9,218		7	8.0	196	8.2	.03	23	5.0	9.0		73	21	9.9	.1	2.0	113	78	18
Sept. 11-20	3,399		8	8.0	167	9.2	.03	22	4.5	6.1		82	12	3.5	.1	2.3	98	73	6
Sept. 21-30	4,954		9	8.0	218	7.4	.03	31	5.3	5.5		103	16	5.6	.1	2.3	126	99	15
Average	10,760		7	--	191	6.0	0.07	24	5.1	6.9		75	20	7.8	0.2	2.3	113	81	19

KENTUCKY RIVER BASIN--Continued

KENTUCKY RIVER AT LOCK 4, AT FRANKFORT, KY.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	68	59	47	46	46	44	52	59	70	73	72	77
2	68	58	46	46	46	43	52	59	70	72	72	78
3	67	56	46	46	46	42	54	60	69	74	70	77
4	67	56	46	46	46	42	54	62	68	74	70	76
5	68	57	46	47	48	44	52	63	68	74	70	74
6	66	56	46	47	49	45	51	64	68	74	70	74
7	69	58	46	46	48	45	50	63	68	75	70	72
8	70	57	44	48	48	42	52	63	68	74	71	70
9	69	56	44	48	48	43	52	64	68	74	70	70
10	70	57	44	48	46	44	52	64	68	74	72	70
11	70	57	46	46	47	44	52	64	66	75	74	70
12	68	56	46	47	47	44	51	64	68	76	74	70
13	68	57	47	48	49	44	51	64	68	76	75	70
14	68	57	47	47	49	45	50	66	68	76	76	70
15	68	57	47	49	48	46	50	68	70	76	76	69
16	68	56	46	48	46	46	52	68	72	76	77	69
17	68	54	46	48	46	46	53	64	72	74	78	69
18	68	53	46	47	46	46	54	64	72	72	78	69
19	68	52	46	46	47	46	54	66	72	72	77	69
20	68	52	48	46	46	46	52	66	72	72	76	--
21	68	50	49	46	46	47	54	65	72	74	75	--
22	68	50	48	46	46	47	55	65	71	75	76	--
23	66	50	46	46	46	48	58	67	72	75	74	--
24	64	50	46	48	46	48	58	68	72	75	74	--
25	64	50	46	50	44	49	58	69	73	74	74	--
26	64	48	46	48	44	50	58	70	74	75	76	--
27	62	48	45	46	44	50	58	71	72	72	76	--
28	62	48	45	47	44	51	56	72	73	72	76	68
29	62	50	44	48	--	50	58	72	72	72	--	68
30	62	48	44	48	--	50	60	72	72	72	--	68
31	60	--	44	46	--	51	--	70	--	72	76	--
Average	67	54	46	47	46	46	54	66	70	74	74	--

ELKHORN CREEK NEAR FRANKFORT, KY.

LOCATION.--At gaging station at Knights Bridge, 6 miles northeast of Frankfort, Franklin County, and 7.4 miles downstream from confluence of North and South Elkhorn Creeks.
DRAINAGE AREA.--463 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1950.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, August 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
Aug. 17, 1949	182	--	17	7.4	291	3.6	0.09	44	4.5	11		136	18	13	0.3	4.1	178	128	17
Oct. 10	24	75	15	8.2	457	.6	.02	61	6.9	22	6.9	199	28	26	.4	3.5	264	181	18
Nov. 14	23	--	17	8.2	546	.8	.04	66	8.4	39		a 218	33	44	.7	10	332	199	21
Dec. 20	2,400	53	10	8.1	300	5.2	.08	52	4.5	3.0		136	21	4.5	.2	18	184	148	37
Jan. 31, 1950	8,700	--	5	7.9	206	3.2	.05	36	2.9	3.4		100	14	2.6	.6	9.2	126	102	20
Mar. 9	276	--	5	8.2	330	2.6	.03	58	5.3	3.2		b 166	24	5.8	.2	4.6	199	166	42
Apr. 17	279	--	3	8.4	338	1.4	.03	57	4.7	7.6		c 169	21	6.2	.4	9.6	192	162	23
May 22	312	--	4	8.0	347	2.4	.09	60	5.2	5.6		178	21	6.0	.4	7.5	203	171	25
June 28	340	--	4	8.0	366	4.8	.04	64	5.0	8.5		200	19	4.8	.1	10	228	180	16
Aug. 8	154	75	7	8.5	382	3.6	.07	66	3.8	8.3		d 200	18	6.0	.2	7.6	217	180	16
Sept. 7	87	--	9	8.1	412	8.4	.04	63	5.7	16		194	23	18	.3	7.7	244	181	22

a Includes equivalent of 10 parts per million of carbonate (CO_3).
b Includes equivalent of 7 parts per million of carbonate (CO_3).
c Includes equivalent of 6 parts per million of carbonate (CO_3).
d Includes equivalent of 14 parts per million of carbonate (CO_3).

KENTUCKY RIVER BASIN--Continued

EAGLE CREEK AT GLENCOE, KY.

LOCATION.--At gaging station at bridge on State Highway 16 at Glencoe, Gallatin County, 5.6 miles downstream from Arnolds Creek and 20.4 miles upstream from mouth.
DRAINAGE AREA.--438 square miles.
RECORDS AVAILABLE.--Water temperatures: October 1949 to September 1950.
EXTREMES, 1949-50.--Water temperatures: Maximum, 87°F June 26; minimum, freezing point on several days in December, February, and March.

Temperature (°F) of water, water year October 1949 to September 1950
/Mean of twice-daily measurements at approximately 8 a. m. and 5 p. m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	--	52	42	42	42	37	50	60	70	80	78	76
2	--	46	40	49	45	33	49	63	68	82	78	72
3	--	50	36	50	42	34	53	68	69	83	74	72
4	--	46	42	52	37	36	51	64	64	82	73	70
5	--	44	40	44	38	38	47	67	64	81	76	62
6	--	44	34	--	43	42	46	66	66	82	80	68
7	--	48	40	42	43	46	44	63	70	82	77	64
8	--	48	38	38	44	44	48	62	73	80	78	64
9	--	48	32	42	46	36	46	63	75	79	77	60
10	--	52	36	48	48	44	51	62	75	80	77	64
11	--	56	42	46	46	42	53	63	75	80	76	64
12	--	58	43	46	44	44	50	60	74	82	78	60
13	--	58	42	48	46	42	46	62	72	81	75	61
14	--	54	44	50	50	46	42	62	72	81	76	65
15	--	52	38	47	48	49	46	64	77	80	76	64
16	--	47	36	45	42	44	50	64	78	81	79	63
17	--	46	34	44	40	44	51	68	76	80	80	64
18	--	44	40	44	44	43	56	70	72	80	77	63
19	--	44	41	36	42	42	64	70	70	80	77	70
20	--	46	44	38	42	42	52	72	68	76	74	70
21	--	44	48	40	38	46	54	68	72	76	74	70
22	--	38	49	42	42	45	56	69	72	74	74	72
23	--	40	44	45	46	44	66	68	74	76	74	66
24	59	40	42	46	43	46	64	70	76	76	76	63
25	57	40	47	57	36	46	64	72	78	78	76	62
26	56	47	42	54	40	52	62	75	80	74	74	64
27	54	40	46	48	35	58	60	76	82	78	76	68
28	52	40	42	46	38	54	60	74	77	80	74	66
29	56	42	45	48	--	50	62	72	78	80	76	70
30	54	42	40	47	--	48	62	71	74	80	75	72
31	52	--	38	41	--	48	--	70	--	78	73	--
Average	--	47	41	44	43	44	54	67	73	79	76	66

KENTUCKY RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN KENTUCKY RIVER BASIN IN KENTUCKY

Chemical analyses, in parts per million, August 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micro-mhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Non-carbonate
NORTH FORK KENTUCKY RIVER AT JACKSON																			
Aug. 16, 1949	82		7	7.9	276	10	0.04	22	9.9	19		49	80	9.0	0.2	0.3	180	96	55
Feb. 21, 1950	1,010		5	7.4	223	7.6	.03	18	10	13		19	90	2.0	.2	1.8	158	86	70
KENTUCKY RIVER AT LOCK 14, AT HEIDELBERG																			
Aug. 16, 1949	198		5	7.9	251	12	0.02	19	6.8	19		43	37	30	0.1	0.0	156	75	40
Feb. 20, 1950	2,640		10	7.7	114	3.0	.02	9.4	5.0	7.4		18	38	3.0	.2	1.2	79	44	29
KENTUCKY RIVER AT LOCK 10, NEAR WINCHESTER																			
Aug. 16, 1949	482		6	7.7	150	12	0.02	14	4.6	7.9		38	26	8.2	0.2	0.8	92	54	23
Feb. 1, 1950	59,000		7	7.9	84.8	4.7	.05	10	2.3	5.0		35	11	2.0	.5	1.2	53	34	6
KENTUCKY RIVER AT LOCK 8, NEAR CAMP NELSON																			
Aug. 17, 1949	665		7	7.7	209	11	0.05	22	6.0	9.8		59	37	9.0	0.2	0.8	125	80	31
Feb. 2, 1950	80,000		5	7.8	97.3	4.6	.04	13	2.3	4.1		42	11	1.5	.4	2.2	59	42	8
KENTUCKY RIVER AT LOCK 6, AT WARWICK																			
Aug. 17, 1949	1,770		7	7.9	224	9.1	0.04	30	5.3	6.5		92	21	9.0	0.2	0.4	132	97	21
Feb. 2, 1950	86,700		5	7.8	98.7	4.2	.02	13	2.8	4.3		44	11	2.2	.4	1.9	61	44	8
KENTUCKY RIVER AT LOCK 2, AT LOCKPORT																			
Aug. 17, 1949	2,620		7	8.0	334	9.0	0.02	37	6.9	19		100	35	30	0.1	0.2	203	121	39
Jan. 30, 1950	38,600		7	7.6	182	3.0	.06	27	4.5	4.7		85	16	3.8	.2	4.7	113	86	16
KENTUCKY RIVER AT CARROLLTON																			
Sept. 18, 1950	2,900		8	7.9	412	10	0.15	56	14	20		211	39	14	--	9.2	278	198	25
Sept. 19-23	5,280		15	6.0	170	7.1	.06	23	4.4	4.0	2.2	79	13	5	0.2	1.5	109	75	10
Sept. 24-29	5,850		15	7.9	220	7.5	.12	33	4.9	3.6	1.8	117	17	5.8	.2	2.5	135	102	6

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MIDDLE FORK KENTUCKY RIVER AT TALLEGA

Aug. 16, 1949.....	28		8	7.8	79.3	9.7	0.08	6.4	3.0	5.3	32	7.2	4.0	0.1	0.2	49	28	2
Feb. 21, 1950.....	471		4	7.7	57.2	6.0	.07	4.6	2.0	3.3	16	10	1.8	.1	.7	36	20	7

SOUTH FORK KENTUCKY RIVER AT BOONEVILLE

Aug. 16, 1949.....	73		7	7.6	120	9.6	0.02	8.3	3.4	10	34	11	12	0.1	0.1	72	35	7
Feb. 21, 1950.....	630		18	7.5	61.1	7.0	.04	4.8	2.3	4.9	16	12	3.9	.1	.9	43	21	8

RED RIVER AT CLAY CITY

Aug. 16, 1949.....	100		15	7.6	291	3.2	0.08	25	5.2	26	66	9.2	54	0.2	0.0	173	84	30
Feb. 1, 1950.....	13,900		10	7.6	57.3	3.7	.03	7.0	1.5	2.9	21	6.9	2.4	.6	.5	39	24	6

DIX RIVER NEAR DANVILLE

Aug. 17, 1949.....	630		20	7.5	167	3.5	0.02	22	5.8	4.1	94	7.1	1.5	0.3	0.5	100	79	2
Feb. 13, 1950.....	1,480		21	7.9	167	5.6	.13	23	5.7	2.1	82	11	2.0	.3	4.0	101	81	14

EAGLE CREEK AT SADIEVILLE

Aug. 17, 1949.....	46		40	7.3	228	4.0	0.09	36	4.4	5.0	118	17	2.6	0.2	0.3	157	108	11
Jan. 31, 1950.....	852		13	7.9	215	2.8	.02	40	3.2	1.4	119	13	1.2	.4	2.8	130	113	15

EAGLE CREEK AT GLENCOE

Aug. 17, 1949.....	130		23	7.3	158	3.1	0.05	26	2.4	3.3	83	10	1.8	0.3	0.1	102	75	7
Mar. 31, 1950.....	203		13	8.1	426	3.0	.06	69	13	4.6	205	58	3.8	.2	1.6	269	226	58

BEARGRASS CREEK BASIN

MISCELLANEOUS ANALYSES OF STREAMS IN BEARGRASS CREEK BASIN IN KENTUCKY

Chemical analyses, in parts per million, September 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
SOUTH FORK BEARGRASS CREEK AT LOUISVILLE																			
Sept. 19, 1949	1.1		6	8.0	482	6.8	0.05	76	11	11		247	33	11	0.1	7.8	308	235	32
Feb. 17, 1950	68		5	7.7	356	6.8	.04	51	10	6.6		162	26	7.0	.1	16	212	168	36

SALT RIVER BASIN

SALT RIVER AT SHEPHERDSVILLE, KY.

LOCATION.--At gaging station at bridge on State Highway 61 at Shepherdsville, Bullitt County, 700 feet downstream from Louisville & Nashville Railroad bridge, and 1 mile downstream from Buffalo Run.
DRAINAGE AREA.--1,230 square miles.
RECORDS AVAILABLE.--Chemical analyses: September 1949 to September 1950.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, September 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
Sept. 15, 1949	10	--	14	8.1	278	3.4	0.03	45	6.4	4.1		158	11	3.8	0.2	0.9	166	139	9
Oct. 17	28	67	15	7.7	352	2.4	.02	58	6.9	8.0	5.7	192	18	9.8	.3	2.0	209	173	16
Nov. 28	1,240	46	20	7.7	381	3.0	.04	62	10	5.4		217	17	7.8	.3	.3	224	196	18
Feb. 17, 1950	3,440	--	6	7.7	306	4.2	.03	49	8.2	2.4		163	18	2.2	.2	6.5	178	156	22
Mar. 20	1,380	--	5	8.1	386	3.0	.06	63	10	6.6		210	31	3.1	.2	4.2	227	198	26
Apr. 28	350	--	5	8.0	389	.6	.04	67	12	2.9		220	34	4.8	.1	.3	237	216	36
June 6	3,240	--	4	7.9	329	9.2	.07	54	8.5	.9		173	19	2.8	.2	6.8	213	170	28
July 5	168	--	8	7.8	426	4.4	.04	70	11	6.4		248	22	3.5	.1	3.1	249	220	17
Aug. 11	197	--	8	8.0	354	3.8	.08	56	8.7	3.1		196	15	2.0	.2	3.0	202	176	15
Sept. 15	706	--	20	7.9	318	6.8	.09	53	9.2	.9		178	19	2.8	.1	2.8	191	170	24

SALT RIVER BASIN--Continued

ROLLING FORK NEAR BOSTON, KY.

LOCATION.--At gaging station at bridge on U. S. Highway 62 and State Highway 61, three-eighths of a mile downstream from Beech Fork and 2½ miles southwest of Boston, Nelson County.
DRAINAGE AREA.--1,290 square miles.
RECORDS AVAILABLE.--Water temperatures: October 1949 to September 1950.
EXTREMES, 1949-50.--Water temperatures: Maximum, 87°F July 4; minimum, 39°F Mar. 2, 3.

Temperature (°F) of water, water year October 1949 to September 1950
/Mean of twice-daily measurement at approximately 8 a. m. and 4 p. m.; one measurement only on many days during January, February, and March/

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	56	57	53	44	46	40	50	62	73	80	74	76
2	58	56	54	44	45	39	50	60	72	80	75	76
3	60	54	53	48	46	39	--	62	70	78	74	73
4	60	58	52	--	46	41	--	62	68	82	74	75
5	62	59	52	41	46	44	--	64	69	78	74	74
6	66	50	52	--	46	45	48	62	70	77	74	70
7	66	53	53	--	46	46	51	62	70	77	74	69
8	65	54	52	--	46	40	50	64	72	76	76	70
9	69	54	50	--	46	44	50	65	72	77	74	69
10	72	58	53	48	47	44	50	64	71	78	74	70
11	74	60	57	46	46	43	49	64	70	77	74	71
12	72	59	--	48	47	42	54	64	70	77	74	72
13	67	62	--	47	46	40	50	61	70	77	74	70
14	66	60	--	49	--	40	50	62	68	78	76	70
15	66	60	--	47	45	40	50	62	70	78	76	70
16	66	60	--	45	44	42	52	64	68	78	76	70
17	66	57	--	46	--	44	52	64	69	78	78	70
18	66	54	56	46	--	44	55	64	68	78	76	70
19	66	56	56	44	45	41	55	67	68	76	74	71
20	68	56	57	44	44	44	52	66	68	76	75	72
21	68	53	62	45	44	44	55	66	70	78	72	72
22	65	56	50	46	44	44	56	68	72	78	73	70
23	64	58	47	46	44	47	55	70	70	74	72	70
24	62	56	48	47	46	47	60	72	72	74	74	70
25	60	54	54	46	46	48	62	74	72	76	73	65
26	60	53	47	47	40	48	62	74	77	73	73	64
27	60	54	46	46	40	57	64	73	80	74	73	66
28	58	57	46	46	43	54	61	74	80	72	76	64
29	60	56	45	46	--	54	60	76	78	74	76	66
30	62	55	45	46	--	50	64	72	78	74	74	66
31	58	--	46	45	--	50	--	72	--	76	74	--
Average	64	56	51	46	45	45	54	66	72	77	74	70

MISCELLANEOUS ANALYSES OF STREAMS IN SALT RIVER BASIN IN KENTUCKY

Chemical analyses, in parts per million, September 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
SALT RIVER NEAR VAN BUREN																			
Sept. 15, 1949	0.8		9	8.1	309	2.2	0.03	53	5.2	5.8		168	22	3.5	0.2	0.2	187	154	16
Feb. 13, 1950	1,440		20	7.9	253	3.6	.12	44	4.1	3.6		124	24	2.1	.4	4.9	155	127	25
ROLLING FORK NEAR BOSTON																			
Sept. 15, 1949	29		7	7.7	313	5.4	0.05	47	10	4.1		180	14	3.2	0.1	0.5	188	158	11
Feb. 16, 1950	7,370		20	8.0	199	5.6	.13	30	5.8	4.0		105	15	2.0	.3	2.6	199	99	13

GREEN RIVER BASIN

GREEN RIVER AT GREENSBURG, KY.

LOCATION.--At gaging station at bridge on State Highways 61 and 70, 300 feet upstream from Clover Lick Creek, a quarter of a mile south of Greensburg, Green County, and 2.6 miles upstream from Russell Creek.
DRAINAGE AREA.--742 square miles.
RECORDS AVAILABLE.--Water temperatures: October 1949 to September 1950.
EXTREMES, 1949-50.--Water temperatures: Maximum, 78°F June 19, 28, July 2, 3, 4; minimum, 37°F Dec. 17, Mar. 3.

Temperature (°F) of water, water year October 1949 to September 1950
/Mean of twice-daily measurements at approximately 7 a. m. and 5 p. m.;
One measurement only on many days during August and September/

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	61	54	44	44	45	42	50	64	69	74	73	73
2	62	53	44	46	46	40	50	62	68	76	73	74
3	63	52	42	50	44	38	54	62	68	76	72	73
4	66	50	42	53	44	41	56	65	66	78	71	73
5	65	50	40	50	42	43	52	66	66	75	71	65
6	67	47	40	47	48	44	49	68	66	75	71	65
7	68	48	42	46	47	48	48	64	67	72	72	66
8	69	48	42	44	48	48	50	63	68	74	72	65
9	70	48	40	44	50	44	52	66	71	72	74	68
10	70	48	40	48	48	44	56	67	72	73	74	68
11	71	51	46	48	42	44	58	68	71	75	74	71
12	70	52	51	47	46	47	57	65	70	75	75	70
13	67	55	50	49	49	48	54	65	73	76	74	68
14	67	54	46	50	52	45	50	63	69	74	--	66
15	66	51	42	51	50	44	46	68	68	75	--	67
16	64	46	39	50	46	45	50	65	70	74	--	65
17	68	48	38	46	44	46	53	66	73	75	--	67
18	64	46	43	47	42	46	56	67	74	75	--	68
19	65	44	46	46	44	48	57	67	76	77	--	66
20	65	48	48	42	43	48	54	68	72	76	--	70
21	66	44	49	42	44	48	54	68	71	73	--	69
22	66	42	50	44	45	48	59	68	72	72	--	69
23	62	42	47	52	44	48	61	70	72	73	--	70
24	61	45	42	--	44	50	63	72	74	73	70	65
25	59	42	42	--	44	52	65	73	76	74	70	64
26	60	40	43	--	42	54	62	77	--	74	72	64
27	56	41	46	--	40	57	62	74	--	70	73	65
28	57	44	46	--	42	56	62	73	77	72	74	64
29	58	46	46	49	--	53	63	73	76	72	75	65
30	58	46	42	46	--	50	64	72	74	72	75	65
31	57	--	42	44	--	48	--	72	--	74	72	--
Average	64	47	44	47	45	47	56	68	71	74	--	68

GREEN RIVER BASIN--Continued

GREEN RIVER AT MUNFORDVILLE, KY.

LOCATION.--At gaging station at bridge on U. S. Highway 31W at Munfordville, Hart County.
DRAINAGE AREA.--1,790 square miles.
RECORDS AVAILABLE.--Chemical analyses: September 1949 to September 1950.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, September 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
Sept. 20, 1949.....	209		5	7.7	290	4.2	0.44	46	7.1	5.0		165	9.4	6.0	0.1	1.3	171	144	9
Oct. 24	265		7	7.7	277	5.3	.02	43	6.4	4.6	2.2	160	10	5.5	.1	.6	160	134	2
Nov. 28.....	326		15	7.9	258	4.5	.04	39	7.0	4.0		137	12	6.5	.1	.8	147	126	14
Jan. 4, 1950	11,700		9	8.0	184	4.5	.10	28	3.8	2.5		94	8.2	2.0	.1	2.7	106	85	8
Feb. 20.....	3,450		5	7.5	192	5.4	.03	29	4.9	3.6		102	9.5	3.1	.1	2.7	109	92	9
Mar. 27	1,950		5	7.8	198	4.4	.09	30	5.4	3.0		106	11	2.5	.1	2.0	117	97	10
May 1.....	1,620		3	8.2	206	4.5	.02	31	5.4	4.4		112	12	2.5	.2	.9	119	100	8
June 5	7,320		7	8.1	139	6.8	.12	20	4.1	2.8		72	7.9	2.2	.2	2.4	85	67	8
July 11	1,090		6	8.1	193	7.1	.09	28	5.4	4.5		104	9.6	3.0	.2	2.2	113	92	7
Aug. 14.....	740		4	8.2	231	5.6	.05	36	5.4	4.5		130	8.9	2.0	.1	3.4	137	112	5
Sept. 26	1,770		10	8.0	234	8.2	.06	38	5.9	3.1		136	8.4	2.2	.2	2.5	138	119	8

GREEN RIVER AT LIVERMORE, KY.

LOCATION.--At auxiliary gage at Louisville and Nashville Railroad bridge at Livermore, McLean County, 650 feet downstream from Rough River, and 7.8 miles upstream from base gage at Calhoun.
DRAINAGE AREA.--7,580 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1950.
Water temperatures: October 1949 to September 1950.
EXTREMES, 1949-50.--Dissolved solids: Maximum, 182 ppm Oct. 11-20, 21-31; minimum, 84 ppm Feb. 1-10.
Hardness: Maximum, 148 ppm Nov. 21-30; minimum, 60 ppm Feb. 1-10.
Water temperatures: Maximum, 77°F on several days in July and August; minimum, 45°F on several days in December, February, and March.
REMARKS.--Daily water temperatures reported in the temperature table are averages of twice-daily measurements. The data reported under extremes are the individual maximum and minimum measurements. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (°F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
Oct. 1-10, 1949 ...	2,237		5	7.5	230	6.0	0.04	35	5.4	3.2	1.6	120	14	3.8	0.2	2.8	135	110	11
Oct. 11-20	2,891		5	7.5	298	5.7	.04	42	8.7	6.5		117	48	4.8	.3	1.8	182	141	45
Oct. 21-31	1,677		5	7.9	309	3.8	.04	46	7.9	11		157	28	7.2	.3	1.7	182	147	19
Nov. 1-10	2,403		4	7.8	275	5.8	.11	43	9.7	2.4		140	25	7.0	.1	2.1	164	147	32
Nov. 11-20	1,704		8	7.8	288	6.8	.08	44	8.7	6.7		150	25	6.5	.2	1.9	174	146	23
Nov. 21-30	1,609		5	8.1	298	4.4	.04	45	8.7	4.1		142	29	6.0	.2	1.9	174	148	32
Dec. 1-10	2,047		5	7.7	283	5.8	.06	40	9.4	3.7		122	36	5.0	.1	2.1	167	138	38
Dec. 11-20	41,890		10	7.9	181	4.6	.03	26	4.7	3.4		84	15	3.5	.1	2.5	105	84	15
Dec. 21-31	45,830		14	7.7	160	6.0	.19	24	4.0	4.1		76	16	2.2	.1	3.7	105	76	14
Jan. 1-10, 1950 ...	38,810		9	7.9	173	5.8	.09	28	3.9	5.7		90	16	2.8	.3	3.9	112	86	12
Jan. 11-20	78,450		12	7.8	126	8.4	.15	20	3.0	4.4		72	7.3	1.8	.1	3.0	86	62	3
Jan. 21-31	57,880		8	7.9	140	6.2	.12	22	3.8	3.1		72	12	2.0	.3	2.6	92	70	12
Feb. 1-10	64,310		9	7.8	139	5.4	.07	19	3.0	5.1		66	11	2.0	.2	2.5	84	60	6
Feb. 11-20	59,590		6	8.1	147	6.8	.04	21	3.8	2.3		68	13	1.2	.1	2.2	88	68	12
Feb. 21-28	44,460		7	7.9	172	4.8	.13	25	5.5	2.5		75	22	2.4	.1	2.9	108	85	24
Mar. 1-10	20,570		2	7.7	216	4.8	.04	30	6.4	4.8		89	31	2.8	.1	2.8	135	101	28
Mar. 11-20	24,620		5	7.9	193	3.2	.05	28	5.0	4.2		90	18	3.1	.3	2.4	116	90	17
Mar. 21-31	16,330		6	7.8	202	5.2	.04	30	5.2	3.6		96	18	2.6	.3	2.7	124	96	18
Apr. 1-10	28,740		23	8.0	170	5.4	.25	24	4.5	3.7		78	16	2.8	.1	2.2	108	78	14
Apr. 11-20	13,480		3	7.9	211	3.6	.06	30	5.3	2.9		92	21	2.5	.1	2.4	122	97	21
Apr. 21-30	5,823		0	7.9	247	5.0	.05	38	6.1	3.3		120	20	3.2	.5	2.6	140	120	22
May 1-10	15,640		3	8.1	219	5.9	.04	32	5.7	5.5		103	23	3.4	.1	2.2	132	103	19
May 11-20	23,810		4	8.0	182	7.1	.04	26	4.8	4.4		89	15	2.5	.1	2.4	108	85	12
May 21-31	8,309		4	8.0	213	7.4	.05	32	5.4	4.9		108	17	2.9	.1	2.7	129	102	14

GREEN RIVER BASIN--Continued

GREEN RIVER AT LIVERMORE, KY.--Continued

Chemical analyses, in parts per million, water year October 1949 to September 1950--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
June 1-10, 1950 ...	14,600		3	8.3	208	5.9	0.04	31	5.4	3.3		102	16	3.0	0.1	2.4	122	100	16
June 11-20	15,320		7	8.1	179	7.1	.03	26	4.8	3.7		86	15	2.8	.2	2.6	106	85	14
June 21-30	25,930		6	8.1	151	6.1	.02	22	3.8	3.4		74	11	2.0	.2	3.0	90	70	10
July 1-10.....	5,253		8	8.1	224	8.2	.06	33	5.8	4.8		114	15	2.8	.2	3.8	133	106	13
July 11-20	5,407		6	8.0	225	7.8	.11	33	5.9	5.0		117	13	4.0	.2	2.4	132	107	11
July 21-31	15,640		7	8.0	204	8.3	.08	30	5.4	4.1		100	16	3.4	.2	2.6	121	97	15
Aug. 1-10	16,220		8	8.0	184	9.0	.30	25	4.8	5.7		84	19	2.5	.2	2.3	113	82	13
Aug. 11-20	4,957		4	7.9	224	8.2	.04	35	5.8	3.0		118	14	2.6	.1	3.1	135	111	14
Aug. 21-31	3,950		5	8.0	252	7.5	.05	40	6.2	5.9		142	14	3.1	.2	2.9	150	125	9
Sept. 1-10.....	34,840		9	7.7	160	9.6	.06	24	4.0	5.2		85	13	2.0	.1	1.7	101	76	7
Sept. 11-20	23,310		7	7.7	207	8.9	.06	32	5.3	2.9		102	19	2.2	.2	1.0	127	102	18
Sept. 21-30	7,239		5	7.9	253	8.2	.05	41	6.1	3.2		140	12	3.1	.1	3.3	150	127	13
Average	21,420		7	--	210	6.4	0.08	31	5.6	4.4		102	19	3.3	0.2	2.5	126	100	17

GREEN RIVER BASIN--Continued

GREEN RIVER AT LIVERMORE, KY.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	68	62	48	46	48	46	52	61	70	75	73	75
2	69	61	48	46	46	45	52	60	71	76	72	74
3	68	60	47	49	45	45	54	62	71	76	72	73
4	69	59	47	50	45	46	54	64	70	76	72	74
5	68	58	47	48	46	46	53	65	70	76	72	72
6	68	58	47	47	46	46	52	64	70	75	72	71
7	69	58	47	48	47	48	52	64	70	76	72	69
8	70	57	46	47	47	46	54	64	69	76	72	70
9	69	57	45	47	48	45	54	65	70	76	73	69
10	70	58	45	47	48	46	54	64	70	76	74	68
11	70	57	46	46	48	48	54	62	70	76	73	68
12	68	57	47	48	48	48	53	64	70	76	72	68
13	68	56	48	48	49	47	52	64	70	76	74	68
14	68	56	50	48	49	47	52	64	70	76	74	68
15	69	56	49	50	48	48	54	64	72	76	73	67
16	68	55	48	49	47	48	54	66	72	76	74	68
17	68	55	46	48	47	48	56	66	72	76	76	67
18	66	54	47	48	48	48	56	66	72	76	76	66
19	66	54	47	48	47	49	56	66	72	76	76	66
20	66	54	48	48	47	49	56	66	72	76	74	70
21	68	52	48	48	47	48	56	68	72	76	74	70
22	67	51	48	48	48	49	56	66	72	76	74	69
23	67	51	48	48	46	49	58	66	73	74	74	69
24	68	50	47	49	46	50	60	68	73	76	76	66
25	65	50	46	50	46	52	60	70	74	76	76	68
26	64	49	46	50	45	52	60	70	74	74	76	66
27	64	49	47	49	46	53	61	71	74	74	76	66
28	64	49	46	50	46	54	60	72	74	73	76	66
29	64	49	47	51	--	54	62	72	74	72	76	66
30	64	49	48	48	--	52	62	71	74	72	76	66
31	63	--	46	48	--	51	--	70	--	73	75	--
Average	67	55	47	48	47	48	56	66	72	75	74	66

GREEN RIVER BASIN--Continued

GREEN RIVER NEAR SEBREE, KY.

LOCATION.--At State Highway 56, 2¼ miles northeast of Sebree, Webster County, 3½ miles downstream from Deer Creek, and 12 miles downstream from Pond River.
RECORDS AVAILABLE.--Chemical analyses: April to September 1950.
REMARKS.--No discharge records available for this station.

Chemical analyses, in parts per million, April to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
Apr. 25, 1950			3	7.8	261	4.8	0.04	38	6.9	5.2		110	36	3.0	0.3	2.3	153	123	33
June 6			5	7.8	175	2.5	.05	24	5.4	2.9		68	25	2.8	.2	2.7	113	82	26
July 12			4	8.2	259	6.9	.06	41	6.5	3.3		138	15	3.5	.2	2.4	153	129	16
Aug. 23			3	7.8	234	7.2	.01	36	7.0	1.2		109	26	2.2	.1	2.0	137	118	29
Sept. 19			?	7.7	227	8.8	.03	32	7.3	2.8		85	40	2.2	.1	1.6	139	110	40

GREEN RIVER BASIN--Continued

BARREN RIVER AT BOWLING GREEN, KY.

LOCATION.--At gaging station at old bridge 400 feet downstream from bridge on U. S. Highways 31W and 68 at Bowling Green, Warren County, 800 feet upstream from Louisville & Nashville Railroad bridge, 6 miles downstream from Drakes Creek, and 8.9 miles upstream from Jennings Creek.
DRAINAGE AREA.--1,680 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1950.
Water temperatures: October 1949 to September 1950.
EXTREMES, 1949-50.--Dissolved solids: Maximum, 176 ppm Nov. 11-20; minimum, 90 ppm Jan. 11-20.
Hardness: Maximum, 146 ppm Nov. 21-30; minimum, 67 ppm Jan. 11-20.
Water temperatures: Maximum, 76°F June 19; minimum, 42°F Dec. 6, 9, 10.
REMARKS.--Daily water temperatures reported in the table are averages of twice-daily measurements. The data reported under "Extremes" are the individual maximum and minimum measurements. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (°F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
Oct. 1-10, 1949	435		5	7.5	290	4.4	0.04	42	9.5	6.1	1.3	156	17	6.8	0.4	1.1	161	144	16
Oct. 11-20	1,059		30	7.5	223	6.0	.06	33	7.3	4.0		116	14	6.5	.4	1.6	137	112	17
Oct. 21-31	1,894		7	7.8	284	6.2	.10	43	8.7	3.1		150	14	7.5	.2	1.4	163	143	20
Nov. 1-10	998		6	7.5	250	6.3	.07	36	9.6	3.1		134	15	6.0	.1	2.4	147	129	20
Nov. 11-20	567		11	7.7	282	6.1	.06	41	8.5	11		160	16	8.0	.2	1.6	176	137	6
Nov. 21-30	536		5	8.0	295	4.0	.08	42	10	4.6		153	18	7.5	.1	1.3	167	146	21
Dec. 1-10	467		6	8.0	281	3.8	.08	41	9.8	3.2		144	18	8.0	.1	1.5	158	143	25
Dec. 11-20	15,870		7	7.8	193	5.5	.05	28	5.7	2.6		97	10	4.0	.1	4.0	111	93	14
Dec. 21-31	3,644		7	7.7	226	7.6	.05	33	6.0	4.4		116	12	3.8	.1	4.3	132	107	12
Jan. 1-10, 1950	21,300		8	7.7	174	5.6	.10	26	4.3	2.9		90	6.9	3.0	.1	4.1	105	83	9
Jan. 11-20	19,630		5	7.9	139	4.6	.11	21	3.6	4.9		77	6.3	2.8	.4	4.0	90	67	4
Jan. 21-31	8,056		6	7.9	176	7.0	.09	27	4.8	4.7		98	8.7	2.8	.2	4.4	113	87	7
Feb. 1-10	17,500		5	8.0	146	4.8	.06	23	4.2	3.0		82	7.0	2.5	.0	4.0	92	75	7
Feb. 11-20	11,720		9	7.9	164	7.6	.14	24	4.4	2.8		84	8.7	2.2	.1	3.4	100	78	9
Feb. 21-28	3,304		9	8.0	204	8.0	.09	30	5.8	2.9		105	10	3.5	.2	3.8	123	99	13
Mar. 1-10	3,140		4	7.7	202	6.8	.05	30	5.9	4.3		107	11	4.5	.4	2.5	128	99	11
Mar. 11-20	4,935		3	7.8	195	6.8	.07	29	5.7	4.1		106	9.5	4.0	.0	2.8	125	96	9
Mar. 21-31	3,658		3	7.9	204	6.0	.04	30	6.2	4.4		110	11	3.8	.2	3.0	127	100	10
Apr. 1-10	3,972		3	8.0	201	7.0	.03	29	6.1	5.2		109	11	3.8	.2	2.7	124	97	8
Apr. 11-20	1,704		2	8.3	233	6.3	.05	33	7.2	4.7		122	13	4.4	.0	3.1	135	112	12
Apr. 21-30	1,423		4	8.2	235	5.6	.06	34	7.2	3.9		122	13	4.7	.1	3.1	136	114	14
May 1-10	4,594		3	8.2	213	7.3	.04	30	6.9	3.4		111	11	4.0	.1	2.9	125	103	12
May 11-20	3,815		2	8.4	214	8.4	.05	29	6.6	5.7		113	10	4.1	.0	3.9	126	100	7
May 21-31	1,440		5	7.9	246	6.7	.10	35	6.7	6.0		128	13	4.6	.1	3.4	143	115	10

BARREN RIVER AT BOWLING GREEN, KY.--Continued

Chemical analyses, in parts per million, water year October 1949 to September 1950--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
June 1-10, 1950	2,110		4	8.2	212	7.8	0.08	30	6.0	4.3		107	11	4.0	0.1	4.6	124	100	12
June 11-20	2,731		4	8.0	196	8.0	.06	28	6.0	4.0		104	9.4	3.1	.2	4.0	114	94	9
June 21-30	5,183		4	8.0	201	8.0	.06	29	5.9	3.7		106	8.5	3.1	.2	5.1	115	97	10
July 1-10	1,764		5	7.9	219	7.3	.05	29	6.5	8.1		120	9.9	3.8	.2	2.6	127	99	1
July 11-20	1,992		6	7.7	216	8.4	.03	31	5.9	4.5		116	9.3	3.6	.3	.8	126	102	7
July 21-31	5,423		5	7.9	203	9.0	.07	29	5.8	4.9		109	9.8	3.5	.1	2.7	119	96	7
Aug. 1-10	2,638		4	8.1	230	14	.16	33	6.9	4.9		127	9.0	3.6	.1	3.2	137	111	7
Aug. 11-20	1,513		4	7.9	222	8.8	.03	34	6.8	4.9		120	14	5.6	.1	2.9	142	113	14
Aug. 21-31	1,062		5	8.0	251	7.8	.04	37	7.3	5.1		136	12	5.0	.1	2.7	147	122	11
Sept. 1-10	7,928		18	7.9	180	8.3	.20	27	5.2	4.9		104	6.8	3.1	.1	3.1	110	89	4
Sept. 11-20	3,069		7	8.0	235	9.9	.06	36	6.8	3.8		132	8.8	3.9	.1	3.7	141	118	10
Sept. 21-30	974		3	8.1	266	8.4	.04	40	8.0	3.9		148	11	4.2	.1	2.9	154	133	11
Average	4,726		6	--	219	7.1	0.07	32	6.6	4.5		117	11	4.4	0.2	3.0	131	107	11

GREEN RIVER BASIN--Continued

BARREN RIVER AT BOWLING GREEN, KY.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	61	54	47	46	48	46	50	62	69	72	71	70
2	60	53	46	49	48	44	52	62	68	72	72	71
3	64	51	46	54	48	44	54	62	68	73	71	70
4	64	50	45	56	48	45	56	65	68	74	70	70
5	64	50	44	53	47	46	54	66	66	74	69	68
6	66	50	43	48	50	48	52	67	66	73	70	68
7	66	48	44	46	52	50	50	64	68	72	70	66
8	68	48	44	48	52	50	52	62	68	72	70	64
9	68	48	43	48	53	48	54	64	69	72	70	64
10	68	50	44	50	52	46	57	64	70	72	70	66
11	70	52	48	52	50	48	58	64	70	72	70	67
12	68	54	54	50	50	48	58	64	68	73	70	68
13	67	54	54	52	52	49	56	62	68	74	71	67
14	68	53	50	54	54	49	53	62	69	72	72	68
15	64	52	47	54	53	48	52	62	70	72	72	66
16	62	50	48	53	50	49	54	64	71	72	72	68
17	64	50	48	51	48	50	54	65	72	72	72	67
18	62	48	48	50	48	50	55	66	72	72	74	68
19	63	48	49	50	48	50	56	66	75	72	72	68
20	64	48	51	49	47	52	56	66	75	72	70	68
21	64	46	52	48	48	51	56	64	74	72	70	69
22	62	44	53	48	48	51	58	68	72	72	68	68
23	62	44	50	52	48	50	60	68	72	71	70	68
24	60	44	48	54	48	52	64	70	72	72	70	63
25	59	44	46	57	48	53	64	72	73	72	70	64
26	58	44	46	57	46	55	64	72	73	72	70	64
27	56	44	49	54	46	56	62	72	73	70	72	62
28	56	46	48	50	46	56	62	70	72	69	72	65
29	58	48	49	52	--	54	62	70	72	70	72	66
30	58	47	48	52	--	53	63	70	72	70	72	66
31	56	--	46	48	--	50	--	70	--	70	72	--
Average	63	49	48	51	49	50	57	66	70	72	71	67

GREEN RIVER BASIN--Continued

ROUGH RIVER AT DUNDEE, KY.

LOCATION.--At bridge on State Highway 69 at Dundee, Ohio County, and 7.1 miles downstream from Caney Creek.
DRAINAGE AREA.--775 square miles.
RECORDS AVAILABLE.--Water temperatures: October 1949 to September 1950.
EXTREMES, 1949-50.--Water temperatures: Maximum, 75°F June 26, 27; minimum, 40° Dec. 9.

Temperature (°F) of water, water year October 1949 to September 1950
(Mean of twice-daily measurements at approximately 9:30 a. m. and 5 p. m.)

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	61	52	45	--	43	45	50	60	--	--	73	72
2	60	50	44	46	42	42	--	60	66	74	74	73
3	60	48	45	51	42	42	54	60	66	73	73	72
4	61	48	44	55	42	44	52	62	68	73	72	70
5	64	48	42	--	41	46	50	66	68	73	73	70
6	63	48	42	48	42	45	50	62	68	73	71	69
7	64	48	43	45	44	46	51	--	68	72	68	70
8	66	47	42	43	36	45	52	62	70	70	69	68
9	60	46	41	44	50	45	54	64	70	70	68	66
10	67	49	43	47	50	46	54	65	70	70	68	67
11	68	52	48	44	51	46	54	64	70	72	69	67
12	68	52	52	48	50	46	53	64	70	73	70	66
13	65	54	50	50	50	44	53	63	69	74	70	68
14	63	52	--	48	50	44	52	63	70	70	70	64
15	62	51	45	50	47	45	50	64	72	71	72	63
16	62	48	46	48	45	45	50	65	71	71	71	64
17	62	--	42	48	45	45	50	64	70	71	73	64
18	60	45	43	48	46	46	54	65	72	72	74	64
19	63	44	44	45	45	46	55	75	72	72	72	65
20	63	47	46	44	45	45	54	67	72	73	71	65
21	64	46	52	42	45	47	56	64	72	73	72	64
22	64	43	52	47	44	46	58	64	73	72	73	66
23	61	43	48	52	45	46	59	65	73	71	69	66
24	60	44	46	54	44	46	65	66	72	72	66	--
25	58	45	46	55	45	46	62	66	--	71	68	64
26	56	42	46	51	45	--	62	68	74	71	71	62
27	55	42	46	48	44	55	62	69	74	70	72	63
28	54	44	46	46	45	57	63	70	74	71	71	64
29	--	45	46	48	--	--	63	69	74	70	72	64
30	55	45	45	45	--	54	62	68	74	70	71	63
31	54	--	44	44	--	--	--	68	--	70	71	--
Average	61	47	45	48	45	46	55	65	71	71	71	66

POND RIVER AT JEWEL CITY, KY.

LOCATION.--At Jewel City, Hopkins County, 200 feet upstream from Cyprus Creek, and three-quarters of a mile upstream from mouth.
RECORDS AVAILABLE.--Chemical analyses: April to Septsmber 1950.
REMARKS.--No discharge records available for this station.

Chemical analyses, in parts per million, April to September 1950

Date of collectioa	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C.)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
Apr. 25, 1950			2	5.8	666	7.6	1.3	68	32	19	2.4	15	317	3.6	0.4	0.2	508	301	289
June 6			5	5.8	240	7.1	2.4	21	9.1	6.9		6.0	91	2.5	.3	2.9	158	90	85
July 12			2	3.90	686	9.6	1.0	54	33	22	2.4	0	324	3.0	.4	.4	a491	270	270
Aug. 17			2	4.30	480	9.6	.50	44	18	9.4	1.8	0	213	2.0	.3	.5	b331	184	184
Sept. 19			10	7.6	230	9.4	.03	28	5.8	4.9		38	66	3.0	.0	.4	148	94	63

a Includes 41 parts per million total acidity as H_2SO_4.
b Includes 33 parts per million total acidity as H_2SO_4.

GREEN RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN GREEN RIVER BASIN IN KENTUCKY

Chemical analyses, in parts per million, September 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
GREEN RIVER AT GREENSBURG																			
Sept. 21, 1949	21		9	7.9	171	4.1	0.08	22	5.7	5.5	93	9.1	3.0	0.1	0.1	96	78	2
Feb. 14, 1950	3,880		20	7.8	96.0	7.1	.31	12	2.9	3.3	43	8.5	1.8	.3	1.9	61	42	7
GREEN RIVER AT LOCK 4, AT WOODBURY																			
Sept. 20, 1949	765		5	8.0	274	4.8	0.50	45	6.6	3.5	156	11	4.0	0.1	2.4	183	139	12
Jan. 31, 1950	40,400		8	6.9	164	6.2	.09	26	3.9	3.0	88	8.6	2.4	.2	3.0	95	81	9
LITTLE PITMAN CREEK AT CAMPBELLSVILLE																			
Sept. 20, 1949	--		5	8.2	166	2.9	0.01	24	4.2	4.4	96	4.1	2.5	0.1	0.1	94	77	0
NOLIN RIVER NEAR KYROCK																			
Sept. 20, 1949	156		11	8.1	314	3.0	0.06	55	6.6	4.4	187	14	2.6	0.2	2.5	191	164	11
Feb. 22, 1950	1,760		4	7.8	202	6.0	.09	35	3.6	.9	112	8.5	1.9	.1	.7	117	102	10
BARREN RIVER NEAR PAGEVILLE																			
Sept. 20, 1949	218		7	7.9	221	4.8	0.06	32	7.9	3.2	130	8.4	2.1	0.0	1.2	124	112	6
Feb. 1, 1950	16,500		15	7.6	74.8	5.7	.19	9.7	2.4	2.9	38	4.6	1.5	.2	2.1	48	34	3
MUD RIVER NEAR LEWISBURG																			
Sept. 21, 1949	3.7		6	7.6	395	3.8	0.08	70	4.9	1.8	208	21	4.0	0.1	0.7	230	195	24
Feb. 3, 1950	1,030		8	7.9	220	6.6	.09	40	3.0	.7	122	7.7	1.9	.2	3.6	129	112	12
ROUGH RIVER NEAR DUNDEE																			
Sept. 20, 1949	178		5	8.1	318	3.8	0.03	54	6.7	3.4	182	15	2.5	0.1	1.4	189	162	13
Feb. 25, 1950	1,500		9	7.6	159	6.0	.30	24	3.4	5.1	80	14	2.0	.2	1.9	102	74	8
POND RIVER NEAR APEX																			
Sept. 22, 1949	3.0		5	7.2	248	3.6	0.04	39	5.2	5.4	142	9.9	2.0	0.2	9.5	145	119	2
Jan. 30, 1950	1,110		8	7.9	173	7.0	.09	28	3.3	3.3	88	14	2.2	.1	.7	103	83	11

MISCELLANEOUS ANALYSES OF STREAMS IN WABASH RIVER BASIN IN INDIANA

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
WABASH RIVER NEAR MOUNT VERNON																			
Sept. 18-23, 1950	17,900		7	8.0	508	8.0	0.05	60	21	13	2.6	a219	64	18	0.3	0.8	313	235	55
Sept. 24-29	42,000		17	7.7	327	7.5	.05	40	13	6.4	3.0	152	35	10	.4	2.2	201	153	28

a Includes equivalent of 6 parts per million of carbonate (CO_3).

TRADEWATER RIVER BASIN

TRADEWATER RIVER AT OLNEY, KY.

LOCATION.--At gaging station at highway bridge at Olney, Hopkins County, 1.1 miles upstream from Cave Creek, and 5.1 miles downstream from Flynn Creek.
DRAINAGE AREA.--255 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to August 1950.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, October 1949 to August 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
Oct. 17, 1949	79	--	3	5.7	412	11	0.04	40	21	7.8	4.8	4	184	3.2	0.4	0.0	305	186	183
Nov. 21	53	--	5	7.4	351	9.8	.03	36	17	5.3		17	145	4.0	.2	.1	247	160	146
Jan. 3, 1950	2,000	--	16	6.8	89.2	6.4	.19	9.5	2.6	3.3		18	22	1.5	.4	.9	62	34	20
Jan. 30	2,120	42	5	7.1	127	7.4	.07	12	5.0	5.6		10	49	1.8	.2	.5	93	50	42
Mar. 6	211	--	1	7.7	259	9.4	.02	25	11	6.4		20	97	2.0	.3	.7	173	108	91
Apr. 10	722	--	4	7.7	180	8.1	.07	17	6.9	5.5		17	63	1.6	.2	.3	120	71	57
May 15	1,130	61	2	7.5	177	8.8	.07	17	7.2	5.1		16	64	1.8	.2	.4	122	72	59
June 22	544	--	3	4.45	556	15	.07	50	25	8.4	2.7	0	261	2.1	.4	1.0	400	226	228
July 24	151	--	6	6.5	232	6.0	.07	24	9.3	5.0		20	84	2.4	.3	1.2	151	98	82
Aug. 28	27	--	7	6.6	317	9.6	.61	34	15	3.3		18	129	2.5	.2	.9	217	147	132

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CUMBERLAND RIVER BASIN

CUMBERLAND RIVER AT BARBOURVILLE, KY.

LOCATION.--At gaging station at bridge on State Highway 11 at Barbourville, Knox County, and 0.2 mile upstream from Richland Creek.
DRAINAGE AREA.--972 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to August 1950.
Water temperatures: October 1949 to September 1950.
EXTREMES, 1949-50.--Water temperatures: Maximum, 83°F Aug. 17; minimum, 39°F Dec. 6, Mar. 3.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, October 1949 to August 1950

Date of collection	Mean discharge (second-feet)	Temperature (°F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
Oct. 1, 1949	148		7	7.9	416	0.8	0.04	20	8.7	58		136	83	10	0.2	0.2	250	86	0
Nov. 7	808		8	8.1	139	5.8	.11	11	4.4	11		38	29	3.8	.1	1.8	87	46	14
Dec. 9	426		20	7.9	168	4.5	.24	10	4.5	19		50	35	4.5	.1	1.2	99	43	2
Jan. 17, 1950	7,520		9	7.2	101	5.6	.12	7.4	3.1	8.3		24	24	2.0	.2	1.5	64	31	12
Feb. 20	1,440		7	7.4	197	5.2	.11	12	6.0	18		44	50	2.5	.1	2.0	118	55	19
Apr. 3	1,390		3	8.0	150	4.8	.06	9.6	4.3	14		39	35	2.4	.0	.9	89	42	10
May 12	4,970		17	6.8	107	6.4	.60	9.0	3.1	8.3		32	20	3.0	.3	1.5	73	35	9
May 31	1,470		4	7.9	253	2.0	.15	15	9.2	21		74	51	3.5	.2	1.7	149	75	15
July 26	1,240		4	7.9	119	5.6	.09	9.0	3.9	9.5		38	22	2.8	.1	1.0	72	38	7
Aug. 28	242		7	8.0	285	3.2	.03	16	6.9	36		96	56	6.0	.2	.8	168	68	0

CUMBERLAND RIVER BASIN--Continued

CUMBERLAND RIVER AT BARBOURVILLE, KY.--Continued

Temperature (°F) of water, water year October 1949 to September 1950
/Mean of twice-daily measurements at approximately 8 a. m. and 6 p. m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	--	56	47	44	54	44	48	68	70	77	79	78
2	--	54	46	46	53	40	49	64	69	78	78	78
3	--	52	43	51	50	40	54	66	70	78	78	78
4	--	50	42	52	48	41	60	68	68	78	76	76
5	--	50	41	52	45	43	56	71	64	78	75	75
6	--	48	40	54	47	46	50	72	65	77	76	74
7	--	48	43	50	50	50	48	68	69	76	74	72
8	--	48	42	45	50	48	50	63	71	76	76	71
9	--	48	40	44	50	44	53	64	72	78	76	74
10	74	48	42	48	50	43	57	66	72	78	76	74
11	72	50	45	48	50	45	60	67	72	79	78	74
12	72	50	52	47	49	47	59	66	74	80	78	74
13	70	50	49	50	54	49	54	61	73	80	79	74
14	68	53	50	52	56	47	50	60	75	79	78	74
15	68	52	45	50	53	44	50	60	77	79	78	73
16	68	50	42	50	48	46	50	62	78	78	80	73
17	68	48	41	48	44	46	51	63	77	78	82	74
18	67	46	43	48	44	48	56	66	79	79	81	74
19	67	46	48	48	44	49	56	66	80	78	80	73
20	66	47	50	45	42	50	55	67	71	78	78	76
21	68	45	50	44	44	50	54	68	69	74	76	75
22	67	43	52	47	46	50	56	68	68	72	76	72
23	64	42	49	50	45	49	59	69	70	72	77	72
24	64	43	46	49	46	50	60	70	74	72	78	68
25	62	42	44	58	44	52	63	72	76	74	78	67
26	61	42	48	58	--	54	62	72	77	74	78	66
27	60	44	50	54	47	55	64	75	79	74	78	66
28	60	44	50	50	44	56	65	74	78	76	78	66
29	60	48	50	52	--	52	66	72	78	76	77	66
30	60	48	48	52	--	47	67	74	78	77	78	68
31	58	--	44	52	--	46	--	72	--	77	78	--
Average	--	48	46	50	48	47	56	68	73	77	78	73

CUMBERLAND RIVER BASIN--Continued

CUMBERLAND RIVER AT BURKESVILLE, KY.

LOCATION.--At ferry on State Highway 90 about 1 mile south of Burkesville, Cumberland County.
RECORDS AVAILABLE.--Water temperatures: October 1949 to September 1950.
EXTREMES, 1949-50.--Water temperatures: Maximum, 80°F Aug. 16-18; minimum, 42°F on several days in December and March.

Temperature (°F) of water, water year October 1949 to September 1950
/Mean of twice-daily measurements at approximately 6 a.m. and 6 p.m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Jnly	Aug.	Sept.
1	--	59	44	44	49	44	50	64	72	--	74	78
2	--	58	45	44	50	43	51	64	70	78	74	76
3	--	56	44	44	48	42	52	64	70	78	74	76
4	--	54	44	44	50	42	52	66	70	77	76	76
5	--	54	43	43	50	42	52	68	68	76	76	76
6	--	52	42	44	50	44	52	68	69	74	76	75
7	--	50	44	44	49	45	52	66	70	76	76	74
8	--	51	43	46	46	44	54	66	70	78	76	72
9	--	51	42	44	48	43	54	66	70	78	76	73
10	--	52	42	46	49	44	54	65	70	77	76	72
11	--	52	44	47	48	45	56	66	70	78	76	73
12	--	52	46	49	48	44	56	66	69	79	76	72
13	--	54	46	49	48	44	54	64	70	78	76	72
14	--	53	48	48	48	46	54	64	70	78	78	73
15	--	58	46	50	48	46	52	64	71	78	79	72
16	66	50	46	50	47	46	52	62	72	78	80	73
17	67	50	45	50	46	46	54	62	74	78	80	72
18	67	48	44	50	49	47	54	64	74	77	80	72
19	66	49	44	48	47	47	54	66	76	77	78	72
20	67	49	45	46	46	46	54	66	76	79	76	72
21	66	48	46	48	47	46	54	66	74	78	76	72
22	66	50	47	46	44	46	54	69	74	78	76	72
23	64	51	46	46	44	48	--	70	74	78	78	71
24	63	52	45	48	45	50	--	70	74	76	78	--
25	62	44	44	50	44	50	--	70	74	78	78	--
26	60	44	45	50	44	52	--	71	74	78	78	--
27	60	44	44	49	45	53	--	72	76	76	77	--
28	60	45	44	50	44	52	--	73	76	78	78	--
29	61	46	44	52	--	52	--	74	78	78	78	--
30	61	44	44	50	--	52	64	74	78	76	78	--
31	60	--	43	50	--	52	--	72	--	74	79	--
Average	--	50	44	47	47	47	--	67	71	75	77	--

CUMBERLAND RIVER BASIN--Continued

CUMBERLAND RIVER AT SMITHLAND, KY.

LOCATION.--At gaging station at bridge on U. S. Highway 60 at Smithland, Livingston County, 1 mile downstream from McCormick Creek, and 2.8 miles upstream from mouth.
DRAINAGE AREA.--18,080 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1950.
Water temperatures: October 1949 to September 1950.
EXTREMES, 1949-50.--Dissolved solids: Maximum, 164 ppm Sept. 21-30; minimum, 77 ppm Feb. 11-20.
Hardness: Maximum, 132 ppm Sept. 21-30; minimum, 53 ppm Feb. 11-20.
Water temperatures: Maximum, 79°F July 9-11, 19; minimum, 44°F Mar. 3.
REMARKS.--Daily water temperatures reported in the table are averages of twice-daily measurements. The data reported under "Extremes" are the individual maximum and minimum measurements. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (°F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Non-carbonate
Oct. 1-10, 1949	3,741		23	7.4	215	4.8	0.22	30	4.3	9.1	1.3	100	20	3.8	0.7	1.7	129	93	11
Oct. 11-20	5,246		15	7.8	230	3.3	.06	32	4.3	10		105	25	4.2	.4	1.2	137	98	12
Oct. 21-31	4,898		10	7.4	245	7.0	.04	35	5.2	11		116	27	5.0	.4	2.4	153	109	14
Nov. 1-10	18,890		7	7.8	250	6.4	.04	38	5.5	9.3		124	25	4.8	.3	3.1	155	155	16
Nov. 11-20	9,935		9	7.8	245	5.2	.04	36	5.8	8.6		123	22	4.2	.2	2.7	146	114	13
Nov. 21-30	7,323		7	7.3	238	7.0	.07	34	5.5	1.0		95	23	4.0	.2	1.9	129	107	30
Dec. 1-10	6,443		7	7.7	225	6.2	.07	31	5.9	14		123	23	3.0	.3	1.5	154	102	0
Dec. 11-20	66,690		10	7.6	180	8.9	.05	26	3.6	5.4		86	14	2.5	.2	3.0	109	80	9
Dec. 21-31	47,709		7	7.8	194	11	.05	30	3.8	4.5		96	14	2.8	.1	3.5	120	90	12
Jan. 1-10, 1950	80,440		14	7.8	171	5.7	.13	27	3.1	4.3		86	12	2.8	.1	2.9	103	80	10
Jan. 11-20	145,100		6	7.9	147	7.4	.06	24	3.0	3.5		78	10	2.0	.1	3.2	97	72	8
Jan. 21-31	123,400		9	7.9	142	5.6	.10	22	2.8	5.0		74	10	2.0	.1	4.0	93	66	6
Feb. 1-10	136,200		9	7.9	150	4.4	.11	24	3.0	3.2		76	11	2.0	.2	2.6	92	72	10
Feb. 11-20	185,600		7	7.9	128	4.6	.04	17	2.6	5.3		60	9.9	2.0	.2	2.2	77	53	4
Feb. 21-28	130,700		8	7.8	154	4.8	.10	22	3.1	5.4		76	11	2.2	.2	2.4	92	68	5
Mar. 1-10	53,720		6	7.9	187	7.8	.10	28	3.8	5.5		92	14	3.5	.2	2.4	110	85	10
Mar. 11-20	57,600		4	8.1	184	6.9	.14	27	4.1	3.0	2.1	91	13	2.0	.2	2.5	106	84	10
Mar. 21-31	49,840		5	8.0	166	6.2	.04	24	3.3	5.2		82	13	1.4	.1	2.3	96	73	6
Apr. 1-10	45,860		5	8.1	168	7.1	.05	24	3.5	5.1		82	13	2.1	.1	1.8	98	74	7
Apr. 11-20	22,100		4	8.1	190	6.3	.17	27	4.1	6.1		94	15	2.2	.1	1.8	114	84	7
Apr. 21-30	10,310		3	8.2	215	6.0	.04	32	4.9	6.2		108	17	2.9	.4	2.8	126	100	12
May 1-10	30,690		7	8.2	200	6.2	.03	29	4.5	6.8		99	17	3.0	.3	2.1	120	91	10
May 11-20	63,410		6	8.1	172	6.7	.04	24	4.1	5.8		85	13	2.4	.4	2.1	103	77	7
May 21-31	29,720		3	8.2	156	7.3	.03	23	3.8	3.9		76	14	2.0	.1	2.0	92	73	11

CUMBERLAND RIVER BASIN--Continued

CUMBERLAND RIVER AT SMITHLAND, KY.--Continued

Chemical analyses, in parts per million, water year October 1949 to September 1950--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
June 1-10, 1950	29,980		7	7.9	180	6.4	0.06	26	3.8	4.6		86	14	2.4	0.2	1.8	106	80	10
June 11-20	32,250		15	8.2	178	9.0	.16	25	5.2	3.3		84	15	2.5	.2	3.1	105	84	15
June 21-30	37,000		12	8.0	171	7.1	.06	22	4.4	5.3		78	16	2.1	.2	.6	102	73	9
July 1-10	19,390		8	8.1	178	7.1	.06	24	4.5	5.2		82	16	2.4	.2	2.4	105	78	11
July 11-20	16,400		5	7.9	187	7.1	.03	27	3.6	5.0		89	14	2.2	.3	2.1	110	82	9
July 21-31	25,640		5	7.6	180	8.0	.00	26	3.9	8.2		94	15	2.5	.2	2.4	108	81	4
Aug. 1-10	20,480		4	8.0	200	8.2	.04	30	4.5	6.0		104	15	2.2	.2	2.5	120	93	8
Aug. 11-20	16,700		5	7.8	195	8.8	.02	30	4.2	4.4		99	14	2.4	.2	2.5	121	92	11
Aug. 21-31	12,160		5	7.6	219	8.8	.05	34	4.4	6.3		116	15	2.5	.2	2.5	132	103	8
Sept. 1-10	39,090		8	7.8	177	7.8	.06	28	3.6	4.8		98	9.5	1.9	.2	2.1	109	85	4
Sept. 11-20	23,680		7	7.9	244	10	.04	40	4.6	6.0		137	13	2.2	.2	2.9	148	119	6
Sept. 21-30	12,620		5	7.7	272	8.7	.06	44	5.3	5.8		145	17	3.0	.2	3.7	164	132	13
Average	44,500		8	--	193	6.9	0.07	28	4.2	6.0		96	16	2.7	0.2	2.4	116	87	8

CUMBERLAND RIVER BASIN--Continued

CUMBERLAND RIVER AT SMITHLAND, KY.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	70	59	49	48	48	47	54	62	73	74	76	72
2	69	59	48	48	48	46	54	62	72	74	78	72
3	68	58	48	52	46	46	54	64	72	76	76	72
4	69	58	49	51	46	48	54	64	71	76	76	72
5	68	56	48	48	46	48	52	64	71	76	76	70
6	68	56	48	48	48	48	52	64	72	76	76	70
7	68	56	47	48	49	48	53	66	72	76	76	70
8	70	56	46	46	50	47	54	65	72	76	75	69
9	70	56	46	48	49	47	54	65	72	78	75	69
10	70	57	46	49	50	48	55	64	72	78	76	68
11	70	56	49	48	50	49	54	65	72	78	76	68
12	70	56	50	48	50	48	54	66	72	77	77	68
13	69	56	50	51	52	46	54	66	72	78	77	68
14	69	54	51	50	50	46	54	66	74	77	76	68
15	68	54	48	52	49	48	55	66	74	77	76	67
16	68	54	48	50	48	48	56	66	74	77	77	68
17	68	53	47	50	48	49	56	67	72	77	76	69
18	68	52	48	50	48	49	56	66	73	77	76	70
19	68	52	48	48	48	40	56	66	74	78	74	70
20	68	52	48	48	49	49	56	66	74	77	73	70
21	68	51	50	48	48	50	56	66	74	76	72	71
22	68	50	48	50	48	49	58	66	74	77	74	70
23	66	50	48	50	48	50	61	68	75	78	74	70
24	66	51	48	52	48	51	61	68	76	76	74	68
25	66	50	48	53	48	52	61	70	76	75	74	68
26	65	48	49	52	46	54	62	70	76	74	74	68
27	64	49	48	49	46	54	61	70	75	73	76	68
28	64	50	47	50	48	54	62	72	74	74	75	70
29	62	50	48	51	--	53	62	72	74	74	76	70
30	63	50	47	48	--	54	62	72	74	74	74	70
31	60	--	48	48	--	54	--	72	--	74	74	--
Average	67	54	48	49	48	49	56	67	73	76	75	69

CUMBERLAND RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN CUMBERLAND RIVER BASIN IN KENTUCKY

Chemical analyses, in parts per million, September 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Non-carbonate
POOR FORK AT CUMBERLAND																			
Sept. 28, 1949	31		25	8.0	542	2.8	0.25	16	6.3	107		292	44	8.8	0.3	1.5	337	66	0
Feb. 23, 1950	170		8	7.6	222	4.4	.04	10	4.5	32		85	36	2.5	.2	1.2	133	43	0
CUMBERLAND RIVER AT CUMBERLAND FALLS																			
Sept. 30, 1949	130		3	7.7	248	2.6	0.07	13	5.9	29		70	52	6.1	0.2	0.0	145	57	0
Feb. 28, 1950	2,090		11	7.9	170	6.2	.04	11	5.8	20		48	47	3.2	.1	1.3	113	51	12
CUMBERLAND RIVER NEAR ROWENA																			
Oct. 4, 1949	314		16	7.8	162	3.5	0.04	17	4.2	9.0		61	22	4.2	0.1	0.3	99	60	10
Feb. 6, 1950.....	63,000		15	7.6	86.9	5.6	.14	9.4	2.5	4.9		31	14	2.0	.2	1.3	54	34	8
ROCKCASTLE RIVER AT BILLOWS																			
Sept. 30, 1949	14		5	7.6	165	4.5	0.05	23	4.1	5.6		77	18	3.0	0.1	0.1	97	74	11
Mar. 1, 1950	862		7	7.8	97.1	5.8	.02	13	3.0	4.1		42	15	2.0	.1	.9	62	45	10
SOUTH FORK CUMBERLAND RIVER NEAR STEARNS																			
Oct. 5, 1949	82		8	7.7	57.8	4.7	0.14	4.7	1.6	5.3		16	13	2.2	0.0	0.0	37	18	5
Feb. 10, 1950	16,000		11	7.1	31.3	4.0	.05	2.5	1.1	2.9		8	8.1	1.0	.2	.2	24	11	4

TENNESSEE RIVER NEAR PADUCAH, KY.

LOCATION.--At auxiliary gage at bridge on U. S. Highway 60, 1 mile upstream from Clarks River, 3 miles southeast of Paducah, McCracken County, 5.3 miles upstream from mouth, and 16.3 miles downstream from base gage at Gilbertsville.
DRAINAGE AREA.--40,320 square miles.
RECORDS AVAILABLE.--Chemical analyses: Intermittently October 1949 to August 1950.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, October 1949 to August 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
Oct. 28, 1949	53,600		5	7.8	140	3.3	0.02	18	3.4	5.7	2.3	64	9.1	8.5	0.2	0.3	81	59	6
Dec. 14	160,000		7	7.8	150	5.2	.03	19	3.7	4.8		60	9.4	9.0	.2	1.1	85	63	13
Jan. 23, 1950	113,000		14	7.7	111	3.8	.19	15	2.8	3.3		49	7.2	4.5	.3	1.7	68	49	9
Mar. 15	262,000		6	7.8	131	5.6	.24	18	3.5	3.9		62	7.6	5.0	.1	2.1	85	59	8
Apr. 18	30,800		17	8.1	106	6.2	.11	15	2.8	4.1		53	7.2	2.9	.3	2.5	72	49	6
May 26	54,200		6	7.5	109	1.0	.09	16	2.6	3.2		56	7.2	2.5	.1	.5	62	51	5
June 30	43,600		3	8.2	119	1.2	.05	17	3.1	3.9		64	6.5	3.0	.1	.0	69	55	3
Aug. 1	69,000		3	8.2	132	.6	.03	19	3.1	3.3		67	7.2	3.0	.1	.5	75	60	5

TENNESSEE RIVER BASIN--Continued

SOUTH FORK HOLSTON RIVER AT VESTAL, VA.

LOCATION.--At gaging station 200 feet upstream from highway bridge at Vestal, Washington County, three-quarters of a mile downstream from Laurel Creek, 4¾ miles upstream from Middle Fork Holston River.
DRAINAGE AREA.--301 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1950.
Water temperatures: October 1949 to September 1950.
EXTREMES, 1949-50.--Dissolved solids: Maximum, 91 ppm Aug. 21-31; minimum, 40 ppm Feb. 1-10.
Hardness: Maximum, 74 ppm Aug. 11-20; minimum, 29 ppm Feb. 1-10, May 11-20.
Water temperatures: Maximum, 75°F June 26; minimum, 33°F Feb. 20.
REMARKS.--Records of specific conductance of daily samples available in district office at Charlottesville, Va. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																	Total	Non-carbonate
Oct. 1-10, 1949	146	5	6.9	141	8.1	0.02	17	6.8	2.0	1.2	81	5.3	1.2	0.0	0.3	82	70	4
Oct. 11-20	149	8	6.9	139	7.6	.03	17	6.6	2.1	1.5	80	5.8	1.2	.0	.3	81	70	4
Oct. 21-31	242	10	7.2	130	5.8	.04	15	6.2	2.7	1.1	71	7.2	1.5	.1	.3	75	63	5
Nov. 1-10	851	12	7.6	79.5	8.3	.01	8.6	3.4	1.7		39	4.1	1.2	.2	.8	49	35	4
Nov. 11-20	234	9	7.6	117	6.9	.02	13	5.3	2.1		61	5.8	1.1	.2	.8	67	54	4
Nov. 21-30	511	9	7.5	94.5	6.8	.05	10	4.2	3.0		49	5.6	1.1	.2	.8	56	42	2
Dec. 1-10	440	5	7.5	80.2	5.7	.02	9.6	3.6	1.6		43	4.6	1.1	.1	.5	50	39	4
Dec. 11-20	334	8	7.3	102	7.5	.02	12	4.5	1.8		53	6.3	1.2	.1	.6	63	48	5
Dec. 21-31	509	10	6.5	71.0	5.9	.02	9.1	3.7	1.5		39	6.3	1.4	.1	.6	47	38	6
Jan. 1-10, 1950	388	15	6.9	95.0	9.5	.02	11	3.9	2.7		49	6.7	1.2	.0	.6	58	44	3
Jan. 11-20	1,286	13	6.7	67.0	4.8	.06	7.9	2.7	2.0		32	5.6	1.6	.1	.8	42	31	5
Jan. 21-31	1,381	20	6.7	81.2	5.0	.04	10	3.4	1.3		42	4.7	1.1	.1	.8	49	39	5
Feb. 1-10	2,711	20	6.8	61.6	4.3	.06	7.6	2.5	1.0		29	4.7	1.1	.2	.8	40	29	6
Feb. 11-19	1,023	5	6.6	101	6.6	.02	12	4.3	1.2		53	3.4	1.0	.0	2.3	59	48	4
Feb. 20-28	447	4	7.0	122	6.2	.03	16	5.2	--		65	4.3	1.1	.1	2.2	69	61	8
Mar. 1-10	502	4	7.1	97.5	6.1	.02	12	4.2	1.7		54	3.7	1.2	.0	1.3	57	47	3
Mar. 11-20	959	--	6.1	71.1	5.3	.04	8.3	3.4	.8		37	3.2	1.0	.1	1.5	44	35	4
Mar. 21-31	950	--	5.9	74.7	5.5	.04	9.2	3.5	.8		40	3.2	1.2	.1	1.3	48	37	5
Apr. 1-10	576	7	7.1	91.2	6.0	.02	11	4.1	1.7		50	3.8	1.2	.1	1.5	55	44	3
Apr. 11-20	362	6	7.3	110	5.4	.03	14	4.9	.7		60	4.5	1.2	.0	1.4	64	55	6
Apr. 21-30	281	6	7.2	120	5.4	.07	15	5.4	1.3		67	4.9	1.0	.0	1.4	69	60	5
May 1-10	750	7	7.1	73.7	5.3	.04	8.8	3.4	.8		39	3.4	.8	.0	1.2	46	36	4
May 11-20	1,415	10	7.1	61.6	6.2	.07	7.2	2.8	.9		32	3.0	.8	.0	1.2	41	29	3
May 21-31	703	25	6.8	87.5	7.6	.10	11	3.6	1.5		46	4.8	1.2	.1	1.1	54	42	5

June 1-10	648	14	7.3	85.0	9.5	.05	10	3.5	2.4	45	5.1	.8	.1	1.2	54	39	2
June 11-20	352	13	7.4	117	7.5	.04	15	4.7	2.0	64	5.4	1.1	.1	1.4	68	57	5
June 21-30	1,087	8	6.3	67.5	6.8	.07	8.5	4.4	--	36	5.2	1.1	.1	1.3	45	39	10
July 1-10	323	8	6.6	113	7.3	.12	15	5.3	--	63	5.2	1.2	.1	1.6	68	59	8
July 11-20	262	8	6.6	128	7.1	.12	17	6.5	--	73	6.1	1.5	.1	1.6	76	69	9
July 21-31	395	10	7.5	119	6.7	.06	15	5.6	1.5	66	6.3	.9	.1	2.0	69	60	6
Aug. 1-10	268	7	7.7	130	6.5	.06	16	6.2	1.4	73	4.4	1.0	.2	2.5	74	65	6
Aug. 11-20	196	15	8.1	152	6.8	.04	18	7.2	1.6	82	6.5	1.4	.1	2.2	85	74	7
Aug. 21-31	195	8	7.7	157	7.7	.05	18	6.8	5.1	84	9.3	1.8	.1	3.1	91	73	4
Sept. 1-10	228	6	7.8	145	7.3	.03	16	5.8	5.5	74	10	1.8	.1	2.4	84	64	3
Sept. 11-20	183	3	8.0	144	6.7	.02	18	5.7	3.6	76	10	1.9	.1	.8	84	68	6
Sept. 21-30	187	0	8.0	138	6.5	.03	16	5.9	4.7	72	12	1.6	.0	.6	83	64	5
Average	596	9	--	105	6.6	0.04	13	4.7	2.1	56	5.6	1.2	0.1	1.3	62	51	5

TENNESSEE RIVER BASIN--Continued

SOUTH FORK HOLSTON RIVER AT VESTAL, VA.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	55	50	40	40	50	36	40	60	60	60	70	70
2	56	48	40	45	50	35	42	60	61	61	68	68
3	60	45	38	48	48	36	48	58	60	65	68	66
4	60	45	38	50	42	34	55	61	60	68	60	69
5	60	48	38	55	43	38	60	62	55	68	60	65
6	60	46	35	55	48	40	52	63	60	70	61	50
7	65	46	--	50	48	42	43	62	60	60	68	58
8	68	44	--	47	--	44	40	60	61	62	65	50
9	66	40	40	46	50	38	48	60	60	--	60	51
10	65	45	38	40	50	--	50	61	60	--	68	58
11	60	45	38	50	48	40	52	60	60	70	70	--
12	64	48	38	45	--	45	45	60	61	71	60	--
13	65	50	40	49	50	50	50	61	59	70	65	--
14	60	50	48	50	50	40	51	60	65	70	66	--
15	60	45	50	46	50	40	50	58	66	72	65	--
16	60	40	--	48	42	45	40	60	65	70	68	--
17	60	45	--	43	38	40	45	55	70	70	60	--
18	60	38	40	49	38	50	50	60	70	70	68	--
19	60	38	45	50	42	44	52	62	72	70	70	--
20	58	40	40	46	33	40	59	62	70	70	70	--
21	58	40	45	40	34	40	45	60	70	70	70	--
22	60	38	45	44	38	45	45	56	68	68	70	--
23	60	38	60	50	40	42	50	50	60	70	70	--
24	55	40	38	50	38	40	52	61	70	70	70	--
25	55	40	38	50	40	46	50	65	70	71	68	--
26	55	38	40	50	38	48	60	65	75	70	68	--
27	55	38	38	50	36	50	55	56	65	70	70	--
28	54	40	44	48	40	50	55	60	60	70	68	--
29	54	45	40	50	--	--	58	58	60	70	66	--
30	58	45	38	50	--	40	64	58	60	70	66	--
31	56	--	38	48	--	38	--	57	--	68	68	--
Average	59	43	41	48	43	42	50	60	64	68	67	--

MIDDLE FORK HOLSTON RIVER AT SEVENMILE FORD, VA.

LOCATION.--At gaging station at bridge on U. S. Highway 11 at Sevenmile Ford, Smyth County, 0.25 mile upstream from Meade Creek, 3.2 miles downstream from Walker Creek, and 5.2 miles west of Marion.
DRAINAGE AREA.--132 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1950.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																	Total	Noncarbonate
Oct. 7, 1949	44	18	6.5	180	4.8	0.02	22	8.5	2.8		101	8.0	1.9	0.0	2.6	103	90	7
Nov. 22	52	5	7.5	260	4.6	.04	34	14	.7		154	12	2.1	.1	2.5	146	142	16
Dec. 19	121	10	7.6	190	4.2	.07	25	9.2	1.6		108	9.2	1.9	.0	3.6	112	100	12
Feb. 6, 1950	438	--	7.6	190	6.3	.03	25	8.6	.7		104	7.4	2.0	.1	4.2	114	98	13
Mar. 31	273	10	7.4	168	7.5	.02	21	7.6	1.8		92	7.5	1.4	.1	2.8	100	84	8
Apr. 28	75	6	7.3	228	3.8	.02	28	11	3.6		130	11	1.5	.2	2.9	131	115	9
May 16	758	9	7.1	114	10	.05	14	5.1	2.5		61	7.9	1.1	.0	1.9	70	56	6
June 29	75	--	8.3	246	5.9	.01	33	13	1.9		153	8.3	2.0	.1	3.5	144	136	10
July 21	91	7	7.8	248	1.6	.01	32	13	4.2		152	11	1.9	.1	4.4	144	133	9
Aug. 21	85	--	8.0	228	2.4	.00	30	12	1.8		137	9.4	2.0	.1	3.7	136	124	12
Sept. 4	80	9	7.6	228	--	.02	29	12	1.9		132	11	2.1	.1	3.8	129	122	14

NORTH FORK HOLSTON RIVER NEAR SALTVILLE, VA.

LOCATION.--At gaging station half a mile upstream from Cedar Branch bridge, 1½ miles northeast of Saltville, Smyth County, and 4½ miles upstream from McHenry Creek.
DRAINAGE AREA.--222 square miles.
RECORDS AVAILABLE.--Chemical analyses: June 1930 to March 1931, October 1949 to September 1950.
EXTREMES, 1930-31.--Dissolved solids: Maximum, 170 ppm Oct. 11-20; minimum, 68 ppm Mar. 21-31.
Hardness: Maximum, 164 ppm Oct. 11-20; minimum, 58 ppm Mar. 21-31.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
Oct. 30, 1949	70	59	18	7.2	216	5.4	0.03	29	10	4.0		115	14	2.0	0.1	2.0	128	113	19
Nov. 30	952	45	23	7.5	112	5.7	.12	15	3.5	1.4		52	7.6	1.4	.1	2.6	68	52	9
Dec. 30	334	40	10	7.3	150	4.2	.03	20	5.3	1.5		73	11	1.5	.1	1.7	85	72	12
Jan. 31, 1950	4,780	--	28	7.1	117	6.2	.15	17	3.5	1.5		57	9.1	.9	.1	3.0	73	57	10
Feb. 28	181	36	4	7.8	192	6.0	.02	27	7.4	1.5		108	8.5	1.1	.0	2.8	115	98	9
Mar. 3	338	41	4	7.8	134	5.7	.03	18	5.4	1.6		72	7.9	1.2	.0	2.1	82	67	8
May 1	198	64	12	7.6	187	3.9	.02	24	8.8	2.6		108	11	1.1	.0	.2	112	96	8
May 31	321	66	8	7.3	170	6.2	.03	23	7.2	2.1		96	8.8	1.5	.0	2.0	99	87	8
June 30	151	72	5	--	191	7.4	.02	26	9.0	1.7		108	12	2.0	.1	2.2	114	102	14
July 31	260	70	4	--	141	5.1	.04	19	6.3	--		82	9.3	.8	.0	1.4	76	73	6
Aug. 31	112	69	7	8.0	258	2.9	.06	27	10	14		128	12	14	.0	1.9	150	108	4
Sept. 30	82	60	6	7.8	234	--	.03	32	11	1.5		141	8.7	1.4	.1	1.9	132	125	10

NORTH FORK HOLSTON RIVER NEAR GATE CITY, VA.

LOCATION.--At gaging station at highway bridge 1½ miles downstream from Big Moccasin Creek and 2 miles southeast of Gate City, Scott County.
DRAINAGE AREA.--672 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1950.
Water temperatures: October 1949 to September 1950.
EXTREMES, 1949-50.--Dissolved solids: Maximum, 4,010 ppm Oct. 21-30; minimum, 197 ppm Feb. 1-4, 6.
Hardness: Maximum, 2,480 ppm Oct. 21-30; minimum, 141 ppm Feb. 1-4, 6.
Water temperatures: Maximum observed, 75° F June 18; minimum, 38° F Dec. 5, 6.
REMARKS.--Records of specific conductance of daily samples available in district office at Charlottesville, Va. Values reported for dissolved solids are sums of determined constituents. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																	Total	Non-carbonate
Oct. 1-10, 1949	150	6	7.1	6,400	4.0	0.04	785	23	421	16	60	39	2,080	--	1.0	3,400	2,050	2,040
Oct. 11-20	154	9	7.2	7,030	2.8	.03	881	25	477	13	59	38	2,280	--	.6	3,750	2,300	2,250
Oct. 21-30	155	10	7.4	7,550	--	.03	950	26	512	24	57	48	2,420	--	2.2	4,010	2,480	2,430
Oct. 31-Nov. 10	1,078	4	7.5	1,700	5.6	.02	192	8.7	100	5.3	82	16	455	0.0	1.7	825	515	448
Nov. 11-20	285	2	7.7	2,980	4.0	.02	365	12	173	5.7	85	24	885	--	1.0	1,510	960	890
Nov. 21-30	569	4	7.8	2,880	4.8	.02	360	10	165	5.3	84	22	880	--	1.1	1,470	939	870
Dec. 1-10	648	6	7.2	1,450	5.6	.02	185	7.0	83	2.9	82	21	412	.0	4.8	762	490	424
Dec. 11-20	1,148	8	7.5	1,210	9.6	.02	153	6.6	70	1.8	80	20	345	.0	3.1	649	409	344
Dec. 21-31	1,437	10	7.4	916	6.0	.02	117	5.8	50	2.1	83	16	237	.0	2.5	477	316	248
Jan. 1-10, 1950	765	8	7.5	1,510	2.4	.08	191	13	88	3.5	83	21	428	.0	2.4	790	530	462
Jan. 11-20	2,631	23	7.6	557	8.2	.06	69	5.2	29	1.9	88	16	120	.2	3.6	297	194	122
Jan. 21, 23-25, 29	1,862	5	6.8	593	2.4	.03	75	6.1	31	--	96	14	140	--	3.0	320	212	134
Jan. 22, 26-28, 30-31	5,307	4	7.2	390	7.2	.02	51	5.1	19	--	102	13	65	--	2.8	213	148	65
Feb. 1-4, 6	10,300	4	7.4	372	6.0	.03	49	4.6	16	--	84	12	65	--	3.0	197	141	72
Feb. 5, 7-10	4,080	5	7.5	620	4.8	.02	80	5.7	33	--	88	13	140	--	3.2	323	223	151
Feb. 11-14, 17	2,530	3	7.4	641	4.8	.01	80	6.5	38	--	93	14	135	--	3.8	328	226	150
Feb. 15-16, 18-20	1,106	4	7.5	1,150	7.2	.02	144	8.6	75	--	102	16	310	--	4.3	615	395	312
Feb. 21-22	739	3	7.6	622	6.0	.02	75	8.5	36	--	121	19	115	--	3.8	323	222	123
Feb. 23-28	7,032	3	7.6	1,150	4.0	.02	142	9.0	76	--	108	17	290	--	3.2	594	392	303
Mar. 1-9	982	4	7.4	1,180	4.4	.03	142	7.5	75	--	87	16	295	--	2.6	585	396	314
Mar. 10-11	610	4	7.5	2,370	4.0	.02	300	8.4	153	--	83	24	690	--	2.6	1,220	783	715
Mar. 12-20	1,787	7	7.2	994	17	.03	133	7.3	48		85	12	270	--	3.3	533	362	292
Mar. 21-31	1,922	5	7.1	787	17	.06	112	6.6	36		79	13	215	--	3.1	442	306	241
Apr. 1-10	1,100	6	6.9	1,020	--	.05	138	8.0	48		85	14	280	--	2.6	533	378	308

TENNESSEE RIVER BASIN--Continued

NORTH FORK HOLSTON RIVER NEAR GATE CITY, VA.--Continued

Chemical analyses, in parts per million, water year October 1949 to September 1950--Continued

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																	Total	Noncarbonate
Apr. 11-20, 1950	610	6	6.4	1,190	--	0.06	150	10	71	--	84	13	345	--	1.8	633	415	346
Apr. 21-30	486	7	7.3	2,190	--	.04	259	10	128	4.8	68	18	635	--	1.2	1,090	687	632
May 1-10	2,017	6	7.6	1,040	3.6	.04	126	6.8	58	4.2	83	15	275	--	2.5	532	342	275
May 11-20	3,929	8	7.8	793	4.0	.04	97	6.3	44	4.2	87	13	200	--	2.6	414	268	196
May 21-31	1,244	5	7.6	1,390	2.0	.04	170	8.6	73	5.2	94	15	375	--	3.6	699	460	383
June 1-10	1,380	5	7.8	1,000	1.2	.04	120	8.0	51	4.2	92	12	255	--	1.6	498	332	257
June 11-20	533	7	7.8	2,230	.8	.04	264	13	138	4.4	80	19	660	--	1.4	1,140	712	647
June 21-30	610	3	7.6	1,550	6.8	.06	188	8.9	84		88	15	425	--	.6	771	506	434
July 1-10	405	5	7.7	2,780	4.0	.05	340	13	176		76	23	850	--	.3	1,440	902	839
July 11-20	329	5	7.6	3,270	2.0	.06	403	14	191		68	26	990	--	.2	1,660	1,060	1,010
July 21-31	1,073	10	7.5	2,350	4.0	.10	291	11	153		70	22	725	--	.7	1,240	771	714
Aug. 1-10	745	0	8.0	1,750	4.8	.02	214	16	95		81	18	510	--	2.0	900	600	533
Aug. 11-20	431	3	7.4	3,070	--	.02	382	18	190		68	22	965	--	1.5	1,610	1,030	971
Aug. 21-31	286	0	7.7	2,800	4.0	.02	343	21	164		69	21	865	--	1.4	1,450	942	886
Sept. 1-10	310	3	7.9	3,350	4.0	.02	426	20	226		76	21	1,100	--	2.6	1,840	1,150	1,080
Sept. 11-20	212	3	7.5	4,560	10	.01	568	23	325	--	70	28	1,480	--	1.9	2,470	1,510	1,450
Sept. 21-30	324	3	7.9	3,990	6.0	.01	517	19	242		72	27	1,280	--	1.2	2,130	1,370	1,310
Average	1,204	6	--	2,080	5.4	0.03	259	11	+-	--	82	20	621	--	2.3	1,090	693	626

TENNESSEE RIVER BASIN--Continued

NORTH FORK HOLSTON RIVER NEAR GATE CITY, VA.--Continued

Temperature (°F) of water, October 1949 to July 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	66	55	45	42		--	45	68	70	68		
2	66	55	44	45		--	51	68	71	68		
3	67	51	42	48		--	56	64	--	70		
4	68	49	45	51		--	59	64	--	70		
5	69	48	38	51		--	56	68	--	70		
6	71	47	38	55		--	50	71	--	68		
7	75	47	42	50		--	45	67	--	67		
8	73	49	40	49		--	51	67	68	68		
9	75	48	39	45		--	51	68	68	69		
10	76	50	39	44		--	54	65	68	70		
11	76	52	42	44		--	59	66	68	70		
12	74	53	45	46		48	59	63	68	69		
13	70	52	48	50		48	52	63	69	69		
14	70	53	46	53		46	50	62	68	68		
15	69	50	44	50		45	--	64	72	68		
16	69	49	40	50		46	48	60	70	69		
17	68	45	39	47		48	55	65	73	70		
18	69	42	43	46		48	56	63	75	68		
19	68	43	47	47		46	57	67	73	70		
20	68	47	48	46		46	58	68	73	68		
21	68	43	48	--		48	53	69	70	68		
22	69	42	49	--		50	52	67	67	68		
23	67	40	45	--		49	59	69	68	69		
24	68	39	43	--		49	62	69	74	68		
25	61	39	40	--		51	61	66	74	68		
26	62	39	43	--		55	65	71	72	68		
27	63	41	47	--		59	66	70	72	62		
28	60	40	47	--		56	68	70	68	62		
29	62	45	44	--		57	69	68	68	63		
30	62	49	43	--		49	71	68	67	65		
31	60	--	41	--		47	--	67	--	65		
Average	68	47	43	--		--	56	66	70	68		

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TENNESSEE RIVER BASIN--Continued

OCONALUFTY RIVER AT BIRDTOWN, N. C.

LOCATION.--At county bridge, 200 feet downstream from gaging station, which is 0.5 mile south of Birdtown, Swain County, 0.6 mile downstream from Adams Creek, 0.6 mile upstream from Goose Creek, and 2.2 miles southwest of Cherokee, Swain County.
DRAINAGE AREA.--184 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1950.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
Oct. 15, 1949	268		7	6.4	21.2	7.7	0.02	1.6	0.6	1.9	0.6	11	1.8	0.9	0.0	0.1	21	6	0
Nov. 15	341		9	6.5	16.9	6.5	.03	1.5	.4	2.6		8	2.0	1.5	.1	.2	19	5	0
Dec. 15	744		7	6.2	15.8	6.4	.03	1.6	.5	2.4		8	1.9	1.5	.1	.5	19	6	0
Jan. 15, 1950	814		3	6.7	15.5	6.7	.02	1.7	.5	1.7	.6	7	1.9	.9	.2	.3	17	6	1
Feb. 15	1,100		2	6.3	16.3	7.7	.02	1.8	.7	2.1		10	1.8	.8	.1	.6	20	7	0
Mar. 15	1,600		4	6.1	22.0	6.7	.04	1.7	.4	1.3		6	1.5	1.0	.1	.8	16	6	1
Apr. 15	501		2	6.8	15.4	6.6	.02	1.4	.4	1.3	.5	8	1.5	.6	.0	.3	17	5	0
May 15	702		7	6.4	19.1	6.6	.04	2.0	.6	2.1		7	3.9	.6	.1	1.5	21	7	2
June 15	414		3	6.3	17.3	8.4	.04	1.9	.4	1.8		9	1.6	.6	.1	.4	19	6	0
July 15	583		8	6.3	17.4	7.9	.05	1.8	.5	1.6	.5	8	1.8	.5	.2	.8	21	7	0
Aug. 15	276		17	6.1	22.9	9.8	.03	1.6	.5	2.0		9	1.5	.6	.1	.5	21	6	0
Sept. 13	288		7	6.6	17.1	9.0	.02	1.6	.4	1.8	.7	9	1.4	.5	.2	.2	19	6	0

TENNESSEE RIVER BASIN--Continued

CLINCH RIVER AT RICHLANDS, VA.

LOCATION.--At gaging station 1 mile southeast of Richlands, Tazewell County, 1.6 miles downstream from Middle Creek, and 2.2 miles upstream from Big Creek.
DRAINAGE AREA.--139 squsre miles. (Revised August 1950).
RECORDS AVAILABLE.--Chemical analyses: November 1949 to September 1950.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, November 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
Nov. 7, 1949	142	--	8	8.0	256	5.4	0.03	41	8.3	1.8		149	12	2.1	0.1	3.1	149	136	14
Dec. 5	142	36	10	7.5	252	5.4	.03	39	9.0	2.0		141	12	2.1	.0	2.4	148	134	23
Jan. 4, 1950	142	52	9	7.3	259	4.7	.04	37	8.1	4.6		142	13	2.1	.0	3.5	143	126	9
Feb. 15	255	46	3	6.7	230	6.4	.05	34	7.7	2.0		125	13	2.0	.0	2.5	137	116	14
Mar. 25	349	49	4	6.7	194	4.6	.05	30	6.2	.6		105	11	1.8	.0	2.0	116	100	16
Apr. 27	97	62	4	6.7	223	2.3	.05	30	8.5	5.1		125	14	2.1	.0	1.2	131	110	7
May 12	402	62	20	7.4	224	9.0	.04	33	6.1	4.6		123	12	1.8	.1	1.7	133	107	7
June 6	225	69	3	--	223	9.3	.03	35	8.3	--		133	8.4	1.8	.0	2.1	--	122	13
July 13	71	--	2	7.8	270	3.7	.01	37	11	8.6		166	14	2.5	.1	2.3	159	138	2
Aug. 8	55	69	0	7.9	271	4.6	.01	37	10	8.0		161	14	2.0	.0	1.8	159	133	1
Sept. 8	56	62	9	7.8	303	--	.03	41	12	8.5		182	15	2.4	.1	2.2	172	152	2

TENNESSEE RIVER BASIN--Continued

CLINCH RIVER AT CLEVELAND, VA.

LOCATION.--At gaging station 500 feet upstream from highway bridge at Cleveland, Russell County, 0.5 mile downstream from Muddy Hollow, and 2.3 miles downstream from Weaver Creek.
DRAINAGE AREA.--528 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1950.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
Oct. 3, 1949	127	--	12	7.6	246	2.1	0.02	36	12	2.5		157	11	2.9	0.0	0.4	148	139	10
Nov. 7	540	--	8	7.9	281	5.7	.05	44	9.3	1.7		162	13	2.2	.1	2.6	162	148	15
Dec. 5	496	36	10	7.4	247	4.8	.02	38	9.0	3.5		140	11	1.5	.0	3.8	144	132	23
Jan. 4, 1950	580	50	7	7.5	250	4.2	.03	35	7.9	4.6		138	11	2.0	.1	2.9	136	120	7
Feb. 15	1,040	52	8	7.6	227	5.5	.06	35	8.0	1.9		131	11	1.8	.1	3.4	128	120	13
Mar. 25	1,230	48	4	6.8	192	5.3	.02	30	6.3	.8		108	9.7	1.4	.0	2.5	120	101	12
Apr. 27	370	60	4	6.7	215	1.0	.02	30	9.0	2.6		125	11	1.7	.0	1.5	125	112	9
May 29	1,530	65	32	7.2	249	5.8	.01	35	4.0	12		130	16	3.1	.1	1.7	167	104	0
June 5	1,490	61	--	7.8	227	6.0	.01	35	7.9	--		132	7.4	1.5	.0	2.4	138	120	12
July 13	245	74	2	7.6	226	3.3	.01	31	11	2.8		140	9.8	1.8	.0	1.5	131	123	8
Aug. 10	227	73	0	7.9	233	2.6	.01	34	11	3.5		149	11	1.9	.1	1.5	133	130	8
Sept. 8	182	64	--	8.1	244	1.8	.00	34	10	5.4		147	12	2.0	.1	2.0	141	126	6

TENNESSEE RIVER BASIN--Continued

CLINCH RIVER AT SPEERS FERRY, VA.

LOCATION.--At gaging station at highway bridge half a mile downstream from Copper Creek, three-quarters of a mile northwest of Speers Ferry, Scott County, and 2 miles downstream from Clinchport.
DRAINAGE AREA.--1,126 square miles.
RECORDS AVAILABLE.--Chemical analyses: April 1930 to March 1931, October 1949 to September 1950.
Water temperatures: October 1949 to September 1950.
EXTREMES, 1949-50.--Dissolved solids: Maximum, 160 ppm Oct. 1-10; minimum, 103 ppm May 11-20.
Hardness: Maximum, 145 ppm Oct. 1-10; minimum, 90 ppm May 11-20.
Water temperatures: Maximum, 84°F Sept. 2; minimum, 37°F Dec. 6.
EXTREMES, 1930-31, 1949-50.--Dissolved solids: Maximum, 175 ppm Nov. 11-20, 1930; minimum, 101 ppm May 11-20, 1930, Mar. 21-31, 1931.
Hardness: Maximum, 156 ppm Nov. 11-20, 1930; minimum, 85 ppm May 11-20, 1930.
REMARKS.--Records of specific conductance of daily samples available in district office at Charlottesville, Va. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (°F)	Color	pH	Specific conductance (micromhos at 25°C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
Oct. 1-10, 1949	262		4	7.3	282	2.9	0.01	35	14	5.2	1.8	165	16	2.6	0.0	0.5	160	145	10
Oct. 11-20	529		7	7.4	253	3.6	.02	32	11	3.9	2.2	141	15	2.6	.0	1.6	145	125	10
Oct. 21-31	934		10	7.4	227	4.2	.04	31	10	3.8	2.1	133	14	2.2	.0	1.0	133	118	9
Nov. 1-10	2,667		6	7.8	223	7.4	.03	32	7.8	2.2		121	12	2.0	.1	2.5	129	112	13
Nov. 11-20	606		5	7.9	247	6.4	.03	35	9.8	1.6		138	13	2.0	.1	1.8	140	128	15
Nov. 21-30	1,567		5	7.9	225	9.1	.08	30	8.7	2.6		120	13	2.0	.1	1.6	129	111	12
Dec. 1-10	1,516		10	8.0	208	9.9	.03	31	7.6	1.0		115	12	1.6	.1	1.8	126	109	14
Dec. 11-20	3,353		8	7.2	192	7.4	.04	27	6.8	2.3		101	12	1.8	.1	2.8	117	95	13
Dec. 21-31	2,918		8	7.5	194	5.1	.07	27	6.7	3.3		103	12	1.6	.1	3.3	112	95	10
Jan. 1-10, 1950	1,837		6	7.6	198	4.4	.04	28	7.2	2.9		107	12	1.9	.1	3.1	115	99	12
Jan. 11-20	4,930		--	7.0	184	6.4	.04	26	6.4	1.6		96	11	1.6	.0	2.8	106	91	12
Jan. 21-31	6,106		--	7.2	191	6.4	.03	27	6.9	1.6		100	12	1.6	.0	3.1	111	96	14
Feb. 1-10	11,830		--	7.1	179	6.2	.05	26	6.4	.8		92	12	1.6	.0	3.3	106	91	16
Feb. 11-19	3,348		--	7.2	206	5.8	.03	30	8.1	.6		111	13	1.4	.1	3.5	118	108	17
Feb. 20-28	1,290		--	7.4	225	5.4	.02	31	9.6	1.0		117	17	2.0	.0	3.2	127	117	21
Mar. 1-10	1,496		--	6.9	205	5.4	.04	28	9.2	.5		110	14	1.8	.0	1.9	118	108	18
Mar. 11-20	2,672		--	6.7	179	5.0	.05	25	7.1	1.4		95	12	1.8	.0	2.1	104	92	14
Mar. 21-31	2,963		--	6.4	181	6.6	.06	26	6.6	1.1		96	11	1.6	.0	2.4	106	92	13
Apr. 1-10	1,934		--	6.8	194	5.5	.03	27	7.5	3.0		106	13	1.8	.0	2.2	112	98	11
Apr. 11-20	1,076		--	6.9	209	5.9	.04	28	9.1	1.3		112	14	1.9	.0	1.2	116	107	15
Apr. 21-30	8,302		4	7.7	222	4.4	.04	29	9.5	3.2		120	16	1.8	.0	1.1	118	111	13
May 1-10	2,465		10	7.7	186	5.4	.02	25	6.9	3.5		102	11	1.2	.0	2.0	105	91	7
May 11-20	6,657		12	7.7	175	7.3	.12	25	6.6	1.4		96	10	1.2	.1	2.1	103	90	11
May 21-31	2,236		24	7.7	210	5.8	.14	28	7.9	4.3		115	12	1.5	.1	3.1	121	102	8

TENNESSEE RIVER BASIN--Continued

CLINCH RIVER AT SPEERS FERRY, VA.--Continued

Chemical analyses, in parts per million, water year October 1949 to September 1950--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
June 1-10, 1950	2,125		5	7.7	200	7.2	0.03	29	7.2	0.9		110	10	1.2	0.0	2.1	119	102	12
June 11-20	1,138		8	7.8	227	4.4	.02	35	9.8	--		134	12	1.2	.0	2.0	134	128	18
June 21-30	2,569		8	7.7	206	6.8	.03	28	7.9	3.0		116	9.4	1.2	.0	2.6	121	102	7
July 1-10	784		5	--	260	5.7	.16	34	11	1.8		143	12	1.6	.1	2.2	141	130	13
July 11-20	580		5	--	260	3.3	.04	33	12	.5		137	14	2.0	.1	1.6	142	130	18
July 21-31	1,439		5	--	262	5.1	.03	32	12	2.9		144	11	1.6	.1	2.9	144	128	10
Aug. 1-10	1,057		3	8.3	343	4.8	.01	36	10	2.4		146	11	1.8	.0	3.1	143	131	11
Aug. 11-20	1,009		4	7.9	237	4.8	.02	34	9.8	3.3		142	11	1.9	.0	2.2	137	125	9
Aug. 21-31	480		0	8.3	251	4.3	.01	34	13	1.3		150	12	1.9	.0	2.1	143	137	14
Sept. 1-10	526		5	8.1	252	2.2	.04	32	11	4.1		136	16	2.1	.1	3.3	143	125	14
Sept. 11-20	386		5	8.1	254	2.0	.04	32	12	2.8		139	15	2.3	.1	2.8	143	129	15
Sept. 21-30	866		3	8.1	230	6.5	.05	29	12	1.3		127	14	2.0	.0	3.0	133	121	17
Average	2,202		--	--	220	5.5	0.05	30	9.0	2.3		120	13	1.8	0.04	2.3	126	112	13

TENNESSEE RIVER BASIN--Continued

CLINCH RIVER AT SPEERS FERRY, VA.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	59	52	47	42	52	40	47	65			--	80
2	64	54	45	44	54	41	50	67			76	84
3	60	52	43	46	52	42	54	64			77	82
4	62	50	42	48	48	40	57	65			70	80
5	64	48	40	56	44	42	56	66			73	75
6	64	46	37	54	45	46	51	67			75	70
7	64	44	42	51	47	47	49	65			--	69
8	65	46	40	47	48	48	50	63			78	70
9	69	48	40	44	50	43	50	63			76	73
10	68	44	40	44	50	43	55	63			79	76
11	68	44	42	46	50	45	57	63			77	76
12	68	46	45	45	49	45	57	62			80	75
13	67	52	48	49	50	48	53	61			80	75
14	68	48	47	50	54	45	52	59			75	75
15	68	46	44	50	52	44	52	59			71	74
16	64	48	42	50	48	46	53	80			79	68
17	64	46	38	48	45	47	50	63			75	75
18	64	46	43	47	44	47	54	65			74	75
19	62	46	46	48	44	49	55	63			76	74
20	82	46	47	47	45	48	55	65			77	75
21	82	46	47	45	42	50	55	67			79	73
22	63	44	48	46	45	49	52	65			80	73
23	64	44	47	48	45	48	54	67			81	70
24	61	40	45	53	45	49	63	67			80	69
25	80	40	42	53	47	48	80	70			82	65
26	80	42	43	52	46	52	82	70			75	65
27	59	42	45	52	44	55	64	--			80	64
28	59	44	46	49	42	54	61	--			82	64
29	80	47	46	50	--	53	63	--			80	66
30	80	47	44	53	--	51	65	--			80	65
31	59	--	43	52	--	48	--	--			78	--
Average	63	46	44	49	47	47	55	64			77	72

LITTLE RIVER AT WARDELL, VA.

LOCATION.--At gaging station 50 feet upetream from Katie Branch, 0.5 mile downstream from Indian Creek, and 0.5 mile northwest of Wardell, Tazewell County.
DRAINAGE AREA.--103 square miles.
RECORDS AVAILABLE.--Chemical analyses: January to September 1950.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, January to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
Jan. 4, 1950	125	--	--	7.6	208	4.7	0.01	33	6.8	--		125	4.2	1.0	0.0	3.0	118	110	8
Feb. 15	246	--	--	7.2	203	8.1	.02	32	6.2	--		117	3.8	.9	.0	3.4	116	105	10
Mar. 25	303	50	5	7.4	194	--	--	32	5.2	1.0		115	4.4	1.1	.0	3.7	108	101	7
Apr. 27	78	62	9	7.4	214	3.9	.04	32	6.9	2.8		129	4.3	1.0	.0	2.4	117	108	2
May 12	379	60	5	7.5	215	5.5	.03	36	6.0	1.1		130	5.8	1.0	.1	3.3	126	114	8
June 6	204	--	0	--	188	7.0	.03	32	6.4	--		120	4.0	1.0	.0	2.7	112	106	8
July 13	51	74	4	7.2	219	6.1	.01	35	8.0	3.4		148	2.7	.8	.1	2.8	126	120	0
Aug. 8	70	72	3	7.9	229	3.6	.06	37	8.7	--		145	5.7	1.0	.1	3.2	131	128	9
Sept. 8	45	61	4	7.7	241	--	.07	38	9.3	.9		154	4.3	1.2	--	3.1	131	133	7

TENNESSEE RIVER BASIN--Continued

GUEST RIVER AT COEBURN, VA.

LOCATION.--At gaging station 1 mile southeast of Coeburn, Wise County, 1.4 miles upstream from Jaybird Branch, 1.8 miles downstream from Pine Camp Creek, and 6 miles upstream from mouth.
DRAINAGE AREA.--87.3 square miles.
RECORDS AVAILABLE.--Chemical analyses: January to September 1950.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, January to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
Jan. 5, 1950	120	52	5	7.1	145	6.3	0.05	11	5.2	8.9		34	35	2.0	0.1	1.1	85	49	21
Feb. 16	168	--	--	7.3	168	6.3	.04	13	6.6	8.9		33	46	1.9	.0	1.5	103	60	33
Mar. 1	137	42	8	7.6	159	6.1	.02	13	6.2	8.3		29	46	1.8	.1	1.8	103	58	34
Apr. 5	177	52	4	7.9	140	4.7	.02	11	5.6	7.2		22	42	1.8	.2	1.4	89	50	32
May 13	1,320	68	--	7.0	63.9	5.6	.06	4.9	2.5	1.3		9	15	.5	.0	2.2	43	23	15
June 28	62	73	3	--	161	7.8	.03	13	8.8	5.7		41	40	2.4	.1	2.5	102	69	35
July 10	21	72	5	7.5	226	4.2	.02	19	9.0	15		62	59	2.9	.1	1.5	142	84	34
Aug.10	14	73	5	8.0	246	1.8	.01	21	9.7	17		68	65	3.6	.1	1.1	155	92	37
Sept. 7	25	64	3	7.4	199	7.0	.04	17	8.5	15		60	52	3.4	.1	1.8	130	77	28

TENNESSEE RIVER BASIN--Continued

STONY CREEK AT FORT BLACKMORE, VA.

LOCATION.--At gaging station at Fort Blackmore, Scott County, 2,000 feet upstream from mouth and 9½ miles north of Gate City.
DRAINAGE AREA.--41.4 square miles.
RECORDS AVAILABLE.--Chemical analyses: January to September 1950.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, January to September 1950

Date of collection	Meas discharge (second-feet)	Temperature (° F)	Oxygen consumed		Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
			Unfiltered	Filtered																Total	Noncarbonate
Jan. 6, 1950	108	52			7	7.3	56.2	4.6	0.02	7.2	2.4	1.6		32	3.5	0.8	0.1	0.1	33	28	2
Feb. 16	91	45			10	7.6	62.7	4.7	.03	8.4	2.6	1.7		35	5.2	.5	.1	.3	38	32	3
Mar. 1	103	44			6	7.9	60.8	5.2	.06	7.9	2.6	--		32	3.6	.4	.1	.3	39	30	4
Mar. 24	101	62			6	7.2	84.1	5.0	.03	11	3.7	.9		47	4.3	.8	.0	.6	48	43	4
Apr. 4	74	57			5	7.4	59.0	4.2	.02	7.6	2.5	1.2		32	4.7	.4	.0	.2	35	29	3
June 16	42	--			3	--	93.2	5.9	.03	13	4.6	--		56	4.5	.8	.0	.4	55	51	6
July 5	18	68			0	7.5	109	3.6	.01	15	4.7	1.0		65	3.8	.8	.0	.7	65	57	4
Aug. 11	9.5	70			0	7.6	131	4.5	.01	19	5.8	1.4		81	5.3	● 1.0	.0	1.2	73	71	5
Sept. 6	11	64			0	7.8	108	4.9	.01	16	4.5	1.2		66	4.8	1.0	.0	.5	63	58	4

POWELL RIVER AT BIG STONE GAP, VA.

LOCATION.--At gaging station at highway bridge in town of Big Stone Gap, Wise County, 1 mile upstream from South Fork Powell River, and 2.5 miles downstream from Pigeon Creek.
DRAINAGE AREA.--112 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1950.
Water temperatures: October 1949 to September 1950.
EXTREMES, 1949-50.--Dissolved solids: Maximum, 263 ppm Oct. 1-10; minimum, 81 ppm Jan. 11-20.
Hardness: Maximum, 114 ppm Oct. 1-10; minimum, 42 ppm Jan. 11-20.
Water temperatures: Maximum, 75°F Aug. 19; minimum, freezing point Mar. 4.
REMARKS.--Records of specific conductance of daily samples available in district office at Charlottesville, Va. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																	Total	Non-carbonate
Oct. 1-10, 1949	26.1	6	7.2	434	3.6	0.02	26	12	46	4.0	154	83	3.4	0.2	1.6	263	114	0
Oct. 11-20	84.0	10	6.9	275	4.7	.04	18	7.7	28	3.0	99	52	2.5	.1	2.0	168	77	0
Oct. 21-31	284	13	6.9	188	3.5	.05	13	5.8	16	2.1	59	40	2.0	.1	.8	115	56	8
Nov. 1-10	299	5	7.2	164	6.6	.02	12	5.4	13		48	37	1.2	.1	.7	101	52	13
Nov. 11-20	63.0	50	7.4	241	6.2	.03	16	7.6	24		81	52	1.8	.1	.6	148	71	5
Nov. 21-30	251	8	7.3	162	5.0	.03	11	4.9	15		50	34	1.8	.1	.6	98	48	7
Dec. 1-10	147	5	7.3	210	6.4	.04	14	6.5	21		69	45	1.4	.1	.8	129	62	5
Dec. 11-20	582	10	7.2	174	4.9	.11	12	5.6	16		53	39	1.4	.1	1.0	107	53	10
Dec. 21-31	445	8	7.1	165	5.3	.04	12	5.4	13		48	38	1.2	.1	.7	102	52	13
Jan. 1-10, 1950	395	10	7.6	167	6.1	.03	11	5.0	15		49	36	1.5	.2	.7	103	48	8
Jan. 11-20	800	8	7.5	135	5.8	.04	9.6	4.3	10		37	30	1.2	.1	.8	81	42	12
Jan. 21-31	1,014	10	7.6	187	8.6	.03	12	5.7	17		56	41	1.2	.2	.7	116	53	8
Feb. 1-10	1,243	5	7.1	178	6.8	.06	13	5.8	15		48	44	1.0	.1	1.9	112	56	17
Feb. 11-19	330	3	7.3	237	5.4	.04	15	6.9	24		72	54	1.2	.1	1.8	144	66	7
Feb. 20-28	177	4	7.5	244	5.1	.04	14	6.4	28		78	55	1.2	.1	1.9	149	61	0
Mar. 1-10	178	4	7.0	219	4.2	.04	16	7.1	19		71	47	1.5	.1	1.5	132	69	11
Mar. 11-20	388	4	7.1	179	4.2	.05	12	5.3	16		56	37	1.2	.1	1.3	110	52	6
Mar. 21-31	340	4	7.0	181	4.6	.06	11	5.5	19		59	38	1.2	.1	.7	110	50	2
Apr. 1-10	217	6	7.3	199	5.6	.06	13	6.0	19		65	41	1.0	.0	1.3	122	57	4
Apr. 11-20	120	5	7.4	259	3.6	.05	16	7.6	28		95	50	1.2	.0	1.0	155	71	0
Apr. 21-30	120	5	7.4	259	3.5	.04	16	7.6	27		92	50	1.2	.1	1.1	156	71	0
May 1-10	286	4	7.3	175	6.7	.03	11	5.1	17		61	32	1.0	.0	1.2	107	48	0
May 11-20	796	4	7.3	148	9.0	.06	10	4.9	13		46	31	1.0	.0	1.2	94	45	7
May 21-31	243	5	7.6	247	7.0	.04	16	7.3	27		90	49	1.4	.0	1.3	153	70	0

TENNESSEE RIVER BASIN--Continued

POWELL RIVER AT BIG STONE GAP, VA.--Continued

Chemical analyses, in parts per million, water year October 1949 to September 1950--Continued

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																	Total	Non-carbonate
June 1-10, 1950	294	7	7.5	187	6.6	0.06	12	5.2	19		66	34	1.1	0.0	1.1	114	51	0
June 11-20	110	10	7.6	301	4.6	.04	19	8.4	34		114	56	1.8	.0	1.3	187	82	0
June 21-30	280	5	6.5	186	6.1	.07	13	8.4	16		72	37	1.5	--	1.5	123	67	8
July 1-10	67.3	5	7.5	348	4.0	.07	22	11	45		143	72	2.0	.1	1.3	233	98	0
July 11-20	63.0	5	7.1	336	3.0	.08	21	10	40		130	66	2.5	.1	1.7	212	94	0
July 21-31	68.0	8	7.0	286	4.1	.06	18	8.5	32		110	52	2.4	.1	1.7	173	80	0
Aug. 1-10	67.7	6	6.9	268	5.4	.08	18	8.0	30		103	52	2.2	.1	1.5	169	78	0
Aug. 11-20	37.9	5	7.0	361	4.0	.08	22	10	46		142	73	2.6	.1	1.4	229	97	0
Aug. 21-31	40.3	10	7.0	264	4.6	.14	23	9.0	49		143	74	3.4	.2	1.5	240	95	0
Sept. 1-10	54.2	5	--	285	3.1	.01	20	8.0	34		113	55	4.4	.2	.5	180	83	0
Sept. 11-20	41.9	4	7.9	319	2.0	.01	21	8.9	36		118	63	3.0	.2	1.4	198	89	0
Sept. 21-30	110	6	--	211	6.5	.10	15	6.4	22		75	44	2.2	.1	1.0	134	64	2
Average	280	8	--	236	5.2	0.05	15	7.0	25		82	48	1.8	0.1	1.2	146	67	4

TENNESSEE RIVER BASIN--Continued

POWELL RIVER AT BIG STONE GAP, VA.--Continued

Temperature (°F) of water, water year October 1949 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	54	53	42	51	51	43	45	60	59	64	72	72
2	58	50	45	55	52	36	43	60	58	66	72	72
3	54	48	37	52	47	36	52	61	59	67	70	73
4	60	45	40	53	43	32	54	57	64	66	70	67
5	64	50	37	54	41	33	50	62	56	69	68	64
6	64	41	37	53	47	42	44	66	57	--	69	62
7	65	43	38	47	49	46	40	68	59	66	69	64
8	64	42	41	45	47	47	44	56	61	65	68	64
9	63	42	37	42	49	38	46	56	49	66	66	65
10	65	43	41	47	48	36	54	60	57	67	68	67
11	63	46	39	45	47	41	56	66	65	69	67	67
12	64	48	41	49	46	43	51	60	61	70	67	66
13	65	48	47	46	48	50	47	53	61	70	68	66
14	65	50	44	51	55	44	41	56	66	69	67	66
15	62	45	43	52	52	42	42	55	66	68	70	65
16	65	42	38	52	45	46	40	54	67	70	71	67
17	61	44	38	44	40	43	45	57	70	69	71	65
18	60	41	35	49	37	41	55	57	73	72	72	63
19	59	40	40	51	34	43	50	56	68	71	75	64
20	59	43	46	42	38	47	50	57	66	73	73	65
21	59	46	45	43	40	45	45	58	67	73	66	67
22	62	39	47	48	39	40	47	61	64	66	62	70
23	54	39	47	51	45	44	46	61	63	70	67	62
24	56	45	47	58	49	42	54	62	65	71	64	64
25	58	48	46	52	40	49	62	62	69	70	70	58
26	55	42	44	53	35	35	53	64	67	72	68	55
27	52	44	49	54	42	52	52	64	70	67	70	55
28	54	44	47	48	37	50	52	66	65	68	72	52
29	57	51	44	45	--	47	56	60	66	68	74	56
30	56	45	39	52	--	46	57	64	64	68	69	62
31	57	--	38	55	--	39	--	62	--	70	70	--
Average	60	45	42	49	44	44	49	60	64	69	69	64

TENNESSEE RIVER BASIN--Continued

POWELL RIVER NEAR JONESVILLE, VA.

LOCATION.--At gaging station at highway bridge 2 miles southeast of Jonesville, Lee County, and 10 miles upstream from Wallen Creek.
DRAINAGE AREA.--319 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1950.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																	Total	Noncarbonate
Oct. 5, 1949	59	8	7.2	335	1.4	0.02	32	11	26		149	52	3.2	0.1	0.5	201	125	3
Nov. 9	314	7	7.6	188	5.1	.06	21	5.7	8.5		75	28	1.5	.0	2.0	113	76	14
Dec. 6	295	10	7.4	171	5.1	.05	19	5.8	10		76	26	1.4	.0	2.0	110	71	9
Jan. 6, 1950	860	6	7.4	171	5.9	.05	19	4.8	8.9		70	24	1.5	.1	2.1	99	67	10
Feb. 16	680	--	7.5	190	6.1	.03	20	5.9	10		76	26	1.2	.0	2.0	114	74	12
Mar. 1	1,060	5	7.7	195	5.9	.05	22	6.1	9.8		81	28	2.0	.1	3.4	122	80	14
Apr. 4	448	5	7.6	182	4.3	.03	18	6.1	11		74	28	2.0	.0	1.7	110	70	9
May 25	366	5	7.2	226	5.4	.06	23	6.6	11		90	29	1.6	.1	2.5	132	85	11
June 29	280	--	7.4	213	4.8	.00	23	7.7	9.1		100	23	1.2	.0	1.6	132	89	7
July 4	171	1	8.0	239	1.8	.01	27	8.0	17		123	31	1.4	.0	1.5	146	100	0
Aug. 10	131	--	7.8	234	.4	.00	30	8.3	10		125	24	1.8	.0	2.2	137	109	7
Sept. 7	124	--	8.2	228	2.1	.02	28	7.8	9.9		107	29	1.9	.2	2.7	139	102	14

TENNESSEE RIVER BASIN--Continued

NORTH FORK POWELL RIVER AT PENNINGTON GAP, VA.

LOCATION.--At gaging station at highway bridge 0.8 mile north of town of Pennington Gap, Lee County, 1.3 miles downstream from Straight Creek, and 4.5 miles upstream from Powell River.
DRAINAGE AREA.--70 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1950.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1173.

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
Oct. 5, 1949	5.4	--	10	6.6	237	3.6	0.02	17	6.3	22		42	73	3.6	0.0	0.2	150	68	34
Nov. 9	46	--	7	7.6	120	5.9	.02	9.8	3.9	6.7		17	37	1.6	.0	.5	76	40	27
Dec. 7	40	40	10	6.6	117	5.8	.01	8.6	4.0	6.1		15	35	1.4	.1	.4	73	38	26
Jan. 6, 1950	680	52	8	7.4	93.2	6.2	.07	6.6	2.9	7.5		17	27	1.5	.1	.3	57	28	14
Feb. 16	107	--	--	7.1	120	5.8	.02	8.1	3.7	9.2		17	38	1.2	.0	.4	76	35	21
Mar. 1	345	42	10	6.5	71.0	5.2	.05	4.9	2.9	2.0		8	18	1.4	.1	1.2	48	24	18
Apr. 4	63	60	8	6.8	138	6.3	--	8.0	3.9	12		18	43	1.8	.1	.8	88	36	21
May 25	50	76	35	7.0	151	6.0	.06	13	5.2	8.0		23	45	2.2	.1	2.8	100	54	35
June 28	36	73	--	7.8	154	6.4	.02	10	4.8	12		34	39	1.8	.0	.5	95	45	17
July 4	32	71	1	6.9	162	4.6	.01	13	5.0	13		36	47	1.9	.0	.5	104	53	24
Aug. 10	25	75	--	7.4	168	1.9	.01	14	5.5	12		34	50	1.8	.1	.5	103	58	30
Sept. 7	19	64	2	7.7	258	4.0	.04	14	5.7	35		73	66	3.6	.2	.2	156	58	0

EAST FORK CLARKS RIVER NEAR BENTON, KY.

LOCATION.--At gaging station at bridge on U. S. Highway 68 and State Highway 95, 1 mile north of Benton, Marshall County, and 6.8 miles upstream from Middle Fork Creek.
DRAINAGE AREA.--227 square miles.
RECORDS AVAILABLE.--Water temperatures: October 1949 to September 1950.
EXTREMES, 1949-50.--Water temperatures: Maximum, 81°F Aug. 11; Minimum, 35°F Jan. 7.

Chemical analyses, in parts per million, September 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
Sept. 26, 1949	6.6		17	6.8	71	9.2	0.28	5.7	1.6	7.5		29	5.9	4.5	0.1	0.7	51	21	0
Feb. 3, 1950	2,810		20	7.2	51.3	8.5	.27	4.7	1.2	3.4		16	6.6	1.5	.3	1.6	40	17	4

TENNESSEE RIVER BASIN--Continued

EAST FORK CLARKS RIVER NEAR BENTON, KY.--Continued

Temperature (°F) of water, water year October 1949 to September 1950
(Mean of twice-daily measurements at approximately 8 a. m. and 5 p. m.)

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	57	50	48	48	40	42	50	64	74	70	77	72
2	59	50	46	53	40	40	54	60	67	66	74	72
3	62	50	46	58	40	42	61	67	70	72	70	74
4	65	50	46	56	42	46	54	66	66	71	67	74
5	64	48	44	38	44	47	48	70	66	72	72	70
6	66	48	46	43	46	47	44	64	68	74	67	66
7	68	52	46	38	47	50	50	64	70	71	73	68
8	68	50	44	39	51	49	51	66	72	67	72	64
9	69	53	42	42	53	44	56	72	72	70	70	66
10	70	53	45	51	51	44	62	64	75	70	74	68
11	70	56	60	46	48	48	56	64	71	74	75	70
12	68	58	56	48	46	46	52	61	60	74	72	67
13	65	58	45	56	54	41	50	62	70	74	75	69
14	63	56	40	51	50	44	48	64	73	74	72	68
15	62	47	38	55	41	44	50	68	74	73	72	65
16	62	49	40	50	40	45	55	66	77	74	74	68
17	65	49	40	46	42	49	56	68	75	76	76	68
18	62	44	48	48	44	47	60	68	75	75	75	68
19	66	46	48	44	43	48	56	68	76	74	72	69
20	66	48	53	44	44	44	56	68	74	76	69	70
21	66	46	48	42	46	47	56	67	72	72	67	71
22	64	43	47	48	46	48	62	68	74	75	67	68
23	60	45	46	56	44	50	66	70	76	73	68	67
24	60	48	44	57	46	56	68	70	72	74	67	63
25	59	45	42	60	44	56	60	70	78	74	69	60
26	55	45	48	52	42	59	68	70	77	74	69	76
27	49	46	50	44	42	58	62	68	73	74	72	66
28	54	48	48	46	46	58	56	70	74	74	71	65
29	56	49	49	51	--	48	64	68	73	71	73	68
30	57	49	44	47	--	50	66	68	69	75	74	67
31	53	--	46	43	--	51	--	71	--	75	71	--
Average	62	49	46	48	45	48	57	67	72	73	71	68

MISCELLANEOUS ANALYSES OF STREAMS IN TENNESSEE RIVER BASIN IN VIRGINIA

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Non-carbonate
SOUTH FORK HOLSTON RIVER AT RIVERSIDE, NEAR CHILHOWIE																			
Oct. 7, 1949	34	--	18	7.4	154	6.0	0.02	19	9.3	1.3	102	2.4	1.4	0.0	0.5	90	86	2	
Feb. 6, 1950	321	--	--	7.6	103	5.4	.02	12	5.4	.8	57	4.0	1.0	.1	1.6	59	52	5	
Apr. 3	135	51	8	7.6	106	--	--	12	5.4	1.2	60	3.0	1.1	.1	.8	57	52	4	
June 29	79	72	0	7.8	119	8.3	.02	14	7.2	.5	72	3.5	1.0	.1	1.8	68	65	6	
Sept. 5	48	62	4	7.9	147	2.5	.02	18	8.8	1.4	95	3.7	.9	.1	1.3	79	81	3	
BEAVERDAM CREEK AT DAMASCUS																			
Jan. 9, 1950	90	43	9	6.3	26.1	4.8	0.01	2.5	1.0	1.7	12	2.4	0.9	0.1	0.1	19	10	1	
Mar. 27	110	52	5	7.6	23.6	--	--	2.4	.6	.9	8	2.3	.8	.1	.2	17	8	2	
June 29	104	72	--	7.9	48.9	4.5	.05	2.9	1.4	8.0	23	2.1	6.2	.0	.7	38	13	0	
Aug. 31	26	69	3	7.7	40.9	1.5	.02	4.2	2.4	1.3	21	3.4	1.2	.0	1.0	25	20	3	
Sept. 5	28	62	3	7.4	42.0	4.2	.04	4.5	2.6	.7	22	3.9	.5	.0	.8	25	22	4	
MIDDLE FORK HOLSTON RIVER AT GROSECLOSE																			
Feb. 6, 1950	27	--	10	7.3	146	6.5	0.04	16	8.1	0.9	74	8.6	1.8	0.2	3.0	82	73	13	
Mar. 11	7.2	46	5	6.8	189	--	--	22	11	2.2	107	13	1.2	.1	2.2	108	100	12	
June 27	5.9	70	--	8.1	232	9.5	.01	27	15	.5	136	15	1.2	.1	1.5	139	129	18	
Aug. 24	8.2	58	6	7.6	186	--	.02	21	11	7.2	106	22	1.0	.1	2.4	103	98	11	
Sept. 19	6.0	64	10	7.7	234	--	.03	27	14	.6	130	17	1.0	.0	2.0	132	126	19	
MIDDLE FORK HOLSTON RIVER NEAR MEADOWVIEW																			
Jan. 11, 1950	270	42	5	7.4	255	--	--	35	11	1.6	146	9.4	1.8	0.1	4.7	141	133	13	
Apr. 3	324	55	5	7.6	269	--	--	38	12	1.0	158	9.7	2.0	.1	4.5	150	144	15	
July 21	136	78	2	7.6	281	4.2	0.02	38	15	1.9	174	12	1.8	.1	3.5	170	156	14	
Aug. 8	120	72	--	7.5	197	2.3	.00	27	9.4	2.0	114	11	1.8	.1	3.3	121	106	13	
Aug. 24	118	72	8	7.7	264	--	.03	34	13	2.0	152	12	2.1	.0	3.2	148	138	14	
BEAVER CREEK NEAR WALLACE																			
Jan. 9, 1950	17	51	5	8.2	342	7.9	0.02	48	17	1.2	221	6.2	1.2	0.1	3.3	191	190	9	
Feb. 7	94	46	29	7.5	229	7.7	.04	32	10	--	134	5.4	1.1	.2	4.8	140	121	11	
Mar. 27	42	54	5	8.0	309	--	--	45	15	--	201	5.4	1.1	.1	3.5	174	174	9	
May 24	30	59	--	7.7	308	8.8	.03	44	16	--	198	2.6	1.2	.1	3.9	170	176	13	
June 2	27	62	--	7.8	319	8.0	.01	47	16	--	205	2.9	1.1	.1	2.9	165	183	15	
July 6	15	70	--	7.8	321	7.0	.01	46	16	2.9	214	6.7	1.9	.2	3.3	186	181	5	

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TENNESSEE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN TENNESSEE RIVER BASIN IN VIRGINIA--Continued

Chemical analyses, in parts per million, water year October 1949 to September 1950--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
BEAVER CREEK NEAR WALLACE--Continued																			
Aug. 22, 1950	11	60	--	8.3	330	6.2	0.00	48	17	1.1		220	6.7	1.1	0.2	3.3	190	190	9
Sept. 5	11	--	--	8.2	330	6.2	.01	47	17	2.9		220	8.1	1.0	.2	3.5	193	187	7
COPPER CREEK NEAR GATE CITY																			
Jan. 6, 1950	153	56	6	7.8	278	5.4	0.02	39	13	0.6		176	4.2	1.0	0.1	2.2	154	151	7
Apr. 4	156	58	4	7.8	258	4.9	.02	34	13	.9		159	5.3	1.0	.1	2.7	142	138	7
May 24	141	65	4	8.3	246	6.5	.05	32	13	--		a155	2.8	.9	.0	2.9	137	133	6
July 5	101	71	0	8.2	237	4.2	.01	33	14	.6		165	2.4	.9	.0	2.9	134	140	5
Aug. 11	73	67	4	8.2	268	1.9	.02	36	16	--		180	4.4	.8	.0	2.6	153	156	8
Sept. 6	55	62	5	8.4	251	5.2	.01	38	14	1.2		179	3.9	1.2	.0	3.0	150	152	6

a Includes equivalent of 8 parts per million of carbonate (CO_3).

TENNESSEE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN TENNESSEE RIVER BASIN IN NORTH CAROLINA

Chemical analyses, in parts per million, water year October 1949 to September 1950

Date of collection	Discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
																		Total	Noncarbonate
DEEP CREEK NEAR BRYSON CITY																			
June 24, 1950	92.0		3	6.4	15.2	6.9	0.02	1.2	0.5	1.7		7	2.1	0.4	0.0	0.2	18	5	0

STREAMS TRIBUTARY TO LAKE HURON

RIFLE RIVER AT "THE RANCH" NEAR LUPTON, MICH.

LOCATION.--At gaging station on left bank, a quarter of a mile downstream from Houghton Creek, and 3 miles southwest of Lupton.
DRAINAGE AREA.--54 square miles.
RECORDS AVAILABLE.--Water Temperatures: July to September 1950.
EXTREMES, July to September 1950.--Water temperatures, Maximum, 71°F July 10, 11.
REMARKS.--Records of discharge for period July to September 1950 given in Water-Supply Paper 1207.

Temperature (°F) of water, July to September 1950
[Water-stage recorder with temperature attachment, continuous ethyl-alcohol actuated thermograph]

Day	May		June		July		August		September	
	max	min	max	min	max	min	max	min	max	min
1					--	--	66	65	61	60
2					--	--	65	62	61	59
3					--	--	63	61	60	57
4					--	--	63	60	59	55
5					--	--	66	61	59	55
6					--	--	69	62	58	55
7					69	66	67	63	59	55
8					70	64	66	63	59	56
9					70	64	66	64	60	58
10					71	64	67	64	60	59
11					71	65	66	62	60	57
12					69	65	65	60	57	57
13					68	63	65	60	57	57
14					65	60	64	60	57	56
15					67	61	66	62	56	56
16					68	63	69	64	56	56
17					67	65	68	65	56	54
18					68	63	67	63	55	54
19					67	62	65	62	56	55
20					66	61	63	60	58	56
21					67	62	61	58	58	56
22					67	64	61	58	56	56
23					67	64	62	60	56	53
24					66	64	64	60	53	50
25					68	63	63	62	52	50
26					67	63	62	60	54	52
27					68	64	62	61	54	54
28					68	65	62	60	54	54
29					69	64	60	60	56	54
30					70	66	60	59	57	55
31					68	66	61	59	--	--
Average					68	64	64	61	57	55

STREAMS TRIBUTARY TO LAKE HURON--Continued

HOUGHTON CREEK NEAR LUPTON, MICH.

LOCATION.--At gaging station on right bank half a mile upstream from mouth, 3 miles downstream from Wilkins Creek, and 3 miles southwest of Lupton.
DRAINAGE AREA.--27 square miles.
RECORDS AVAILABLE.--Water temperatures: July to September 1950.
EXTREMES, July to September 1950.--Water temperatures: Maximum, 63°F Aug. 16,17.
REMARKS.--Records of discharge for period July to September 1950 given in Water-Supply Paper 1207.

Temperature (°F) of water, July to September 1950
[Water-stage recorder with temperature attachment, continuous ethyl-alcohol actuated thermograph]

Day	May		June		July		August		September	
	max	min	max	min	max	min	max	min	max	min
1					--	--	58	57	57	56
2					--	--	57	56	57	54
3					--	--	57	55	56	53
4					--	--	57	54	55	53
5					--	--	60	54	56	52
6					--	--	60	56	56	52
7					--	--	61	56	55	52
8					--	--	60	56	56	54
9					--	--	61	57	57	55
10					--	--	61	57	57	56
11					--	--	60	56	57	56
12					--	--	58	53	56	55
13					--	--	58	54	55	55
14					--	--	59	55	54	54
15					--	--	61	56	55	54
16					--	--	63	58	54	53
17					--	--	63	59	53	50
18					61	61	62	57	54	51
19					61	61	59	55	55	53
20					61	61	58	54	55	53
21					61	61	56	52	55	53
22					61	61	56	54	54	52
23					60	60	60	55	54	51
24					60	60	60	57	51	47
25					60	60	60	58	51	47
26					60	60	58	55	54	50
27					62	60	58	57	54	52
28					61	57	58	56	54	52
29					62	56	56	55	55	54
30					62	59	55	54	56	54
31					61	58	57	54	--	--
Average					--	--	59	56	55	53

STREAMS TRIBUTARY TO LAKE ERIE

MAUMEE RIVER AT WATERVILLE, OHIO

LOCATION.--At gaging station at bridge on State Highway 64 in Waterville, Lucas County, 3 miles downstream from Tontogany Creek.
DRAINAGE AREA.--6,314 square miles.
RECORDS AVAILABLE.--Chemical analyses: March to September 1950.
Water temperatures: March to September 1950.
Sediment records: April to September 1950.
EXTREMES, 1950.--Dissolved solids: Maximum, 350 ppm June 1-10; minimum, 173 ppm April 1-10.
Hardness: Maximum, 278 ppm June 1-10; minimum, 136 ppm April 1-10.
Water temperatures: Maximum, 85°F July 16.
Sediment concentrations: Maximum, 684 ppm Apr. 27; minimum, 5 ppm May 30.
Sediment loads: Maximum daily, 34,500 tons June 12; minimum daily, 10 tons May 30.
REMARKS.--Records of specific conductance of daily samples available in district office at Columbus, Ohio. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1174.

Chemical analyses, in parts per million, March to September 1950

Date of collection	Mean discharge (second-feet)	Oxygen consumed		Color	pH	Specific conductance (micromhos at 25°C)	Silica (SiO_2)	Iron (Fe)	Copper (Cu)	Chromium (Cr)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
		Unfiltered	Filtered																		Total	Noncarbonate
Mar. 1-10, 1950 ..	10,800	7.5	5.9	19	8.1	417	12	0.06	0.0	0.00	58	14	10		168	64	10	0.4	6.6	268	202	65
Mar. 11-20	13,600	6.1	3.5	21	8.3	354	8.4	.06	.0	.00	50	12	5.3		136	54	6.5	.4	9.6	232	174	63
Mar. 21-31	26,800	14	6.9	22	8.1	304	6.0	.05	.0	.00	44	10	4.0		122	43	5.0	.4	8.5	202	151	51
Apr. 1-10	26,100	15	6.7	25	8.2	275	5.4	.04	.0	.00	40	8.9	3.7		118	35	4.0	.3	6.0	173	136	40
Apr. 11-20	13,700	12	6.6	25	8.2	354	5.4	.04	.1	.00	50	11	7.1		140	47	9.0	.4	10	221	170	55
Apr. 21-30	11,300	14	6.4	22	8.2	371	5.4	.07	.1	.00	53	13	4.0		154	52	6.0	.3	5.8	229	186	60
May 1-10.....	9,980	10	4.5	26	8.1	350	6.2	.05	.0	.00	48	12	5.8		140	49	5.5	.6	8.1	228	169	54
May 11-20.....	1,820	7.6	4.8	21	8.0	446	7.0	.08	.0	.00	62	16	5.4		175	66	9.0	.5	7.7	287	220	77
May 21-31.....	993	7.0	6.2	18	8.2	496	3.4	.15	.1	.00	64	21	11		206	82	10	.5	1.2	311	246	77
June 1-10.....	1,240	7.0	6.0	17	8.2	556	3.4	.03	.0	.00	75	22	16		a248	87	12	.4	1.4	350	278	74
June 11-20	7,330	13	8.6	30	8.0	380	6.4	.04	.0	.00	53	12	5.9		144	47	8.5	.4	18	241	182	64
June 21-30	3,240	12	5.4	33	8.3	415	8.6	.04	.0	.00	60	13	7.6		170	52	7.0	.1	20	277	203	64
July 1-10.....	1,050	9.7	5.3	23	8.4	487	9.0	.04	.0	.00	67	17	13		b211	66	9.2	.1	13	325	237	64
July 11-20.....	541	5.8	4.8	27	8.2	410	7.6	.03	.1	.00	46	18	12		155	69	9.0	.2	4.6	260	189	62
July 21-31.....	3,820	8.0	5.3	35	8.2	414	7.8	.03	.1	.00	53	15	10		162	59	9.0	.1	11	266	194	61
Aug. 1-10	802	12	9.3	40	8.2	401	8.4	.07	.1	.00	54	14	9.3		b166	54	8.5	.4	8.6	264	192	56
Aug. 11-20	489	9.4	7.0	28	8.1	389	6.2	.03	.0	.00	47	15	11		152	62	8.5	.2	2.2	260	179	54
Aug. 21-31	669	9.4	7.2	27	8.0	464	5.4	.05	.0	.00	56	18	14		182	73	12	.3	2.0	279	214	65
Sept. 1-10.....	4,760	9.6	6.2	27	8.0	376	6.0	.06	.0	.00	46	13	13		146	56	10	.3	5.6	234	168	49
Sept. 11-20.....	2,810	11	7.0	30	8.0	391	13	.03	.0	.00	53	13	11		170	51	8.5	.3	6.1	252	186	46
Sept. 21-30.....	3,650	11	7.8	30	8.0	417	10	.04	.0	.00	56	15	9.6		176	57	9.5	.3	5.6	266	201	57

a Includes equivalent of 10 parts per million of carbonate (CO_3).

b Includes equivalent of 12 parts per million of carbonate (CO_3).

STREAMS TRIBUTARY TO LAKE ERIE--Continued

MAUMEE RIVER AT WATERVILLE, OHIO--Continued

Dissolved oxygen, cyanide, and phenols, March to September 1950

Date of collection	Time	Mean discharge (second-feet)	Temperature		Dissolved oxygen		Cyanide	Phenols
			°F	°C	Parts per million	Percent saturation	Parts per million	Parts per million
Mar. 16, 1950	11:50 a. m.	10,300	34	1.1	13.2	93	--	--
Mar. 28	12:15 p. m.	43,500	45	7.2	10.4	86	--	--
Apr. 12	1:15 p. m.	26,200	42	5.6	11.0	87	--	--
Apr. 26	12:05 p. m.	17,700	50	10.0	9.0	79	--	--
May 10	3:15 p. m.	2,930	63	17.2	9.8	101	--	--
May 23	10:00 a. m.	1,530	68	20.0	10.5	114	--	--
June 7	11:15 a. m.	1,470	75	23.9	9.2	108	--	--
June 21	1:00 p. m.	1,550	72	22.2	8.6	98	--	--
July 6	9:45 a. m.	1,270	75	23.9	8.5	100	--	--
July 19	11:30 a. m.	380	79	26.1	--	--	0.0	0.00
Aug. 2	10:45 a. m.	1,170	77	25.0	7.2	86	--	--
Aug. 16	8:45 a. m.	462	75	23.9	9.8	115	--	--
Sept. 1	11:30 p. m.	2,330	76	24.4	8.3	98	.0	.00
Sept. 13	10:15 a. m.	3,520	70	21.1	7.3	81	.0	.00
Sept. 25	9:30 a. m.	3,920	58	14.4	8.5	83	--	--

Temperature (°F) of water, March to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						32	43	50	72	74	78	74
2						32	43	49	73	70	78	71
3						32	44	54	67	73	74	70
4						32	45	56	73	73	75	68
5						34	45	61	74	76	77	69
6						34	46	61	75	76	78	69
7						36	45	62	76	76	81	68
8						36	44	59	78	80	83	70
9						32	42	80	76	76	77	71
10						37	--	62	75	79	79	72
11						35	42	59	74	83	77	73
12						34	43	63	72	83	76	72
13						35	42	65	69	78	74	70
14						35	41	66	72	81	79	68
15						36	41	66	73	84	81	68
16						34	43	66	76	77	81	68
17						34	47	66	71	76	85	66
18						34	50	65	69	85	73	69
19						34	50	66	67	72	78	68
20						36	49	66	70	71	75	68
21						37	50	66	73	73	--	65
22						38	50	68	75	75	73	66
23						39	52	70	79	74	76	65
24						41	49	71	79	76	82	59
25						40	50	75	75	75	80	61
26						41	50	78	79	76	84	62
27						43	49	74	73	78	77	62
28						45	50	74	73	79	78	64
29						44	48	76	75	79	80	63
30						43	47	76	72	79	77	67
31						44	--	74	--	78	74	--
Average						37	46	65	74	77	78	68

STREAMS TRIBUTARY TO LAKE ERIE--Continued

MAUMEE RIVER AT WATERVILLE, OHIO--Continued

Suspended sediment, April to September 1950

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	--	--	--	17,200	272	12,600	848	12	27
2	--	--	--	20,100	277	15,000	710	10	19
3	--	--	--	17,200	271	12,900	725	10	20
4	--	--	--	12,500	211	7,120	800	10	22
5	--	--	--	8,900	143	3,440	800	10	22
6	--	--	--	7,370	122	2,430	740	11	22
7	--	--	--	5,230	88	1,240	1,470	19	75
8	--	--	--	4,380	69	816	1,490	16	64
9	--	--	--	3,990	72	776	1,390	18	68
10	--	--	--	2,930	69	546	3,410	52	s 557
11	--	--	--	2,520	61	415	17,000	168	s 8,220
12	26,200	400	a 28,000	2,580	58	404	20,100	638	s 34,500
13	23,400	341	21,500	2,180	52	306	11,800	408	s 13,000
14	17,700	267	12,800	1,720	48	223	7,800	277	5,830
15	12,700	199	6,820	1,660	43	193	4,710	206	2,620
16	9,130	144	3,550	1,740	45	211	3,740	161	1,630
17	7,370	119	2,370	1,720	44	204	2,630	136	966
18	6,350	102	1,750	1,590	40	172	1,900	107	549
19	5,410	93	1,360	1,040	40	112	1,740	102	479
20	4,540	82	1,110	1,430	38	147	1,870	104	525
21	4,020	70	760	1,040	23	65	1,550	95	398
22	3,460	58	542	1,130	21	64	1,130	87	265
23	3,800	44	451	1,530	23	95	1,260	82	279
24	9,930	144	s 4,260	977	12	32	1,500	76	s 329
25	15,200	351	s 14,500	896	11	27	10,800	308	s 9,410
26	17,700	513	s 24,900	1,040	10	28	6,550	286	s 5,170
27	17,200	684	s 31,300	896	11	27	3,520	220	2,090
28	14,700	503	s 20,100	884	9	21	2,580	184	1,140
29	13,200	382	13,600	864	6	14	1,920	158	809
30	14,200	363	13,900	770	5	10	1,640	140	620
31	--	--	--	912	8	20	--	--	--
Total	b 226,210	--	b 203,573	128,899	--	59,658	118,123	--	89,725

Day	July			August			September		
1	1,130	114	348	1,110	120	360	2,330	88	663
2	1,170	119	376	1,170	115	363	9,830	150	a 4,000
3	1,100	118	350	1,170	102	322	13,700	166	6,060
4	1,170	112	354	848	88	201	7,160	159	3,070
5	1,310	103	364	864	80	187	4,710	155	1,970
6	1,270	95	326	695	61	114	3,460	140	1,310
7	1,130	80	244	594	43	69	2,440	102	672
8	800	59	127	586	39	80	1,490	91	366
9	800	52	112	524	36	51	1,310	78	276
10	594	47	75	474	33	42	1,130	71	217
11	580	28	44	426	42	48	1,310	77	272
12	486	27	35	414	38	43	1,760	75	356
13	510	27	37	390	38	40	3,520	150	a 1,400
14	426	28	32	426	31	36	3,890	102	1,070
15	380	20	21	450	30	36	3,430	88	815
16	402	26	28	462	27	34	2,880	96	746
17	426	43	49	474	25	32	2,230	101	608
18	438	44	52	450	25	30	2,080	114	640
19	380	43	44	552	29	43	2,130	125	719
20	1,380	85	a 340	848	61	140	4,880	140	1,840
21	4,840	110	a 1,400	1,270	105	360	4,880	94	1,240
22	6,960	105	1,970	864	101	236	5,960	90	1,450
23	6,550	127	2,250	608	44	72	6,350	100	1,710
24	5,780	117	1,830	486	30	39	5,410	108	1,580
25	5,060	132	1,800	594	31	50	3,920	118	1,250
26	3,920	134	1,420	486	37	49	3,110	120	1,010
27	2,850	138	1,060	608	32	53	2,230	108	650
28	2,130	128	736	594	34	55	1,660	90	403
29	1,530	120	496	438	30	35	1,510	78	318
30	1,220	108	356	566	36	55	1,470	65	258
31	1,170	114	380	848	67	153	--	--	--
Total	57,892	--	17,036	20,269	--	3,408	112,170	--	36,939

Total discharge for period Apr. 12 to Sept. 30 (second-foot-days) 663,563
Total load for period Apr. 12 to Sept. 30 (tons) 410,339

s Computed by subdividing day.
a Computed from partly estimated concentration graph.
b Total for period April 12-30.

STREAMS TRIBUTARY TO LAKE ERIE--Continued

MAUMEE RIVER AT TOLEDO, OHIO

LOCATION.--At Toledo Terminal Railroad Bridge in Toledo, Lucas County, 1 mile upstream from mouth, and 3¾ miles downstream from Swan Creek.
DRAINAGE AREA.--6,586 square miles (above mouth).
RECORDS AVAILABLE.--Chemical analyses: March to September 1950.
Water temperatures: March to September 1950.
EXTREMES, 1950.--Dissolved solids: Maximum, 307 ppm July 21-31; minimum, 195 ppm Apr. 1-10.
Hardness: Maximum, 230 ppm May 11-20; minimum, 136 ppm Apr. 1-10.
Water temperatures: Maximum, 81°F Aug. 1.
REMARKS.--Records of specific conductance of daily samples available in district office at Columbus, Ohio. There is some influence by backwater from Lake Erie during low flow. Discharge records for gaging station at Waterville, drainage area 6,314 square miles, for water year October 1949 to September 1950 given in Water-Supply Paper 1174.

Chemical analyses, in parts per million, March to September 1950

Date of collection	Mean discharge (second-feet)	Oxygen consumed		Color	pH	Specific conductance (micromhos at 25°C)	Silica (SiO_2)	Iron (Fe)	Copper (Cu)	Chromium (Cr)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
		Unfiltered	Filtered																		Total	Noncarbonate
Mar. 1-10, 1950 ..	10,800	7.3	6.1	20	8.1	431	7.4	0.06	0.0	0.00	60	15	9.4		172	67	10	0.5	7.0	274	211	70
Mar. 11-20.....	13,600	5.7	3.6	22	8.2	358	6.4	.06	.0	.00	50	12	7.3		139	55	7.2	.4	9.4	232	174	60
Mar. 21-31.....	26,800	13	6.4	20	8.1	322	5.4	.03	.0	.00	46	10	5.0		128	44	5.5	.2	9.7	204	156	51
Apr. 1-10.....	26,100	17	8.9	25	8.2	285	12	.04	.0	.00	40	8.7	5.7		120	36	4.5	.5	5.6	195	136	37
Apr. 11-20.....	13,700	12	6.9	25	8.0	328	5.4	.05	.2	.00	46	11	4.9		134	45	5.0	.4	7.2	206	160	50
Apr. 21-30.....	11,300	13	6.6	21	8.2	369	5.6	.06	.1	.00	52	13	4.5		150	53	6.0	.3	7.0	228	183	60
May 1-10.....	9,980	11	5.2	26	8.0	361	6.2	.07	.0	.00	50	12	7.5		150	50	5.5	.6	7.5	234	174	51
May 11-20.....	1,820	7.0	4.7	22	8.0	461	4.2	.07	.0	.00	64	17	8.9		198	69	7.8	.6	2.8	293	230	67
May 21-31.....	993	8.2	6.9	20	7.8	496	4.8	.18	.0	.00	83	17	18		196	74	18	.5	2.1	303	227	66
June 1-10	1,240	8.8	6.5	17	7.7	460	4.0	.04	.0	.00	55	16	17		170	71	16	.4	3.9	278	203	64
June 11-20.....	7,330	12	7.3	26	7.8	394	5.4	.04	.0	.00	52	12	11		146	52	11	.4	17	244	179	59
June 21-30.....	3,240	8.6	6.9	25	8.2	382	7.6	.05	.0	.00	55	13	3.2		150	49	9.8	.1	12	248	191	68
July 1-10.....	1,050	8.6	7.1	27	8.0	418	9.0	.09	.0	.00	58	12	2.6		151	49	10	.1	13	259	194	70
July 11-20.....	541	7.2	5.8	23	8.0	455	6.6	.05	.0	.00	58	13	18		170	57	20	.1	6.6	274	193	54
July 21-31.....	3,820	8.0	6.5	23	8.0	497	5.6	.05	.0	.00	58	18	12		178	75	10	.2	8.6	307	219	73
Aug. 1-10.....	802	8.6	5.3	22	7.8	439	7.8	.04	.0	.00	53	14	17		174	60	14	.1	2.2	282	190	47
Aug. 11-20.....	489	7.9	7.5	18	7.8	429	7.6	.02	.0	.00	60	12	11		171	54	19	.2	.2	258	199	59
Aug. 21-31.....	669	7.3	4.8	13	7.7	406	6.6	.03	.0	.00	45	13	19		153	55	17	.1	.6	245	166	40
Sept. 1-10.....	4,760	9.6	6.2	20	7.8	414	6.8	.09	.0	.00	48	14	23		160	68	14	.4	5.4	267	177	46
Sept. 11-20.....	2,810	9.8	6.5	23	7.5	385	9.8	.05	.0	.00	50	12	10		150	51	10	.3	6.6	241	174	51
Sept. 21-30.....	3,650	11	7.1	25	7.8	445	9.5	.04	.0	.00	59	15	12		180	64	11	.3	6.4	283	209	61

STREAMS TRIBUTARY TO LAKE ERIE--Continued

MAUMEE RIVER AT TOLEDO, OHIO--Continued

Dissolved oxygen, cyanide, and phenols, March to September 1950

Date of collection	Time	Mean discharge (second-feet)	Temperature		Dissolved oxygen		Cyanide	Phenols
			°F	°C	Parts per million	Percent saturation	Parts per million	Parts per million
Mar. 16, 1950	10:25 a. m.	10,300	35	1.7	12.8	92	--	--
Mar. 28	10:15 a. m.	43,500	43	6.1	10.6	85	--	--
Apr. 12	10:35 a. m.	26,200	42	5.6	11.4	90	--	--
Apr. 26	10:20 a. m.	17,700	48	8.9	9.0	77	--	--
May 10	1:50 p. m.	2,930	60	15.6	8.1	81	--	--
May 23	9:00 a. m.	1,530	67	19.4	5.0	54	--	--
June 7	9:30 a. m.	1,470	73	22.8	3.0	34	--	--
June 21	10:30 a. m.	1,550	72	22.2	2.4	27	--	--
July 5	4:45 p. m.	1,310	74	23.3	1.8	21	--	--
July 19	10:00 a. m.	380	78	25.6	.9	11	0.0	0.00
Aug. 2	9:35 a. m.	1,170	77	25.0	2.4	29	.0	.00
Aug. 15	4:15 p. m.	450	78	25.6	.2	2	--	--
Sept. 1	8:30 a. m.	2,330	78	25.6	.0	0	.0	.00
Sept. 13	9:30 a. m.	3,520	67	19.4	3.9	42	.0	.00
Sept. 25	11:00 a. m.	3,920	61	16.1	7.3	74	--	--

Temperature (°F) of water, March to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						34	43	48	73	74	81	78
2						34	42	50	72	74	78	76
3						34	45	50	66	73	77	73
4						34	47	55	67	74	72	72
5						35	47	57	68	74	76	72
6						35	45	57	72	75	76	70
7						35	45	59	73	75	77	70
8						34	44	57	74	75	77	70
9						35	43	58	74	76	78	71
10						35	44	60	74	77	76	72
11						36	45	60	73	78	78	72
12						36	44	61	73	79	77	74
13						35	42	62	71	78	76	72
14						35	42	63	70	77	76	--
15						36	42	64	72	78	76	70
16						36	43	63	72	77	78	70
17						35	47	64	72	77	79	67
18						36	49	64	72	77	77	70
19						35	47	65	72	78	76	68
20						38	51	64	72	76	74	68
21						37	50	64	72	76	75	63
22						38	50	66	73	74	74	61
23						39	52	65	75	74	73	--
24						41	52	66	74	75	74	57
25						43	50	68	75	75	74	60
26						38	48	70	79	76	74	64
27						42	50	71	76	78	76	62
28						45	53	70	77	78	78	63
29						46	52	70	75	77	78	63
30						44	47	72	75	78	75	64
31						44	--	72	--	80	77	--
Average						37	47	62	73	76	76	68

PORTAGE RIVER AT ELMORE, OHIO

LOCATION.--At bridge on State Highway 120 in Elmore, Ottawa County, 4¾ miles downstream from gaging station at Woodville, and 6 miles upstream from Sugar Creek.
DRAINAGE AREA.--433 square miles (above gaging station).
RECORDS AVAILABLE.--Chemical analyses: November 1947 to October 1948, March to September 1950.
Water temperatures: March to September 1950.
EXTREMES, 1950.--Dissolved solids: Maximum, 578 ppm Aug. 21-31; minimum, 262 ppm Mar. 21-31.
Hardness: Maximum, 316 ppm Sept. 21-31; minimum, 198 ppm Mar. 21-31.
Water temperatures: Maximum, 86°F Aug. 17.
REMARKS.--Records of specific conductance of daily samples available in district office at Columbus, Ohio. Discharge records for gaging station at Woodville for water year October 1949 to September 1950 given in Water-Supply Paper 1174. No appreciable inflow between sampling point and gaging station except during periods of heavy local rains.

Chemical analyses, in parts per million, March to September 1950

Date of collection	Mean discharge (second-feet)	Oxygen consumed		Color	pH	Specific conductance (micromhos at 25°C)	Silica (SiO_2)	Iron (Fe)	Copper (Cu)	Chromium (Cr)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
		Unfiltered	Filtered																		Total	Noncarbonate
Mar. 1-10, 1950	838	6.5	4.6	15	6.1	463	6.4	0.07	0.0	0.00	62	15	13		166	74	16	0.3	11	294	216	80
Mar. 11-20	879	4.4	2.1	20	8.2	491	7.2	.06	.0	.00	67	16	15		176	82	18	.4	13	309	233	89
Mar. 21-31	1,870	--	--	10	8.2	419	5.0	.01	.0	.00	58	13	8.6		a148	61	14	.4	14	262	198	77
Apr. 1-10	1,060	--	5.7	8	8.2	520	6.6	.02	.0	.00	70	15	18		b184	77	24	.4	12	323	236	85
Apr. 11-20	400	6.3	4.7	13	8.2	565	4.8	.05	.0	.00	75	19	14		c200	94	20	.4	6.9	365	265	101
Apr. 21-30	860	12	5.3	17	8.1	522	4.6	.07	.0	.00	68	18	13		182	83	20	.2	9.4	330	244	94
May 1-10	909	8.9	5.8	15	8.3	593	5.6	.06	.0	.00	74	18	24		196	88	36	.3	8.4	375	259	98
May 11-20	79	6.4	5.5	10	8.1	657	1.2	.04	.0	.00	64	26	35		166	129	50	.3	2.3	418	267	131
May 21-31	58	6.6	6.7	15	8.0	750	4.8	.11	.0	.00	64	26	53		162	131	78	.4	3.2	469	267	134
June 1-10	133	8.0	6.5	22	7.9	620	4.4	.06	.0	.00	68	19	33		180	93	44	.4	14	380	248	100
June 11-20	278	6.3	6.4	22	8.2	601	7.6	.08	.1	.00	81	19	18		199	82	37	.4	21	364	280	117
June 21-30	768	7.2	6.8	27	8.3	598	7.0	.07	.1	.00	72	18	21		189	81	32	.4	18	393	254	99
July 1-10	259	8.4	6.6	32	8.0	563	8.2	.07	.0	.00	70	18	19		a194	74	33	.2	8.2	344	249	89
July 11-20	66	6.6	6.1	18	8.0	742	2.4	.05	.1	.00	65	25	46		176	120	67	.1	2.5	456	265	121
July 21-31	128	7.2	6.1	23	8.1	591	4.6	.05	.1	.00	61	18	29		160	89	42	.1	6.4	368	226	95
Aug. 1-10	21	8.3	7.3	20	7.8	790	2.4	.06	.0	.00	58	24	67		136	124	102	.4	3.2	480	243	132
Aug. 11-20	27	6.6	5.5	20	7.9	622	5.2	.06	.0	.00	59	19	41		144	110	56	.4	2.5	384	225	107
Aug. 21-31	30	10	5.7	17	7.9	928	6.0	.12	.0	.00	77	29	72		152	172	114	.5	2.4	578	311	187
Sept. 1-10	312	8.6	7.0	28	8.1	652	9.6	.10	.0	.00	77	19	36		218	97	46	.3	4.9	420	270	92
Sept. 11-20	314	11	6.2	25	7.8	539	3.7	.10	.0	.00	64	16	26		d190	66	38	.3	3.4	315	226	70
Sept. 21-30	260	7.6	6.0	23	8.1	759	3.0	.06	.0	.00	92	21	38		b250	90	68	.3	4.2	461	316	111

a Includes equivalent of 8 parts per million of carbonate (CO_3).
b Includes equivalent of 12 parts per million of carbonate (CO_3).
c Includes equivalent of 10 parts per million of carbonate (CO_3).
d Includes equivalent of 6 parts per million of carbonate (CO_3).

STREAMS TRIBUTARY TO LAKE ERIE--Continued

PORTAGE RIVER AT ELMORE, OHIO--Continued

Dissolved oxygen, cyanide, and phenols, March to September 1950

Date of collection	Time	Mean discharge (second-feet)	Temperature		Dissolved oxygen		Cyanide	Phenols
			°F	°C	Parts per million	Percent saturation	Parts per million	Parts per million
Mar. 16, 1950	9:25 a. m.	469	35	1.7	13.4	96		
Mar. 28	8:45 a. m.	4,040	45	7.2	9.6	79		
Apr. 12	9:40 a. m.	830	42	5.6	11.6	92		
May 23	8:00 a. m.	40	63	17.2	7.2	74		
June 20	6:55 p. m.	103	74	23.3	9.9	115		
July 5	3:45 p. m.	780	74	23.3	6.6	76		
Sept. 1	7:15 a. m.	468	71	21.7	7.0	79	0.0	0.00
Sept. 25	12:05 p. m.	212	55	12.8	10.0	94		

Temperature (°F) of water, March to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						34	44	45	66	--	82	--
2						32	40	47	70	--	79	70
3						33	45	49	65	--	74	68
4						32	50	51	66	--	70	71
5						35	45	60	65	--	80	68
6						34	43	61	--	71	82	63
7						37	43	62	70	75	79	60
8						42	43	54	80	80	80	68
9						35	40	55	70	82	76	71
10						35	40	59	71	80	75	75
11						36	46	58	65	79	72	70
12						34	42	55	70	78	72	68
13						33	37	60	67	74	70	68
14						32	35	63	67	70	67	68
15						34	37	65	70	74	72	69
16						35	45	62	80	78	82	67
17						36	45	63	65	76	86	66
18						34	52	62	70	74	74	67
19						34	49	60	63	69	70	68
20						36	50	62	67	70	68	64
21						39	49	66	70	73	64	64
22						40	47	69	70	74	73	62
23						40	54	68	77	79	71	52
24						40	42	68	79	78	70	51
25						42	47	69	--	74	70	50
26						40	48	72	76	73	74	54
27						48	49	67	75	74	78	58
28						45	49	65	--	83	73	60
29						43	48	73	--	79	76	64
30						40	46	60	--	84	75	65
31						41	--	65	--	80	--	--
Average						37	45	61	70	76	74	64

SANDUSKY RIVER AT FREMONT, OHIO

LOCATION.--At bridge on U. S. Highway 20 in Fremont, Sandusky County, 3½ miles downstream from gaging station near Fremont, and 7.2 miles downstream from Wolf Creek.
DRAINAGE AREA.--1,260 square miles (above Fremont, computed by U. S. Weather Bureau).
RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1948, March to September 1950.
Water temperatures: October 1947 to September 1948, March to September 1950.
EXTREMES, 1950.--Dissolved solids: Maximum, 494 ppm Aug. 11-20; minimum, 235 ppm Apr. 1-10.
Hardness: Maximum, 338 ppm Aug. 11-20; minimum, 173 ppm Apr. 1-10.
Water temperatures: Maximum, 84°F July 12.
EXTREMES, 1947-48, 1950.--Dissolved solids: Maximum, 622 ppm Feb. 1-10, 1948; minimum, 159 ppm Feb. 11-20, 1948.
Hardness: Maximum, 511 ppm Feb. 1-10, 1948; minimum, 110 ppm Feb. 11-20, 1948.
Water temperatures: Maximum, 86°F Aug. 29, 1948; minimum, freezing point Mar. 3, 1950.
REMARKS.--In 1947-48 raw-water samples collected at municipal filtration plant in Fremont. Records of specific conductance of daily samples available in district office at Columbus, Ohio. Discharge records for gaging station near Fremont for water year October 1949 to September 1950 given in Water-Supply Paper 1174. No appreciable inflow between sampling point and gaging station except during periods of heavy local rains.

Chemical analyses, in parts per million, March to September 1950

Date of collection	Mean discharge (second-feet)	Oxygen consumed		Color	pH	Specific conductance (micromhos at 25°C)	Silica (SiO_2)	Iron (Fe)	Copper (Cu)	Chromium (Cr)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
		Unfiltered	Filtered																		Total	Non-carbonate
Mar. 1-10, 1950	1,090	5.4	4.9	21	8.1	480	9.6	0.10	0.0	0.00	64	18	11		164	98	10	0.4	8.6	312	234	99
Mar. 11-20	2,230	5.2	2.6	15	8.1	393	7.2	.07	.0	.00	52	14	8.5		122	80	8.5	.3	12	260	187	87
Mar. 21-31	3,450	11	7.3	15	7.5	363	7.0	.06	.0	.00	47	14	3.2		114	70	7.0	.4	5.8	247	175	81
Apr. 1-10	3,000	14	7.1	25	8.4	376	7.0	.12	.1	.00	48	13	6.0		a120	68	6.0	.5	9.1	235	173	75
Apr. 11-20	1,350	7.1	5.1	18	8.3	469	7.0	.04	.0	.00	63	18	8.2		a162	93	8.0	.4	8.8	304	231	98
Apr. 21-30	893	8.8	7.1	11	8.0	490	12	.09	.0	.00	65	19	13		180	97	8.9	.4	7.1	327	240	93
May 1-10	2,570	8.0	6.1	17	7.9	409	7.2	.10	.0	.00	54	15	10		147	77	6.4	.7	8.8	282	196	76
May 11-20	406	6.5	5.4	8	7.9	558	5.4	.08	.0	.00	72	25	13		198	122	11	.8	3.6	372	282	120
May 21-31	966	9.6	4.7	18	8.2	512	4.8	.04	.1	.00	66	21	8.1		168	106	12	.2	4.0	340	251	113
June 1-10	1,490	13	6.0	28	8.2	396	8.2	.03	.1	.00	51	14	9.4		137	66	8.8	.2	4	272	185	73
June 11-20	711	11	5.6	23	8.2	457	7.2	.03	.2	.00	60	16	9.8		154	80	11	.2	14	296	216	89
June 21-30	401	8.3	4.4	21	8.2	426	8.0	.05	.0	.00	53	15	12		151	71	10	.1	10	276	194	70
July 1-10	161	6.4	4.1	17	8.2	550	6.8	.04	.0	.00	67	21	18		188	100	20	.2	6.2	363	254	99
July 11-20	179	4.8	3.0	11	8.2	608	4.4	.03	.0	.00	72	26	19		199	132	17	.3	2.4	398	287	124
July 21-31	294	12	5.6	21	8.1	441	6.4	.06	.1	.00	53	16	15		152	79	11	.4	8.3	269	198	74
Aug. 1-10	97	7.7	5.3	18	8.1	596	6.8	.06	.1	.00	69	25	19		202	110	24	.5	1.8	386	275	109
Aug. 11-20	84	5.8	4.7	16	8.1	732	5.6	.06	.0	.00	81	33	29		202	184	30	.7	.6	494	338	172
Aug. 21-31	173	6.4	4.7	15	7.9	641	3.6	.07	.0	.00	69	28	25		156	168	26	.6	.8	427	287	159
Sept. 1-10, 1950	390	--	--	--	--	--	--	--	--	--	--	--	--		--	--	--	--	--	--	--	--
Sept. 11-20	315	8.8	5.0	22	8.1	462	4.2	0.05	0.0	0.00	62	17	9.0		a184	70	11	0.3	5.0	287	225	74
Sept. 21-30	766	9.0	5.7	22	8.1	485	11	.03	.0	.00	63	18	12		174	88	12	.3	5.8	316	231	89

a Includes equivalent of 6 parts per million of carbonate (CO_3).

STREAMS TRIBUTARY TO LAKE ERIE--Continued

SANDUSKY RIVER AT FREMONT, OHIO--Continued

Dissolved oxygen, cyanide, and phenols, March to September 1950

Date of collection	Time	Mean discharge (second-feet)	Temperature		Dissolved oxygen		Cyanide	Phenols
			°F	°C	Parts per million	Percent saturation	Parts per million	Parts per million
Mar. 15, 1950	6:10 p. m.	1,740	36	2.2	12.6	92	--	--
Mar. 28	7:45 a. m.	6,640	46	7.8	10.8	90	--	--
Apr. 11	7:50 p. m.	3,120	45	7.2	11.8	98	--	--
Apr. 26	9:05 a. m.	1,170	49	9.4	9.6	84	--	--
May 10	11:05 a. m.	502	63	17.2	9.4	97	--	--
May 22	4:30 p. m.	406	67	19.4	9.6	103	--	--
July 18	8:30 p. m.	63	82	27.8	11.0	138	--	--
Aug. 1	4:25 p. m.	312	82	27.8	7.4	93	0.0	0.00
Aug. 31	8:50 p. m.	139	77	25.0	5.5	66	.0	.00
Sept. 13	12:45 p. m.	962	70	21.1	6.4	71	.0	.00
Sept. 25	2:35 p. m.	651	58	14.4	8.9	87	--	--

Temperature (°F) of water, March to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						33	40	46	68	72	70	--
2						33	40	51	72	74	70	--
3						32	35	50	66	74	70	--
4						34	35	57	66	74	70	--
5						36	--	63	63	74	80	--
6						34	--	63	68	75	80	--
7						36	--	63	69	77	80	--
8						38	--	60	70	76	80	--
9						35	--	62	72	68	72	--
10						35	--	62	74	80	72	--
11						37	--	60	74	82	74	--
12						35	43	62	72	84	72	--
13						35	40	65	68	78	74	70
14						35	40	68	72	78	74	65
15						36	42	68	73	78	72	68
16						36	50	68	78	80	78	67
17						35	50	68	73	80	78	68
18						35	53	67	67	80	78	70
19						35	52	63	67	82	78	67
20						37	53	66	68	72	80	66
21						40	50	67	70	72	80	65
22						40	54	--	74	74	80	63
23						40	54	78	77	74	80	58
24						40	49	78	80	74	80	57
25						40	52	74	79	75	80	58
26						--	49	74	79	77	80	80
27						--	52	68	74	78	80	60
28						--	52	70	76	80	80	70
29						--	46	70	75	--	80	72
30						40	47	67	72	--	--	70
31						40	--	67	--	--	77	--
Average						36	--	65	72	76	77	--

HURON RIVER AT MILAN, OHIO

LOCATION.--At gaging station at bridge on U. S. Highway 250 at Milan, Erie County, 2 miles downstream from confluence of East Branch and West Branch.
DRAINAGE AREA.--363 square miles.
RECORDS AVAILABLE.--Chemical analyses: March to September 1950.
Water temperatures: March to August 1950.
EXTREMES, 1950.--Dissolved solids: Maximum, 405 ppm Aug. 21-31; minimum 177 ppm Sept. 12.
Hardness: Maximum, 297 ppm May 11-20; minimum, 140 ppm Sept. 12.
Water temperatures: Maximum, 87°F June 26, Aug. 16.
REMARKS.--Records of specific conductance of daily samples available in district office at Columbus, Ohio. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1207.

Chemical analyses, in parts per million, March to September 1950

Date of collection	Mean discharge (second-feet)	Oxygen consumed		Color	pH	Specific conductance (micromhos at 25°C)	Silica (SiO_2)	Iron (Fe)	Copper (Cu)	Chromium (Cr)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
		Unfiltered	Filtered																		Total	Noncarbonate
Mar. 1-10, 1950 .	--	5.3	4.0	9	7.5	400	6.6	0.05	0.0	0.00	53	14	8.3		110	96	8.2	0.1	7.5	261	190	100
Mar. 11-20	618	3.9	2.0	20	8.1	386	7.6	.13	.0	.00	50	14	7.6		100	93	8.8	.2	8.8	257	182	100
Mar. 21-31	1,280	1½	10	12	8.0	361	7.4	.09	.0	.00	47	13	4.9		96	85	7.5	.3	3.6	243	171	92
Apr. 1-10	910	7.1	5.3	17	8.0	427	6.6	--	.0	.00	58	15	6.9		122	100	8.8	.2	5.6	286	206	106
Apr. 11-20	252	6.0	4.8	17	8.2	499	5.2	.07	.0	.00	68	18	10		148	121	10	.4	4.0	324	244	122
Apr. 21-30	1,400	12	5.6	20	8.1	378	5.6	.09	.0	.00	50	14	6.1		110	87	7.0	.3	5.2	239	182	92
May 1-10	898	7.8	5.9	18	8.2	463	5.4	.08	.0	.00	64	16	10		142	112	8.0	.3	3.5	303	226	109
May 11-20	144	5.3	4.9	10	8.2	602	2.4	.05	.0	.00	81	23	12		186	146	12	.3	1.2	397	297	144
May 21-31	225	8.6	6.2	20	8.0	522	5.6	.23	.0	.00	71	18	14		178	115	8.2	.3	3.2	342	251	105
June 1-10	590	13	7.0	27	7.9	427	6.4	.06	.0	.00	57	14	10		130	91	10	.3	7.3	272	200	93
June 11-20	93	5.9	4.2	18	8.2	572	4.8	.03	.0	.00	78	20	15		192	128	10	.1	4.9	383	277	120
June 21-30	336	7.7	4.2	23	8.4	542	4.8	.03	.0	.00	71	19	18		a176	121	12	.1	7.8	368	255	111
July 1-10	55	6.7	4.0	18	8.2	565	6.0	.03	.0	.00	76	20	15		178	133	12	.1	5.0	388	272	126
July 11-20	106	5.9	3.1	17	8.3	599	5.0	.04	.0	.00	69	22	26		178	139	18	.0	3.4	399	263	117
July 21-31	128	7.5	5.1	21	7.9	435	7.8	.06	.1	.00	56	15	10		134	90	10	.3	5.9	285	201	92
Aug. 1-10.....	87	6.4	5.2	20	8.2	483	6.6	.06	.0	.00	60	17	19		b160	102	14	.3	2.8	315	220	88
Aug. 11-20	30	4.5	3.7	12	8.2	605	9.6	.06	.0	.00	76	23	19		194	134	17	.2	3.2	402	284	125
Aug. 21-31.....	33	4.7	4.7	13	8.2	607	6.4	.06	.0	.00	73	22	24		180	140	21	.3	1.8	405	273	125
Sept. 12	405	8.3	6.2	23	7.5	269	5.9	.06	.0	.00	38	11	1.3		90	51	7.5	.2	6.1	177	140	66

a Includes equivalent of 6 parts per million of carbonate (CO_3).
b Includes equivalent of 12 parts per million of carbonate (CO_3).

STREAMS TRIBUTARY TO LAKE ERIE--Continued

HURON RIVER AT MILAN, OHIO--Continued

Dissolved oxygen, cyanide, and phenols, March to September 1950

Date of collection	Time	Mean discharge (second-feet)	Temperature		Dissolved oxygen		Cyanide	Phenols
			°F	°C	Parts per million	Percent saturation	Parts per million	Parts per million
Mar. 15, 1950	4:50 p. m.	330	40	4.4	12.6	97	--	--
June 6	2:00 p. m.	258	74	23.3	8.8	102	--	--
June 20	5:05 p. m.	62	71	21.7	11.3	127	--	--
July 5	1:55 p. m.	109	76	24.4	8.4	99	--	--
Aug. 15	1:45 p. m.	16	72	22.2	8.0	91	0.0	0.00
Aug. 31	6:15 p. m.	28	76	24.4	7.9	93	.0	.00
Sept. 12	2:35 p. m.	405	71	21.7	7.5	84	.0	.00

Temperature (°F) of water, March to August 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						34	40	50	74	75	84	
2						32	45	48	74	68	79	
3						32	40	60	59	74	73	
4						34	38	73	61	69	75	
5						37	36	72	70	85	79	
6						40	--	67	76	84	75	
7						44	37	64	82	81	79	
8						40	35	59	84	80	81	
9						36	40	58	67	62	82	
10						38	44	64	72	70	--	
11						37	44	60	71	81	79	
12						35	47	69	64	79	70	
13						35	38	66	67	77	73	
14						38	40	70	75	78	79	
15						42	51	73	79	73	81	
16						37	50	72	85	71	87	
17						--	55	72	83	80	85	
18						35	55	71	85	85	73	
19						32	53	72	81	68	78	
20						48	50	71	74	69	85	
21						37	45	70	74	74	77	
22						42	48	70	81	65	73	
23						40	45	74	85	69	78	
24						45	51	76	86	75	68	
25						43	--	72	82	76	70	
26						40	50	72	87	75	73	
27						50	48	71	73	79	69	
28						50	50	72	71	82	82	
29						43	46	75	75	84	81	
30						48	45	73	75	79	77	
31						48	--	72	--	81	75	
Average					--	40	45	68	76	76	77	

VERMILION RIVER NEAR VERMILION, OHIO

LOCATION.--At gaging station at bridge on North Ridge Road, Lorain County, 3½ miles southeast of Vermilion and 4½ miles upstream from mouth.
DRAINAGE AREA.--260 square miles.
RECORDS AVAILABLE.--Chemical analyses: March to September 1950.
Water temperatures: March to August 1950.
EXTREMES, 1950.--Dissolved solids: Maximum, 312 ppm Aug. 21-31; minimum, 195 ppm Mar. 21-31.
Hardness: Maximum, 213 ppm May 11-20; minimum, 124 ppm Mar. 21-31.
Water temperatures: Maximum, 81°F Aug. 26-29.
REMARKS.--Records of specific conductance of daily samples available in district office at Columbus, Ohio. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1207.

Chemical analyses, in parts per million, March to September 1950

Date of collection	Mean discharge (second-feet)	Oxygen consumed		Color	pH	Specific conductance (micromhos at 25°C)	Silica (SiO_2)	Iron (Fe)	Copper (Cu)	Chromium (Cr)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
		Unfiltered	Filtered																		Total	Non-carbonate
Mar. 1-10, 1950 .	--	5.6	4.5	13	8.0	324	5.4	0.03	0.0	0.00	42	12	5.3		88	75	8.0	0.1	5.0	209	154	82
Mar. 11-20	838	6.3	4.8	25	7.9	310	7.8	.04	.0	.00	38	11	8.4		86	69	7.8	.2	5.6	204	140	70
Mar. 21-31	1,490	8.2	6.0	18	7.8	270	5.8	.06	.0	.00	34	9.4	7.9		76	62	6.5	.3	4.8	195	124	61
Apr. 1-10	688	7.9	6.0	13	7.8	316	7.0	.15	.1	.00	41	11	9.2		100	70	6.5	.5	2.8	214	148	66
Apr. 11-20	178	5.3	5.0	16	8.0	412	4.0	.12	.0	.00	53	15	12		132	92	9.9	.2	1.4	259	194	86
Apr. 21-30	1,100	8.7	6.3	25	7.4	331	5.2	.04	.0	.00	42	12	5.0		98	71	6.0	.3	1.9	223	154	74
May 1-10	668	7.2	6.3	28	7.5	329	5.0	.09	.0	.00	45	12	2.3		106	68	5.0	.2	1.6	216	162	75
May 11-20	115	6.0	4.0	18	8.2	456	2.0	.07	.0	.00	59	16	12		156	92	9.5	.4	.5	286	213	85
May 21-31	301	11	6.2	22	8.1	346	5.2	.04	.2	.00	45	12	7.0		115	68	6.5	.4	2.1	222	162	67
June 1-10	366	10	7.6	25	7.5	355	4.6	.04	.0	.00	46	16	4.1		132	66	6.5	.2	3.6	223	181	72
June 11-20	89	8.1	6.8	22	8.1	396	4.6	.07	.0	.00	52	15	7.7		137	75	11	.2	2.3	254	191	79
June 21-30	68	4.6	4.2	22	8.3	396	6.4	.04	.0	.00	48	13	16		138	78	9.1	.1	1.7	256	173	60
July 1-10	21	6.7	3.8	17	8.3	398	5.0	.04	.0	.00	49	14	13		134	79	9.4	.2	2.3	256	180	70
July 11-20	51	6.0	3.4	10	8.2	433	4.2	.04	.1	.00	46	15	24		140	91	12	.1	1.4	276	176	62
July 21-31	58	5.8	3.9	23	8.2	386	7.6	.04	.1	.00	43	13	15		118	71	14	.0	4.8	245	161	64
Aug. 1-10	67	7.0	6.1	25	8.4	331	3.2	.06	.0	.00	41	11	10		114	58	10	.3	2.0	211	148	54
Aug. 11-20	12	5.4	4.6	12	8.1	415	4.0	.03	.0	.00	50	14	14		136	81	12	.1	.8	266	182	71
Aug. 21-31	16	5.2	4.0	12	8.1	488	3.0	.02	.0	.00	50	15	28		144	86	28	.1	.6	312	186	68
Sept. 25	67	8.9	7.8	29	7.9	385	8.2	.04	.0	.00	49	15	4.2		124	71	10	.2	3.7	247	184	82

STREAMS TRIBUTARY TO LAKE ERIE--Continued

VERMILION RIVER NEAR VERMILION, OHIO--Continued

Dissolved oxygen, cyanide, and phenols, March to September 1950

Date of collection	Time	Mean discharge (second-feet)	Temperature		Dissolved oxygen		Cyanide	Phenols
			°F	°C	Parts per million	Percent saturation	Parts per million	Parts per million
Mar. 15, 1950.....	4:00 p. m.	879	37	2.8	13.3	98		
Mar. 27	3:35 p. m.	2,870	45	7.2	10.8	89		
Apr. 11.....	4:30 p. m.	275	43	6.1	11.2	90		
Apr. 25.....	7:00 p. m.	1,990	50	10.0	9.8	86		
May 10	9:15 a. m.	103	60	15.6	9.8	98		
May 22	2:15 p. m.	71	66	18.9	9.8	105		
July 18	6:15 p. m.	12	84	28.9	7.8	100		
Aug. 1.....	2:30 p. m.	189	80	26.7	6.9	85		
Aug. 31.....	5:05 p. m.	5.9	77	25.0	8.5	101	0.0	0.00
Sept. 25	4:30 p. m.	67	57	13.9	10.2	98		

Temperature (°F) of water, March to August 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						34	47	46	64	64	75	
2						32	44	49	64	67	71	
3						33	49	50	89	69	67	
4						35	54	55	59	70	65	
5						34	55	61	61	72	69	
6						36	47	63	64	69	67	
7						36	44	59	67	68	66	
8						41	47	54	69	68	67	
9						38	43	55	73	70	69	
10						38	45	60	68	70	--	
11						38	51	58	65	72	--	
12						39	44	54	64	75	--	
13						37	34	57	69	66	64	
14						36	38	57	66	68	64	
15						38	40	64	67	71	67	
16						34	41	63	73	75	72	
17						34	50	64	71	74	72	
18						33	51	62	61	--	79	
19						34	55	61	59	70	70	
20						36	48	--	65	67	67	
21						39	48	58	65	65	67	
22						42	46	63	66	66	65	
23						43	52	63	73	69	64	
24						41	46	64	77	71	71	
25						43	49	73	78	67	80	
26						45	--	67	75	70	81	
27						45	51	67	72	69	81	
28						51	48	61	65	71	81	
29						50	49	63	69	72	81	
30						45	48	65	64	73	67	
31						43	--	69	--	74	78	
Average						39	47	60	67	70	71	

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BLACK RIVER NEAR ELYRIA, OHIO

LOCATION.--At bridge on State Highway 254, Lorain County, 4½ miles upstream from French Creek, and 6½ miles downstream from Elyria.
DRAINAGE AREA.--392 square miles (at gaging station).
RECORDS AVAILABLE.--Chemical analyses: March to September 1950.
Water temperatures: March to September 1950.
EXTREMES, 1950.--Dissolved solids: Maximum, 445 ppm Aug. 11-20; minimum, 203 ppm Mar. 21-31.
Hardness: Maximum, 262 ppm May 11-20; minimum, 131 ppm Mar. 21-31.
Water temperatures: Maximum, 86°F June 26.
REMARKS.--Records of specific conductance of daily samples available in district office at Columbus, Ohio. Discharge records for station at Elyria for water year October 1949 to September 1950 given in Water-Supply Paper 1174. No appreciable inflow between sampling point and gaging station except during periods of heavy local rains.

Chemical analyses, in parts per million, March to September 1950

Date of collection	Mean discharge (second-feet)	Oxygen consumed		Color	pH	Specific conductance (micromhos at 25°C)	Silica (SiO_2)	Iron (Fe)	Copper (Cu)	Chromium (Cr)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
		Unfiltered	Filtered																		Total	Non-carbonate
Mar. 1-10, 1950 ..	723	7.1	6.4	16	8.0	411	17	0.10	0.0	0.06	43	12	20		84	94	20	0.4	4.4	273	157	88
Mar. 11-20.....	756	--	5.1	7	8.0	374	8.6	.07	.0	.08	42	10	17		70	92	16	.3	8.7	233	146	89
Mar. 21-31.....	1,670	--	5.9	10	7.6	325	7.2	.04	.0	.14	37	9.4	17		68	86	13	.4	5.4	203	131	75
Apr. 1-10.....	878	10	6.0	15	8.1	394	6.0	.04	.0	.08	46	13	13		95	93	14	.2	2.8	251	168	90
Apr. 11-20.....	250	7.9	5.4	10	8.0	548	4.8	.08	.1	.16	60	17	24		128	123	26	.4	2.6	340	220	115
Apr. 21-30.....	1,510	12	6.3	24	7.9	410	5.6	.12	.1	.20	46	13	13		92	92	16	.4	2.8	250	168	93
May 1-10.....	782	8.4	6.3	24	7.9	425	5.8	.10	.1	.20	49	13	18		102	98	17	.4	4.0	266	176	92
May 11-20.....	129	7.2	5.4	10	7.7	688	3.2	.20	.2	.10	72	20	32		152	145	38	.4	.8	398	262	137
May 21-31.....	334	11	5.8	22	8.2	482	5.2	.04	.2	.10	56	15	19		122	104	22	.2	4.7	308	201	101
June 1-10.....	483	13	5.7	23	8.3	431	7.8	.02	.2	.30	50	13	17		100	98	15	.3	12	283	178	96
June 11-20.....	179	5.6	6.1	28	8.1	470	5.4	.08	.1	.30	49	14	22		105	95	22	.5	12	320	180	94
June 21-30.....	32	4.8	5.1	35	8.2	606	5.0	.07	.1	.40	59	16	37		141	120	34	.5	5.5	400	213	97
July 1-10.....	30	6.1	6.2	25	8.0	680	4.6	.05	.2	.60	66	18	41		140	140	43	.5	6.4	420	239	124
July 11-20.....	75	3.1	2.1	35	8.2	654	6.0	.02	.2	1.90	57	16	54		140	124	45	.4	20	410	208	93
July 21-31.....	42	5.2	3.6	30	8.0	485	6.8	.03	.2	1.20	46	12	32		97	96	23	.4	25	310	164	85
Aug. 1-10.....	44	6.1	5.4	40	8.1	620	6.0	.06	.2	1.10	54	16	49		132	128	40	.7	10	392	201	92
Aug. 11-20.....	14	7.0	4.9	55	8.2	727	8.0	.08	.2	3.20	56	15	70		152	135	58	.4	7.0	445	201	77
Aug. 21-31.....	13	6.6	4.8	--	7.7	658	6.0	.09	.2	.80	53	14	61		108	150	48	.7	11	413	190	101
Sept. 1-10.....	23	7.4	5.6	22	7.7	581	6.2	.06	.1	.70	52	14	46		120	122	38	.5	10	365	187	89
Sept. 11-20.....	98	9.0	5.7	20	7.8	467	8.6	.06	.1	.22	46	12	27		80	103	30	.2	9.4	298	164	99
Sept. 21-30.....	40	8.6	6.1	22	7.9	535	9.2	.05	.1	.38	54	14	34		118	118	28	.2	7.0	345	192	96

STREAMS TRIBUTARY TO LAKE ERIE--Continued

BLACK RIVER NEAR ELYRIA, OHIO--Continued

Dissolved oxygen, cyanide, and phenols, March to September 1950

Date of collection	Time	Mean discharge (second-feet)	Temperature		Dissolved oxygen		Cyanide	Phenols
			°F	°C	Parts per million	Percent saturation	Parts per million	Parts per million
Mar. 15, 1950 ..	2:45 p. m.	645	37	2.8	14.0	103	--	--
July 18	5:00 p. m.	24	80	26.7	11.4	140	0.0	0.00
Aug. 1	1:45 p. m.	55	81	27.2	8.8	109	--	.00
Aug. 15	12:30 p. m.	9.6	72	22.2	--	--	.0	--
Aug. 31	4:15 p. m.	8.2	76	24.4	7.7	91	.0	.00
Sept. 12	1:35 p. m.	234	70	21.1	6.6	74	.0	.00
Sept. 25	5:15 p. m.	46	60	15.6	9.0	90	--	--

Temperature (°F) of water, March to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						33	45	49	70	76	82	75
2						32	43	51	71	69	79	75
3						33	47	53	64	71	73	73
4						34	49	60	60	75	74	70
5						34	47	61	71	77	75	67
6						35	44	66	73	74	76	66
7						36	45	65	77	75	78	68
8						37	43	61	79	76	76	--
9						34	43	62	82	78	77	61
10						36	47	64	73	75	80	67
11						36	45	62	69	75	78	62
12						35	44	66	70	76	76	66
13						35	43	64	69	73	77	57
14						34	44	64	75	72	70	55
15						36	44	65	73	71	71	59
16						35	48	67	78	73	75	58
17						35	50	68	71	74	84	54
18						34	56	69	67	80	76	56
19						34	53	68	69	77	76	54
20						40	53	67	69	73	70	55
21						38	54	68	76	72	72	52
22						41	56	69	78	73	69	54
23						40	54	70	71	72	71	52
24						42	48	73	83	73	73	48
25						44	50	73	65	74	73	48
26						41	52	69	86	77	74	49
27						46	52	68	73	78	78	50
28						--	54	68	75	80	80	51
29						46	55	68	74	82	81	55
30						44	53	70	75	83	76	57
31						44	--	69	--	78	78	--
Average						37	49	65	73	75	76	59

ROCKY RIVER AT CLEVELAND, OHIO

LOCATION.--At bridge on Puritas Spring Road in Cleveland, Cuyahoga County, 3¾ miles downstream from gaging station near Berea, and 8 miles upstream from mouth.
DRAINAGE AREA.--269 square miles (above gaging station).
RECORDS AVAILABLE.--Chemical analyses: March to September 1950.
Water temperatures: March to August 1950.
EXTREMES, 1950.--Dissolved solids: Maximum, 543 ppm Sept. 25; minimum, 188 ppm Mar. 21-31.
Hardness: Maximum, 242 ppm Aug. 1-10; minimum, 124 ppm Mar. 21-31.
Water temperatures: Maximum, 88°F Aug. 1.
REMARKS.--Records of specific conductance of daily samples available in district office at Columbus, Ohio. Discharge records for gaging station near Berea for water year October 1949 to September 1950 given in Water-Supply Paper 1174. No appreciable inflow between sampling point and gaging station except during periods of heavy local rains.

Chemical analyses, in parts per million, March to September 1950

Date of collection	Mean discharge (second-feet)	Oxygen consumed		Color	pH	Specific conductance (micromhos at 25°C)	Silica (SiO_2)	Iron (Fe)	Copper (Cu)	Chromium (Cr)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
		Unfiltered	Filtered																		Total	Noncarbonate
Mar. 1-10, 1950..	732	5.7	4.0	15	7.9	335	7.4	0.08	0.0	0.00	39	11	12		74	80	14	0.3	4.1	215	143	82
Mar. 11-20.....	513	3.0	1.8	16	8.1	340	14	.15	.0	.00	39	11	13		77	81	14	.3	4.3	227	143	79
Mar. 21-31.....	1,280	8.3	4.7	11	7.9	296	5.2	.05	.0	.00	34	9.4	9.9		64	71	11	.1	3.6	188	124	71
Apr. 1-10.....	735	6.8	4.4	10	8.1	354	5.6	.06	.0	.00	41	11	12		82	83	13	.1	2.4	225	148	80
Apr. 11-20.....	236	3.8	3.0	6	7.9	406	3.6	.07	.0	.00	49	14	17		110	99	16	.2	1.8	260	180	90
Apr. 21-30.....	1,490	9.7	4.6	10	7.9	323	5.6	.08	.0	.00	38	10	9.7		76	75	10	.2	2.4	200	136	74
May 1-10.....	600	6.4	5.1	10	7.9	355	5.8	.12	.0	.00	45	11	11		101	79	10	.2	2.5	228	158	75
May 11-20.....	146	3.8	3.1	12	8.3	433	3.2	.06	.0	.00	49	14	17		a109	94	20	.4	1.1	273	180	90
May 21-31.....	113	8.6	5.8	16	8.1	452	4.0	.19	.1	.00	53	13	21		122	99	18	.4	2.0	284	186	86
June 1-10.....	389	9.6	4.7	18	8.0	407	5.8	.04	.2	.00	48	12	14		104	87	13	.3	4.5	259	169	84
June 11-20.....	81	5.4	5.0	18	8.1	469	5.6	.07	.0	.00	55	15	17		123	98	21	.3	3.3	323	199	98
June 21-30.....	20	3.7	4.4	10	8.2	609	3.4	.06	.0	.00	61	18	35		134	122	44	.3	2.5	352	226	116
July 1-10.....	21	4.8	4.0	15	8.3	599	5.2	.07	.0	.00	58	18	32		b115	127	42	.1	2.6	370	219	124
July 11-20.....	77	5.8	5.2	18	8.3	650	3.6	.05	.0	.00	55	18	48		c118	128	59	.1	3.0	408	211	114
July 21-31.....	25	6.2	5.8	25	8.2	551	3.8	.05	.0	.00	52	15	33		96	118	41	.1	4.8	364	191	113
Aug. 1-10.....	12	5.2	5.0	15	8.3	874	2.0	.08	.0	.00	64	20	81		d128	154	107	.3	1.5	527	242	137
Aug. 11-20.....	5.0	4.8	3.8	7	8.1	733	7.0	.03	.0	.03	61	18	63		120	159	68	.3	2.2	465	226	128
Aug. 21-31.....	6.5	3.4	4.2	11	8.6	786	4.6	.04	.0	.04	60	18	75		e128	149	88	.3	1.4	509	224	118
Sept. 25.....	15	--	--	8	8.4	880	3.2	.04	--	--	61	21	91		f134	155	115	.3	1.8	543	239	128

a Includes equivalent of 6 parts per million of carbonate (CO_3).
b Includes equivalent of 9 parts per million of carbonate (CO_3).
c Includes equivalent of 10 parts per million of carbonate (CO_3).
d Includes equivalent of 7 parts per million of carbonate (CO_3).
e Includes equivalent of 11 parts per million of carbonate (CO_3).
f Includes equivalent of 8 parts per million of carbonate (CO_3).

STREAMS TRIBUTARY TO LAKE ERIE--Continued

ROCKY RIVER AT CLEVELAND, OHIO--Continued

Dissolved oxygen, cyanide, and phenols, March to September 1950

Date of collection	Time	Mean discharge (second-feet)	Temperature		Dissolved oxygen		Cyanide	Phenols
			°F	°C	Parts per million	Percent saturation	Parts per million	Parts per million
Mar. 15, 1950	12:30 p. m.	547	36	2.2	13.4	97	--	--
June 6	11:50 a. m.	191	70	21.1	9.0	100	--	--
June 20	3:15 p. m.	40	74	23.3	--	--	--	--
July 5	12:05 p. m.	35	73	22.8	11.0	126	--	--
Aug. 15	11:30 a. m.	3.0	78	25.6	10.4	126	0.0	0.00
Aug. 31	2:30 p. m.	8.0	78	25.6	10.4	126	.0	.00
Sept. 25	6:30 p. m.	15	59	15.0	11.8	116	--	--

Temperature (°F) of water, March to August 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						34	41	49	75	74	88	
2						32	46	45	74	--	79	
3						35	47	62	62	76	70	
4						38	49	66	64	80	76	
5						40	45	71	71	79	75	
6						35	44	--	77	78	77	
7						39	47	62	80	80	77	
8						38	40	59	84	79	78	
9						35	45	64	78	77	73	
10						37	47	65	71	79	81	
11						32	44	60	79	79	--	
12						36	42	67	76	84	70	
13						37	38	66	68	81	--	
14						38	--	72	73	76	73	
15						39	46	74	78	78	--	
16						38	51	68	87	76	82	
17						37	52	72	68	82	86	
18						37	57	70	61	79	73	
19						40	50	68	69	79	73	
20						43	47	65	74	69	72	
21						41	48	69	73	75	74	
22						42	48	69	84	78	75	
23						40	--	68	86	78	78	
24						44	--	78	86	86	77	
25						45	--	--	86	81	82	
26						42	54	73	84	81	78	
27						45	54	75	70	82	82	
28						48	48	70	75	80	85	
29						44	54	72	75	76	79	
30						45	48	79	74	84	76	
31						46	--	69	--	81	--	
Average						39	47	67	75	79	77	

CUYAHOGA RIVER AT BRECKSVILLE, OHIO

LOCATION.--At bridge on Station Road, Cuyahoga County, 2½ miles downstream from Mason Creek, 3½ miles upstream from Brandywine Creek, and 8 miles upstream from gaging station at Independence.
DRAINAGE AREA.--584 square miles; 709 square miles (above gaging station).
RECORDS AVAILABLE.--Chemical analyses: March to September 1950.
Water temperatures: March to September 1950.
EXTREMES, 1950.--Dissolved solids: Maximum, 638 ppm Aug. 11-20; minimum, 177 ppm Mar. 21-31.
Hardness: Maximum, 299 ppm Aug. 21-31; minimum, 114 ppm Mar. 21-31.
Water temperatures: Maximum 78°F June 25, Aug. 29.
REMARKS.--Records of specific conductance of daily samples available in district office at Columbus, Ohio. Discharge records for gaging station at Independence for water year October 1949 to September 1950 given in Water-Supply Paper 1174. Some inflow between sampling point and gaging station.

Chemical analyses, in parts per million, March to September 1950

Date of collection	Mean discharge (second-feet)	Oxygen consumed		Color	pH	Specific conductance (micromhos at 25°C)	Silica (SiO_2)	Iron (Fe)	Copper (Cu)	Chromium (Cr)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
		Unfiltered	Filtered																		Total	Noncarbonate
Mar. 1-10, 1950	1,740	7.1	8.0	20	7.8	400	7.6	0.08	0.0	0.00	44	10	20		88	83	24	0.4	2.2	258	151	79
Mar. 11-20	1,820	3.8	2.2	15	7.8	337	6.2	.13	.0	.00	38	9.1	14		73	72	16	.4	4.5	209	132	72
Mar. 21-31	3,810	--	4.3	7	7.3	298	5.0	.06	.0	.00	34	7.1	13		58	63	117	.5	4.6	177	114	66
Apr. 1-10	2,080	--	5.0	9	7.5	336	5.0	.06	.0	.00	36	6.7	21		74	67	21	.4	1.9	201	117	57
Apr. 11-20	933	8.9	5.7	12	7.6	498	6.0	.04	.0	.00	48	12	25		104	91	28	.4	4.6	302	169	84
Apr. 21-30	2,900	13	5.6	20	7.7	389	6.0	.08	.0	.00	40	9.9	23		86	73	28	.3	3.4	233	140	70
May 1-10	1,620	9.8	7.0	18	7.7	426	4.2	.04	.0	.00	44	10	27		96	77	34	.3	3.4	264	151	72
May 11-20	778	10	6.5	18	7.8	557	4.8	.05	.0	.00	56	13	40		120	99	52	.4	4.3	338	193	95
May 21-31	497	10	7.2	17	7.6	725	6.8	.16	.0	.00	64	15	62		142	107	86	.5	6.2	429	221	105
June 1-10	820	9.4	7.1	20	7.9	586	8.4	.05	.0	.00	60	14	40		140	104	46	.5	6.0	363	207	93
June 11-20	531	9.6	7.3	20	8.0	636	8.0	.05	.0	.00	64	14	46		138	104	62	.5	8.4	387	217	104
June 21-30	422	8.3	7.8	18	7.9	737	6.8	.08	.0	.00	68	15	57		144	114	79	.5	6.0	417	231	113
July 1-10	324	7.9	7.0	25	8.3	974	7.2	.06	.0	.00	90	16	82		146	114	158	.3	8.0	593	290	171
July 11-20	252	8.4	8.1	20	7.8	948	6.8	.06	.0	.00	79	18	81		167	143	110	.4	6.1	589	271	134
July 21-31	200	8.9	8.9	22	8.2	911	8.0	.06	.0	.00	79	18	82		a187	131	109	.4	5.6	584	271	118
Aug. 1-10	179	9.9	7.9	22	7.7	915	6.5	.14	.0	.00	78	19	85		198	136	106	.6	3.8	563	273	110
Aug. 11-20	143	9.6	8.0	20	7.8	1,070	10	.13	.0	.00	86	20	109		202	155	144	.8	1.2	638	297	131
Aug. 21-31	146	9.6	7.6	22	7.8	1,030	10	.14	.0	.00	87	20	100		208	158	126	.8	2.4	619	299	129
Sept. 1-10	159	10	8.6	20	7.6	926	12	.11	.0	.00	83	18	85		218	143	96	.6	1.0	566	281	102
Sept. 11-20	290	12	8.0	20	7.8	857	4.2	.13	.0	.00	76	19	76		188	141	92	.5	1.2	512	268	114
Sept. 21-30	227	9.8	8.6	20	7.7	865	4.4	.14	.0	.00	76	18	78		182	127	106	.6	1.6	510	264	114

a Includes equivalent of 8 parts per million of carbonate (CO_3).

STREAMS TRIBUTARY TO LAKE ERIE--Continued

CUYAHOGA RIVER AT BRECKSVILLE, OHIO--Continued

Dissolved oxygen, cyanide, and phenols, March to September 1950

Date of collection	Time	Mean discharge (second-feet)	Temperature		Dissolved oxygen		Cyanide	Phenols
			°F	°C	Parts per million	Percent saturation	Parts per million	Parts per million
Mar. 14, 1950	3:30 p. m.	2,050	38	3.3	12.4	93	--	--
Mar. 27	7:15 a. m.	6,480	40	4.4	11.6	89	--	--
Apr. 11	9:00 a. m.	1,270	49	9.4	9.2	80	--	--
Apr. 25	10:30 a. m.	4,900	50	10.0	9.3	82	--	--
May 9	12:50 p. m.	760	59	15.0	7.9	78	--	--
May 22	7:30 a. m.	500	64	17.8	6.2	65	--	--
June 6	7:00 a. m.	820	67	19.4	6.2	67	--	--
June 20	10:00 a. m.	314	67	19.4	4.6	50	--	--
July 5	8:00 a. m.	390	72	22.2	4.7	53	--	--
July 18	9:00 a. m.	359	75	23.9	2.9	34	0.0	0.07
Aug. 1	8:45 a. m.	280	77	25.0	2.3	27	.0	.03
Aug. 15	7:00 a. m.	119	70	21.1	2.8	31	--	.06
Aug. 31	8:20 a. m.	142	74	23.3	2.2	25	.0	.08
Sept. 12	9:00 a. m.	463	70	21.1	2.6	29	.0	.00
Sept. 26	10:30 a. m.	179	60	15.6	5.0	50	--	--

Temperature (°F) of water, March to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						42	44	49	66	70	76	75
2						37	42	51	66	70	77	76
3						40	46	52	70	70	75	69
4						41	51	58	62	71	71	72
5						37	49	61	64	71	71	67
6						40	45	65	68	70	68	62
7						42	42	60	69	68	70	66
8						42	45	56	71	69	71	68
9						37	44	59	72	69	73	70
10						38	44	62	72	72	72	71
11						40	50	61	70	71	75	73
12						38	42	58	68	71	71	71
13						37	43	61	69	74	65	72
14						38	41	60	70	70	68	71
15						41	43	64	71	70	70	69
16						40	43	64	72	73	73	67
17						37	49	64	72	76	75	62
18						38	52	64	64	75	77	65
19						39	55	64	62	73	74	65
20						37	51	63	65	73	71	67
21						40	50	63	69	70	68	67
22						40	50	64	69	71	67	66
23						40	54	64	72	70	68	65
24						40	47	65	77	75	71	61
25						41	50	70	78	73	72	58
26						40	50	72	73	74	69	58
27						41	50	72	75	72	74	60
28						46	51	66	70	74	76	63
29						44	51	65	72	74	78	66
30						42	51	66	69	75	74	66
31						42	--	69	--	77	74	--
Average						40	48	62	70	72	72	67

CUYAHOGA RIVER AT CLEVELAND, OHIO

LOCATION.--At bridge on Center Street in Cleveland, Cuyahoga County, three-quarters of a mile upstream from mouth, and 3¼ miles downstream from Kingsbury Run.
DRAINAGE AREA.--813 square miles (above mouth).
RECORDS AVAILABLE.--Chemical analyses: March to September 1950.
Water temperatures: March to September 1950.
EXTREMES, 1950.--Dissolved solids: Maximum, 592 ppm Aug. 21-31; minimum, 235 ppm Mar. 21-31.
Hardness: Maximum, 279 ppm Aug. 1-10; minimum, 135 ppm Mar. 21-31.
Water temperatures: Maximum, 89°F Aug. 1, Sept. 1.
REMARKS.--Records of specific conductance of daily samples available in district office at Columbus, Ohio.

Chemical analyses, in parts per million, March to September 1950

Date of collection	Mean discharge (second-feet)	Oxygen consumed		Color	pH	Specific conductance (micromhos at 25°C)	Silica (SiO_2)	Iron (Fe)	Copper (Cu)	Chromium (Cr)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
		Unfiltered	Filtered																		Total	Noncarbonate
Mar. 1-10, 1950.		7.8	4.6	13	7.3	509	7.2	0.08	0.0	0.00	50	11		36	68	131	38	0.8	1.2	308	170	114
Mar. 11-20		3.9	2.1	12	7.5	473	13	.10	.0	.00	49	10		30	66	123	30	.6	2.9	291	163	109
Mar. 21-31		--	4.6	5	7.3	377	12	.05	.0	.00	41	7.9		22	66	91	22	.6	2.4	235	135	81
Apr. 1-10		--	4.7	5	7.5	441	15	.04	.0	.00	47	9.5		27	72	112	26	.6	1.9	279	156	97
Apr. 11-20		8.3	6.4	15	7.5	634	4.8	.39	.1	.00	64	14		44	82	173	44	1.0	.4	397	217	150
Apr. 21-30		13	5.7	20	7.6	471	6.8	.27	.0	.00	50	11		29	84	117	28	.8	.4	290	170	101
May 1-10		10	5.7	9	7.2	506	6.0	.08	.0	.00	54	12		29	82	129	31	.7	.5	308	184	117
May 11-20		12	6.1	7	7.2	703	6.8	.06	.0	.00	72	15		50	102	180	52	2.2	.6	430	241	148
May 21-31		13	6.0	25	7.2	762	8.0	.64	.0	.00	72	15		63	118	173	70	1.3	.2	472	241	145
June 1-10		9.0	5.2	8	7.8	678	6.8	.04	.0	.00	71	15		41	107	160	49	1.4	.1	425	239	151
June 11-20		11	4.9	8	7.8	714	6.6	.06	.1	.00	74	15		45	110	176	47	2.0	.2	452	246	156
June 21-30		9.9	5.9	8	7.7	823	8.0	.08	.0	.00	76	16		64	114	197	66	1.2	.5	517	255	162
July 1-10		10	5.1	10	7.6	792	6.8	.08	.1	.00	75	15		53	128	152	69	1.2	.2	447	249	144
July 11-20		7.6	5.4	8	7.5	885	7.6	.06	.0	.00	78	16		75	131	191	80	1.2	1.0	542	260	153
July 21-31		5.2	4.9	8	7.3	811	8.4	.06	.0	.00	78	15		63	112	198	64	1.2	1.5	486	256	164
Aug. 1-10		16	5.8	7	7.3	908	9.0	.09	.0	.00	82	18		81	124	221	84	1.6	.3	563	279	177
Aug. 11-20		17	5.3	8	7.4	907	7.0	.12	.0	.00	83	17		80	118	224	82	1.9	.3	553	277	180
Aug. 21-31		11	5.9	12	7.4	963	9.5	2.2	.0	.00	85	15		92	116	231	98	.2	.0	592	274	179
Sept. 1-10		9.4	6.5	20	7.3	848	11	2.1	.0	.00	77	13		82	126	204	76	.3	.0	526	246	142
Sept. 11-20		11	6.3	7	7.3	872	5.1	.14	.0	.00	83	16		75	122	213	77	2.2	.0	524	273	173
Sept. 21-30		13	6.0	8	7.4	901	4.3	.49	.0	.00	82	17		81	136	203	87	2.3	.0	537	274	163

STREAMS TRIBUTARY TO LAKE ERIE--Continued

CUYAHOGA RIVER AT CLEVELAND, OHIO--Continued

Dissolved oxygen, cyanide, and phenols, March to September 1950

Date of collection	Time	Mean discharge (second-feet)	Temperature		Dissolved oxygen		Cyanide	Phenols
			°F	°C	Parts per million	Percent saturation	Parts per million	Parts per million
Mar. 15, 1950	11:40 a. m.		43	6.1	9.7	78	--	--
Mar. 27	1:00 p. m.		43	6.1	9.4	76	--	--
Apr. 11	2:15 p. m.		53	11.7	6.4	59	--	--
Apr. 25	4:05 p. m.		52	11.1	7.6	69	--	--
May 9	5:15 p. m.		69	20.6	.0	0	--	--
May 22	12:05 p. m.		74	23.3	.0	0	--	--
June 6	11:00 a. m.		74	23.3	.0	0	--	--
June 20	2:25 p. m.		81	27.2	.0	0	--	--
July 5	11:15 a. m.		81	27.2	.0	0	--	--
July 18	4:00 p. m.		87	30.6	.0	0	0.0	0.04
Aug. 1	12:05 p. m.		91	32.8	.0	0	.0	.08
Aug. 15	10:15 a. m.		85	29.4	.0	0	--	.06
Aug. 31	1:45 p. m.		85	29.4	.4	5	.0	.12
Sept. 12	12:20 p. m.		86	30.0	.0	0	.0	.15
Sept. 25	8:30 p. m.		74	23.3	.2	2	--	--

Temperature (°F) of water, March to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						45	50	55	78	80	89	89
2						44	50	57	78	80	87	82
3						43	52	60	82	82	85	80
4						43	55	65	78	82	85	78
5						43	52	67	70	80	85	79
6						40	50	70	75	80	84	82
7						43	50	65	77	81	84	79
8						44	52	68	77	80	84	81
9						43	50	69	77	81	84	81
10						42	52	69	84	81	85	80
11						45	53	69	78	82	86	82
12						45	51	68	78	83	85	86
13						48	54	68	79	84	80	83
14						42	53	70	78	83	81	78
15						45	53	71	80	82	82	80
16						44	55	75	80	82	83	80
17						45	56	72	82	82	86	78
18						42	60	75	78	86	85	78
19						44	63	73	78	86	86	81
20						45	64	73	81	75	85	80
21						47	60	73	79	72	87	80
22						47	62	69	79	78	81	79
23						45	62	73	80	82	80	80
24						43	50	70	83	80	82	79
25						45	53	76	84	86	81	77
26						45	53	78	84	82	82	77
27						45	57	75	84	80	82	72
28						45	58	73	84	82	82	76
29						47	58	75	84	85	87	76
30						46	57	76	83	82	--	75
31						48	--	76	--	85	--	--
Average						44	55	70	80	81	84	80

STREAMS TRIBUTARY TO LAKE ERIE--Continued

CHAGRIN RIVER NEAR WILLOUGHBY, OHIO

LOCATION.--At bridge on State Highway 283, Lake County, three-quarters of a mile upstream from mouth, and 4½ miles downstream from gaging station at Willoughby .

DRAINAGE AREA.--267 square miles (above mouth); 251 square miles (above gaging station).

RECORDS AVAILABLE.--Chemical analyses: March to September 1950.
Water temperatures: March to August 1950.

REMARKS.--Records of specific conductance of daily samples available in district office at Columbus, Ohio. Discharge records for gaging station at Willoughby for water year October 1949 to September 1950 given in Water-Supply Paper 1174. No appreciable inflow between sampling point and gaging station except during periods of heavy local rains.

Chemical analyses, in parts per million, March to September 1950

Date of collection	Mean discharge (second-feet)	Oxygen consumed		Color	pH	Specific conductance (micromhos at 25°C)	Silica (SiO_2)	Iron (Fe)	Copper (Cu)	Chromium (Cr)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
		Unfiltered	Filtered																		Total	Noncarbonate
Mar. 21-31, 1950..	2,000	--	3.3	5	7.7	206	5.0	0.02	0.0	0.00	26	4.8	8.3		59	42	6.0	0.3	1.6	124	85	36
Apr. 1-10.....	1,040	--	4.1	3	7.9	237	5.8	.01	.0	.00	31	6.4	7.6		74	46	6.8	.4	1.2	145	104	43
Apr. 11-20.....	301	3.2	2.8	5	7.7	280	4.0	.07	.0	.00	38	9.3	8.2		100	53	8.5	.3	1.2	174	133	51
Apr. 21-30.....	1,290	6.2	3.6	9	7.6	251	8.0	.04	.0	.00	33	8.6	4.3		82	47	6.5	.2	1.5	163	118	50
May 1-10.....	529	6.7	2.8	7	7.8	278	4.0	.09	.0	.00	37	8.2	7.7		96	51	5.8	.6	1.4	171	126	47
May 11-20.....	198	3.6	3.0	7	8.1	318	2.4	.06	.0	.00	43	10	5.8		116	54	6.0	.3	.7	192	148	53
May 21-31.....	118	6.5	3.8	6	8.2	368	3.0	.04	.0	.00	50	12	7.5		139	60	7.5	.4	2.9	228	174	60
June 1-10.....	273	5.8	4.3	10	7.9	340	4.4	.10	.0	.00	46	14	.9		128	53	7.8	.3	3.0	203	172	67
June 11-20.....	90	3.9	4.2	13	8.1	372	6.6	.07	.0	.00	49	12	9.6		a142	57	9.2	.3	3.5	241	172	55
June 21-30.....	59	3.2	3.8	8	8.3	401	2.8	.08	.0	.00	53	13	9.8		b150	64	9.0	.2	5.0	255	186	62
July 1-10.....	81	3.1	3.1	7	8.2	389	3.8	.06	.0	.00	52	13	4.5		144	58	9.0	.1	2.0	232	183	65
July 11-20.....	181	3.3	3.0	7	8.2	368	2.8	.06	.0	.00	48	12	2.7		c126	56	8.0	.2	2.5	223	170	66
July 21-31.....	130	4.0	3.6	8	8.2	346	4.6	.09	.0	.00	46	11	6.6		a132	50	8.0	.2	2.5	209	160	52
Aug. 1-10.....	80	3.6	3.4	8	8.3	369	4.6	.06	.0	.00	40	9.4	23		d141	56	9.0	.2	2.5	225	138	22
Aug. 11-20.....	33	3.3	2.2	7	8.3	417	4.2	.03	.0	.00	54	14	13		e166	65	11	.1	1.4	273	192	56
Aug. 21-31.....	28	3.1	2.2	6	8.0	420	3.6	.02	.0	.00	54	14	12		163	66	10	.1	2.2	261	192	59
Sept. 12.....	240	3.8	3.5	6	7.8	409	3.2	.08	.0	.00	52	17	6.8		162	60	11	.2	3.4	222	200	67

a Includes equivalent of 8 parts per million of carbonate (CO_3).
b Includes equivalent of 10 parts per million of carbonate (CO_3).
c Includes equivalent of 18 parts per million of carbonate (CO_3).
d Includes equivalent of 16 parts per million of carbonate (CO_3).
e Includes equivalent of 6 parts per million of carbonate (CO_3).

STREAMS TRIBUTARY TO LAKE ERIE--Continued

CHAGRIN RIVER NEAR WILLOUGHBY, OHIO--Continued

Dissolved oxygen, cyanide, and phenols, March to September 1950

Date of collection	Time	Mean discharge (second-feet)	Temperature		Dissolved oxygen		Cyanide	Phenols
			°F	°C	Parts per million	Percent saturation	Parts per million	Parts per million
Mar. 14, 1950	6:00 p. m.	491	35	1.7	13.6	97	--	--
Aug. 15	9:15 a. m.	32	70	21.1	4.3	48	0.0	0.00
Aug. 31	11:30 a. m.	32	75	23.9	4.5	53	.0	.00
Sept. 12.....	11:15 a. m.	240	72	22.2	3.8	43	.0	.00

Temperature (°F) of water March to August 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						--	42	59	72	75	82	
2						--	42	54	72	73	75	
3						--	46	60	65	75	70	
4						--	50	60	61	77	75	
5						--	45	60	70	77	75	
6						--	45	61	75	78	75	
7						--	46	63	76	78	75	
8						--	42	60	80	78	75	
9						--	45	62	80	80	75	
10						--	46	52	75	75	76	
11						--	43	61	73	75	75	
12						--	43	58	73	80	73	
13						--	40	61	70	77	74	
14						--	--	69	74	77	72	
15						--	45	68	80	78	75	
16						--	50	68	77	81	75	
17						--	50	70	72	80	76	
18						--	50	60	65	80	80	
19						--	51	65	62	78	75	
20						--	50	61	70	68	73	
21						37	50	67	69	73	70	
22						40	55	--	75	75	72	
23						37	54	68	82	78	75	
24						40	48	72	85	73	74	
25						42	50	75	87	75	76	
26						40	49	75	75	77	75	
27						40	51	73	83	80	80	
28						50	52	70	76	81	80	
29						44	51	72	75	82	81	
30						47	49	71	75	80	--	
31						48	--	74	--	82	--	
Average						--	48	65	74	77	75	

GRAND RIVER AT PAINESVILLE, OHIO

LOCATION.--At bridge on Highway 535 in Painesville, Lake County, 2¼ miles upstream from mouth, and 8 miles downstream from Kellogg Creek.
DRAINAGE AREA.--712 square miles (above mouth); 587 square miles (above gaging station).
RECORDS AVAILABLE.--Chemical analyses: March to September 1950.
Water temperatures: March to September 1950.
EXTREMES, 1950.--Dissolved solids: Maximum, 18,900 ppm Aug. 9; minimum, 448 ppm Mar. 21-31.
Hardness: Maximum, 9,280 ppm Aug. 9; minimum, 201 ppm Mar. 21-31.
Water temperatures: Maximum, 87°F June 25, 26.
REMARKS.--Records of specific conductance of daily samples available in district office at Columbus, Ohio. Discharge records for gaging station near Madison for water year October 1949 to September 1950 given in Water-Supply Paper 1174. Some inflow between sampling point and gaging station.

Chemical analyses, in parts per million, March to September 1950

Date of collection	Mean discharge (second-feet)	Oxygen consumed		Color	pH	Specific conductance (micromhos at 25°C)	Silica (SiO_2)	Iron (Fe)	Copper (Cu)	Chromium (Cr)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
		Unfiltered	Filtered																		Total	Noncarbonate
Mar. 1-10, 1950..	2,040	5.7	9.0	17	7.2	2,370	8.0	0.13	0.0	0.40	194	7.2	252		34	55	690	0.4	2.5	1,390	514	486
Mar. 11-20	1,350	2.8	1.9	15	8.3	2,000	7.0	.09	.0	.34	198	7.2	166		a 40	52	565	.3	1.1	1,390	524	491
Mar. 21-31.....	5,320	7.4	4.8	17	8.1	739	4.8	.06	.0	.14	72	5.1	66		41	38	190	.3	1.5	448	201	157
Apr. 1-10.....	2,100	7.8	5.5	20	8.2	1,570	8.0	.09	.0	.24	164	6.3	139		48	46	460	.2	.8	967	435	396
Apr. 11-20.....	319	7.5	5.8	17	8.6	4,180	2.0	.09	.0	.60	422	9.4	407		b 62	73	1,310	.3	1.0	2,470	1,090	1,040
Apr. 21-30.....	2,070	8.3	6.2	25	8.0	2,590	4.0	.64	.0	.40	232	8.3	269		46	56	780	.3	.9	1,460	613	575
May 1-6.....	1,990	6.6	6.7	25	8.2	1,300	3.5	.11	.0	.20	131	8.1	108	5.8	54	45	350	.3	1.2	680	360	316
May 7-10.....	450	8.0	6.5	31	8.2	3,910	5.0	.08	--	.60	405	10	350	7.2	58	60	1,220	.4	.8	2,090	1,050	1,000
May 11-20.....	337	14	7.3	27	8.0	4,920	3.0	.06	.0	.60	481	11	489	7.2	68	70	1,560	.3	.6	2,660	1,250	1,190
May 21-31.....	148	11	9.2	27	7.8	7,920	18	.46	.0	.70	824	11	807		50	85	2,640	.1	2.4	4,410	2,100	2,060
June 1-3.....	166	14	13	20	8.1	10,100	10	.16	.0	.70	1,140	8.3	1,070		30	95	3,600	.1	.5	6,290	2,880	2,850
June 4-10.....	725	9.4	9.0	32	7.9	3,240	8.0	.06	.0	.40	334	7.4	298		64	46	1,000	.4	1.4	1,730	864	811
June 11-20.....	154	12	8.8	20	7.7	7,510	12	.16	.0	.50	780	9.2	798		50	77	2,550	.2	.5	4,630	1,980	1,940
June 21-30.....	40	8.4	8.0	18	9.5	12,600	16	.32	.0	.90	1,410	10	1,390		c 0	101	4,560	.0	--	8,150	3,560	3,510
July 1-10.....	36	14	9.3	20	8.6	13,000	10	.28	.0	.60	1,470	21	1,370		d 69	109	4,650	.1	.4	7,670	3,750	3,700
July 11-20	44	8.6	5.9	20	8.9	15,200	4.0	.28	.0	.80	1,720	9.6	1,740		e 60	106	5,640	.0	--	9,540	4,330	4,280
July 21-31	114	3.5	2.5	15	7.9	5,840	6.0	.32	.0	.40	620	10	560		72	79	1,890	.0	--	3,490	1,590	1,530
July 28-31.....	48	8.2	6.6	15	7.8	14,400	4.0	.28	.0	.40	1,660	9.6	1,530		77	74	5,230	.0	--	9,000	4,180	4,120
Aug. 1-8, 10	47	8.3	6.8	15	8.0	7,570	10	.32	.1	.30	810	14	768		84	66	2,560	.2	.5	4,270	2,080	2,010
Aug. 9.....	26	--	--	13	6.7	26,800	--	--	.1	.30	3,690	18	3,000		76	79	11,100	.0	1.4	18,900	9,280	9,220
Aug. 11-20.....	14	10	7.0	8	7.4	9,950	16	.18	.0	.20	1,140	14	1,000		82	75	3,500	.0	.2	6,400	2,900	2,830
Aug. 21-27, 30-31	20	9.8	7.8	7	7.5	7,550	6.5	.14	.1	.32	848	14	780		82	61	2,650	.0	.4	4,480	2,170	2,110
Aug. 28-29.....	16	--	--	7	7.7	12,900	4.9	.18	.1	.10	1,580	15	1,360		88	58	4,840	.0	.4	7,840	3,990	3,920

a Includes equivalent of 6 parts per million of carbonate (CO_3).
b Includes equivalent of 12 parts per million of carbonate (CO_3).
c Carbonate (CO_3) 31 parts per million; hydroxide (OH) 0.2 parts per million.
d Includes equivalent of 15 parts per million of carbonate (CO_3).
e Includes equivalent of 17 parts per million of carbonate (CO_3).

STREAMS TRIBUTARY TO LAKE ERIE--Continued

GRAND RIVER AT PAINESVILLE, OHIO--Continued

Chemical analyses, in parts per million, March to September 1950--Continued

Date of collection	Mean discharge (second-feet)	Oxygen consumed		Color	pH	Specific conductance (micromhos at 25°C)	Silica (SiO_2)	Iron (Fe)	Copper (Cu)	Chromium (Cr)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
		Unfiltered	Filtered																		Total	Noncarbonate
Sept. 1-10, 1950..	238	8.0	5.8	20	7.5	4,090	4.0	0.14	0.4	0.40	424	16	379		66	56	1,300	0.2	1.5	2,320	1,120	1,070
Sept. 11-13, 19-20	137	9.0	6.8	19	7.7	5,600	3.5	.10	.1	.30	616	17	551		72	62	1,900	.1	1.4	3,220	1,610	1,550
Sept. 14-18.....	1,210	11	6.8	30	8.1	1,010	5.1	.09	.2	.00	111	10	68		66	41	260	.2	3.0	615	318	264
Sept. 21-30.....	40	8.2	6.7	19	7.5	5,200	3.3	.14	.6	.50	550	17	512		66	72	1,720	.2	1.4	3,010	1,440	1,390

STREAMS TRIBUTARY TO LAKE ERIE--Continued

GRAND RIVER AT PAINESVILLE, OHIO--Continued

Dissolved oxygen, cyanide, and phenols, March to September 1950

Date of collection	Time	Mean discharge (second-feet)	Temperature		Dissolved oxygen		Cyanide	Phenols
			°F	°C	Parts per million	Percent saturation	Parts per million	Parts per million
Mar. 14, 1950	6:35 p. m.	1,700	35	1.7	14.8	106	--	--
Mar. 27	11:00 a. m.	9,660	40	4.4	12.0	92	--	--
Apr. 11	12:05 p. m.	454	46	7.8	11.4	95	--	--
Apr. 25	1:50 p. m.	4,220	50	10.0	10.4	92	--	--
May 9	3:00 p. m.	222	61	16.1	9.0	91	--	--
May 22	9:00 a. m.	129	66	18.9	8.2	88	--	--
June 6	8:30 a. m.	770	67	19.4	8.6	93	--	--
June 20	11:45 a. m.	72	75	23.9	7.6	89	--	--
July 5	9:35 a. m.	38	83	28.3	6.3	80	--	--
July 18	11:45 a. m.	18	84	28.9	5.5	71	0.0	0.05
Aug. 1	10:25 a. m.	32	80	26.7	5.1	63	.0	.00
Aug. 15	8:30 a. m.	12	72	22.2	5.0	57	--	.00
Aug. 31	10:40 a. m.	19	77	25.0	7.9	94	.0	.00
Sept. 12	10:30 a. m.	18	73	22.8	4.3	49	.0	.00
Sept. 26	8:00 a. m.	33	59	15.0	8.2	81	--	--

Temperature (°F) of water, March to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						38	45	48	72	78	79	77
2						34	43	48	74	81	81	72
3						35	47	53	74	79	77	69
4						35	48	57	62	84	71	69
5						39	47	60	65	84	72	65
6						32	45	63	63	83	72	67
7						35	44	63	72	83	75	70
8						35	44	61	74	85	75	70
9						32	42	62	76	84	75	71
10						34	46	62	76	84	75	72
11						34	48	60	73	82	77	73
12						35	46	58	75	82	74	70
13						33	43	60	75	85	74	72
14						34	42	62	73	78	73	67
15						36	44	61	75	80	75	68
16						34	47	62	77	80	76	63
17						35	53	68	75	86	79	63
18						34	53	67	74	84	79	61
19						35	51	66	73	86	75	64
20						38	52	63	73	78	74	63
21						36	55	63	76	70	73	64
22						36	53	67	76	70	73	64
23						36	58	68	80	73	73	67
24						36	56	69	84	74	75	61
25						33	49	72	87	74	73	59
26						39	49	73	87	75	78	--
27						41	51	74	82	76	77	62
28						43	51	70	79	77	78	64
29						40	53	70	82	78	80	69
30						44	53	72	83	79	77	70
31						44	--	73	--	80	79	--
Average						36	49	64	76	80	76	67

STREAMS TRIBUTARY TO LAKE ERIE--Continued

ASHTABULA RIVER AT ASHTABULA, OHIO

LOCATION.--At Main Street Bridge in Ashtabula, Ashtabula County, 1½ miles downstream from Hubbard Run, 2½ miles downstream from gaging station, and 3 miles above mouth.
DRAINAGE AREA.--118 square miles (at gaging station).
RECORDS AVAILABLE.--Chemical analyses: Intermittently, March to August 1950.
REMARKS.--Discharge records for gaging station near Ashtabula for water year October 1949 to September 1950 given in Water-Supply Paper 1207 No appreciable inflow between gage and sampling station except during periods of heavy local rain.

Chemical analyses, in parts per million, March to August 1950

Date of collection	Mean discharge (second-feet)	Oxygen consumed		Color	pH	Specific conductance (micromhos at 25°C)	Silica (SiO_2)	Iron (Fe)	Copper (Cu)	Chromium (Cr)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
		Unfiltered	Filtered																		Total	Noncarbonate
Mar. 1-10, 1950.	--	7.6	6.0	22	7.8	179	5.6	0.06	0.0	0.00	19	4.7	10		34	43	10	0.4	1.0	116	67	39
Mar. 11-20.....	--	6.0	5.3	--	7.7	209	4.2	.04	.0	.00	18	4.8	16		34	42	18	.2	1.2	132	65	37
Mar. 21-31	--	16	5.8	35	7.8	126	3.2	.04	.0	.00	13	3.5	5.0		20	31	5.5	.2	1.0	83	47	30
Apr. 12.....	82	--	--	--	7.9	252	2.2	.06	--	--	32	5.6	15		74	57	10	.3	1.5	155	103	42
May 23	15	--	--	12	8.1	272	1.4	.22	--	--	34	8.7	7.5		72	65	7.0	.1	.1	179	121	62
June 27	3.7	--	--	--	9.0	913	7.5	.07	--	--	64	12	117		a144	185	106	.8	1.5	537	209	92
July 18	1.6	--	7.3	--	7.4	895	4.5	.10	.0	.00	68	15	89		122	124	138	.2	.5	518	231	131
Aug. 22	.4	--	--	--	6.4	972	3.0	.06	.0	.00	90	14	41		62	231	56	.3	.8	b1,040	282	231

a Includes equivalent of 43 parte per million of carbonate (CO_3).
b Includes large proportion of organic matter; sum of mineral constituents 467 parts per million.

CONNEAUT CREEK AT AMBOY, OHIO

LOCATION.--At gaging station at highway bridge, half a mile east of Amboy, Ashtabula County, 3 miles southwest of Conneaut, and about 6 miles above mouth.
DRAINAGE AREA.--178 square miles.
RECORDS AVAILABLE.--Chemical analyses: Intermittently, March to August 1950.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1207.

Chemical analyses, in parts per million, March to August 1950

Date of collection	Mean discharge (second-feet)	Oxygen consumed		Color	pH	Specific conductance (micromhos at 25°C)	Silica (SiO_2)	Iron (Fe)	Copper (Cu)	Chromium (Cr)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	
		Unfiltered	Filtered																		Total	Noncarbonate
Mar. 20, 1950 ..	--	--	--	9	7.8	196	3.8	0.08	--	--	30	5.8	0.4		46	50	6.0	0.1	1.4	122	99	61
Apr. 12	170	--	--	6	7.8	188	3.0	.05	--	--	24	5.9	6.9		58	41	5.5	.1	1.2	116	84	37
May 23	79	--	--	7	7.9	247	.6	.06	--	--	27	6.2	16		86	45	6.6	.0	.2	153	93	22
June 27	25	--	--	8	7.8	332	2.4	.04	--	--	39	9.8	13		102	57	16	.2	.8	195	138	54
July 18	18	3.0	2.6	4	8.2	341	1.6	.02	0.0	0.00	40	11	15		114	58	16	.1	.4	201	145	52
Aug. 22	25	3.6	2.9	5	8.2	385	1.0	.03	.0	.00	42	9	29		13	48	34	.2	.2	218	144	35

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