Quality of Surface Waters of the United States 1950

Parts 9–14. Colorado River Basin to Pacific Slope Basins in Oregon and Lower Columbia 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 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 analysis, 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

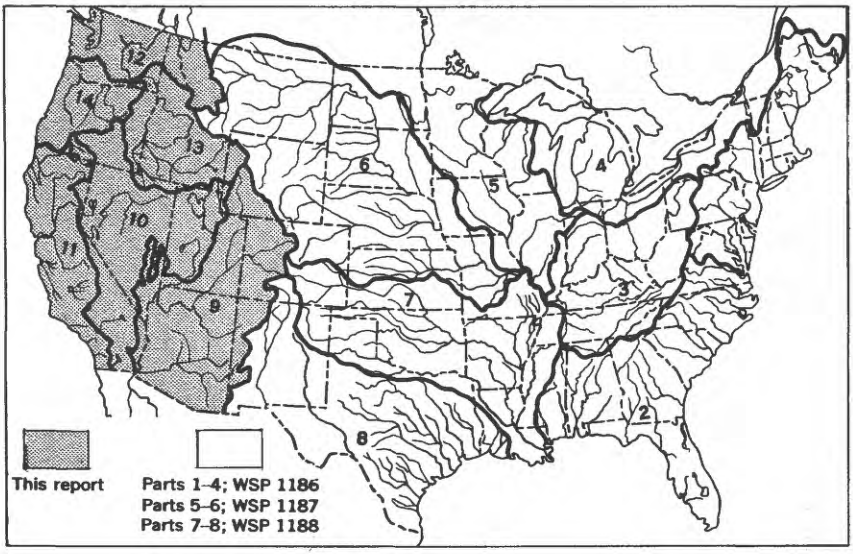

Figure 1. Map of the United States showing basins covered by the four water-supply papers on quality of surface waters in 1950. The shaded portion represents the section of the country covered by this volume; the unshaded portion represents the section of the country covered by other water-supply papers.

During the year ended September 30, 1950, 36 regular sampling stations on 28 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 36 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 12 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 6 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. 17) 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

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. 7). 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, 1133, and 1163.

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

Financial assistance was furnished by the Bureau of Reclamation of the United States Department of the Interior, in the operation of some stations in Arizona and New Mexico.

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

In addition to the above assistance, many of the stations were operated from funds appropriated directly to the Geological Survey for quality-of-water investigations. Investigation of the chemical quality and suspended-sediment loads in the Colorado River basin in Arizona, Colorado, Nevada, New Mexico,

and Utah have been carried on as a continuing Federal project since 1925.

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 supervision of district chemists as follows: In New Mexico--J. D. Hem; in Colorado (except that part in Missouri River basin), Nevada, Utah, California, Washington, and Idaho--C. S. Howard. Subsequent to the collection of the data in this report, two new district offices were established in the area covered by this report. Any additional analytical data on file for the sampling stations can be obtained by writing or visiting the responsible Geological Survey quality of water district office as listed in the following table.

District office	Drainage basin
University Station, Box 293 Albuquerque, N. Mex.	Colorado River basin (Arizona, New Mexico).
Post Office Box 2657 Fort Douglas Salt Lake City, Utah	Colorado River basin (Colorado, Utah, and Nevada). The Great Basin (Utah, Nevada).
2520 Marconi Avenue Sacramento, Calif.	The Great Basin (California). Pacific Slope basins in California.
Interior Department Bldg. 1001 N. E. Lloyd Blvd. Portland 14, Oreg.	Pacific Slope basins in Washington and upper Columbia River basin. Snake River basin. Pacific Slope basins in Oregon and lower Columbia River basin.

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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COLORADO RIVER MAIN STEM

COLORADO RIVER AT HOT SULPHUR SPRINGS, COLO.

LOCATION.--At bridge at Hot Sulphur Springs, Grand County, 1 mile downstream from gaging station which is 3 miles upstream from Beaver Creek.
DRAINAGE AREA.--782 square miles (above gaging station).
RECORDS AVAILABLE.--Chemical analyses: April 1947 to September 1950.
Water temperatures: April 1949 to September 1950.
EXTREMES, 1949-50.--Dissolved solids: Maximum, 109 ppm Aug. 11-20; minimum, 58 ppm June 1-20.
Hardness: Maximum, 71 ppm Aug. 11-20; minimum, 32 ppm June 1-10.
Water temperatures: Maximum, 65°F on several days in July and August; minimum, freezing point on several days in January and February.
EXTREMES, 1947-50.--Dissolved solids: Maximum, 109 ppm Aug. 11-20, 1950; minimum, 38 ppm June 21-30, 1947.
Hardness: Maximum, 71 ppm Aug. 11-20, 1950; minimum, 20 ppm June 21-30, 1947.
Water temperatures: 1949-50.- Maximum, 65°F on several days in July and August 1950; minimum, freezing point on several days in January and February 1950.
REMARKS.--Records of specific conductance of daily samples available in regional office at Salt Lake City, Utah. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1179.

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

Date of collection	Mean discharge (second-feet)	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)	Boron (B)	Dissolved solids			Hardness as $CaCO_3$		Percent sodium
																Parts per million	Tons per acre-foot	Tons per day	Total	Noncarbonate	
Oct. 1-10, 1949	97.6	7.3	128	12	0.11	16	2.8	6.2	2.7	72	6.5	1.2	0.3	0.2		84	0.11	22	51	0	20
Oct. 11-20	115	7.4	129	12	.11	16	3.9	4.9	1.4	72	6.8	1.0	.3	.2		82	.11	25	56	0	16
Oct. 21-31	117	--	126	--	--	--	--	--	--	--	--	--	--	--		--	--	--	--	--	--
Nov. 1-10	126	7.0	120	14	--	16	3.8	3.4		67	6.3	.9	--	.4		78	.11	27	56	1	12
Nov. 11-20	118	7.0	125	13	--	16	--	--	--	68	--	.5	--	.4		--	--	--	--	--	--
Nov. 21-30	115	--	116	--	--	--	--	--	--	--	--	--	--	--		--	--	--	--	--	--
Dec. 1-10	112	--	117	--	--	--	--	--	--	--	--	--	--	--		--	--	--	--	--	--
Dec. 11-20	82.1	7.5	131	14	--	18	5.2	1.6		74	7.0	1.1	--	.3		84	.11	19	66	6	5
Dec. 21-31	94.1	--	117	--	--	--	--	--	--	--	--	--	--	--		--	--	--	--	--	--
Jan. 1-10, 1950	89.6	--	111	--	--	--	--	--	--	--	--	--	--	--		--	--	--	--	--	--
Jan. 11-20	82.7	8.1	115	11	--	14	2.6	5.0		60	4.3	1.5	--	.9		69	.09	15	46	0	19
Jan. 21-31	85.6	--	110	--	--	--	--	--	--	--	--	--	--	--		--	--	--	--	--	--
Feb. 1-10	89.4	7.5	115	13	--	14	2.8	6.2		64	5.5	.9	--	.5		74	.10	18	46	0	22
Feb. 11-19	86.2	7.7	111	12	--	14	2.7	5.7		62	5.9	.7	--	.5		72	.10	17	46	0	21
Feb. 20-28	93.7	7.7	112	12	--	14	2.8	5.1		61	5.7	.9	--	.5		71	.10	18	46	0	19
Mar. 1-10	93.1	7.2	116	12	--	14	3.0	5.9		63	6.3	1.2	--	.4		74	.10	19	47	0	21
Mar. 11-20	92.7	7.4	116	12	--	14	3.0	6.6		65	6.1	1.2	--	.4		75	.10	19	47	0	23
Mar. 21-31	101	7.3	121	13	--	14	3.2	6.9		66	6.2	1.6	--	.4		78	.11	21	48	0	24
Apr. 1-10	227	7.4	126	11	--	15	3.4	7.0		66	9.1	1.8	--	.6		80	.11	49	51	0	23
Apr. 11-20	352	7.3	127	10	--	15	3.5	7.1		68	7.9	2.2	--	.4		80	.11	76	52	0	23
Apr. 21-30	375	7.4	114	11	--	14	3.2	5.2		60	7.1	1.8	--	.3		72	.10	73	48	0	19

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER AT HOT SULPHUR SPRINGS, COLO.--Continued

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

Date of collection	Mean discharge (second-feet)	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)	Boron (B)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
May 1-10, 1950....	397	7.5	111	11	--	13	3.1	5.6		56	8.0	2.0	--	0.3		71	0.10	76	45	0	21
May 11-20.....	534	7.3	95.5	11	--	12	2.4	4.5		50	5.8	1.3	--	.8		62	.08	89	40	0	20
May 21-31.....	692	7.2	89.1	11	--	10	2.3	6.7		50	5.8	1.1	--	.5		62	.08	116	34	0	30
June 1-10.....	873	7.2	81.7	11	--	9.7	2.0	5.7		45	5.8	.9	--	.7		58	.08	137	32	0	28
June 11-20.....	859	7.1	81.1	11	--	9.8	2.0	5.8		47	4.2	1.4	--	.5		58	.08	135	33	0	28
June 21-30.....	450	7.2	101	13	--	13	2.5	5.6		58	4.1	1.8	--	.6		69	.09	84	43	0	22
July 1-10.....	261	--	132	--	--	--	--	--		--	--	--	--	--		--	--	--	--	--	--
July 11-20.....	210	7.3	153	17	--	21	3.8	7.2		94	4.9	.8	--	.3		101	.14	57	68	0	19
July 21-31.....	132	--	166	--	--	--	--	--		--	--	--	--	--		--	--	--	--	--	--
Aug. 1-10.....	94.6	--	170	--	--	--	--	--		--	--	--	--	--		--	--	--	--	--	--
Aug. 11-20.....	92.5	7.4	165	16	--	22	3.9	9.5		102	5.7	1.3	--	.3		109	.15	27	71	0	23
Aug. 21-31.....	104	--	135	--	--	--	--	--		--	--	--	--	--		--	--	--	--	--	--
Sept. 1-10.....	79.2	--	129	--	--	--	--	--		--	--	--	--	--		--	--	--	--	--	--
Sept. 11-20.....	109	7.5	128	14	--	16	2.8	8.8		77	5.4	1.1	--	.3		86	.12	25	51	0	27
Sept. 21-30.....	110	--	129	--	--	--	--	--		--	--	--	--	--		--	--	--	--	--	--
Weighted average.	215	--	a 104	12	--	13	2.7	6.0		58	5.9	1.3	--	0.5		69	0.09	40	44	0	23

a Based on only those analyses for which most of the constituents were determined.

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER AT HOT SULPHUR SPRINGS, COLO.--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	39	36	36	34	33	35	51	53	56	64	60
2	53	38	37	34	33	34	35	51	50	57	63	59
3	54	38	36	33	32	35	35	50	51	56	6?	59
4	51	37	34	34	--	36	36	50	52	57	6'	60
5	50	37	37	34	34	35	36	51	51	60	6?	60
6	50	38	35	33	34	34	35	51	52	61	64	59
7	49	36	36	32	33	35	38	52	53	61	64	59
8	38	35	34	32	35	34	37	51	52	60	6?	58
9	39	36	36	33	34	33	37	52	49	64	63	58
10	36	37	37	34	33	34	38	51	50	63	64	57
11	41	36	34	34	34	35	42	52	52	64	63	58
12	41	35	35	--	33	33	45	51	53	63	64	57
13	40	37	37	33	34	34	46	52	52	62	63	58
14	40	36	34	34	34	34	45	52	53	64	63	57
15	46	38	34	32	33	33	46	51	53	63	64	56
16	45	36	35	32	33	34	46	49	55	63	64	57
17	45	37	34	33	33	33	47	50	53	64	64	57
18	46	38	34	34	33	34	46	52	52	64	64	56
19	45	35	36	33	34	33	47	52	53	65	65	56
20	44	36	37	34	33	35	46	52	54	63	64	56
21	45	36	34	34	34	36	47	51	52	64	63	56
22	42	36	34	33	34	35	46	50	53	64	63	55
23	41	36	34	33	33	36	47	52	53	65	64	56
24	40	35	35	34	35	36	48	51	54	64	63	55
25	41	36	34	32	34	35	45	52	52	63	64	55
26	40	35	33	33	34	36	47	49	53	65	59	54
27	40	36	35	33	34	35	46	51	56	64	60	53
28	40	35	33	32	34	36	47	51	57	65	57	52
29	38	37	34	32	--	35	47	51	57	64	58	51
30	38	36	34	34	--	36	50	52	58	65	60	50
31	36	--	34	33	--	37	--	52	--	64	59	--
Average	43	36	35	33	34	35	43	51	53	62	63	56

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER NEAR GLENWOOD SPRINGS, COLO.

LOCATION.--At Shoshone power plant, 6 miles upstream from gaging station at Glenwood Springs, Garfield County, which is half a mile upstream from Roaring Fork.
DRAINAGE AREA.--4,560 square miles (above gaging station).
RECORDS AVAILABLE.--Chemical analyses: October 1941 to September 1950.
Water temperatures: May 1949 to September 1950.
EXTREMES, 1949-50.--Dissolved solids: Maximum, 540 ppm Oct. 11-20; minimum, 133 ppm June 11-20.
Hardness: Maximum, 270 ppm Oct. 11-20; minimum, 91 ppm June 11-20.
Water temperatures: Maximum, 65°F on several days in July, August, and September; minimum, 35°F on many days during winter months.
EXTREMES, 1941-50.--Dissolved solids: Maximum, 2,030 ppm Aug. 10, 1947; minimum, 105 ppm June 1-10, 1942.
Hardness: Maximum, 1,480 ppm Aug. 10, 1947; minimum, 72 ppm June 1-20, 1942.
Water temperatures: 1949-50. Maximum, 67°F Aug. 6, 9, 1949; minimum, 35°F on many days during winter months of 1949-50.
REMARKS.--Records of specific conductance of daily samples available in regional office at Salt Lake City, Utah. Discharge records for gaging station at Glenwood Springs for water year October 1949 to September 1950 given in Water-Supply Paper 1179.

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

Date of collection	Mean discharge (second-feet)	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)	Boron (B)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 1-10, 1949 ...	1,053	--	832	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Oct. 11-20	956	7.7	893	12		80	17	84		157	151	118		0.8		540	0.73	1,390	270	141	40
Oct. 21-31	970	--	866	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Nov. 1-10	971	--	874	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Nov. 11-20	930	7.7	850	12		73	17	82		147	135	119		.8		511	.69	1,280	252	132	41
Nov. 21-30	867	--	867	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Dec. 1-10	970	--	786	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Dec. 11-20	912	7.8	859	12		72	--	--		146	122	125		.8		--	--	--	--	--	--
Dec. 21-31	967	--	726	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Jan. 1-10, 1950 ...	808	--	837	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Jan. 11-20	938	7.9	793	13		64	14	73		130	102	116		.8		447	.61	1,130	217	110	42
Jan. 21-31	974	--	793	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Feb. 1-10	984	7.8	743	12		60	13	72		128	97	109		.7		427	.58	1,130	203	98	44
Feb. 11-19	912	7.6	732	12		59	14	71		130	98	106		.8		425	.58	1,050	204	98	43
Feb. 20-28	1,032	7.8	655	12		54	11	63		117	87	91		.8		376	.51	1,050	180	84	43
Mar. 1-10	1,323	7.8	574	12		50	11	48		110	77	74		.8		327	.44	1,170	170	80	38
Mar. 11-20	1,293	7.8	539	12		50	11	43		110	74	68		.6		313	.43	1,090	170	80	35
Mar. 21-31	1,272	7.8	570	11		48	12	52		119	83	70		.6		335	.46	1,150	170	72	40
Apr. 1-10.....	1,737	7.8	480	11		44	11	39		113	72	51		.7		284	.39	1,330	155	62	35
Apr. 11-20	2,626	7.7	414	11		41	9.7	31		110	59	41		.7		248	.34	1,760	142	52	32
Apr. 21-30	2,733	7.6	414	11		40	10	31		112	55	41		.7		244	.33	1,800	141	49	32
May 1-10	2,630	7.4	421	11		38	9.1	34		112	53	41		.7		242	.33	1,720	132	40	36
May 11-20	4,055	7.6	351	11		36	7.9	23		110	42	28		.4		202	.27	2,210	122	32	29
May 21-31	5,792	7.4	301	8.8		33	7.1	17		102	36	19		.7		172	.23	2,690	112	28	25

June 1-10	7,734	7.5	254	9.4		29	6.4	12	90	32	13		.7		147	.20	3,070	99	26	21
June 11-20.....	8,477	7.5	228	7.5		27	5.7	11	85	28	12		.3		133	.18	3,040	91	22	21
June 21-30	5,416	--	300	--		--	--	--	--	--	--		--		--	--	--	--	--	--
July 1-10	2,972	--	422	--		--	--	--	--	--	--		--		--	--	--	--	--	--
July 11-20	2,178	7.7	556	10		53	12	45	126	91	58		.3		331	.45	1,950	182	78	35
July 21-31	1,595	--	655	--		--	--	--	--	--	--		--		--	--	--	--	--	--
Aug. 1-10	1,341	--	648	--		--	--	--	--	--	--		--		--	--	--	--	--	--
Aug. 11-20	1,219	7.7	635	9.2		56	13	56	123	99	78		.5		372	.51	1,220	193	92	39
Aug. 21-31	1,322	--	599	--		--	--	--	--	--	--		--		--	--	--	--	--	--
Sept. 1-10	1,211	--	596	--		--	--	--	--	--	--		--		--	--	--	--	--	--
Sept. 11-20	1,100	7.8	736	11		66	14	64	131	121	90		.5		431	.59	1,280	222	114	39
Sept. 21-30	1,030	--	872	--		--	--	--	--	--	--		--		--	--	--	--	--	--
Weighted average	2,038	--	a412	10		41	9.0	31	107	58	42		0.6		244	0.33	1,340	140	52	33

a Based on only those analyses for which most of the constituents were determined.

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER NEAR GLENWOOD SPRINGS, COLO.--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	57	43	40	35	35	36	44	47	53	60	64	63
2	56	42	39	35	35	36	42	49	52	60	65	63
3	55	42	38	35	35	36	47	50	52	60	65	64
4	56	42	37	35	35	38	44	51	50	60	62	64
5	56	42	36	35	35	38	43	46	51	60	64	64
6	56	42	36	35	35	38	43	44	53	62	64	65
7	56	42	36	35	35	39	47	46	53	64	62	65
8	56	41	38	35	35	40	49	48	50	64	63	64
9	55	42	38	36	35	40	48	48	50	63	62	64
10	50	43	40	36	35	38	44	52	51	62	64	61
11	47	44	40	35	35	37	42	50	52	64	63	59
12	46	43	37	36	35	36	46	52	54	65	62	58
13	47	40	35	36	35	36	44	52	55	64	62	58
14	49	40	35	36	36	37	48	52	53	64	62	57
15	52	41	35	36	35	37	48	53	54	63	63	57
16	52	41	35	35	35	39	42	50	54	63	62	57
17	51	41	35	36	36	42	44	50	55	62	62	57
18	31	40	35	35	35	41	46	51	54	61	62	57
19	50	40	35	36	35	39	46	49	54	60	64	58
20	41	40	35	35	35	39	48	49	54	62	62	57
21	45	39	35	36	35	39	49	50	55	61	64	54
22	43	38	35	36	35	40	52	50	55	62	64	55
23	44	38	35	36	35	40	52	52	55	64	64	57
24	44	38	35	36	37	42	49	52	58	64	63	56
25	44	41	35	36	36	43	44	51	57	62	63	56
26	44	44	35	35	36	41	45	46	57	64	61	56
27	45	43	38	36	37	41	47	48	57	63	60	56
28	45	43	35	36	36	38	46	50	58	63	62	57
29	46	43	35	35	--	38	46	49	58	63	59	56
30	44	41	35	35	--	40	46	--	59	65	61	54
31	44	--	35	35	--	42	--	54	--	64	--	--
Average	49	41	36	35	35	39	46	50	54	63	63	58

COLORADO RIVER NEAR CAMEO, COLO.

LOCATION.--At diversion dam, about 1½ miles upstream from Cameo, Mesa County, and 5 miles downstream from gaging station.
DRAINAGE AREA.--8,055 square miles (above gaging station).
RECORDS AVAILABLE.--Chemical analyses: October 1933 to September 1950.
Water temperatures: April 1949 to September 1950.
EXTREMES, 1949-50.--Dissolved solids: Maximum, 785 ppm Jan. 11-20; minimum, 177 ppm June 11-20.
Hardness: Maximum, 338 ppm Dec. 21-31; minimum, 106 ppm June 11-20.
Water temperatures: Maximum, 69°F on several days in July, August, and September; minimum, freezing point Jan. 8, 1950.
EXTREMES, 1933-50.--Dissolved solids: Maximum, 1,050 ppm Dec. 21-31, 1939; minimum, 143 ppm June 11-20, 1935.
Hardness: Maximum, 399 ppm July 21-31, 1934; minimum, 98 ppm June 21-30, 1935.
Water temperatures: 1949-50. Maximum, 71°F Aug. 4-6, 1949; minimum, freezing point Jan. 8, 1950.
REMARKS.--Records of specific conductance of daily samples available in regional office at Salt Lake City, Utah. Discharge records for gaging station near Cameo for water year October 1949 to September 1950 given in Water-Supply Paper 1179.

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

Date of collection	Mean discharge (second-feet)	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)	Boron (B)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 1-10, 1949...	2,100	--	1,180	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Oct. 11-20	2,010	--	1,240	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Oct. 21-31	2,011	--	1,240	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Nov. 1-10	1,879	--	1,260	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Nov. 11-20	1,873	--	1,200	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Nov. 21-30	1,708	--	1,290	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Dec. 1-10	1,734	--	1,280	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Dec. 11-20	1,616	--	1,330	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Dec. 21-31	1,560	7.8	1,300	12		86	30	141		194	179	210		2.7		756	1.03	3,180	338	179	47
Jan. 1-10, 1950 ..	1,388	--	1,340	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Jan. 11-20	1,479	7.8	1,310	13		82	26	161		193	190	215		2.6		785	1.07	3,130	312	154	53
Jan. 21-31	1,586	--	1,210	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Feb. 1-10	1,558	7.4	1,180	11		82	22	131		177	163	185		6.1		687	.93	2,890	295	150	49
Feb. 11-20	1,492	7.9	1,220	10		84	24	137		182	175	191		6.7		717	.98	2,890	308	159	49
Feb. 21-28	1,750	7.9	1,210	13		76	21	139		196	176	165		2.9		690	.94	3,260	276	116	52
Mar. 1-10	1,969	8.0	1,180	12		74	21	135		181	167	171		2.4		672	.91	3,570	271	122	52
Mar. 11-20	1,950	7.7	1,050	14		66	20	122		166	143	159		2.6		608	.83	3,200	246	110	52
Mar. 21-31	1,862	7.8	1,120	13		72	20	125		170	155	163		2.0		634	.86	3,190	262	122	51
Apr. 1-10	2,389	7.8	979	13		68	20	109		168	138	146		2.4		579	.79	3,730	252	114	49
Apr. 11-20	3,755	7.9	703	14		57	14	72		156	100	86		2.3		422	.57	4,280	200	72	44
Apr. 21-30	4,557	7.7	613	11		53	14	56		156	83	68		1.7		364	.50	4,480	190	62	39
May 1-10.....	4,207	7.7	647	11		52	15	60		150	89	75		1.1		377	.51	4,280	191	68	41
May 11-20	6,110	7.8	533	9.8		45	13	49		140	73	58		.9		318	.43	5,250	166	52	39
May 21-31	9,782	7.6	440	--		--	--	--		144	--	--		--		--	--	--	--	--	--

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER NEAR CAMEO, COLO.--Continued

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

Date of collection	Mean discharge (second-feet)	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)	Boron (B)	Dissolved solids			Hardness as $CaCO_3$		Percent sodium
																Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate	
June 1-10, 1950	13,910	7.2	362	--		--	--	--		122	--	--		--		--	--	--	--	--	--
June 11-20	15,620	7.1	314	8.0		30	7.5	22		102	34	24		1.2		177	0.24	7,460	106	22	31
June 21-30	10,120	7.2	389	--		--	--	--		99	--	--		--		--	--	--	--	--	--
July 1-10	6,029	--	521	--		--	--	--		--	--	--		--		--	--	--	--	--	--
July 11-20	4,458	7.3	742	8.3		60	15	73		166	110	85		.1		433	.59	5,210	211	75	43
July 21-31	2,960	--	916	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Aug. 1-10	2,197	--	1,070	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Aug. 11-20	1,992	7.2	1,100	9.5		74	19	127		166	157	170		.5		639	.87	3,440	262	126	51
Aug. 21-31	1,896	--	1,150	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Sept. 1-10	1,795	--	1,150	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Sept. 11-20	1,840	7.5	1,240	10		89	22	143		189	196	187		1.7		742	1.01	3,690	312	158	50
Sept. 21-30	1,962	--	1,220	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Weighted average	3,532	--	733	--		--	--	--		--	--	--		--		--	--	--	--	--	--

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER NEAR CAMEO, COLO.--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	43	38	34	33	41	45	52	59	65	69	68
2	--	--	38	35	33	41	50	53	57	63	69	69
3	58	44	--	33	33	41	49	54	55	65	--	68
4	58	43	37	33	--	42	45	51	53	64	69	67
5	57	--	36	33	33	42	48	49	--	64	69	69
6	56	43	36	33	33	43	50	48	58	67	69	68
7	56	43	36	33	34	42	49	49	55	66	68	69
8	58	43	37	32	34	39	52	--	52	65	69	69
9	55	42	38	33	34	40	50	51	53	--	67	67
10	50	--	39	33	34	42	49	--	57	69	69	64
11	47	44	37	34	34	40	48	55	57	67	67	63
12	47	41	34	34	34	38	51	57	58	67	66	62
13	48	--	34	34	34	37	52	58	58	68	65	63
14	51	41	34	33	33	39	52	58	58	69	66	60
15	53	42	34	33	34	40	50	59	58	66	66	60
16	54	42	35	33	34	41	48	57	58	67	67	57
17	54	42	34	34	34	43	53	58	57	66	66	59
18	--	42	34	34	35	44	54	58	57	67	69	60
19	54	41	35	34	35	43	51	54	57	67	67	60
20	47	41	35	34	--	44	52	55	58	69	66	56
21	45	39	35	34	39	45	53	57	58	66	69	57
22	45	38	35	33	38	43	54	53	59	69	66	60
23	46	38	34	34	38	45	53	55	58	68	69	58
24	46	38	--	35	39	45	52	56	60	69	67	58
25	45	39	34	33	40	45	49	53	60	68	68	58
26	46	40	36	33	40	44	50	51	64	69	66	59
27	46	40	--	33	41	42	51	51	62	69	65	59
28	45	40	--	33	42	39	51	53	61	69	67	59
29	45	40	35	33	--	40	49	53	62	68	66	59
30	44	40	35	33	--	42	50	56	64	69	65	58
31	44	--	34	33	--	43	--	58	--	69	66	--
Average	50	41	36	33	36	42	50	54	58	67	67	62

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER NEAR CISCO, UTAH

LOCATION.--At gaging station, 1 mile downstream from Dolores River, 11 miles south of Cisco, Grand County, 97 miles upstream from Green River, and 235 miles upstream from San Juan River.
DRAINAGE AREA.--24,100 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: August 1928 to September 1950.
Water temperatures: May 1949 to September 1950.
Sediment records: May 1930 to September 1950 (revised).
EXTREMES, 1949-50.--Dissolved solids: Maximum, 1,690 ppm Aug. 21-31; minimum, 286 ppm June 11-20.
Hardness: Maximum, 825 ppm Aug. 21-31; minimum, 173 ppm June 11-20.
Water temperatures: Maximum observed, 78°F July 24; minimum, freezing point on several days in December and January.
Sediment loads: Maximum daily, 155,000 tons July 10; minimum daily, 132 tons Nov. 21.
EXTREMES, 1928-50.--Dissolved solids: Maximum, 2,670 ppm Aug. 11-20, 1940; minimum, 202 ppm June 11-20, 1933.
Hardness: (1928-35, 1943-50) Maximum, 1,090 ppm Sept. 1-10, 1934; minimum, 132 ppm June 11-20, 1933.
Water temperatures: (May 1949 to September 1950) Maximum observed 78°F Aug. 1, 1949, July 24, 1950; minimum, freezing point on several days in December 1949 and January 1950.
Sediment loads: (1930-50): Maximum daily, 2,790,000 tons Oct. 14, 1941; minimum daily, less than 100 tons on many days.
REMARKS.--Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1179.

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

Date of collection	Mean discharge (second-feet)	Temperature (°F)	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)	Boron (B)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 4-6, 8-10, 1949	3,287		--	2,030	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Oct. 11-16	3,445		--	2,120	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Oct. 21, 28-31	3,732		--	1,820	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Nov. 1-10	3,627		--	1,880	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Nov. 11-13	3,723		--	1,830	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Nov. 21-30	3,317		--	1,830	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Dec. 1-10	2,984		--	1,700	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Dec. 11-20	2,884		8.2	1,960	15		130	62	220		226	518	232		9.2		1,300	1.77	10,100	580	394	45
Dec. 28-30	2,770		--	1,880	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Jan. 1-2, 10, 1950	3,047		--	1,770	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Jan. 11-20	3,131		7.2	1,810	16		118	51	207		216	435	225		7.9		1,170	1.59	9,890	504	327	47
Jan. 21-31	3,764		--	1,690	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Feb. 1-10	3,719		7.7	1,740	13		119	54	179		199	418	214		11		1,110	1.51	11,100	519	356	43
Feb. 11-19	3,661		7.9	1,620	14		110	49	170		217	427	154		8.0		1,040	1.41	10,300	476	298	44
Feb. 20-28	3,458		8.0	1,650	14		106	45	179		198	419	166		8.3		1,030	1.40	9,620	450	288	46
Mar. 1-10	3,565		8.1	1,530	18		101	44	171		200	396	158		6.4		993	1.35	9,560	433	269	46
Mar. 11-20	3,375		7.9	1,500	15		92	40	175		188	349	179		5.6		948	1.29	8,640	394	240	49
Mar. 21-31	3,269		7.8	1,490	14		95	41	172		198	348	177		5.3		950	1.29	8,380	406	244	48

Apr. 1-10	5,600		8.1	1,010	14		84	27	104	202	234	95		4.9		662	.90	10,000	320	155	41
Apr. 11-20	8,490		7.8	721	12		71	20	53	186	155	41		2.8		446	.61	10,200	259	106	31
Apr. 21-30	13,180		7.8	585	11		59	16	43	164	119	32		2.7		364	.50	13,000	213	78	30
May 1-10	9,709		7.8	604	11		55	18	45	142	135	35		1.7		371	.50	9,730	211	94	31
May 11-20	10,460		7.8	702	11		59	21	62	144	178	45		2.3		449	.61	12,700	234	116	37
May 21-31	16,670		7.7	538	--		--	--	--	157	--	--		--		--	--	--	--	--	--
June 6-7, 9-10	20,000		7.9	496	--		--	--	--	137	--	--		--		--	--	--	--	--	--
June 11-20	21,350		7.8	476	11		48	13	30	131	96	22		1.4		286	.39	16,500	173	66	28
June 21-30	14,290		7.8	595	--		--	--	--	118	--	--		--		--	--	--	--	--	--
July 1-10	7,980		--	959	--		--	--	--	--	--	--		--		--	--	--	--	--	--
July 11, 13, 15-16, 20	6,308		--	1,200	--		--	--	--	--	--	--		--		--	--	--	--	--	--
July 21-31	3,140		8.1	1,430	12		121	47	129	174	453	111		5.6		964	1.31	8,170	496	353	36
Aug. 4-7, 10	2,016		--	1,920	--		--	--	--	--	--	--		--		--	--	--	--	--	--
Aug. 16	1,750		--	1,970	--		--	--	--	--	--	--		--		--	--	--	--	--	--
Aug. 21-31	1,488		7.8	2,300	13		189	86	236	308	879	172		11		1,690	2.30	6,790	825	654	38
Sept. 1-10	1,474		--	2,300	--		--	--	--	--	--	--		--		--	--	--	--	--	--
Sept. 11-20	2,376		7.9	2,240	15		200	79	223	232	834	172		9.1		1,650	2.24	10,600	824	634	37
Sept. 21-30	3,092		--	1,990	--		--	--	--	--	--	--		--		--	--	--	--	--	--
Weighted average .	6,006		--	1,030	--		--	--	--	--	--	--		--		--	--	--	--	--	--

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER NEAR CISCO, UTAH--Continued

Temperature (°F) of water, May to September 1949
/Once-daily temperature measurement generally between 6 a. m. and 6 p. m./

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

Temperature (°F) of water, water year October 1949 to September 1950
/Once-daily temperature measurement generally between 8 a. m. and 6 p. m./

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

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER NEAR CISCO, UTAH--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	3,410	e1,000	9,210	3,790	116	1,190	3,070	52	431
2	3,170	e600	5,140	3,620	113	1,100	3,170	38	325
3	3,210	e300	2,600	3,510	101	957	3,070	63	522
4	3,170	380	3,250	3,580	184	1,780	2,870	45	349
5	3,100	220	1,840	3,790	116	1,190	2,940	37	294
6	2,900	450	3,520	3,740	102	1,030	2,890	57	445
7	3,120	e3,180	26,800	3,680	100	994	2,660	62	445
8	3,280	3,170	28,100	3,620	30	293	2,660	61	438
9	3,990	5,170	s57,700	3,410	66	608	3,170	66	565
10	3,280	5,400	47,800	3,530	268	s2,810	3,340	100	902
11	3,160	1,860	15,900	3,760	600	6,090	3,510	150	1,420
12	3,320	550	4,930	3,790	400	4,090	3,340	110	992
13	3,490	560	5,280	3,850	329	3,420	3,030	56	458
14	3,680	400	3,970	3,640	e300	2,950	2,440	100	659
15	3,490	186	1,750	3,470	e260	2,440	2,250	98	595
16	3,530	211	2,010	3,430	e250	2,320	2,140	130	751
17	3,550	207	1,980	3,550	e200	1,920	2,490	177	1,190
18	3,580	e200	1,930	3,700	110	1,100	3,070	e280	2,320
19	7,200	e5,400	s118,000	3,640	67	658	3,140	211	1,790
20	4,390	e2,800	33,200	3,600	51	496	3,430	e180	1,670
21	4,130	1,250	13,900	3,490	14	132	3,170		
22	4,050	e500	5,470	3,380	30	274	2,990		
23	4,110	e280	3,110	3,250	18	158	3,100		
24	3,790	e200	2,050	3,250	32	281	3,030	e150	1,200
25	3,760	e200	2,030	3,280	37	328	2,940		
26	3,700	e200	2,000	3,450	74	689	2,710		
27	3,660	e180	1,780	3,530	39	372	2,850		
28	3,660	155	1,530	3,260	36	317	2,730	138	1,020
29	3,660	117	1,160	3,180	53	452	2,800	131	990
30	3,570	149	1,440	3,120	57	480	2,780	156	1,170
31	3,640	234	2,300	--	--	--	3,100	199	1,670
Total	113,750	--	411,700	105,870	--	40,920	90,880	--	2[illegible]810

Day	January			February			March		
1	3,190	250	2,150	3,800	192	1,970	3,990	1,440	15,500
2	3,450	294	2,740	3,700	196	1,960	3,680	940	9,340
3	3,200	e250	2,160	3,500	36	340	3,790	640	6,550
4	2,990	e230	1,860	3,350	28	253	3,720	580	5,830
5	2,700	e210	1,530	3,450	60	559	3,620	830	8,110
6	2,500	e200	1,350	3,600	57	554	3,550	700	6,710
7	2,300	e200	1,240	3,700	428	4,280	3,300	e600	5,350
8	2,260	e200	1,220	3,800	480	4,920	3,300	300	2,670
9	2,400	e600	3,890	4,000	633	6,640	3,190	180	1,550
10	2,500	740	5,000	4,290	640	7,410	3,510	e250	2,370
11	2,700	720	5,250	4,250	620	7,110	3,700	220	2,200
12	2,900	579	4,530	4,000	576	6,220	3,550	180	1,730
13	2,820	567	4,320	3,800	358	3,670	3,680	150	1,490
14	3,000	162	1,310	3,600	413	4,010	3,320	110	986
15	3,190	138	1,190	3,400	480	4,410	3,190	70	603
16	3,200	346	2,990	3,400	424	3,890	3,160	39	333
17	3,300	46	410	3,400	1,000	9,180	3,400	32	294
18	3,400	58	532	3,500	1,090	10,300	3,210	38	329
19	3,400	e53	487	3,600	e1,200	11,700	3,280	16	141
20	3,400	48	441	3,600	e1,400	13,600	3,280	75	664
21	3,300	52	463	3,500	1,650	15,600	3,170	127	1,090
22	3,500	e100	945	3,350	1,620	14,700	2,900	475	3,720
23	3,950	464	4,950	3,250	931	8,170	3,100	88	737
24	4,300	370	4,300	3,210	800	6,930	3,260	101	889
25	4,170	267	3,010	3,320	570	5,110	3,260	104	915
26	4,030	209	2,270	3,400	530	4,870	3,410	102	939
27	3,900	178	1,870	3,620	640	6,260	3,570	126	1,210
28	3,750	291	2,950	3,870	1,350	14,100	3,640	91	894
29	3,600	283	2,750	--	--	--	3,280	129	1,140
30	3,400	483	4,430	--	--	--	3,320	e300	2,690
31	3,500	389	3,680	--	--	--	3,050	e500	4,120
Total	100,200	--	76,220	101,260	--	178,900	105,360	--	9[illegible],090

e Estimated or interpolated.
s Computed by subdividing day.

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER NEAR CISCO, UTAH--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	3,010	786	6,390	10,700	600	17,300	15,700	e360	15,300
2	3,160	e1,310	11,200	8,920	262	6,310	19,700	1,160	61,700
3	3,450	2,580	24,000	8,610	e260	6,040	22,200	e1,700	102,000
4	5,060	2,600	35,500	10,600	590	16,900	23,300	e2,340	147,000
5	5,470	2,100	31,000	12,400	e1,770	59,300	20,900	1,000	56,400
6	5,100	2,020	27,800	11,800	1,660	52,900	18,600	620	31,500
7	5,250	2,980	42,200	10,500	540	15,300	20,800	860	48,300
8	6,400	2,860	49,400	8,950	440	10,600	22,800	1,050	64,600
9	8,700	e5,290	s135,000	7,920	e160	3,420	21,600	540	31,500
10	10,400	5,460	s155,000	6,690	e130	2,350	18,800	510	25,900
11	8,750	2,000	47,200	6,270	153	2,590	18,400	460	22,900
12	7,230	1,150	22,400	6,220	150	2,520	19,800	650	34,700
13	6,740	819	14,900	6,620	600	10,700	21,900	770	45,500
14	6,960	765	14,400	7,850	1,140	24,200	23,100	e890	55,500
15	8,000	1,600	34,600	8,610	580	13,500	22,400	700	42,300
16	9,220	2,000	49,800	11,200	1,180	35,700	21,900	560	33,100
17	8,950	2,000	48,300	12,600	e1,720	58,500	21,800	560	33,000
18	8,750	1,150	27,200	14,000	1,880	71,100	22,500	300	18,200
19	9,480	1,340	34,300	15,500	2,150	90,000	22,000	270	16,000
20	10,800	1,940	56,600	15,700	1,920	81,400	19,700	340	18,100
21	10,900	1,960	58,300	15,500	1,100	46,000	17,500	210	9,920
22	12,000	2,260	73,200	16,100	650	28,300	16,800	e200	9,070
23	14,100	3,360	128,000	17,900	1,630	78,800	17,100	350	16,200
24	15,800	3,600	154,000	19,700	1,520	80,800	15,500	340	14,200
25	15,900	e2,580	111,000	21,300	1,320	75,900	14,300	340	13,100
26	13,800	530	19,700	20,200	1,000	54,500	14,300	760	29,300
27	12,900	472	16,400	17,500	1,110	52,400	13,300	820	29,400
28	12,800	500	17,300	15,100	e580	23,600	12,300	340	11,300
29	11,900	1,100	35,300	14,100	e250	9,520	11,200	210	6,350
30	11,700	780	24,600	13,000	250	8,780	10,600	80	2,290
31	--	--	--	13,000	e240	8,420	--	--	--
Total	272,700	--	1,505,000	385,060	--	1,048,000	561,000	--	1,045,000

Day	July			August			September		
1	9,990	e70	1,890	2,340	210	1,330	1,650	110	490
2	9,420	59	1,500	2,070	e200	1,120	1,640	90	399
3	8,810	120	2,850	1,930	160	938	1,600	100	432
4	8,190	e110	2,430	2,030	160	877	1,510	110	448
5	7,610	60	1,640	2,030	150	822	1,460	e100	394
6	7,000	e100	1,890	2,030	96	526	1,240	200	724
7	6,400	130	2,250	2,060	90	501	1,260	e150	510
8	7,850	3,310	s75,900	2,010	100	543	1,270	162	555
9	7,300	1,460	29,200	1,960	90	476	1,500	100	405
10	7,230	1,260	24,600	1,930	94	490	1,510	146	595
11	7,430	1,290	25,900	1,930	80	417	1,500	130	526
12	7,230	1,060	21,100	2,140	e90	520	1,680	70	318
13	7,360	990	19,700	2,040	100	551	1,750	71	335
14	6,710	e760	13,800	1,990	60	430	2,090	170	959
15	5,990	546	8,830	2,010	100	543	2,490	160	1,210
16	5,720	440	6,800	1,750	75	354	2,570	147	1,020
17	5,390	300	4,370	1,650	100	446	2,350	140	888
18	5,080	e230	3,160	1,680	80	363	2,070	110	615
19	4,450	200	2,400	1,680	e60	272	3,010	3,920	s42,300
20	5,040	229	3,120	1,540	70	291	4,250	7,190	s85,200
21	4,740	244	3,120	1,320	50	178	3,470	e3,010	28,200
22	4,390	190	2,250	1,310	90	318	3,570	2,800	27,000
23	3,780	117	1,190	1,240	94	315	3,550	2,300	22,000
24	3,340	90	812	1,190	80	257	3,140	650	5,510
25	2,870	61	473	1,460	440	1,730	3,170	410	3,510
26	2,540	62	425	1,590	550	2,360	3,080	400	3,330
27	2,390	62	400	1,540	500	2,080	2,780	383	2,870
28	2,570	90	625	1,670	350	1,580	2,760	350	2,610
29	2,590	70	490	1,750	160	756	2,760	e360	2,830
30	2,760	e450	3,350	1,650	110	490	2,640	e340	2,420
31	2,570	235	1,630	1,650	139	619	--	--	--
Total	174,740	--	268,100	55,170	--	22,490	69,420	--	238,600

Total discharge for year (second-foot days) 2,135,410
Total load for year (tons) 4,956,000

e Estimated or interpolated
s Computed by subdividing day.

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER AT HITE, UTAH

LOCATION.--At gaging station at Hite, San Juan County, a quarter of a mile upstream from Trachyte Creek, 1 mile downstream from White Canyon, 8 miles downstream from Dirty Devil River, and 84 miles upstream from San Juan River.
DRAINAGE AREA.--76,600 square miles, approximately.
RECORDS AVAILABLE.--Water temperatures: May 1949 to September 1950.
Sediment records: October 1948 to September 1950.
EXTREMES, 1949-50.--Water temperatures: Maximum observed, 81°F July 27, 30, Aug. 3, 28, 30; minimum, freezing point Jan. 5-7.
Sediment loads: Maximum daily, 1,280,000 tons July 9, minimum daily, 707 tons Dec. 31.
EXTREMES, 1948-50.--Water temperatures: (May 1949 to September 1950): Maximum observed, 81°F Aug. 2, 3, Sept. 6, 1949, July 27, 30, Aug. 3, 28, 30, 1950; minimum freezing point Jan. 5-7, 1950.
Sediment loads: Maximum daily, 1,280,000 tons July 9, 1950; minimum daily, 707 tons Dec. 31, 1949.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1179.

Temperature (°F) of water, water year October 1949 to September 1950
(Once-daily temperature measurement generally during afternoon)

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

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER AT HITE, UTAH--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	6,210	3,320	55,700	7,300	840	16,600	6,080	994	16,300
2	7,980	3,770	81,200	7,300	933	18,400	5,980	924	14,900
3	7,320	4,900	96,800	7,470	782	15,800	5,900	908	14,500
4	6,740	6,450	117,000	7,380	1,250	24,900	6,020	827	13,400
5	6,860	4,800	88,900	7,170	745	14,400	5,980	826	13,300
6	6,530	3,740	65,900	7,150	1,030	19,900	5,880	817	13,000
7	5,940	a3,400	54,500	7,250	856	16,800	5,850	807	12,700
8	5,680	a3,400	52,100	7,230	835	16,300	5,830	808	12,700
9	5,770	2,670	41,600	7,110	994	19,100	5,680	804	12,300
10	6,060	2,840	46,600	6,960	1,080	20,300	5,570	785	11,800
11	6,900	2,160	40,200	6,700	1,100	19,900	5,750	778	12,100
12	7,000	1,940	36,700	6,630	1,120	20,000	6,040	582	9,490
13	6,630	1,620	29,000	6,920	1,040	19,400	6,110	269	4,440
14	8,210	2,590	57,400	6,980	1,110	30,900	6,040	227	3,700
15	7,750	2,500	52,300	6,900	1,050	19,600	5,470	202	2,980
16	7,270	3,560	69,900	6,860	961	17,800	4,690	210	2,660
17	6,650	3,600	64,600	6,680	923	16,600	3,980	a200	2,150
18	6,630	3,740	66,900	6,510	912	16,000	3,420	a200	1,850
19	8,590	5,500	128,000	6,510	a910	16,000	3,450	391	3,630
20	10,600	a7,770	s239,000	6,720	907	16,500	4,050	955	10,400
21	13,200	a11,500	410,000	6,700	814	14,700	4,520	494	6,030
22	9,360	a9,200	233,000	6,650	917	16,500	4,710	232	2,950
23	8,780	a9,020	214,000	6,490	841	14,700	4,580	149	1,840
24	8,980	9,500	230,000	6,310	889	15,100	4,150	131	1,470
25	8,640	6,500	152,000	6,230	809	13,600	3,910	116	1,220
26	7,980	5,600	121,000	6,190	803	13,400	4,090	284	2,920
27	7,710	4,800	99,900	6,230	823	13,800	4,330	126	1,470
28	7,490	2,700	54,600	6,350	871	14,900	4,180	120	1,350
29	7,400	a2,000	40,000	6,530	976	17,200	3,980	88	946
30	7,400	1,100	22,000	6,250	897	15,100	3,980	73	784
31	7,400	977	19,500	--	--	--	3,970	66	707
Total	235,660	--	3,080,000	303,660	--	514,200	154,180	--	210,000

Day	January			February			March		
1	4,080	210	2,310	5,480	896	13,300	6,760	1,200	21,900
2	4,440	202	2,420	5,870	953	15,100	7,000	1,380	26,100
3	4,760	202	2,600	5,560	702	10,500	7,150	1,450	28,000
4	5,130	219	3,030	5,220	444	6,260	7,080	1,410	27,000
5	4,940	180	2,400	5,150	358	4,980	7,210	1,500	29,200
6	4,530	240	2,940	5,290	190	2,710	8,070	1,840	s44,500
7	4,120	270	3,000	5,380	173	2,510	13,100	5,410	191,000
8	3,320	185	1,660	5,410	185	2,700	13,300	3,200	115,000
9	3,280	143	1,270	5,880	a230	3,650	12,600	3,420	116,000
10	3,420	163	1,510	6,090	277	4,550	12,500	3,130	106,000
11	3,520	166	1,580	6,630	432	7,730	12,600	e3,650	124,000
12	3,990	a170	1,830	6,650	447	8,030	12,600	e3,550	121,000
13	4,240	178	2,040	6,310	421	7,170	12,600	2,880	99,500
14	4,710	168	2,140	6,020	405	6,580	11,400	1,980	60,900
15	4,960	124	1,660	5,920	330	5,270	10,600	2,100	60,100
16	4,790	136	1,760	5,940	389	6,240	9,990	1,500	40,500
17	4,890	144	1,900	5,900	438	6,980	9,100	1,380	33,900
18	5,050	201	2,740	5,900	445	7,090	8,420	1,280	29,100
19	4,860	180	2,360	5,940	486	7,790	8,520	1,680	38,600
20	4,910	189	2,510	6,250	530	8,940	8,210	1,350	29,900
21	5,430	230	3,370	6,370	545	9,370	8,070	1,320	28,800
22	5,750	359	5,570	6,330	688	11,800	8,090	1,330	29,100
23	5,720	389	6,010	6,490	847	11,300	7,960	1,240	26,700
24	6,020	521	8,470	6,390	630	10,900	7,820	1,240	25,500
25	6,190	514	8,590	6,270	e600	10,200	7,660	1,320	27,300
26	6,170	478	7,960	6,230	e600	10,100	8,140	1,280	28,100
27	5,920	497	7,940	6,370	950	16,300	8,280	1,290	28,800
28	5,830	595	9,370	6,530	1,110	19,600	8,560	1,370	31,700
29	5,470	542	8,000	--	--	--	8,660	1,350	31,600
30	5,340	896	12,900	--	--	--	8,490	e1,300	29,800
31	5,240	919	13,000	--	--	--	7,960	1,220	26,200
Total	151,020	--	134,800	167,770	--	237,600	288,500	--	1,656,000

s Computed by subdividing day.
a Computed from estimated concentration graph.

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER AT HITE, UTAH--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	7,730	1,210	25,300	25,300	2,720	186,000	37,900	3,390	347,000
2	7,380	1,210	24,100	23,800	2,080	134,000	39,400	3,420	364,000
3	7,270	1,190	23,400	21,000	2,020	115,000	46,000	3,500	435,000
4	7,130	1,160	22,300	20,800	2,060	116,000	52,200	3,580	505,000
5	7,040	1,160	22,000	21,100	1,800	103,000	54,400	3,670	539,000
6	8,090	1,320	28,800	22,600	1,870	114,000	50,800	3,580	491,000
7	9,180	1,380	34,200	23,200	1,830	115,000	48,000	3,620	469,000
8	9,160	1,430	35,400	22,600	2,030	124,000	48,800	3,780	498,000
9	12,000	4,720	s 156,000	21,600	2,220	129,000	52,300	3,840	542,000
10	13,700	5,790	214,000	20,800	2,270	127,000	51,600	3,590	500,000
11	16,300	5,890	259,000	19,600	2,440	129,000	47,900	a 2,900	375,000
12	15,800	5,800	247,000	17,600	2,270	108,000	45,600	a 2,700	332,000
13	14,300	5,480	212,000	16,600	2,100	94,100	45,100	3,300	402,000
14	18,900	6,460	330,000	16,000	2,200	95,000	46,900	3,710	470,000
15	18,600	6,520	327,000	16,100	1,640	71,300	49,000	3,600	476,000
16	17,100	5,800	268,000	16,800	1,950	88,500	48,500	3,690	483,000
17	17,300	5,300	248,000	18,500	2,140	107,000	47,400	3,460	443,000
18	18,100	4,960	242,000	22,800	2,050	126,000	47,300	3,500	447,000
19	19,700	4,800	255,000	27,900	2,380	178,000	48,000	3,420	443,000
20	23,200	4,620	289,000	34,100	a 3,300	304,000	48,100	3,520	457,000
21	23,500	4,610	293,000	37,000	a 3,900	390,000	46,600	3,400	428,000
22	24,300	4,510	296,000	37,700	4,100	417,000	44,300	2,960	354,000
23	25,600	5,130	355,000	38,000	4,550	467,000	42,700	3,160	364,000
24	28,000	5,060	383,000	39,300	4,880	518,000	41,900	2,990	338,000
25	30,300	4,990	408,000	40,400	4,910	536,000	40,700	2,900	319,000
26	30,700	4,420	366,000	45,000	4,400	535,000	38,200	2,810	290,000
27	30,800	4,420	368,000	46,100	3,580	446,000	37,100	2,740	274,000
28	31,300	4,310	364,000	44,600	2,950	355,000	36,000	2,580	251,000
29	30,600	a 4,000	330,000	43,600	3,480	410,000	34,500	2,560	238,000
30	27,500	2,890	215,000	43,700	3,380	399,000	33,400	2,530	228,000
31	--	--	--	40,400	3,550	387,000	--	--	--
Total	550,580	--	6,640,000	885,400	--	7,424,000	1,350,600	--	12,100,000

Day	July			August			September		
1	31,500	2,380	202,000	8,020	a 1,100	23,800	4,320	334	3,900
2	29,500	2,400	191,000	7,930	1,290	27,600	4,160	214	2,400
3	27,400	2,440	181,000	7,690	1,270	26,400	4,120	198	2,200
4	25,000	1,510	102,000	7,420	1,150	23,000	4,040	a 190	2,070
5	23,000	1,460	90,700	7,270	1,360	26,700	3,950	a 185	1,970
6	23,000	1,080	67,100	7,640	1,130	23,300	3,800	182	1,870
7	24,000	1,060	68,700	7,930	1,100	23,600	3,750	244	2,470
8	23,000	7,250	450,000	7,770	2,200	46,200	3,700	221	2,210
9	30,500	15,500	1,260,000	7,580	1,600	32,700	3,680	800	7,950
10	25,200	14,900	1,010,000	7,250	1,100	21,500	3,460	898	8,390
11	23,400	11,600	733,000	6,960	1,050	19,700	3,450	1,200	11,200
12	22,400	8,700	526,000	6,610	1,130	20,200	3,680	1,000	9,940
13	22,400	5,000	302,000	6,390	1,000	17,300	3,780	700	7,140
14	21,800	3,900	230,000	6,410	838	14,500	3,790	600	6,140
15	20,900	3,500	198,000	6,470	716	12,500	4,010	559	6,050
16	19,400	3,020	158,000	6,190	633	10,600	4,040	522	5,690
17	18,200	2,700	133,000	6,170	1,500	25,000	4,390	850	10,100
18	17,300	2,500	117,000	5,980	1,700	27,400	4,640	800	10,000
19	16,700	2,270	102,000	5,660	a 1,100	16,800	5,520	a 2,550	s 40,800
20	15,600	2,150	90,600	5,450	a 900	13,200	6,170	a 2,950	49,100
21	14,700	2,180	86,500	2,340	843	12,200	7,690	3,400	70,600
22	14,300	1,940	74,900	5,190	752	10,500	7,980	5,000	108,000
23	13,300	1,680	60,300	5,120	582	8,050	6,820	8,200	151,000
24	12,300	1,560	51,800	4,980	596	8,010	6,860	9,400	174,000
25	11,300	1,170	35,700	4,840	512	6,690	6,920	8,500	159,000
26	10,400	878	24,700	4,560	500	6,180	6,630	6,000	107,000
27	9,620	758	19,700	4,450	287	3,450	6,610	3,700	66,000
28	8,980	657	15,900	4,580	271	3,350	6,590	1,900	33,800
29	8,440	873	19,900	4,470	277	3,340	6,470	a 1,050	18,300
30	8,180	1,150	25,400	4,360	246	2,900	6,430	a 800	13,900
31	8,090	a 1,100	24,000	4,380	274	3,240	--	--	--
Total	579,810	--	6,671,000	191,080	--	519,900	151,450	--	1,093,000

Total discharge for year (second-foot-days) 4,909,690
Total load for year (tons) 40,280,000

s Computed by subdividing day.
a Computed from estimated concentration graph.

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER AT LEES FERRY, ARIZ.

LOCATION.--At gaging station at head of Marble Gorge at Lees Ferry, Coconino County, just upstream from Paria River, 28 miles downstream from Utah-Arizona state line, 61.5 miles upstream from Little Colorado River, and 79 miles downstream from San Juan River.
DRAINAGE AREA.--107,900 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: July 1926, October 1926 to September 1927, October 1928 to September 1930, October 1942 to September 1945, October 1947 to September 1950.
Water temperatures: July 1949 to September 1950.
Sediment records: October 1928 to September 1933, November 1942 to September 1944, October 1947 to September 1950.
EXTREMES, 1949-50.--Dissolved solids: Maximum, 1,180 ppm Oct. 1-10; minimum, 262 ppm June 11-20.
Hardness: Maximum, 592 ppm Oct. 1-10; minimum, 164 ppm June 11-20.
Water temperatures: Maximum observed, 80°F Aug. 20; minimum, freezing point Jan. 3-5, 7.
Sediment loads: Maximum daily, 1,290,000 tons July 11; minimum daily, 3,610 tons Sept. 5.
EXTREMES, 1928-30, 1942-45, 1947-50.--Dissolved solids: Maximum, 1,410 ppm Oct. 11-20, 1928; minimum, 209 ppm June 11-20, 1929.
Hardness: Maximum, 720 ppm Oct. 11-20, 1928; minimum, 132 ppm June 11-20, 1944.
Water temperatures: (July 1949 to September 1950): Maximum observed, 82°F Aug. 6, 1949; minimum, freezing point Jan. 3-5, 7, 1950.
Ssdiment loads: (1928-33, 1942-44, 1947-50): Maximum daily, 9,450,000 tons Aug. 7, 1929; minimum daily,(b) 1,220 tons Jan. 8, 1949.
REMARKS.--Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1179.

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

Date of collection	Mean discharge (second-feet)	Temperature (°F)	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)	Boron (B)	Dissolved solids			Hardness as $CaCO_3$		Percent sodium
																	Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate	
Oct. 1-10, 1949.....	6,414		7.7	1,700	13	0.01	148	54	162	4.0	206	585	113	0.3	2.9	0.5	1,180	1.60	20,400	592	422	37
Oct. 11-20.....	7,638		7.7	1,640	12	.02	136	51	157	3.2	210	539	111	.3	3.9	.3	1,120	1.52	23,100	549	377	38
Oct. 21-31.....	10,500		7.7	1,500	12	.01	130	44	141	3.6	215	488	90	.4	2.8	.3	1,020	1.39	29,100	506	339	38
Nov. 1-10.....	8,296		7.5	1,430	13	.00	116	47	134	6.4	224	452	91	.3	4.2	.2	974	1.32	21,800	483	300	37
Nov. 11-20.....	8,021		7.7	1,430	13	.00	110	48	136	4.8	223	428	102	.3	3.9	.2	956	1.30	20,700	472	290	38
Nov. 21-30.....	7,520		7.7	1,430	13	.01	110	48	133	4.8	226	423	106	.3	4.0	.2	953	1.30	19,300	472	287	38
Dec. 1-10.....	7,004		7.8	1,430	13	.01	110	49	135	6.4	227	426	106	.3	3.6	.2	961	1.31	18,200	476	290	38
Dec. 11-20.....	6,149		8.0	1,500	13	.01	110	50	148	6.8	230	437	120	.3	3.7	.2	1,000	1.36	16,600	480	292	40
Dec. 21-24, 26-31..	4,908		8.2	1,630	14	.01	124	52	167	4.6	240	469	142	.3	4.8	.2	1,100	1.50	14,600	524	327	41
Jan. 1-10, 1950.....	4,835		7.9	1,670	15	.03	126	53	168	6.0	265	481	138	.4	4.7	--	1,120	1.52	14,600	532	316	40
Jan. 11, 13-20.....	5,022		8.0	1,620	15	.03	124	52	163	5.8	272	465	129	.4	4.5	--	1,090	1.48	14,800	524	300	40
Jan. 21-28, 30-31...	7,072		8.0	1,450	13	.03	110	44	144	5.8	235	400	119	.3	4.1	--	956	1.30	18,300	456	263	40
Feb. 1-10.....	6,544		7.5	1,350	14	.04	103	43	138	3.2	220	377	106	.4	4.7	a.1	897	1.22	15,800	434	254	41
Feb. 11-20.....	7,545		7.7	1,360	14	.04	104	43	135	3.6	218	389	105	.4	4.9	a.1	906	1.23	18,500	436	258	40
Feb. 21-28.....	7,510		7.7	1,360	14	.04	104	43	143	4.6	216	396	103	.4	4.5	a.1	919	1.25	18,600	436	260	41
Mar. 1-10.....	10,250		7.5	1,400	13	.03	106	45	139	8.0	225	418	96	.3	1.6	a.1	938	1.28	26,000	450	265	40
Mar. 11-20.....	12,520		7.6	1,130	11	.04	85	36	114	5.2	207	318	70	.3	4.4	a.1	746	1.01	25,200	360	190	40
Mar. 21-25, 27-31..	9,090		7.6	1,190	11	.05	87	37	111	5.8	202	332	82	.3	3.3	a.1	769	1.05	18,900	369	204	39

a Reported boron concentration is less than figure indicated.
b Reported erroneously as "3,500 tons per day Sept. 27, 1944", in W.S.P. 1163.

Apr. 1-10	9,420		7.6	1,250	12	.01	90	38	126	4.4	217	342	93	.2	2.3	a.1	815	1.11	20,700	380	202	42
Apr. 11-20	19,800		7.7	960	14	.03	77	30	88	3.8	209	247	58	.3	2.0	a.1	623	.85	33,300	316	144	37
Apr. 21-30	32,120		7.8	656	14	.01	61	20	50	2.8	190	144	28	.3	2.3	a.1	416	.57	36,100	234	78	31
May 1-10	26,990		7.8	566	12	.01	56	18	38	2.8	168	116	24	.3	2.1	a.1	352	.48	25,700	214	76	28
May 11-20	21,630		7.8	698	13	.01	63	22	55	2.6	175	168	33	.3	1.9	a.1	445	.61	26,000	248	104	32
May 21-31	46,120		7.8	524	13	.02	52	17	35	3.2	159	109	21	.3	2.0	a.1	331	.45	41,200	200	69	27
June 1-10	51,900		7.2	464	13	.04	47	15	26	3.4	154	90	16	.3	1.2	a.1	288	.39	40,400	179	53	24
June 11-20	53,220		7.5	430	11	.04	44	13	23	3.4	140	83	14	.3	1.1	a.1	262	.36	37,600	164	49	23
June 21-30	45,050		7.2	435	11	.03	45	13	26	3.6	129	89	16	.3	1.3	a.1	269	.37	32,700	166	60	25
July 1-3, 5-10	30,850		7.4	529	12	.02	55	14	33	2.4	153	111	20	.3	1.0	.1	324	.44	27,000	194	69	27
July 11-14	26,420		7.5	1,150	15	.01	137	29	79	6.2	176	435	36	.5	.6	.1	825	1.12	58,900	461	317	27
July 15-20	21,970		7.6	812	14	.02	82	21	61	4.0	172	230	34	.6	2.4	.1	534	.73	31,700	291	150	31
July 21-31	13,490		7.3	872	12	.02	80	27	65	4.8	176	250	42	.3	2.3	.1	570	.78	20,800	310	166	31
Aug. 1-5, 7-10	8,621		7.7	1,020	12	.02	90	33	85	5.2	195	285	58	.4	1.8	.2	666	.90	15,500	360	200	34
Aug. 12, 15-20	6,939		7.7	1,160	11	.02	98	38	103	5.2	197	352	67	.4	2.5	.1	774	1.05	14,500	400	239	35
Aug. 21-26, 28-31	5,183		7.7	1,260	10	.01	102	41	114	5.8	192	398	79	.4	2.5	.2	848	1.15	11,900	423	266	37
Sept. 1-2, 4-7, 9-10	4,323		7.7	1,430	9.5	.18	110	49	131	5.4	187	464	95	.3	2.4	.3	959	1.30	11,200	476	323	37
Sept. 11-18, 20	4,097		7.6	1,540	9.6	.01	121	53	149	5.2	197	511	104	.3	4.0	.3	1,050	1.43	11,600	520	358	38
Sept. 21-30	8,217		7.7	1,660	13	.15	150	51	151	5.6	215	584	100	.5	2.7	.3	1,160	1.58	25,700	584	408	36
Weighted average	15,250		--	850	12	0.03	75	28	70	4.0	179	230	49	0.3	2.2	0.1	559	0.76	23,000	302	156	33

a Reported boron concentration is less than figure indicated.

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER AT LEES FERRY, ARIZ.--Continued

Temperature (°F) of water, water year October 1949 to September 1950
/Once-daily temperature measurement generally during forenoon/

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

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER AT LEES FERRY, ARIZ.--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	5,460	1,300	19,200	8,470	3,400	77,800	7,520	1,130	22,900
2	5,400	3,000	43,700	8,470	2,700	61,700	7,350	1,100	21,800
3	5,600	2,030	30,700	8,360	2,300	51,900	7,210	1,200	23,400
4	7,600	6,440	s 134,000	8,210	1,800	39,900	7,040	1,100	20,900
5	7,380	3,850	s 77,000	8,390	2,000	45,300	6,980	1,100	20,700
6	6,870	2,500	46,400	8,320	2,000	44,900	6,980	1,170	22,000
7	6,600	5,000	89,100	8,130	1,600	35,100	7,040	1,310	24,900
8	6,640	6,700	120,000	8,130	1,500	32,900	6,810	1,240	22,800
9	6,440	4,700	81,700	8,240	1,500	33,400	6,570	1,050	18,600
10	6,150	4,400	73,100	8,240	1,800	40,000	6,540	1,700	30,000
11	5,840	2,700	42,600	8,210	1,700	37,700	6,640	1,110	19,900
12	5,840	1,900	30,000	8,130	1,600	35,100	6,540	1,420	25,100
13	6,310	1,800	30,700	7,950	1,400	30,100	6,640	1,290	23,100
14	7,110	3,000	57,600	7,770	1,300	27,300	6,940	1,350	25,300
15	6,470	2,600	45,400	7,950	1,800	38,600	6,980	1,470	27,700
16	7,520	2,600	52,800	8,060	1,600	34,800	6,910	1,540	28,700
17	8,430	3,400	77,400	8,210	1,500	33,300	6,280	1,120	19,000
18	8,280	3,900	87,200	8,240	1,400	31,100	5,430	900	13,200
19	9,080	3,200	78,500	7,920	1,200	25,700	4,840	920	12,000
20	11,500	e 8,510	s 270,000	7,770	1,200	25,200	4,290	1,020	11,800
21	12,200	10,500	346,000	7,740	1,400	29,300	4,130	960	10,700
22	15,700	10,700	454,000	7,840	1,500	31,800	4,590	1,120	13,900
23	12,000	8,200	269,000	7,810	2,000	42,200	5,350	1,220	17,600
24	10,200	5,500	151,000	7,700	2,700	56,100	5,690	1,640	25,200
25	10,400	5,800	163,000	7,600	1,800	36,900	5,600	e 1,600	24,200
26	10,200	10,400	286,000	7,460	1,600	32,200	5,120	1,070	14,800
27	9,800	7,300	193,000	7,280	1,400	27,500	4,720	900	11,500
28	9,280	4,200	105,000	7,210	1,100	21,400	4,490	810	9,820
29	9,040	3,800	92,800	7,210	1,200	23,400	4,720	910	11,600
30	8,810	3,600	85,600	7,350	1,600	31,800	4,920	770	10,200
31	8,470	4,500	103,000	--	--	--	4,660	1,160	14,600
Total	256,620	--	3,736,000	238,370	--	1,114,000	185,520	--	597,900
	January			February			March		
1	4,640	1,620	20,300	6,410	1,450	25,100	7,490	1,800	36,400
2	4,620	1,550	19,300	6,440	1,150	20,000	7,950	1,930	41,400
3	4,890	1,400	18,500	6,470	1,080	18,900	8,210	1,930	42,800
4	5,400	1,420	20,700	6,840	1,290	23,800	8,770	1,980	46,900
5	5,400	2,070	30,200	6,600	1,200	21,400	9,040	1,980	48,300
6	5,300	2,480	35,500	6,470	1,150	20,100	9,000	1,860	45,200
7	5,000	1,440	19,400	6,440	1,030	17,900	9,000	2,060	50,100
8	4,700	1,110	14,100	6,500	1,600	28,100	12,200	4,160	s 139,000
9	4,400	1,400	16,600	6,600	1,360	24,200	15,700	5,050	214,000
10	4,000	1,040	11,200	6,670	1,500	27,000	15,100	4,110	168,000
11	3,600	1,060	10,300	7,420	2,640	52,900	13,900	4,350	163,000
12	3,660	1,020	10,100	7,920	1,920	41,100	14,400	3,260	127,000
13	3,990	970	10,400	8,390	2,550	57,800	14,600	4,020	158,000
14	4,590	1,280	15,900	8,280	1,780	39,600	14,600	4,040	159,000
15	4,970	2,020	27,100	7,660	1,960	40,500	13,600	4,400	162,000
16	5,460	1,940	28,600	7,460	1,980	39,900	12,700	4,650	159,000
17	5,870	1,880	29,800	7,150	1,790	34,600	11,800	3,690	118,000
18	5,810	1,790	28,100	7,040	1,630	31,000	10,800	2,750	78,700
19	5,960	1,430	23,000	7,150	1,700	32,800	9,720	2,800	73,500
20	6,310	1,350	23,000	6,980	1,520	28,600	9,240	2,390	59,600
21	6,410	1,520	26,300	7,010	1,560	29,500	9,440	3,030	77,200
22	6,210	1,510	25,300	7,250	1,560	30,500	8,890	2,220	53,300
23	6,570	1,580	28,000	7,460	1,820	36,700	8,620	2,120	49,300
24	7,010	1,760	33,300	7,660	1,810	37,400	8,620	1,890	44,000
25	7,210	1,670	32,500	7,770	1,620	34,000	8,660	2,370	55,400
26	7,700	1,820	37,800	7,770	2,170	45,500	9,040	1,780	43,400
27	8,170	2,300	50,700	7,700	1,420	29,500	8,850	1,820	43,500
28	7,740	1,760	36,800	7,460	1,560	31,400	8,970	1,910	46,300
29	7,150	1,760	34,000	--	--	--	9,200	1,910	47,400
30	6,980	1,750	33,000	--	--	--	9,760	2,040	53,800
31	6,640	1,470	26,400	--	--	--	9,930	1,710	45,800
Total	176,360	--	776,200	200,970	--	900,000	327,800	--	1,649,000

e Estmated or interpolated.
s Computed by subdividing day.

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER AT LEES FERRY, ARIZ.--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	9,560	2,000	51,600	31,600	4,820	411,000	44,100	3,800	452,000
2	8,970	1,440	34,900	30,000	4,190	339,000	41,700	3,200	360,000
3	8,580	1,420	32,900	28,000	3,800	287,000	44,600	3,320	400,000
4	8,320	1,660	37,300	25,600	3,610	250,000	49,700	4,120	553,000
5	8,130	1,450	31,800	24,900	3,700	249,000	56,100	3,730	565,000
6	8,100	1,530	33,500	25,300	3,440	235,000	58,300	3,620	570,000
7	9,040	1,610	39,300	26,800	3,900	282,000	56,100	3,800	576,000
8	10,200	3,140	86,500	27,200	3,570	262,000	54,000	3,800	554,000
9	11,300	2,670	81,500	26,000	3,310	232,000	56,100	3,860	585,000
10	12,000	1,860	60,300	24,500	3,080	204,000	58,300	3,400	535,000
11	16,500	3,450	154,000	23,400	2,660	168,000	56,100	3,240	491,000
12	19,800	4,450	238,000	22,100	2,660	159,000	51,800	3,070	429,000
13	19,500	5,050	266,000	20,100	2,400	130,000	50,800	2,820	387,000
14	17,100	4,680	216,000	19,200	2,120	110,000	50,800	3,030	416,000
15	20,100	7,020	s 389,000	18,300	2,150	106,000	54,000	2,920	426,000
16	21,700	8,200	480,000	18,300	2,120	105,000	55,000	3,360	499,000
17	20,400	6,220	343,000	19,200	2,770	144,000	55,000	3,980	588,000
18	20,100	5,880	319,000	20,400	2,660	147,000	52,900	3,080	440,000
19	21,100	5,670	323,000	25,300	3,200	219,000	52,900	2,890	413,000
20	21,700	5,240	307,000	30,000	4,480	363,000	52,900	2,720	388,000
21	26,000	5,740	403,000	37,400	4,710	476,000	51,800	2,870	401,000
22	26,800	5,910	428,000	40,200	4,990	542,000	50,200	2,290	310,000
23	28,000	5,710	432,000	41,700	4,490	506,000	48,100	2,150	279,000
24	30,000	5,730	464,000	43,100	4,360	507,000	48,100	3,090	401,000
25	32,900	6,580	585,000	46,100	4,490	559,000	47,100	3,700	471,000
26	34,700	6,300	590,000	48,100	4,780	621,000	45,100	3,140	382,000
27	36,500	6,320	623,000	51,800	4,720	660,000	41,700	2,440	275,000
28	36,000	5,640	548,000	51,800	4,870	681,000	40,700	2,250	247,000
29	36,000	5,370	522,000	50,800	4,290	588,000	39,800	2,100	226,000
30	34,300	5,020	465,000	48,700	4,300	565,000	37,900	2,190	224,000
31	--	--	--	47,600	3,880	499,000	--	--	--
Total	613,400	--	8,585,000	993,500	--	10,610,000	1,501,700	--	12,840,000

Day	July			August			September		
1	36,500	1,950	192,000	9,580	1,060	27,400	4,520	463	5,650
2	34,300	1,960	182,000	9,400	1,060	26,900	4,460	430	5,180
3	32,900	1,880	167,000	9,400	1,330	33,800	4,490	460	5,580
4	30,400	1,800	148,000	9,000	980	23,800	4,420	482	5,750
5	28,800	1,720	134,000	8,580	890	20,600	4,270	313	3,610
6	27,200	1,730	127,000	8,280	900	20,100	4,250	330	3,790
7	27,200	1,990	146,000	7,920	940	20,100	4,320	370	4,320
8	28,400	2,600	199,000	7,920	1,270	27,200	4,290	1,350	15,600
9	27,200	3,060	225,000	8,130	1,180	25,900	4,290	10,000	116,000
10	35,600	6,120	s 602,000	8,020	1,100	23,800	3,920	1,260	13,300
11	29,600	16,100	1,290,000	7,840	870	18,400	3,880	650	6,810
12	25,600	17,800	1,230,000	7,880	4,470	95,100	3,850	760	7,900
13	25,600	9,770	675,000	7,460	1,260	25,400	3,680	550	5,460
14	24,900	9,100	612,000	7,150	960	18,500	3,620	1,440	14,100
15	24,500	4,940	327,000	6,740	1,470	26,800	3,810	1,500	15,400
16	23,800	3,940	253,000	6,540	973	17,200	4,130	1,280	14,300
17	22,100	4,040	241,000	6,600	975	17,400	4,170	1,510	17,000
18	20,800	4,520	254,000	6,600	960	17,100	4,340	1,130	13,200
19	21,100	9,700	553,000	6,340	1,030	17,600	4,390	1,500	17,800
20	19,500	3,530	186,000	6,240	650	11,000	5,100	1,800	24,800
21	18,300	2,780	137,000	5,900	600	9,580	7,740	5,200	109,000
22	16,800	3,060	139,000	5,660	1,030	15,700	9,000	16,000	389,000
23	16,200	2,240	98,000	5,630	1,030	15,700	9,480	12,000	307,000
24	15,700	2,590	110,000	5,520	850	12,700	9,600	9,830	255,000
25	14,400	3,480	135,000	5,550	5,580	83,300	8,320	9,190	206,000
26	13,400	2,490	90,100	5,120	1,200	16,600	7,920	8,520	182,000
27	12,200	2,090	68,800	4,970	920	12,300	7,810	8,800	186,000
28	11,300	1,540	47,000	4,820	640	8,330	7,600	5,930	122,000
29	10,400	1,510	42,400	4,640	580	7,020	7,320	5,780	114,000
30	9,970	1,610	43,300	4,560	2,820	34,700	7,380	4,460	89,300
31	9,720	1,020	26,800	4,640	1,040	13,000	--	--	--
Total	694,390	--	8,680,000	212,610	--	743,000	166,370	--	2,275,000

Total discharge for year (second-foot-days) 5,567,410
Total load for year (tons) 53,510,000

s Computed by subdividing day.

COLORADO RIVER AT LEES FERRY, ARIZ.--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. 3, 1949	9:00 a. m.	5,600	1,950	2,000	22	33	43	56	--	76	--	--		--		DSWCM
Oct. 6	9:00 a. m.	7,010	2,490	2,630	20	29	42	56	--	76	--	--		--		DSWCM
Oct. 10	9:15 a. m.	6,240	4,070	4,150	25	41	59	74	--	87	--	--		--		DSWCM
Oct. 13	9:00 a. m.	6,210	2,170	2,090	23	31	43	55	--	71	--	--		--		DSWCM
Oct. 17	4:00 p. m.	8,360	3,280	3,320	20	31	45	56	--	78	--	--		--		DSWCM
Oct. 21	1:00 p. m.	12,000	12,000	1,400	24	31	43	54	59	69	86	100		--		BSWCM
Oct. 24	10:30 a. m.	10,200	2,430	4,420	15	26	38	50	--	75	89	100		--		DSWCM
Oct. 27	8:30 a. m.	9,800	7,200	3,910	32	46	62	74	--	87	--	--		--		DSWCM
Oct. 27	8:30 a. m.	9,800	7,200	1,420	43	55	72	82	85	88	95	98		100		BSWCM
Oct. 31	9:30 a. m.	8,470	4,410	921	42	53	64	76	80	87	94	--		--		BWCM
Nov. 3	9:30 a. m.	8,320	2,450	1,650	27	33	43	49	53	61	85	100		--		BSWCM
Nov. 7	9:00 a. m.	8,130	2,100	1,450	20	24	33	38	43	50	78	98		100		BSWCM
Nov. 10	11:30 a. m.	8,240	2,480	1,810	16	16	22	27	32	41	72	98		100		BSWCM
Nov. 14	9:45 a. m.	7,770	1,930	1,520	20	20	26	31	36	44	81	99		100		BSWCM
Nov. 17	10:15 a. m.	8,240	2,230	1,810	17	--	21	25	30	37	72	99		100		BSWCM
Nov. 21	9:15 a. m.	7,770	1,300	994	16	18	28	36	43	51	82	99		100		BSWCM
Nov. 24	10:10 a. m.	7,740	1,400	936	22	23	29	33	36	43	77	99		100		BSWCM
Nov. 28	8:30 a. m.	7,250	1,580	6,330	10	13	17	22	--	39	74	98		99		DSWCM
Dec. 1	10:00 a. m.	7,520	1,410	5,890	9	12	16	22	--	39	67	99		100		DSWCM
Dec. 5	9:00 a. m.	7,010	1,790	6,640	8	12	15	19	--	31	58	99		100		DSWCM
Dec. 8	9:00 a. m.	6,870	1,620	6,310	8	12	15	20	--	34	66	99		100		DSWCM
Dec. 15	2:00 p. m.	7,010	1,830	6,600	8	11	14	19	--	33	62	99		100		DSWCM
Dec. 19	1:45 p. m.	4,760	1,270	4,280	8	12	15	20	--	37	74	98		99		DSWCM
Dec. 22	1:30 p. m.	4,660	1,380	4,760	11	15	19	25	--	38	70	99		100		DSWCM
Dec. 26	12:00 m.	5,490	1,790	6,610	7	10	13	17	--	23	48	95		99		DSWCM
Jan. 2, 1950	1:00 p. m.	4,560	1,780	6,400	6	8	11	15	--	26	54	99		100		DSWCM
Jan. 5	1:30 p. m.	5,780	2,790	2,790	--	--	--	--	--	13	46	97		100		S
Jan. 9	3:15 p. m.	4,520	1,930	1,930	--	--	--	--	--	13	48	98		100		S
Jan. 12	4:00 p. m.	3,680	1,600	1,600	--	--	--	--	--	18	46	97		100		S
Jan. 19	1:00 p. m.	5,960	1,610	1,610	--	--	--	--	--	28	68	99		100		S
Jan. 23	2:00 p. m.	6,600	2,050	9,210	6	9	12	17	--	33	68	99		--		DSWCM
Jan. 26	1:45 p. m.	7,770	2,540	9,240	5	8	11	16	--	32	69	99		100		DSWCM
Jan. 30	1:30 p. m.	7,010	2,590	9,190	6	8	10	14	--	18	59	98		--		DSWCM

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER AT LEES FERRY, ARIZ.--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 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	
Feb. 2, 1950	1:00 p.m.	6,410	1,630	5,450	8	12	15	21	--	35	61	98		--		DSWCM
Feb. 6	1:45 p.m.	6,470	2,010	2,010	--	--	--	--	--	21	51	99		100		S
Feb. 9	2:00 p.m.	6,640	1,560	5,920	9	14	18	22	--	37	72	99		--		DSWCM
Feb. 13	12:45 p.m.	8,540	2,600	9,720	9	14	18	24	--	44	75	100		--		DSWCM
Feb. 16	10:00 a.m.	7,460	2,350	9,900	9	13	16	20	--	36	70	99		--		DSWCM
Feb. 20	11:00 a.m.	7,010	1,890	6,970	8	12	16	23	--	41	72	100		--		DSWCM
Feb. 23	1:30 p.m.	7,490	1,740	7,020	9	14	18	24	--	42	77	99		--		DSWCM
Feb. 27	10:00 a.m.	7,770	2,050	7,130	11	16	21	27	--	41	74	99		--		DSWCM
Mar. 2	10:15 a.m.	7,880	2,390	8,290	11	17	21	27	--	42	73	99		--		DSWCM
Mar. 6	1:30 p.m.	9,080	2,490	10,600	11	17	22	29	--	49	77	100		--		DSWCM
Mar. 8	5:45 p.m.	15,400	5,180	4,180	12	17	20	26	35	49	80	99		100		BSWCM
Mar. 9	12:00 m.	15,700	5,020	17,700	8	13	19	27	--	60	80	99		--		DSWCM
Mar. 13	10:00 a.m.	14,900	4,520	3,510	21	29	36	43	50	61	83	99		100		BSWCM
Mar. 16	10:00 a.m.	12,900	5,600	4,160	15	19	24	30	34	42	67	95		100		BSWCM
Mar. 20	10:15 a.m.	9,120	2,450	1,650	29	38	46	52	57	63	84	98		100		BSWCM
Mar. 23	11:45 a.m.	8,620	2,230	3,720	13	20	27	36	--	57	80	97		--		DSWCM
Mar. 27	12:15 p.m.	8,810	1,880	4,040	15	22	29	39	--	57	75	96		--		DSWCM
Mar. 30	10:30 a.m.	9,680	2,540	2,030	17	21	28	32	35	42	75	100		--		BSWCM
Apr. 3	10:30 a.m.	8,580	1,920	1,500	21	25	32	36	41	51	85	100		--		BSWCM
Apr. 6	10:40 a.m.	8,100	2,790	2,210	16	19	25	30	35	43	77	100		--		BSWCM
Apr. 10	12:30 p.m.	11,500	2,510	2,180	18	22	30	36	40	50	83	100		--		BSWCM
Apr. 11	9:45 a.m.	16,800	4,080	4,160	12	16	21	29	--	58	81	98		100		DSWCM
Apr. 12	11:45 a.m.	19,800	4,830	3,550	14	20	27	35	45	60	82	99		100		BSWCM
Apr. 13	10:30 a.m.	19,800	5,530	1,880	21	27	35	44	52	63	79	96		100		BSWCM
Apr. 17	9:50 a.m.	20,400	5,660	1,980	30	38	49	59	66	72	86	98		100		BSWCM
Apr. 22	10:15 a.m.	26,400	5,430	2,160	29	34	48	60	68	86	90	98		100		BSWCM
Apr. 26	12:30 p.m.	35,200	5,080	1,990	24	30	38	45	58	67	83	95		100		BSWCM
Apr. 27	9:30 a.m.	36,500	5,540	2,280	19	25	36	46	58	69	87	97		100		BSWCM
May 1	9:15 a.m.	32,100	4,210	2,830	19	26	35	44	57	69	87	96		100		BSWCM
May 4	11:45 a.m.	25,300	3,580	2,550	15	19	25	33	--	57	86	98		100		DSWCM
May 8	11:30 a.m.	27,600	3,150	3,330	9	13	18	25	--	73	96	97		100		DSWCM
May 11	1:00 p.m.	23,400	2,390	4,890	9	14	21	32	--	62	82	96		100		DSWCM
May 15	8:45 a.m.	18,300	2,480	5,260	9	15	20	31	--	55	69	87		100		DSWCM
May 18	9:30 a.m.	20,400	2,450	1,770	24	28	35	42	49	60	81	98		100		BSWCM

May 20	9:30 a. m.	29,200	5,050	3,450	11	14	18	21	30	43	76	99	100	BSWCM
May 21	10:00 a. m.	36,000	4,190	2,720	12	15	22	28	39	56	79	96	100	BSWCM
May 22	10:30 a. m.	39,800	5,090	3,670	12	16	21	28	39	53	73	94	100	BSWCM
May 25	8:45 a. m.	44,600	4,830	3,620	14	17	24	31	41	52	70	87	99	BSWCM
May 27	10:10 a. m.	51,800	4,550	3,740	14	17	24	31	42	57	80	95	100	BSWCM
May 29	11:30 a. m.	50,800	4,470	3,480	10	17	22	30	40	54	77	95	100	BSWCM
June 1	10:00 a. m.	43,600	3,310	2,640	11	16	22	29	38	55	78	96	100	BSWCM
June 4	9:45 a. m.	49,700	--	5,010	7	10	14	21	--	46	63	85	99	DSWCM
June 5	11:30 a. m.	56,100	3,500	3,710	7	10	16	23	--	52	75	95	99	DSWCM
June 8	9:00 a. m.	54,000	3,650	13,400	7	11	15	21	--	47	68	94	99	DSWCM
June 12	11:45 a. m.	51,800	2,870	11,700	7	10	15	22	--	50	70	89	99	DSWCM
June 15	9:00 a. m.	54,000	3,560	12,700	5	7	10	14	--	26	46	66	94	DSWCM
June 19	11:20 a. m.	51,800	2,790	11,400	5	7	10	14	--	48	55	87	100	DSWCM
June 22	9:30 a. m.	50,200	2,270	8,290	7	10	14	19	--	45	70	95	100	DSWCM
June 26	12:00 m.	45,100	2,710	3,170	17	26	33	40	--	62	85	97	100	DSWCM
June 29	9:15 a. m.	39,800	1,970	7,280	8	11	15	22	--	48	71	92	99	DSWCM
July 6	10:15 a. m.	27,600	1,890	6,490	6	9	12	17	--	42	61	85	100	DSWCM
July 11	9:45 a. m.	30,000	14,700	2,240	43	59	78	92	97	100	--	--	--	BWCM
July 13	8:30 a. m.	25,600	9,110	1,920	35	51	65	77	89	95	97	--	--	BWCM
July 17	12:45 p. m.	22,400	3,620	2,060	23	34	49	64	--	84	--	--	--	DSWCM
July 20	9:30 a. m.	19,800	3,710	2,500	30	36	46	55	64	78	88	98	100	BSWCM
July 24	11:30 a. m.	15,700	2,790	2,350	35	46	62	67	74	85	94	99	100	BSWCM
July 27	9:15 a. m.	12,400	1,250	4,830	13	28	38	54	--	75	--	--	--	DSWCM
July 31	11:00 a. m.	9,850	1,230	2,750	17	26	35	43	--	69	88	99	100	DSWCM
Aug. 3	10:30 a. m.	9,400	1,500	1,750	19	30	41	51	--	66	--	--	--	DSWCM
Aug. 7	12:30 p. m.	7,840	1,200	2,180	20	29	39	48	--	68	87	99	--	DSWCM
Aug. 10	10:15 a. m.	8,020	1,520	1,620	16	26	33	39	--	61	85	100	--	DSWCM
Aug. 14	10:30 a. m.	7,280	1,200	2,680	19	28	37	46	--	67	89	--	--	DSWCM
Aug. 17	9:15 a. m.	6,570	1,080	1,100	23	32	33	39	--	59	82	98	--	DSWCM
Aug. 21	9:15 a. m.	5,980	848	3,340	13	23	29	35	--	55	86	99	100	DSWCM
Aug. 24	9:15 a. m.	5,550	1,120	2,740	18	28	35	40	--	57	89	98	--	DSWCM
Aug. 28	12:00 m.	4,840	809	1,820	18	33	43	51	--	72	--	--	--	DSWCM
Aug. 31	9:00 a. m.	4,620	1,210	2,240	24	42	55	67	--	81	--	--	--	DSWCM

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER AT LEES FERRY, ARIZ.--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 distilled water; C, chemically dispersed; M, mechanically disperzed)

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	
Sept. 4, 1950	9:10 a. m.	4,440	536	536	--	--	--	--	--	43	82	98		100		S
Sept. 11	9:00 a. m.	3,880	874	1,940	16	26	35	44	--	73	91	97		--		DSWCM
Sept. 14	9:15 a. m.	3,620	1,570	3,550	30	48	64	76	--	--	--	--		--		DWCM
Sept. 18	1:00 p. m.	4,340	4,780	2,350	24	35	46	59	--	74	--	--		--		DSWCM
Sept. 21	12:15 p. m.	8,100	4,520	2,560	21	39	51	63	--	85	--	--		--		DSWCM
Sept. 25	9:45 a. m.	8,360	8,450	1,820	46	62	77	84	90	94	99	100		--		BWCM
Sept. 28	8:30 a. m.	7,630	6,020	2,430	50	64	78	85	90	93	98	100		--		BWCM

COLORADO RIVER NEAR GRAND CANYON, ARIZ.

LOCATION.--At gaging station at Kaibab Bridge, a quarter of a mile upstream from Bright Angel Creek, 11 miles by trail northeast of Grand Canyon Village, Coconino County, 26 miles downstream from Little Colorado River, and 267 miles upstream from Hoover Dam.
DRAINAGE AREA.--137,800 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: August 1925 to November 1942, September 1943 to September 1950.
Water temperatures: October 1936 to October 1942, September 1943 to September 1950.
Sediment records: October 1925 to November 1942, September 1943 to September 1950
EXTREMES, 1949-50.--Dissolved solids: Maximum, 1,220 ppm Oct. 11-20, Jan. 1-10; minimum, 335 ppm June 11-20.
Hardness: Maximum, 607 ppm Oct. 1-10; minimum, 212 ppm June 11-20.
Water temperatures: Maximum observed, 82°F July 15, 16, 22; minimum observed, 33°F Jan. 6.
Sediment loads: Maximum daily, 1,300,000 tons July 13; minimum daily, 1,290 tons Sept. 7.
EXTREMES, 1925-50.--Dissolved solids: Maximum, 1,890 ppm Sept. 21-30, 1934; minimum, 225 ppm June 11-20, 1942.
Hardness: Maximum, 792 ppm Sept. 1-10, 1940; minimum, 127 ppm June 11-17, 1926.
Water tsmperatures (1936-50): Maximum observed, 88°F July 17, 1944; minimum, freezing point on several days during winter months of most years.
Sediment loads: Maximum daily, 27,600,000 tons Sept. 13, 1927; minimum daily, (b) 497 tons July 22, 1934.
REMARKS.--Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1179.

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

Date of collection	Mean discharge (second-feet)	Temperature (°F)	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)	Boron (B)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Noncarbonate	Percent sodium
Oct. 1-10, 1949	6,519		7.6	1,740	13	0.18	156	53	150	9.0	287	535	117	0.3	2.2		1,170	1.59	20,600	607	388	34
Oct. 11-20.....	7,574		7.6	1,780	13	.08	153	53	173	8.6	255	548	144	.3	4.9		1,220	1.66	24,900	600	390	38
Oct. 21-31.....	11,050		7.7	1,620	13	.02	152	46	151	8.0	261	505	115	.3	4.4		1,120	1.52	33,400	568	354	36
Nov. 1-10	8,619		7.9	1,500	13	.13	122	47	153		231	440	127	.3	4.5		1,020	1.39	23,700	498	308	40
Nov. 11-20	8,299		7.8	1,380	12	.13	116	47	144	7.6	232	413	129	.3	3.4		987	1.34	22,100	483	293	39
Nov. 21-22, 25-28..	7,685		7.7	1,530	14	.06	116	49	147	12	242	411	125	.3	3.8		997	1.36	20,700	491	292	39
Dec. 1-10.....	7,124		7.8	1,510	12	.08	103	46	151	10	215	382	128	.4	2.9		941	1.28	18,100	446	270	42
Dec. 11-20.....	6,501		7.8	1,590	13	.09	114	49	171	11	240	417	152	.3	2.9		1,050	1.43	18,400	486	290	43
Dec. 21-31.....	5,076		7.8	1,750	12	.12	120	51	188	9.6	251	437	182	.3	4.5		1,130	1.54	15,500	509	304	44
Jan. 1-10, 1950	5,097		7.8	1,840	14	.08	128	56	201	8.4	273	476	198	.3	5.5		1,220	1.66	16,800	550	326	44
Jan. 11-20.....	5,057		7.7	1,830	15	.11	128	57	200	7.2	283	462	195	.4	5.4		1,210	1.65	16,500	554	322	44
Jan. 21-31.....	7,186		7.7	1,620	15	.12	114	49	170	9.6	253	405	165	.4	5.2		1,060	1.44	20,600	486	278	43
Feb. 1-10.....	6,682		7.7	1,500	14	.07	107	46	157	11	236	372	150	.3	4.7		978	1.33	17,600	456	262	42
Feb. 11-19	7,982		7.4	1,550	15	.08	118	45	156	4.2	264	373	154	.3	5.0		1,000	1.36	21,600	480	263	41
Feb. 20-28	7,792		7.6	1,520	14	.09	118	45	153	4.0	266	378	144	.3	3.8		991	1.35	20,800	480	262	41
Mar. 1-11.....	10,770		7.6	1,510	14	.30	116	43	149	4.3	268	383	129	.3	3.6		974	1.32	28,300	466	247	41
Mar. 12-20.....	12,910		7.7	1,280	13	.16	101	38	128	2.9	266	323	96	.3	2.6		836	1.14	29,100	408	190	40
Mar. 21-31	9,357		7.4	1,360	13	.15	102	35	133	5.9	266	318	111	.4	1.7		851	1.13	21,500	398	190	42

a Less than 0.1 part per million by turmeric method.
b Reported erroneously as "863 tons per day Dec. 27, 1928", in W.S.P. 1163.

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER NEAR GRAND CANYON, ARIZ.--Continued

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

Date of collection	Mean discharge (second-feet)	Temperature (° F)	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)	Boron (B) [a]	Dissolved solids			Hardness as $CaCO_3$		Percent sodium
																	Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate	
Apr. 1-10, 1950....	9,491		7.6	1,380	13	0.30	102	38	143	6.1	262	341	127	0.4	1.8		902	1.23	23,100	410	196	43
Apr. 11-20	19,390		7.7	1,160	14	.09	96	28	118	5.6	258	275	84	.4	2.6		751	1.02	39,300	354	143	42
Apr. 21-30	31,200		7.8	749	14	.07	84	19	58	5.4	236	161	44	.4	2.9		505	.69	42,500	288	94	30
May 1-10	27,410		7.2	692	17	--	70	20	45	5.0	232	114	35	.4	.8		422	.57	31,200	256	66	27
May 11-20	21,050		7.3	818	15	--	77	22	60	5.6	240	157	47	.4	.5		503	.68	28,600	282	86	31
May 21-31	44,900		7.4	680	16	--	71	19	43	5.0	238	117	30	.4	.7		420	.57	50,900	255	60	26
June 1-10, ...	49,730		7.3	590	16	.05	66	16	28	6.2	225	85	24	.3	.2		353	.48	47,400	230	46	20
June 11-20	52,340		7.4	548	16	.14	62	14	29	5.9	213	80	22	.3	.5		335	.46	47,300	212	38	22
June 21-30	45,400		7.4	564	12	.05	66	14	27	3.4	201	92	24	.2	1.2		339	.46	41,600	222	58	21
July 1-2, 7-11	30,700		7.4	641	12	.05	67	17	40	3.7	207	115	36	.2	.8		394	.54	32,700	237	68	26
July 12-20	23,900		7.6	1,140	16	.05	124	28	80	6.4	234	330	53	.3	1.5		755	1.03	48,700	424	233	29
July 21-31	14,330		7.4	1,010	15	.05	96	28	79	5.1	233	245	64	.3	2.2		649	.88	25,100	354	164	32
Aug. 1-10.....	8,767		7.4	1,170	14	.05	94	33	100	5.4	222	286	92	.4	2.2		736	1.00	17,400	370	188	37
Aug. 11-20.....	7,372		7.4	1,290	13	.11	110	40	119	6.0	267	322	106	.3	1.7		850	1.16	16,900	439	220	37
Aug. 21-31.....	5,669		7.4	1,430	13	.06	114	43	142	6.0	251	371	132	.3	1.7		947	1.29	14,500	462	256	40
Sept. 1-10	4,722		7.4	1,560	11	.08	112	48	160	5.2	233	421	150	.3	2.4		1,020	1.39	13,000	477	286	42
Sept. 11-20	4,244		7.4	1,730	12	.10	128	54	176	7.8	256	469	175	.3	2.4		1,150	1.56	13,200	542	332	41
Sept. 21-30	8,331		7.5	1,750	15	.08	148	52	171	5.2	256	549	135	.2	2.7		1,210	1.65	27,200	584	372	39
Weighted average	15,220		--	996	14	0.09	91	28	84	5.8	235	231	70	0.3	1.9		642	0.87	26,400	342	150	34

a Less than 0.1 part per million by turmeric method.

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER NEAR GRAND CANYON, ARIZ.--Continued

Temperature (°F) of water, water year October 1949 to September 1950
/Once-daily temperature measurement generally in forenoon/

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

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER NEAR GRAND CANYON, ARIZ.--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	5,470	611	9,020	8,740	2,580	60,900	7,480	e430	8,680
2	5,730	18,000	278,000	8,690	3,680	86,300	7,550	412	8,400
3	5,660	e1,200	18,300	8,660	e2,800	65,500	7,360	393	7,810
4	5,860	1,150	18,200	8,580	1,910	44,200	7,180	392	7,600
5	7,700	2,150	44,700	8,630	1,230	28,700	7,030	328	6,230
6	7,520	1,850	37,600	8,820	1,070	25,500	6,960	339	6,370
7	7,000	4,100	77,500	8,660	1,020	23,900	6,980	323	6,090
8	6,820	1,800	33,100	8,420	987	22,400	7,000	359	6,790
9	6,820	1,870	34,400	8,420	877	19,900	6,910	329	6,140
10	6,610	4,000	71,400	8,550	895	20,700	6,790	345	6,320
11	6,420	4,600	79,700	8,570	809	18,700	6,700	346	6,260
12	6,120	3,800	62,800	8,420	779	17,700	6,730	292	5,310
13	6,210	2,900	48,800	8,360	678	15,300	6,650	300	5,390
14	6,700	1,900	34,400	8,200	689	15,300	6,700	286	5,170
15	7,310	1,210	23,900	8,090	662	14,500	7,000	315	5,950
16	6,790	1,370	25,100	8,340	687	15,000	7,100	378	7,250
17	7,910	1,850	39,500	8,420	638	14,500	7,000	353	6,670
18	8,450	e2,000	45,600	8,340	643	14,500	6,400	344	5,940
19	8,930	6,680	175,000	8,250	569	12,700	5,610	304	4,600
20	10,900	11,600	341,000	8,000	576	12,400	5,120	290	4,010
21	12,700	12,400	425,000	7,850	531	11,300	4,600	255	3,170
22	13,200	8,190	s299,000	7,840	512	10,800	4,490	247	2,990
23	15,300	10,300	425,000	7,960	e500	10,700	4,990	244	3,290
24	11,600	9,000	282,000	7,940	e490	10,500	5,530	283	4,220
25	10,400	6,450	181,000	7,850	487	10,300	5,770	326	5,080
26	10,600	4,780	137,000	7,720	447	9,320	5,770	342	5,330
27	10,500	4,790	136,000	7,490	505	10,200	5,320	491	7,050
28	9,860	9,140	243,000	7,360	469	9,320	4,830	390	5,090
29	9,360	6,340	160,000	7,300	e460	9,070	4,590	270	3,350
30	9,140	3,060	75,500	7,380	e440	8,770	4,860	212	2,780
31	8,920	2,400	57,800	--	--	--	5,080	248	3,410
Total	262,510	--	3,919,000	245,870	--	648,900	192,080	--	172,700

Day	January			February			March		
1	5,000	207	2,790	6,890	408	7,590	7,940	994	21,300
2	5,000	200	2,700	6,690	348	6,290	8,090	952	20,900
3	4,950	249	3,330	6,580	293	5,210	9,260	e1,500	37,500
4	5,020	e250	3,390	6,650	e295	5,300	9,430	e2,000	50,900
5	5,470	e250	3,690	6,970	297	5,590	9,880	2,370	63,200
6	5,530	251	3,750	6,800	308	5,650	9,820	2,260	59,900
7	5,400	248	3,620	6,560	312	5,530	9,600	1,920	49,800
8	5,180	239	3,340	6,440	392	6,820	9,650	1,750	45,600
9	4,840	294	3,840	6,580	252	4,480	14,000	5,360	s220,000
10	4,580	282	3,490	6,660	866	15,600	15,900	6,250	268,000
11	4,150	364	4,080	6,910	571	10,700	14,900	3,490	140,000
12	3,850	201	2,090	7,660	424	8,780	14,300	3,750	145,000
13	3,990	154	1,660	8,550	931	21,500	14,800	3,330	133,000
14	4,180	140	1,580	9,050	2,450	59,900	14,700	3,830	152,000
15	4,810	234	3,040	8,850	3,260	77,900	14,700	3,450	137,000
16	5,300	254	3,630	8,230	1,830	40,700	13,200	2,820	100,000
17	5,880	317	5,030	7,790	2,280	48,000	12,300	2,320	77,000
18	6,240	370	6,230	7,460	1,640	33,000	11,600	2,280	71,400
19	6,120	313	5,170	7,340	1,160	23,000	10,700	1,950	56,300
20	6,050	283	4,620	7,310	1,020	20,100	9,930	1,810	48,500
21	6,380	315	5,430	7,210	796	15,500	9,570	1,570	40,500
22	6,340	359	6,150	7,250	721	14,100	9,570	1,460	37,700
23	6,380	371	6,390	7,640	707	14,600	9,100	1,390	34,200
24	6,910	533	9,940	8,000	784	16,900	9,000	1,160	28,400
25	7,380	572	11,400	8,100	957	20,900	9,000	1,310	32,200
26	7,460	597	12,000	8,280	1,120	25,000	9,200	1,080	26,900
27	7,920	697	14,900	8,260	1,200	26,800	9,330	1,030	25,900
28	8,100	681	14,900	8,080	1,210	26,400	9,000	950	23,300
29	7,730	624	13,000	--	--	--	9,400	925	23,500
30	7,280	550	10,800	--	--	--	9,500	888	22,800
31	7,170	539	10,400	--	--	--	10,000	1,000	27,000
Total	180,590	--	186,400	208,790	--	571,800	337,690	--	2,220,000

e Estimated or interpolated.

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER NEAR GRAND CANYON, ARIZ.--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	10,000	1,130	30,500	32,400	7,800	682,000	45,300	5,650	691,000
2	9,550	e1,000	25,800	29,700	5,020	403,000	42,400	4,990	571,000
3	9,000	941	22,900	28,800	4,600	358,000	42,400	4,570	523,000
4	8,690	1,010	23,700	26,800	e4,400	318,000	46,200	4,870	607,000
5	8,630	815	19,000	25,100	4,100	278,000	51,800	5,850	818,000
6	8,660	1,090	25,500	25,000	e4,000	270,000	56,100	6,610	1,000,000
7	8,630	1,070	24,900	26,000	3,950	277,000	54,500	6,890	1,010,000
8	9,550	1,240	32,000	27,700	3,950	295,000	51,800	5,990	838,000
9	10,700	1,300	37,600	27,000	2,910	212,000	51,800	5,400	755,000
10	11,500	1,510	46,900	25,600	3,060	212,000	55,000	6,250	928,000
11	13,200	2,000	71,300	24,300	2,530	166,000	56,100	6,570	995,000
12	17,500	3,900	184,000	23,000	2,910	181,000	52,400	5,840	826,000
13	20,900	5,380	304,000	21,300	2,420	139,000	49,800	5,110	687,000
14	18,900	4,830	246,000	19,400	1,810	94,800	49,800	4,120	554,000
15	17,300	4,300	201,000	18,400	1,770	87,900	51,300	4,300	596,000
16	22,100	7,270	434,000	18,000	1,520	73,900	53,400	4,800	692,000
17	21,500	6,990	406,000	18,400	1,620	80,500	54,000	3,710	541,000
18	20,300	6,400	351,000	19,400	1,900	99,500	52,400	3,530	499,000
19	20,700	5,700	319,000	21,300	2,300	132,000	51,800	4,090	572,000
20	21,500	5,500	319,000	27,000	3,600	262,000	52,400	4,170	590,000
21	23,500	5,800	368,000	34,000	5,390	495,000	52,900	3,920	560,000
22	26,300	6,720	477,000	40,100	6,430	696,000	51,300	3,580	496,000
23	27,400	6,780	502,000	41,500	6,300	706,000	48,800	3,560	469,000
24	28,600	7,500	579,000	41,900	7,090	802,000	48,200	3,260	424,000
25	31,600	7,190	613,000	43,800	7,810	924,000	46,700	3,110	392,000
26	33,600	7,980	724,000	46,200	7,350	917,000	45,300	4,000	489,000
27	35,200	7,840	745,000	48,800	7,000	922,000	42,400	3,800	435,000
28	35,700	7,720	744,000	50,800	7,740	1,060,000	40,500	3,300	361,000
29	35,700	7,430	716,000	50,300	7,300	991,000	39,600	2,480	265,000
30	34,400	7,500	697,000	48,800	5,900	777,000	38,300	2,250	233,000
31	--	--	--	47,700	5,070	653,000	--	--	--
Total	800,810	--	9,289,000	978,500	--	13,560,000	1,474,700	--	18,420,000

Day	July			August			September		
1	36,500	2,180	215,000	9,640	1,190	31,000	4,950	339	4,530
2	34,800	1,940	182,000	9,450	971	24,800	4,790	989	12,800
3	32,800	e1,700	151,000	9,250	e650	16,200	4,760	847	10,900
4	30,400	e1,500	123,000	9,230	643	16,000	4,750	237	3,040
5	28,600	e1,300	100,000	8,930	840	20,300	4,690	166	2,100
6	27,000	e1,000	80,200	8,580	564	13,100	4,590	220	2,730
7	26,000	1,060	74,400	8,310	554	12,400	4,590	104	1,290
8	26,800	1,600	116,000	6,000	1,770	38,200	4,700	125	1,590
9	26,700	2,400	173,000	8,030	967	21,000	4,700	119	1,510
10	31,700	4,560	s419,000	8,250	787	17,100	4,700	500	6,340
11	32,400	7,200	630,000	8,210	774	17,200	4,280	4,810	55,600
12	27,400	15,700	1,160,000	8,210	804	17,800	4,190	2,400	27,200
13	25,300	19,000	1,300,000	8,210	621	13,800	4,160	2,860	32,100
14	25,300	8,900	608,000	7,670	2,070	42,900	3,980	704	7,570
15	24,500	7,300	483,000	7,380	2,360	47,000	3,890	431	4,530
16	24,000	4,830	313,000	6,970	975	18,300	4,060	690	7,560
17	23,000	4,600	286,000	6,830	697	12,900	4,330	544	6,360
18	21,600	2,870	187,000	6,870	1,000	18,500	4,410	1,040	12,400
19	22,700	3,570	219,000	6,790	758	13,900	4,550	981	12,100
20	21,300	6,660	383,000	6,580	496	8,810	4,590	965	12,000
21	19,300	5,840	304,000	6,470	404	7,060	5,650	1,100	16,800
22	18,000	2,360	115,000	6,170	399	6,650	8,580	6,000	139,000
23	16,800	2,560	116,000	5,970	250	4,030	9,360	3,440	86,900
24	16,600	2,280	102,000	5,960	245	3,940	9,940	12,400	333,000
25	15,300	2,160	89,200	5,960	602	9,690	9,590	10,900	282,000
26	14,200	2,230	85,500	5,900	1,740	27,700	8,490	8,600	197,000
27	13,200	2,780	99,100	5,510	998	14,800	8,210	6,720	149,000
28	12,200	3,030	99,800	5,350	2,650	38,300	8,080	7,350	180,000
29	11,400	2,240	68,900	5,190	783	11,000	7,800	7,700	162,000
30	10,700	1,580	45,200	4,970	267	3,580	7,610	6,350	130,000
31	10,000	1,880	50,800	4,910	559	7,410	--	--	--
Total	706,400	--	8,358,000	223,750	--	555,400	172,970	--	1,880,000

Total discharge for year (second-foot-days) 5,584,610
Total load for year (tons) 59,780,000

e Estimated or interpolated.
s Computed by subdividing day.

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER NEAR GRAND CANYON, ARIZ.--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	0.006	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
Oct. 4, 1949	8:00 a.m.	5,860	1,160	933	51	64	77	94	99	100	--	--		--		BWCM
Oct. 7	8:30 a.m.	7,110	4,400	1,520	49	65	84	96	97	99	100	--		--		BWCM
Oct. 11	8:45 a.m.	6,540	4,320	923	55	68	93	98	100	--	--	--		--		BWCM
Oct. 14	7:00 a.m.	6,490	2,040	1,560	60	74	90	97	99	100	--	--		--		BWCM
Oct. 19	7:15 a.m.	8,180	2,160	1,730	47	61	77	89	97	100	--	--		--		BWCM
Oct. 21	8:20 a.m.	12,800	11,800	1,830	42	52	65	78	90	98	100	--		--		BWCM
Oct. 25	7:10 a.m.	10,400	7,310	1,160	46	59	78	88	94	99	100	--		--		BWCM
Oct. 28	8:10 a.m.	10,000	8,770	954	51	70	79	93	97	99	99	--		--		BWCM
Nov. 1	7:45 a.m.	8,710	2,290	836	42	63	77	92	97	99	100	--		--		BWCM
Nov. 4	7:45 a.m.	8,580	1,870	1,480	58	68	84	94	97	100	--	--		--		BWCM
Nov. 8	7:35 a.m.	8,410	917	670	45	60	75	90	97	100	--	--		--		BWCM
Nov. 11	11:30 a.m.	8,580	706	530	47	54	73	85	93	99	100	--		--		BWCM
Nov. 15	7:45 a.m.	8,100	653	498	48	56	71	88	95	99	100	--		--		BWCM
Nov. 18	8:20 a.m.	8,310	588	481	40	42	68	84	94	98	--	--		--		BWCM
Nov. 22	8:30 a.m.	7,800	480	368	52	57	73	87	95	99	--	--		--		BWCM
Dec. 2	8:45 a.m.	7,580	415	1,680	29	43	54	71	--	97	--	--		--		DSWCM
Dec. 6	10:30 a.m.	6,970	416	1,390	34	45	58	72	--	98	--	--		--		DSWCM
Dec. 9	8:25 a.m.	6,960	354	1,380	31	40	53	70	--	96	--	--		--		DSWCM
Dec. 13	1:30 p.m	6,650	336	1,370	26	38	49	70	--	98	--	--		--		DSWCM
Dec. 16	8:30 a.m.	7,100	453	1,840	29	43	56	70	--	97	--	--		--		DSWCM
Dec. 20	8:20 a.m.	5,140	352	1,340	32	46	60	74	--	98	--	--		--		DSWCM
Dec. 23	8:45 a.m.	4,900	354	1,270	33	47	60	73	--	98	--	--		--		DSWCM
Dec. 27	1:30 p.m.	5,390	560	426	60	70	87	98	--	--	--	--		--		BWCM
Dec. 30	8:20 a.m.	4,830	248	990	37	53	68	82	--	--	--	--		--		DWCM
Jan. 3, 1950	8:30 a.m.	4,960	293	1,130	34	47	56	68	--	98	--	--		--		DSWCM
Jan. 6	8:20 a.m.	5,530	283	1,050	31	44	56	71	--	97	--	--		--		DSWCM
Jan. 10	8:30 a.m.	4,120	366	1,350	28	43	55	68	--	98	--	--		--		DSWCM
Jan. 13	8:30 a.m.	4,030	273	1,090	35	50	62	78	--	--	--	--		--		DWCM
Jan. 17	8:20 a.m.	5,830	429	1,660	26	37	50	71	--	97	--	--		--		DSWCM
Jan. 20	8:15 a.m.	6,050	363	1,280	26	38	53	71	--	97	--	--		--		DSWCM
Jan. 24	8:15 a.m.	6,800	453	1,750	24	34	45	64	--	96	--	--		--		DSWCM
Jan. 27	8:30 a.m.	7,780	718	2,870	23	36	47	65	--	96	--	--		--		DSWCM
Jan. 31	8:45 a.m.	7,240	520	1,800	28	44	58	76	--	--	--	--		--		DWCM

Feb. 3	7:30 a.m.	6,610	377	1,500	25	40	50	71	--	97	--	--	--	DSWCM
Feb. 10	8:30 a.m.	6,720	901	3,540	23	37	52	70	--	99	--	--	--	DSWCM
Feb. 14	8:30 a.m.	9,030	2,640	1,930	47	60	72	84	93	98	100	--	--	BWCM
Feb. 17	8:30 a.m.	7,860	2,240	1,630	47	69	83	92	96	99	100	--	--	BWCM
Feb. 21	8:20 a.m.	7,240	835	643	58	68	81	89	94	98	100	--	--	BWCM
Feb. 24	8:20 a.m.	7,970	806	3,120	32	44	56	72	--	97	--	--	--	DSWCM
Feb. 28	8:30 a.m.	8,170	1,250	907	49	59	70	79	90	99	100	--	--	BWCM
Mar. 7	8:30 a.m.	9,760	1,840	1,390	39	51	64	74	85	96	100	--	--	BWCM
Mar. 10	8:30 a.m.	16,000	4,040	2,840	18	25	33	41	60	81	98	100	--	BSWCM
Mar. 14	8:30 a.m.	14,900	4,010	3,150	26	33	44	54	68	85	97	100	--	BSWCM
Mar. 17	8:30 a.m.	12,600	2,540	1,990	38	46	57	66	76	85	96	99	100	BSWCM
Mar. 21	10:00 a.m.	9,430	1,630	1,250	43	56	70	79	85	92	98	--	--	BWCM
Mar. 24	8:25 a.m.	9,030	1,150	999	42	56	68	80	88	95	99	--	--	BWCM
Mar. 28	8:20 a.m.	9,050	971	784	40	50	64	76	85	93	98	--	--	BWCM
Mar. 31	8:45 a.m.	9,930	1,140	4,440	28	39	51	64	--	88	--	--	--	DSWCM
Apr. 4	8:30 a.m.	8,660	1,070	3,740	32	43	56	70	--	94	--	--	--	DSWCM
Apr. 7	7:40 a.m.	8,600	--	692	53	68	82	87	91	96	98	--	--	BWCM
Apr. 11	8:30 a.m.	11,800	1,590	6,130	22	33	56	57	--	87	--	--	--	DSWCM
Apr. 14	9:00 a.m.	19,300	4,590	3,450	20	27	35	42	54	73	87	100	--	BSWCM
Apr. 18	8:45 a.m.	20,300	6,370	4,700	35	44	58	67	76	84	95	--	--	BWCM
Apr. 21	8:40 a.m.	22,100	4,940	2,030	31	48	59	66	74	79	93	99	100	BSWCM
Apr. 25	8:40 a.m.	31,200	7,010	5,580	19	24	31	41	52	65	90	99	100	BSWCM
May 2	8:30 a.m.	29,700	4,440	3,610	17	22	30	38	46	65	90	98	100	BSWCM
May 9	8:50 a.m.	27,200	2,590	8,540	11	16	22	32	--	65	85	98	100	DSWCM
May 12	7:00 a.m.	23,000	2,580	10,300	11	17	23	31	--	60	79	97	99	DSWCM
May 16	7:00 a.m.	17,800	1,500	5,430	20	28	39	51	--	74	--	--	--	DSWCM
May 19	7:30 a.m.	20,200	2,230	3,900	17	24	30	36	--	61	81	97	100	DSWCM
May 23	8:45 a.m.	41,500	5,760	5,200	9	12	16	21	--	51	76	95	100	DSWCM
May 26	8:30 a.m.	45,800	6,900	22,500	7	10	14	20	--	44	57	84	99	DSWCM
June 2	8:30 a.m.	42,400	5,610	23,200	5	7	10	15	--	38	55	85	99	DSWCM
June 6	10:00 a.m.	56,100	8,050	5,910	5	9	11	13	19	37	55	85	100	BSWCM
June 9	8:30 a.m.	51,300	4,690	18,900	5	8	11	16	--	38	59	87	99	DSWCM

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER NEAR GRAND CANYON, ARIZ.--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 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	
June 13, 1950	8:15 a.m.	50,300	4,690	18,500	5	7	10	13	--	30	47	80		99		DSWCM
June 16	6:20 a.m.	53,400	4,940	20,800	3	5	7	10	--	33	51	81		99		DSWCM
June 20	8:30 a.m.	51,800	4,410	17,000	4	5	7	10	--	26	51	87		100		DSWCM
June 23	8:45 a.m.	49,800	3,800	14,100	4	6	8	11	--	17	41	73		99		DSWCM
June 27	9:45 a.m.	42,900	3,490	2,790	13	19	27	30	36	54	60	87		100		BSWCM
June 30	6:15 a.m.	38,700	2,200	8,670	7	11	14	20	--	45	67	90		100		DSWCM
July 11	8:30 a.m.	33,200	3,290	3,510	17	28	37	47	--	79	91	98		--		DSWCM
July 18	6:00 a.m.	21,600	2,970	2,790	24	39	50	61	--	87	--	--		--		DSWCM
July 20	8:20 a.m.	22,100	6,540	1,990	38	48	68	77	85	89	95	99		100		BSWCM
July 25	8:30 a.m.	15,300	2,040	2,310	34	48	61	72	--	89	--	--		--		DSWCM
July 28	9:00 a.m.	12,400	2,970	2,120	43	57	72	82	87	96	99	100		--		BSWCM
Aug. 1	8:30 a.m.	9,670	1,130	2,400	43	60	74	85	--	--	--	--		--		DWCM
Aug. 4	8:30 a.m.	9,260	631	1,380	33	47	62	78	--	--	--	--		--		DWCM
Aug. 8	7:20 a.m.	8,040	1,690	2,340	43	64	78	91	--	--	--	--		--		DWCM
Aug. 11	12:05 p.m.	8,180	769	1,180	39	58	77	79	--	--	--	--		--		DWCM
Aug. 15	8:30 a.m.	7,480	2,260	2,320	27	50	67	84	--	--	--	--		--		DWCM
Aug. 25	8:40 a.m.	6,010	431	1,690	25	66	83	92	--	--	--	--		--		DWCM
Aug. 29	8:35 a.m.	5,230	805	3,260	12	47	68	86	--	--	--	--		--		DWCM
Sept. 1	9:15 a.m.	4,970	385	1,480	33	58	77	89	--	--	--	--		--		DWCM
Sept. 5	8:40 a.m.	4,710	186	663	36	55	71	85	--	--	--	--		--		DWCM
Sept. 8	8:50 a.m.	4,540	213	774	39	43	57	78	--	--	--	--		--		DWCM
Sept. 12	8:55 a.m.	4,210	2,350	4,410	32	51	67	86	--	--	--	--		--		DWCM
Sept. 15	8:55 a.m.	3,910	456	1,770	35	47	62	79	--	--	--	--		--		DWCM
Sept. 19	9:15 a.m.	3,550	937	3,650	36	51	65	84	--	--	--	--		--		DWCM
Sept. 22	9:00 a.m.	8,420	5,530	938	52	59	84	92	97	99	100	--		--		BWCM
Sept. 26	8:40 a.m.	8,630	8,480	3,550	35	51	65	80	--	--	--	--		--		DWCM
Sept. 29	8:40 a.m.	7,840	8,110	3,520	35	50	64	79	--	--	--	--		--		DWCM

LAKE MEAD NEAR BOULDER CITY, NEV.

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

[The miles given below represent distances measured along the Colorado River downstream from the gaging station at Lees Ferry, Ariz. A resistance thermometer was used in measuring the temperature of the water]

Date of collection	Depth (feet)	Elevation (feet)	Temperature (°F)	Specific conductance (micromhos at 25°C)	Silica (SiO_2)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
AT LINE OF DEMARCATION BETWEEN TURBID AND CLEAR WATER															
Apr. 19, 1950	0	1,150	68.2	1,170	13	82	36	119		194	300	98	2.9	746	352
Apr. 19	3	1,147	68.2	1,050	15	76	31	107		197	258	81	5.9	671	317
EMERY FALLS, MILE 275.8															
Aug. 23, 1950	5	1,170	80.0	1,230		92	37	129		207	314	118		792	382
Aug. 23	12	1,163	79.3	1,240						204					
PIERCE FERRY BAY, MILE 279															
Nov. 2, 1949	5		70	1,060	12	87	29	105		a 166	293	86	2.9	697	336
Dec. 1	5		65	953	--	--	--	--		160	--	--	--	--	--
Dec. 31	5		56	904	--	--	--	--		154	--	--	--	--	--
Feb. 2, 1950	5		50	990	--	--	--	--		168	--	--	--	--	--
Mar. 1	5		56	969	12	84	29	80		b 164	262	66	1.7	616	328
Apr. 2	5		60	1,080	11	84	33	101		180	282	85	2.9	688	345
Apr. 27	5		62	845	32	56	27	89		c 179	209	56	2.6	560	250
June 1	5		62	515	--	--	--	--		d 149	--	--	--	--	--
July 1	5		78	448	10	36	15	35		e 112	96	26	.1	273	152
Aug. 2	5		84	893	23	81	28	70		169	240	56	2.4	584	317
Sept. 1	5		84	952	--	70	30	92		134	265	80	--	603	298
GRAND WASH, MILE 284.7															
Apr. 18, 1950	5	1,145	70.0	1,100	13	82	33	107		184	286	86	2.4	700	340
Apr. 18	50	1,100	62.0	1,190	--	--	--	--		201	--	--	--	--	--
Apr. 18	100	1,050	60.8	1,190	--	--	--	--		201	--	--	--	--	--
Apr. 18	145	1,005	58.5	1,130	--	--	--	--		212	--	--	--	--	--

a Includes equivalent of 22 parts per million of carbonate (CO_3).
b Includes equivalent of 7.9 parts per million of carbonate (CO_3).
c Includes equivalent of 15 parts per million of carbonate (CO_3).
d Includes equivalent of 20 parts per million of carbonate (CO_3).
e Includes equivalent of 16 parts per million of carbonate (CO_3).

COLORADO RIVER MAIN STEM--Continued

LAKE MEAD NEAR BOULDER CITY, NEV.--Continued

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

/The miles given below represent distances measured along the Colorado River downstream from the gaging station at Lees Ferry, Ariz. A resistance thermometer was used in measuring the temperature of the water/

Date of collection	Depth (feet)	Elevation (feet)	Temperature (°F)	Specific conductance (micromhos at 25°C)	Silica (SiO_2)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
GRAND WASH, MILE 284.7--Continued															
Aug. 22, 1950	5	1,170	86.3	775	11	68	23	74		137	228	53	--	524	264
Aug. 22	50	1,125	83.8	875	13	77	25	79		160	241	59	1.1	574	295
Aug. 22	100	1,075	69.4	852	--	--	--	--		159	--	--	--	--	--
Aug. 22	155	1,020	63.0	1,010	--	--	--	--		190	--	--	--	--	--
Aug. 22	158	1,017	61.8	1,020	--	--	--	--		207	--	--	--	--	--
ICEBERG CANYON, MILE 287.5															
Apr. 18, 1950	5	1,145	68.0	1,070	13	81	32	111		200	280	84	2.0	702	334
Apr. 18	50	1,100	61.0	1,180	--	--	--	--		181	--	--	--	--	--
Apr. 18	100	1,050	60.4	1,200	14	82	40	120		201	305	104	2.7	767	369
Apr. 18	150	1,000	56.2	1,130	--	--	--	--		190	--	--	--	--	--
Apr. 18	170	980	56.0	1,130	--	--	--	--		190	--	--	--	--	--
Apr. 18	173	977	57.6	1,500	--	--	--	--		463	--	--	--	--	--
Aug. 23	5	1,170	86.0	750	10	65	21	64		130	207	46	.1	477	248
Aug. 23	50	1,125	80.0	1,030	--	--	--	--		189	--	--	--	--	--
Aug. 23	100	1,075	68.7	830	--	--	--	--		158	--	--	--	--	--
Aug. 23	150	1,025	61.3	983	--	--	--	--		178	--	--	--	--	--
Aug. 23	192	983	58.5	1,050	13	88	30	107		199	283	82	2.4	703	343
Aug. 23	194	981	56.9	1,130	--	--	--	--		346	--	--	--	--	--
SANDY POINT, MILE 293.5															
Apr. 18, 1950	5	1,145	68.2	1,020	13	78	33	91		172	269	73	2.1	646	330
Apr. 18	50	1,100	61.3	1,140	--	--	--	--		192	--	--	--	--	--
Apr. 18	100	1,050	59.5	1,170	13	83	36	118		195	299	98	2.8	746	355
Apr. 18	150	1,000	56.3	1,090	--	--	--	--		185	--	--	--	--	--
Apr. 18	200	950	55.8	1,120	--	--	--	--		189	--	--	--	--	--
Apr. 18	232	918	55.0	1,130	--	--	--	--		191	--	--	--	--	--
Apr. 18	235	915	55.0	1,180	--	--	--	--		215	--	--	--	--	--
Aug. 22	5	1,170	84.2	722	--	--	--	--		f133	--	--	--	--	--
Aug. 22	50	1,125	78.4	1,010	11	86	30	89		175	272	73	2.1	649	338
Aug. 22	100	1,075	69.0	667	--	--	--	--		146	--	--	--	--	--
Aug. 22	150	1,025	61.5	964	--	--	--	--		170	--	--	--	--	--

f Includes equivalent of 6.9 parts per million of carbonate (CO_3).

Aug. 22	200	975	59.1	1,070	10	86	31	107	188	288	84	2.3	701	342
Aug. 22	250	925	57.1	1,080	--	--	--	--	188	--	--	--	--	--
Aug. 22	255	920	58.6	1,290	26	122	45	105	414	254	76	9.7	842	490
VIRGIN CANYON, MILE 305.5														
Apr. 19, 1950	5	1,145	66.8	928	11	86	26	76	164	250	64	1.4	595	322
Apr. 19	50	1,100	60.8	960	--	--	--	--	167	--	--	--	--	--
Apr. 19	100	1,050	57.4	984	--	--	--	--	c 170	--	--	--	--	--
Apr. 19	150	1,000	55.9	1,050	11	64	31	95	183	267	81	2.3	661	337
Apr. 19	200	950	54.7	1,120	--	--	--	--	188	--	--	--	--	--
Apr. 19	250	900	53.8	1,120	--	--	--	--	187	--	--	--	--	--
Apr. 19	300	850	53.2	1,110	14	88	31	167	189	286	89	2.5	711	347
Apr. 19	306	844	52.8	1,140	--	--	--	--	412	--	--	--	--	--
Aug. 22	5	1,170	80.4	719	9.0	66	21	56	g 142	189	43	--	454	251
Aug. 22	50	1,125	77.3	795	--	--	--	--	153	--	--	--	--	--
Aug. 22	100	1,075	67.7	681	10	58	21	57	150	163	43	1.7	428	231
Aug. 22	150	1,025	62.4	904	--	--	--	--	164	--	--	--	--	--
Aug. 22	200	975	58.5	989	11	82	29	89	170	262	75	--	632	324
Aug. 22	250	925	56.4	1,060	--	--	--	--	184	--	--	--	--	--
Aug. 22	300	875	55.4	1,050	--	--	--	--	182	--	--	--	--	--
Aug. 22	330	845	54.2	1,060	--	--	--	--	194	--	--	--	--	--
Aug. 22	331	844	53.5	1,280	--	--	--	--	390	--	--	--	--	--
OVERTON ARM OF LAKE AT LINE OF DEMARCATION BETWEEN TURBID AND CLEAR WATER														
Apr. 20, 1950	0	1,150	72	1,800	19	146	58	170	160	535	200	2.7	1,210	603
Apr. 20	3	1,147	72	1,890	--	--	--	--	173	--	--	--	--	--
Aug. 24	2	1,177	86.1	928	12	84	28	80	138	280	66	1.0	619	324
OVERTON ARM OF LAKE OPPOSITE SALT MINE, 15 MILES ABOVE MOUTH OF VIRGIN RIVER														
Apr. 20, 1950	0	1,150	71.6	962	14	84	28	78	154	261	68	1.5	610	324
Aug. 24	0	1,179	83.2	843	20	70	25	74	142	230	58	--	547	278

c Includes equivalent of 15 parts per million of carbonate (CO_3).
g Includes equivalent of 4.9 parts per million of carbonate (CO_3).

COLORADO RIVER MAIN STEM--Continued

LAKE MEAD NEAR BOULDER CITY, NEV.--Continued

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

[The miles given below represent distances measured along the Colorado River downstream from the gaging station at Lees Ferry, Ariz. A resistance thermometer was used in measuring the temperature of the water]

Date of collection	Depth (feet)	Elevation (feet)	Temperature (°F)	Specific conductance (micromhos at 25°C)	Silica (SiO_2)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
OVERTON ARM OF LAKE, 9.3 MILES ABOVE MOUTH OF VIRGIN RIVER (LOWER VIRGIN NARROWS)															
Apr. 20, 1950	5	1,145	62.3	925	13	82	28	75		155	254	64	1.8	594	320
Apr. 20	50	1,100	58.2	914	--	--	--	--		154	--	--	--	--	--
Apr. 20	100	1,050	56.1	917	--	--	--	--		159	--	--	--	--	--
Apr. 20	150	1,000	54.8	936	--	--	--	--		163	--	--	--	--	--
Apr. 20	200	950	53.7	981	--	--	--	--		168	--	--	--	--	--
Apr. 20	252	898	53.2	1,030	--	--	--	--		172	--	--	--	--	--
Apr. 20	254	896	54.0	1,090	--	--	--	--		219	--	--	--	--	--
Aug. 24	5	1,170	82.4	617	28	52	19	54		129	157	39	.7	413	208
Aug. 24	50	1,125	80.0	755	--	--	--	--		146	--	--	--	--	--
Aug. 24	100	1,075	69.7	822	19	74	24	76		163	224	57	1.4	556	283
Aug. 24	150	1,025	61.0	932	--	--	--	--		163	--	--	--	--	--
Aug. 24	200	975	57.5	907	--	--	--	--		170	--	--	--	--	--
Aug. 24	250	925	56.0	980	--	83	29	92		h177	265	74	2.0	675	326
Aug. 24	275	900	54.7	1,020	--	--	--	--		179	--	--	--	--	--
BOULDER CANYON, MILE 334															
Apr. 17, 1950	5	1,145	63.8	912	12	82	25	76		157	248	61	1.5	583	308
Apr. 17	50	1,100	59.2	912	--	--	--	--		159	--	--	--	--	--
Apr. 17	100	1,050	56.4	920	--	--	--	--		159	--	--	--	--	--
Apr. 17	150	1,000	54.4	942	--	--	--	--		161	--	--	--	--	--
Apr. 17	200	950	53.2	997	13	85	27	91		170	264	74	2.0	640	323
Apr. 17	250	900	53.0	1,030	--	--	--	--		173	--	--	--	--	--
Apr. 17	300	850	53.0	1,040	--	--	--	--		182	--	--	--	--	--
Apr. 17	350	800	52.8	1,040	14	88	31	92		187	265	82	2.3	666	347
Apr. 17	388	762	52.8	1,050	--	--	--	--		176	--	--	--	--	--
Apr. 17	392	758	55.0	1,380	--	--	--	--		511	--	--	--	--	--
Aug. 21	5	1,170	86.8	628	11	50	18	54		129	152	38	.3	387	199
Aug. 21	50	1,125	78	775	--	--	--	--		143	--	--	--	--	--
Aug. 21	100	1,075	68.2	812	11	72	23	72		158	210	57	1.6	524	274
Aug. 21	150	1,025	60.9	920	--	--	--	--		160	--	--	--	--	--
Aug. 21	200	975	56.5	948	11	84	27	85		164	263	67	1.8	620	320
Aug. 21	250	925	55.4	983	--	--	--	--		169	--	--	--	--	--
Aug. 21	300	875	54.4	986	--	--	--	--		171	--	--	--	--	--

h Includes equivalent of 11 parts per million of carbonate (CO_3).

Aug. 21	350	825	54.0	1,000	--	--	--	--	170	--	--	--	--	--
Aug. 21	400	775	53.8	1,010	11	86	28	95	175	270	77	2.2	655	330
Aug. 21	415	760	54.2	997	--	--	--	--	176	--	--	--	--	--
Aug. 21	416	759	53.2	1,330	--	--	--	---	459	--	--	--	--	--
						NEAR INTAKE TOWERS, MILE 354.7								
Nov. 1, 1949	5	1,176	69.7	766	11	68	24	--	i140	209	--	1.5	--	268
Nov. 1	50	1,131	--	708	--	--	--	--	140	--	--	--	--	--
Nov. 1	100	1,081	--	739	--	--	--	--	139	--	--	--	--	--
Nov. 1	150	1,031	--	848	--	--	--	--	151	--	--	--	--	--
Nov. 1	200	981	--	855	10	80	26	70	149	241	60	2.0	562	306
Nov. 1	250	931	--	952	--	--	--	--	159	--	--	--	--	--
Nov. 1	300	881	--	946	--	--	--	--	160	--	--	--	--	--
Nov. 1	350	831	--	919	10	87	28	82	162	265	71	2.2	625	332
Nov. 1	400	781	--	966	--	--	--	--	167	--	--	--	--	--
Nov. 1	450	731	--	958	--	--	--	--	162	--	--	--	--	--
Nov. 1	453	728	--	1,010	15	92	31	85	218	247	74	2.8	654	357
Nov. 30	5	1,172	64.8	777	9.8	70	24	61	142	208	51	1.5	495	273
Nov. 30	50	1,127	65.3	772	--	--	--	--	146	--	--	--	--	--
Nov. 30	100	1,077	65.2	774	--	--	--	--	142	--	--	--	--	--
Nov. 30	150	1,027	62.0	882	--	--	--	--	155	--	--	--	--	--
Nov. 30	200	977	53.2	950	9.6	87	28	80	158	264	71	2.3	620	332
Nov. 30	250	927	51.4	948	--	--	--	--	160	--	--	--	--	--
Nov. 30	300	877	50.6	964	--	--	--	--	160	--	--	--	--	--
Nov. 30	350	827	50.4	967	--	--	--	--	164	--	--	--	--	--
Nov. 30	400	777	50.1	979	--	--	--	--	172	--	--	--	--	--
Nov. 30	448	729	50.2	945	--	--	--	--	204	--	--	--	--	--
Nov. 30	449	728	50.2	1,060	21	107	32	93	330	209	76	8.2	709	398
Dec. 29	5	1,166	57.7	827	10	74	25	70	150	226	56	1.8	537	288
Dec. 29	50	1,121	58.2	821	--	--	--	--	150	--	--	--	--	--
Dec. 29	100	1,071	58.0	821	--	--	--	--	154	--	--	--	--	--
Dec. 29	150	1,021	58.2	830	--	--	--	--	148	--	--	--	--	--
Dec. 29	200	971	54.2	962	10	89	24	91	162	272	72	1.3	639	320

i Includes equivalent of 8.9 parts per million of carbonate (CO_3).

COLORADO RIVER MAIN STEM--Continued

LAKE MEAD NEAR BOULDER CITY, NEV.--Continued

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

/The miles given below represent distances measured along the Colorado River downstream from the gaging station at Lees Ferry, Ariz. A resistance thermometer was used in measuring the temperature of the water/

Date of collection	Depth (feet)	Elevation (feet)	Temperature (°F)	Specific conductance (micromhos at 25°C)	Silica (SiO_2)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
NEAR INTAKE TOWERS, MILE 354.7--Continued															
Dec. 29, 1949	250	921	51.4	950	--	--	--	--		162	--	--	--	--	--
Dec. 29	300	871	50.3	959	--	--	--	--		164	--	--	--	--	--
Dec. 29	350	821	49.8	968	--	--	--	--		166	--	--	--	--	--
Dec. 29	400	771	49.7	991	--	--	--	--		182	--	--	--	--	--
Dec. 29	441	730	49.7	988	--	--	--	--		175	--	--	--	--	--
Dec. 29	444	727	49.7	1,100	16	105	34	97		331	221	76	4.7	717	402
Jan. 27, 1950	5	1,159	53.0	863	11	79	25	70		152	233	60	2.1	555	300
Jan. 27	50	1,114	53.6	855	--	--	--	--		152	--	--	--	--	--
Jan. 27	100	1,064	53.6	855	--	--	--	--		156	--	--	--	--	--
Jan. 27	150	1,014	53.5	855	--	--	--	--		152	--	--	--	--	--
Jan. 27	200	964	53.3	866	--	--	--	--		152	--	--	--	--	--
Jan. 27	250	914	50.9	974	11	90	30	--		162	266	--	2.5	--	348
Jan. 27	300	864	50.0	990	--	--	--	--		164	--	--	--	--	--
Jan. 27	350	814	50.0	993	--	--	--	--		166	--	--	--	--	--
Jan. 27	400	764	49.7	1,000	--	--	--	--		172	--	--	--	--	--
Jan. 27	435	729	49.6	1,010	--	--	--	--		180	--	--	--	--	--
Jan. 27	436	728	49.6	1,000	12	92	29	--		176	270	--	1.5	--	348
Feb. 28	5	1,152	53.4	870	11	78	26	69		152	236	57	1.7	554	302
Feb. 28	50	1,107	54.1	866	11	80	25	69		150	236	58	1.7	555	302
Feb. 28	100	1,057	52.8	869	--	--	--	--		150	--	--	--	--	--
Feb. 28	150	1,007	52.8	878	10	83	27	65		150	240	60	1.5	560	318
Feb. 28	200	957	52.7	929	11	85	28	72		158	252	64	2.1	592	327
Feb. 28	250	907	51.4	1,000	11	92	26	86		164	275	72	2.2	645	336
Feb. 28	300	857	50.9	994	--	--	--	--		162	--	--	--	--	--
Feb. 28	350	807	50.2	994	11	93	31	74		162	271	73	2.2	635	360
Feb. 28	400	757	50.0	994	11	92	31	73		166	265	73	1.9	629	357
Feb. 28	423	734	50.3	1,000	14	93	31	72		170	262	72	2.3	630	360
Feb. 28	424	733	50.3	1,030	14	95	30	86		206	263	74	1.0	664	360
Mar. 30	5	1,147	57.4	884	10	82	25	68		152	238	58	1.6	558	308
Mar. 30	50	1,102	56.3	882	--	--	--	--		150	--	--	--	--	--
Mar. 30	100	1,052	54.9	882	--	--	--	--		150	--	--	--	--	--
Mar. 30	150	1,002	53.1	906	--	--	--	--		156	--	--	--	--	--
Mar. 30	200	952	52.4	981	11	90	29	72		163	267	62	2.3	614	344
Mar. 30	250	902	52.0	1,010	--	--	--	--		163	--	--	--	--	--

Mar. 30	300	852	51.8	1,010	11	--	--	--	170	266	68	2.2	--	350
Mar. 30	350	802	51.2	987	--	--	--	--	168	--	--	--	--	--
Mar. 30	400	752	51.2	997	--	--	--	--	164	--	--	--	--	--
Mar. 30	419	733	50.9	997	--	--	--	--	168	--	--	--	--	--
Mar. 30	419.5	733	50.9	1,110	17	94	36	99	270	253	78	4.4	714	382
Apr. 26	5	1,146	63.2	898	27	79	26	76	162	242	60	1.5	591	304
Apr. 26	50	1,101	59.6	886	--	--	--	--	157	--	--	--	--	--
Apr. 26	100	1,051	55.5	891	--	--	--	--	154	--	--	--	--	--
Apr. 26	150	1,001	54.5	899	--	--	--	--	j145	--	--	--	--	--
Apr. 26	200	951	54.2	920	--	--	--	--	162	--	--	--	--	--
Apr. 26	250	901	53.0	984	--	--	--	--	166	--	--	--	--	--
Apr. 26	300	851	52.3	1,020	12	88	28	95	173	276	77	2.3	664	334
Apr. 26	350	801	52.0	1,030	--	--	--	--	173	--	--	--	--	--
Apr. 26	400	751	52.0	1,030	--	--	--	--	173	--	--	--	--	--
Apr. 26	418	733	52.0	1,020	--	--	--	--	174	--	--	--	--	--
Apr. 26	419	732	52.6	1,140	13	106	34	98	355	207	76	5.7	715	404
May 26	5	1,150	67.5	910	10	80	24	79	155	247	60	1.4	578	298
May 26	50	1,105	67.1	896	--	--	--	--	155	--	--	--	--	--
May 26	100	1,055	58.3	888	--	--	--	--	152	--	--	--	--	--
May 26	150	1,005	55.2	907	--	--	--	--	154	--	--	--	--	--
May 26	200	955	54.1	959	--	--	--	--	161	--	--	--	--	--
May 26	250	905	52.8	993	--	--	--	--	167	--	--	--	--	--
May 26	300	855	52.3	1,020	11	84	28	95	170	273	75	2.5	652	324
May 26	350	805	52.3	1,020	--	--	--	--	171	--	--	--	--	--
May 26	400	755	51.8	1,040	--	--	--	--	171	--	--	--	--	--
May 26	422	733	52.0	1,030	--	--	--	--	174	--	--	--	--	--
May 26	423	732	52.4	1,100	--	--	--	--	280	--	--	--	--	--
June 29	5	1,168	79.4	924	11	78	27	81	150	256	64	1.6	592	306
June 29	50	1,123	71.0	915	--	--	--	--	148	--	--	--	--	--
June 29	100	1,073	64.1	906	--	--	--	--	154	--	--	--	--	--
June 29	150	1,023	60.3	909	--	--	--	--	154	--	--	--	--	--
June 29	200	973	56.7	920	11	80	27	78	157	251	63	1.8	589	310
June 29	250	923	54.7	985	--	--	--	--	162	--	--	--	--	--

j Includes equivalent of 5.9 parts per million of carbonate (CO_3).

COLORADO RIVER MAIN STEM--Continued

LAKE MEAD NEAR BOULDER CITY, NEV.--Continued

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

[1/] The miles given below represent distances measured along the Colorado River downstream from the gaging station at Lees Ferry, Aris. A resistance thermometer was used in measuring the temperature of the water

Date of collection	Depth (feet)	Elevation (feet)	Temperature (°F)	Specific conductance (micromhos at 25°C)	Silica (SiO_2)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids	Total hardness as $CaCO_3$
NEAR INTAKE TOWERS, MILE 354.7--Continued															
June 29, 1950	300	873	53.6	1,010	--	--	--	--		166	--	--	--	--	--
June 29	350	823	53.6	1,020	--	--	--	--		174	--	--	--	--	--
June 29	400	773	53.5	1,020	12	86	31	89		172	272	77	3.5	655	342
June 29	440	733	53.5	1,020	--	--	--	--		170	--	--	--	--	--
June 29	441	732	53.5	1,040	--	--	--	--		198	--	--	--	--	--
July 28	5	1,172	81.6	860	12	71	24	82		145	238	61	.9	560	276
July 28	50	1,127	74.4	872	--	--	--	--		151	--	--	--	--	--
July 28	100	1,077	68.5	898	--	--	--	--		154	--	--	--	--	--
July 28	150	1,027	61.0	900	--	--	--	--		156	--	--	--	--	--
July 28	200	977	56.4	950	--	--	--	--		163	--	--	--	--	--
July 28	250	927	55.8	970	--	--	--	--		167	--	--	--	--	--
July 28	300	877	54.7	991	--	--	--	--		168	--	--	--	--	--
July 28	350	827	53.8	920	11	78	26	81		154	249	65	1.8	588	302
July 28	400	777	53.6	1,020	--	--	--	--		175	--	--	--	--	--
July 28	443	734	53.6	1,010	--	--	--	--		171	--	--	--	--	--
July 28	444	733	53.7	1,200	21	114	38	107		484	153	81	4.0	756	440
Aug. 30	5	1,169	81.7	833	11	68	25	72		141	224	57	.7	527	272
Aug. 30	50	1,124	79.6	834	--	--	--	--		141	--	--	--	--	--
Aug. 30	100	1,074	66.8	876	--	--	--	--		154	--	--	--	--	--
Aug. 30	150	1,024	58.3	913	--	--	--	--		156	--	--	--	--	--
Aug. 30	200	974	54.1	918	21	82	26	80		160	251	64	1.8	605	312
Aug. 30	250	924	52.3	985	--	--	--	--		167	--	--	--	--	--
Aug. 30	300	874	52.0	1,010	--	--	--	--		171	--	--	--	--	--
Aug. 30	350	824	51.8	1,010	--	--	--	--		172	--	--	--	--	--
Aug. 30	400	774	51.5	1,010	20	86	28	95		176	271	77	2.2	666	330
Aug. 30	438	736	51.4	1,010	--	--	--	--		174	--	--	--	--	--
Aug. 30	441	733	--	970	11	84	29	83		170	257	71	2.8	622	328
Sept. 28	5	1,164	76.1	821	9.6	68	24	--		119	226	57	.9	--	268
Sept. 28	50	1,119	76.0	819	11	67	24	75		138	226	57	.9	529	266
Sept. 28	100	1,069	68.4	864	--	--	--	--		150	--	--	--	--	--
Sept. 28	150	1,019	60.2	887	9.3	79	24	81		151	249	62	1.5	580	296
Sept. 28	200	969	56.0	908	--	--	--	--		159	--	--	--	--	--
Sept. 28	250	919	53.4	878	--	--	--	--		159	--	--	--	--	--

Sept. 28.....	300	869	52.3	952	--	--	--	--	166	--	--	--	--	--
Sept. 28.....	350	819	51.8	886	9.2	82	26	84	158	256	69	1.9	606	312
Sept. 28.....	400	769	51.5	977	--	--	--	--	172	--	--	--	--	--
Sept. 28.....	436	733	51.4	938	11	82	26	90	168	259	70	1.9	623	312
Sept. 28.....	437.5	732	51.4	1,100	--	--	--	--	343	--	--	--	--	--

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER BELOW HOOVER DAM, ARIZ.-NEV.

LOCATION.--At Hoover Dam, about 1 mile upstream from gaging station.
DRAINAGE AREA.--167,800 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1939 to September 1944. Specific conductance: October 1939 to September 1950.
Water temperatures: October 1941 to September 1950.
EXTREMES, 1949-50.--Specific conductance: Maximum, 1,030 micromhos Apr. 13; minimum, 824 micromhos Nov. 14.
Water temperatures: Maximum, 66°F on several days in October and November; minimum, 52°F on many days during winter and spring months.
EXTREMES, 1939-50.--Dissolved solids: Maximum, 824 ppm Mar. 1-10, 1941; minimum, 553 ppm Oct. 11-14, 17-20, 1949.
Hardness: Maximum, 426 ppm Jan. 21-31, 1941; minimum, 284 ppm Oct. 11-14, 17-20, 1949.
Water temperatures: (1941-50): Maximum, 69°F Sept. 27, 1945 and on several days in 1947 and 1948; minimum, 50°F March 23, 28, 30, 1949.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1179.

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

Date of collection	Mean discharge (second-feet)	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)	Boron (B) a	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 11-14, 17-20, 1949	21,190	7.4	877	11	0.01	76	23	76		152	232	58	0.4	1.4		553	0.75	31,600	284	160	37
Dec. 12-16, 19-20	21,810	7.8	984	13	.03	88	25	90		168	268	70	.2	2.2		639	.87	37,600	322	185	38
Dec. 21-23, 27-30	21,610	7.6	980	12	.03	91	25	85		161	272	69	.2	2.2		636	.86	37,100	330	198	36
Jan. 3-6, 9-10, 1950	22,750	7.6	956	12	.02	86	27	81		157	263	68	.3	1.8		616	.84	37,800	326	197	35
Jan. 11-13, 16-20	21,940	7.7	947	13	.03	85	26	81		160	256	67	.3	2.1		609	.83	36,100	319	188	35
Jan. 23-27, 31	23,580	7.7	938	11	.02	86	28	73		158	254	66	.3	1.5		598	.81	38,100	330	200	33
Feb. 1-3, 6-10	22,350	7.8	941	12	.05	90	27	69		160	251	64	--	2.2		594	.81	35,800	336	204	31
Mar. 13-17, 20	22,920	7.8	977	12	.05	93	29	70		166	262	65	.4	2.6		616	.84	38,100	351	215	30
Mar. 22-24, 27-31	19,630	7.5	970	12	.04	84	27	88		164	265	70	.3	1.7		629	.86	33,300	320	186	37
Apr. 3-7, 10	20,220	7.6	970	12	.04	84	29	64		160	268	70	.2	1.7		626	.85	34,300	328	198	36
July 11-14, 17-20	17,990	7.7	905	13	.01	82	24	77		157	247	58	.3	2.2		581	.79	28,200	303	174	36

a Less than 0.1 part per million by turmeric method.

COLORADO RIVER MAIN STEM--Continued

COLORADO RIVER BELOW HOOVER DAM, ARIZ.-NEV.--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	62	--	52	52	--	53	54	--	62	55
2	--	66	64	--	52	52	--	53	54	--	62	--
3	65	66	--	52	52	52	52	52	--	56	63	--
4	--	66	--	52	--	--	52	52	--	--	62	--
5	64	--	64	52	--	--	52	52	54	55	--	55
6	64	--	62	52	52	53	52	--	54	55	--	55
7	64	66	62	--	52	53	52	--	54	55	62	55
8	--	64	62	--	52	52	--	53	53	--	63	55
9	--	64	62	52	52	52	--	54	53	--	63	--
10	65	65	--	52	52	52	52	54	--	55	62	--
11	65	--	--	52	--	--	53	54	--	62	62	55
12	65	--	52	52	--	--	53	54	54	62	--	56
13	65	--	52	52	52	52	53	--	54	62	--	56
14	65	64	52	--	52	52	52	--	55	53	63	56
15	--	65	52	--	52	52	--	54	55	--	62	55
16	65	65	53	52	52	52	--	53	55	--	62	--
17	65	64	--	52	52	52	52	54	--	62	62	--
18	64	64	--	52	--	--	53	54	--	61	63	55
19	64	--	52	52	--	--	53	54	54	62	--	55
20	65	--	52	52	53	52	53	--	55	62	--	55
21	66	63	52	--	54	--	53	--	54	62	63	55
22	--	64	52	--	--	52	--	54	54	--	63	55
23	--	64	52	52	53	52	--	53	55	--	56	--
24	66	--	--	52	53	52	53	54	--	63	54	--
25	66	63	--	52	--	--	52	53	--	63	55	56
26	64	--	--	52	--	--	53	54	55	--	--	56
27	66	--	52	52	52	54	53	--	55	63	--	56
28	66	62	52	--	54	53	54	--	55	63	55	55
29	--	62	52	--	--	52	--	54	55	63	55	55
30	--	64	52	--	--	52	--	--	56	--	55	--
31	66	--	--	52	--	53	--	54	--	63	55	--
Average	--	--	--	--	--	--	--	--	--	--	--	--

COLORADO RIVER MAIN STEM--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN COLORADO 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.)	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)	Boron (B)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Noncarbonate	Percent sodium
COLORADO RIVER NEAR DOTSERO, COLO.																						
Oct. 18, 1949	840			541			58	17	16		138	97	25				281	0.38	637	214	102	14
May 28, 1950	4,430			249	9.4		29	6.9	11		97	32	7.5		0.6		144	.20	1,720	101	21	19
COLORADO RIVER AT YUMA, ARIZ.																						
Oct. 7, 1949	9,840			973	--		--	--	--		168	262	78		1.8		--	--	--	--	--	--
Nov. 7	10,400			905	--		--	--	--		160	243	69		1.5		--	--	--	--	--	--
Dec. 5	11,000			923	14		80	26	78		162	239	67		1.3		585	0.80	17,400	306	174	36
Feb. 8-10, 1950	13,000			1,010	13		88	28	89		166	270	78		1.8		650	.88	22,800	334	198	37
Mar. 8	10,300			993	16		88	29	86		166	268	77		1.2		647	.88	18,000	338	202	35
Apr. 14	2,290			1,090	10		92	30	97		174	284	89		1.0		689	.94	4,260	353	210	37
May 8	7,930			1,050	13		--	--	--		168	281	83		1.2		--	--	--	--	--	--
June 12	4,070			1,050	13		--	--	--		172	278	86		.9		--	--	--	--	--	--
Aug. 7	854			1,200	20		--	--	--		170	303	121		.5		--	--	--	--	--	--
Sept. 7	1,260			1,010	12		83	28	105		158	278	93		.5		677	.92	2,340	322	192	42

YUMA MAIN CANAL BELOW COLORADO RIVER SIPHON AT YUMA, ARIZ.

LOCATION.--At gaging station on Yuma Main Canal below Colorado River siphon, at Yuma, on Arizona side of river, 3 miles downstream from siphon-drop power plant. Samples collected from Oct. 1, 1942 to Jan. 31, 1943, at gaging station on Colorado River, 1,800 feet downstream from highway bridge at Yuma, 5 miles downstream from Gila River, 19 miles downstream from Imperial Dam, and 7 and 29 miles upstream from international boundaries of California and Arizona, respectively, with Mexico.
DRAINAGE AREA.--242,900 square miles, including all closed basins entirely within drainage boundary.
RECORDS AVAILABLE.--Chemical analyses: September 1926 to September 1928, October 1942 to September 1950.
EXTREMES, 1949-50.--Dissolved solids: Maximum, 669 ppm May 11-12, 15-19; minimum, 562 ppm Dec.12-16, 19-20.
Hardness: Maximum, 338 ppm Oct. 3-7, 10, July 3, 5-7, 10; minimum, 276 ppm Dec. 12-16, 19-20.
EXTREMES, 1926-28, 1942-50.--Dissolved solids: Maximum, 1,300 ppm Jan. 11-20, 1927; minimum, 285 ppm June 11-20, 1928.
Hardness: Maximum, 567 ppm Oct. 21-31, 1926; minimum, 163 ppm June 11-20, 1928.
REMARKS.--Records of specific conductance of daily samples available in regional office at Salt Lake City, Utah. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1179.

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

Date of collection	Mean discharge (second-feet)	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)	Boron (B) a	Dissolved solids			Hardness as $CaCO_3$		Percent sodium
																Parts per million	Tons per acre-foot	Tons per day	Total	Noncarbonate	
Oct. 3-7, 10, 1949.	682	7.7	938	13	0.07	88	29	75	6.2	160	265	71	0.3	1.3		628	0.85	1,160	338	208	32
Oct. 11-14, 17-20..	671	7.7	952	12	.10	84	28	73	4.4	156	251	68	.3	1.3		600	.82	1,090	324	195	33
Oct. 21, 24-28, 31.	652	7.8	937	13	.03	83	28	77	3.0	160	254	68	.3	1.4		607	.83	1,070	322	191	34
Nov. 1-5, 8-10	628	7.7	920	12	.07	84	26	74	2.8	156	246	66	.3	1.4		590	.80	1,000	316	187	33
Nov. 11, 15-18	539	7.7	888	12	.08	78	26	77	3.0	156	243	64	.3	1.3		581	.79	846	302	174	35
Nov. 21-23, 25, 28-30.....	523	7.7	887	12	.08	80	27	73	3.2	155	243	64	.3	1.2		580	.79	819	310	184	33
Dec. 1-2, 5-9	470	7.5	904	14	.06	76	24	79	2.8	158	233	64	.3	1.4		572	.78	726	288	158	37
Dec. 12-16, 19-20 .	361	7.7	880	12	.06	73	23	78	2.2	154	236	60	.3	1.4		562	.76	548	276	150	38
Dec. 21-23, 26-27, 29-30.....	409	7.9	884	14	.08	77	24	79	2.4	158	233	62	.3	1.0		571	.78	631	290	161	37
Jan. 2-6, 9-10, 1950	450	7.9	972	14	.07	83	26	88	4.0	184	261	70	.3	1.6		639	.87	776	314	163	38
Jan. 11-13, 16-20..	434	7.9	1,010	13	.04	87	28	95	3.0	168	271	77	.4	1.6		659	.90	772	332	194	38
Jan. 23-25, 27,30-31	359	8.0	1,010	14	.05	87	26	92	3.4	166	273	77	.4	1.4		656	.89	636	324	188	38
Feb. 1-3, 6-8	580	8.0	1,010	12	.05	86	26	93	2.6	166	267	77	.4	1.7		648	.88	1,010	322	186	38
Feb. 13-17.....	671	8.1	994	11	.07	86	26	86	3.0	163	270	75	.4	1.7		639	.87	1,160	322	188	36
Feb. 20-21, 23-24, 27-28.....	574	8.1	982	12	.07	84	26	91	3.0	161	283	74	.4	1.3		634	.86	983	316	184	38
Mar. 1-3, 6-10....	458	7.8	990	12	.03	87	28	90	1.9	168	265	74	.3	1.3		642	.87	794	332	194	37
Mar. 13-17, 20....	551	7.8	997	13	.06	87	28	90	1.8	168	266	76	.2	1.5		646	.88	961	332	194	37
Mar. 21-24, 27-31.	842	7.9	1,010	12	.04	87	28	90	2.1	166	267	77	.2	1.5		647	.88	1,120	332	196	37
Apr. 3-7, 10.....	652	7.9	1,020	11	.05	88	28	93	2.6	168	273	79	.2	1.3		659	.90	1,160	334	197	37
Apr. 11-14, 17-20.	623	7.8	1,040	11	.07	87	27	95	1.2	172	278	80	.4	1.1		665	.90	1,120	328	187	39
Apr. 21, 24-28	572	7.9	1,040	11	.04	87	27	96	1.6	171	278	81	.4	1.3		668	.91	1,030	328	188	39

a Less than 0.1 part per million by turmeric method.

DIVERSIONS AND RETURN FLOWS AT AND BELOW IMPERIAL DAM--Continued

YUMA MAIN CANAL BELOW COLORADO RIVER SIPHON AT YUMA, ARIZ.--Continued

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

Date of collection	Mean discharge (second-feet)	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)	Boron (B)	Dissolved solids			Hardness as $CaCO_3$		Percent sodium
															a	Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate	
May 1-2, 4-5, 8-10, 1950	473	7.9	1,040	13	0.04	87	27	95	1.8	171	276	81	0.4	1.1		667	0.91	852	328	188	38
May 11-12, 15-19	505	8.0	1,040	12	.04	86	27	94	2.6	172	278	80	.4	1.1		669	.91	912	326	184	38
May 22-26, 29, 31	517	8.0	1,040	13	.03	85	27	94	2.0	173	276	81	.4	1.3		665	.90	928	323	181	39
June 1-2, 5-9	510	8.0	1,040	12	.05	84	27	93	2.6	167	275	80	.4	1.3		658	.89	906	320	184	38
June 12-16, 19-20	529	7.7	1,030	13	.03	87	29	92	5.1	168	273	80	.2	2.3		664	.90	948	336	198	37
June 21-23, 26-30	545	7.8	991	18	.03	80	29	93	4.3	150	272	73	.2	2.3		646	.88	1,010	318	196	38
July 3, 5-7, 10	409	7.8	1,020	17	.02	86	30	93	4.6	170	273	76	.2	3.3		667	.91	737	338	198	37
July 11-14, 17-20	434	7.8	1,010	14	.02	86	29	91	3.7	163	269	77	.2	3.2		653	.89	765	334	200	37
July 21, 24-28, 31	505	7.8	1,010	15	.02	84	28	92	4.0	162	269	79	.2	2.0		653	.89	890	324	192	38
Aug. 1-4, 7-10	602	7.7	1,000	14	.03	81	27	93	2.4	158	273	79	.4	1.1		649	.88	1,050	313	184	39
Aug. 11, 14-18	637	7.9	982	19	.07	78	29	95	2.4	156	270	78	.4	.8		649	.88	1,120	314	186	39
Aug. 21-25, 28-31	636	7.8	991	18	.04	80	29	91	2.4	156	271	79	.4	.5		648	.88	1,110	318	190	38
Sept. 1, 4-8	542	7.7	988	12	.04	81	28	89	2.4	156	271	77	.4	.6		638	.87	934	317	189	38
Sept. 11-15, 18-20	716	7.8	985	12	.08	80	28	88	2.8	160	267	78	.4	.8		636	.86	1,230	314	184	38
Sept. 21-22, 25-29	720	7.9	994	17	.10	83	29	90	3.2	166	269	78	.4	.8		652	.89	1,270	326	190	37
Weighted average	551	--	985	13	0.05	84	27	88	2.9	163	265	75	0.3	1.4		637	0.87	948	320	187	37

a Less than 0.1 part per million by turmeric method.

EAGLE RIVER BELOW GYPSUM, COLO.

LOCATION.--At old highway bridge at Gypsum, Eagle County, just above Gypsum Creek, about 150 feet upstream from gaging station which is below Gypsum Creek.
DRAINAGE AREA.--Approximately 849 square miles.
RECORDS AVAILABLE.--Chemical analyses: April 1947 to September 1950.
Water temperatures: April 1949 to September 1950.
EXTREMES, 1949-50.--Dissolved solids: Maximum, 790 ppm Dec. 11-20; minimum, 111 ppm June 1-10.
Hardness: Maximum, 475 ppm Dec. 11-20; minimum, 84 ppm June 1-10.
Water temperatures: Maximum, 68°F on several days in August and September; minimum, freezing point on many days in December and January.
EXTREMES, 1947-50.--Dissolved solids: Maximum, 874 ppm Sept. 21-30, 1948; minimum, 108 ppm May 21-31, 1948.
Hardness: Maximum, 511 ppm Sept. 21-30, 1948; minimum, 78 ppm June 1-10, 1948.
Water temperatures: (1949-50): Maximum, 76°F Aug. 24, 1949; minimum, freezing point on many days in December 1949 and January 1950.
REMARKS.--Records of specific conductance of daily samples available in regional office at Salt Lake City, Utah. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1179.

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

Date of collection	Mean discharge (second-feet)	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)	Boron (B)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Noncarbonate	Percent sodium
Oct. 1-10, 1949 ..	316	--	953	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Oct. 11-20	328	7.7	972	9.5		105	21	75		163	221	104		1.6		617	0.84	546	348	215	32
Oct. 21-31	320	--	1,030	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Nov. 1-10	306	--	1,050	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Nov. 11-20	288	7.7	1,100	10		120	13	104		175	252	121		1.9		708	.96	551	353	210	39
Nov. 21-30	263	--	1,130	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Dec. 1-10	236	--	1,160	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Dec. 11-30	208	8.0	1,250	12		136	33	83		192	293	136		2.2		790	1.07	444	475	318	28
Dec. 21-31	201	--	1,160	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Jan. 1-10, 1950 ..	179	8.0	1,130	11		130	29	81		308	270	116		6.2		746	1.01	361	444	273	28
Jan. 11-20.....	188	8.0	1,080	10		120	29	76		187	258	111		6.4		702	.95	356	418	266	28
Jan. 21-31.....	182	7.9	1,060	10		118	27	72		174	252	109		5.6		679	.92	334	408	263	28
Feb. 1-10	182	8.0	1,130	11		118	26	85		174	260	121		2.3		709	.96	348	402	259	31
Feb. 11-19	182	7.9	1,060	11		116	26	72		174	250	105		2.3		668	.91	328	396	254	28
Feb. 20-28	190	8.0	1,040	11		114	25	71		169	251	99		2.2		656	.89	337	388	249	28
Mar. 1-10	185	7.9	1,040	9.7		112	27	72		168	248	106		1.6		659	.90	329	390	253	29
Mar. 11-20	180	7.7	1,030	9.8		110	27	64		166	235	101		1.6		630	.86	306	386	250	27
Mar. 21-31	160	7.7	997	9.9		106	26	68		166	230	101		1.3		624	.85	303	372	236	28
Apr. 1-10	257	7.7	672	9.4		75	18	41		136	152	56		1.5		420	.57	291	261	150	25
Apr. 11-20	397	7.7	478	8.3		58	14	24		114	107	34		.8		302	.41	324	202	108	20
Apr. 21-30	596	7.8	416	7.9		48	12	30		110	81	27		1.5		252	.34	406	170	80	21
May 1-10	636	7.6	420	9.5		45	11	30		110	72	25		.7		237	.32	407	158	68	22
May 11-20	1,158	7.5	292	9.7		37	7.5	10		105	42	11		1.0		170	.23	532	124	38	15
May 21-31	1,616	7.5	261	8.2		30	6.9	13		90	38	12		1.2		154	.21	672	104	30	21

TRIBUTARIES ABOVE GUNNISON RIVER--Continued

EAGLE RIVER BELOW GYPSUM, COLO.--Continued

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

Date of collection	Mean discharge (second-feet)	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)	Boron (B)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
June 1-10, 1950 ..	2,656	7.3	194	6.6		25	5.3	5.1		71	28	5.5		0.6		111	0.15	796	84	26	12
June 11-20	3,080	7.3	206	7.0		27	5.5	7.8		75	33	7.5		.8		126	.17	1,050	90	28	16
June 21-30	1,804	--	282	--		--	--	--		--	--	--		--		--	--	--	--	--	--
July 1-10	1,046	--	431	--		--	--	--		--	--	--		--		--	--	--	--	--	--
July 11-20.....	679	7.7	664	8.4		75	16	40		141	139	56		1.2		405	.55	742	253	138	26
July 21-31	400	--	762	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Aug. 1-10	259	--	963	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Aug. 11-20.....	198	8.0	1,160	10		139	29	72		194	290	114		1.8		751	1.02	401	466	307	25
Aug. 21-31	168	--	1,350	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Sept. 1-10	156	--	1,250	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Sept. 11-20	213	7.9	1,020	11		124	26	59		183	257	89		1.1		657	.89	378	416	266	23
Sept. 21-30	278	--	1,470	--		--	--	--		271	619	31		--		--	--	--	--	--	--
Weighted average [a]	547	--	b 451	8.3		52	11	26		108	92	34		1.3		278	0.38	411	174	86	24

a Does not include any of the determinations for period Sept. 21-30.
b Based on only those analyses for which most of the constituents were determined.

TRIBUTARIES ABOVE GUNNISON RIVER--Continued

EAGLE RIVER BELOW GYPSUM, COLO.--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	--	34	33	33	38	44	44	50	--	63	60
2	47	--	34	33	33	36	44	48	--	55	64	65
3	47	--	36	32	33	36	45	48	45	55	65	65
4	57	44	38	32	--	38	45	45	45	58	65	68
5	49	41	39	32	33	39	40	48	50	58	65	68
6	48	40	33	--	33	36	41	45	50	57	65	57
7	50	40	33	31	33	36	40	44	50	58	65	60
8	50	44	39	32	33	34	40	45	50	60	65	63
9	42	41	38	33	32	34	43	48	--	60	65	63
19	36	33	34	34	33	33	45	50	48	52	65	61
11	40	40	34	33	33	33	48	50	48	52	65	62
12	45	--	33	33	34	35	48	50	53	60	65	60
13	--	34	33	33	34	35	40	50	53	60	65	60
14	45	42	32	33	34	36	42	50	52	55	60	62
15	45	36	32	34	34	36	50	50	53	55	60	64
16	45	40	32	33	35	34	50	51	53	55	65	60
17	46	39	32	33	35	35	52	50	53	65	65	60
18	38	--	32	33	35	40	52	50	50	65	65	60
19	38	35	32	32	36	40	45	45	50	64	58	61
20	44	--	32	32	35	35	45	45	55	65	58	59
21	39	43	32	33	35	35	45	45	55	65	58	55
22	40	42	34	32	36	35	45	45	55	64	65	55
23	42	40	33	32	36	35	51	50	55	64	65	56
24	40	34	32	32	36	36	47	50	50	56	65	54
25	42	36	32	32	36	37	47	48	51	56	65	56
26	40	36	33	32	34	40	49	48	--	64	68	54
27	42	36	34	32	35	40	40	48	52	65	68	53
28	--	33	32	32	37	43	48	49	52	65	68	52
29	40	33	32	33	--	43	48	49	58	64	68	53
30	40	36	32	33	--	42	48	55	58	55	68	54
31	42	--	33	33	--	45	--	46	--	56	68	--
Average	44	38	34	33	34	37	45	48	51	59	64	59

TRIBUTARIES ABOVE GUNNISON RIVER--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN TRIBUTARIES ABOVE GUNNISON RIVER IN COLORADO

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

Date of collection	Mean discharge (second-feet)	Temperature (° F)	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)	Boron (B)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Noncarbonate	Percent sodium
GYPSUM CREEK AT GYPSUM																						
Oct. 18, 1949				708	17		122	23	24		231	249	2.0		5.7		534	0.73		399	210	12
May 28, 1950				1,630			320	56	11		293	768	6				1,330	1.81		1,030	789	2
ROARING FORK AT GLENWOOD SPRINGS																						
Oct. 18, 1949	724			643	8.6		42	7.8	11		177	57	10		0.9		190	0.26	1,040	137	50	15
May 28, 1950	2,030			320							106											

GUNNISON RIVER NEAR GRAND JUNCTION, COLO.

LOCATION.--At road bridge about half a mile downstream from gaging station, 1 mile downstream from point of diversion of Redlands power canal, and 1½ miles upstream from mouth and Grand Junction, Mesa County.
DRAINAGE AREA.--Approximately 8,020 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1931 to September 1950.
Water temperatures: April 1949 to September 1950.
REMARKS.--During winter months when river is frozen over, samples were obtained from Redlands power canal. Records of specific conductance of daily samples available in regional office at Salt Lake City, Utah. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1179.

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

Date of collection	Mean discharge (second-feet)	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)	Boron (B)	Dissolved solids			Hardness as $CaCO_3$		Percent sodium
																Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate	
Oct. 1-10, 1949	897	--	2,200	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Oct. 11-20	1,245	--	1,970	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Oct. 21-31	1,281	--	1,670	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Nov. 1-10	1,230	--	1,560	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Nov. 11-20	1,294	--	1,540	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Nov. 21-30	1,190	--	1,520	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Dec. 1-10	982	--	1,640	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Dec. 11-20	866	--	1,710	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Dec. 21-31	801	7.9	1,610	20		154	73	124		238	693	19		11		1,210	1.65	2,620	684	489	28
Jan. 1-10, 1950	743	--	1,590	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Jan. 11-20	902	7.9	1,570	21		150	69	113		228	657	18		10		1,150	1.58	2,800	658	471	27
Jan. 21-31	990	--	1,490	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Feb. 1-10	1,065	--	1,470	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Feb. 11-19	981	8.0	1,550	19		135	64	130		218	643	19		10		1,130	1.54	2,990	600	422	32
Feb. 20-28	999	7.9	1,530	18		131	65	140		214	663	18		8.4		1,150	1.56	3,100	594	419	34
Mar. 1-10	1,046	7.8	1,420	18		121	61	122		206	593	17		8.5		1,040	1.41	2,940	553	384	32
Mar. 11-20	973	7.9	1,350	20		114	56	116		198	552	18		6.8		980	1.33	2,570	515	353	33
Mar. 21-31	932	7.9	1,280	18		108	48	109		201	488	19		5.9		895	1.22	2,250	467	302	34
Apr. 1-3	1,046	--	1,230	15		112	50	101		200	492	18		5.1		892	1.21	2,520	485	321	31
Apr. 4-10	2,279	8.0	793	16		80	30	48		158	272	9		3.9		526	.73	3,300	323	195	24
Apr. 11-20	3,116	8.1	591	19		65	19	36		155	171	7		3.0		396	.54	3,330	240	113	24
Apr. 21-30	6,024	7.6	433	15		51	14	22		150	99	3.5		.8		279	.38	4,540	184	62	20

GUNNISON RIVER BASIN--Continued

GUNNISON RIVER NEAR GRAND JUNCTION, COLO.--Continued

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

Date of collection	Mean discharge (second-feet)	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)	Boron (B)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Noncarbonate	Percent sodium
May 1-10, 1950....	4,176	7.6	505	13		54	16	33		128	152	4.8		1.7		338	0.46	3,810	200	96	26
May 11-20	4,908	7.7	496	12		52	17	29		120	151	4.5		1.7		326	.44	4,320	200	101	24
May 21-31	5,915	7.4	514	14		57	16	29		132	146	6.5		1.8		335	.46	5,350	208	100	23
June 1-10.....	6,300	7.6	507	14		55	16	29		124	148	5.5		2.1		331	.45	5,630	203	102	23
June 11-20.....	5,997	7.5	527	14		57	16	29		126	155	4		1.9		339	.46	5,490	208	105	23
June 21-30.....	3,801	7.4	703	15		72	23	46		136	241	7		2.9		474	.64	4,860	274	162	27
July 1-10	1,983	--	1,060	--		--	--	--		--	--	--		--		--	--	--	--	--	--
July 11-20	1,619	7.4	1,490	21		162	56	115		220	651	16		5.7		1,140	1.55	4,980	634	454	28
July 21-31.....	751	--	1,970	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Aug. 1-10.....	642	--	1,990	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Aug. 11-20.....	614	7.3	1,920	19		204	76	161		200	930	25		5.7		1,520	2.07	1,520	822	658	30
Aug. 21-31.....	544	--	2,100	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Sept. 1-10	470	--	2,250	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Sept. 11-20	762	7.3	2,320	21		255	96	202		230	1,190	24		11		1,910	2.60	3,930	1,030	842	30
Sept. 21-30	1,070	--	2,060	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Weighted average.	1,916	--	a727	15		75	26	50		149	256	7.9		3.1		506	0.69	2,620	294	172	27

a Based on oaly those analyses for which most of the constituents were determined.

GUNNISON RIVER BASIN--Continued

GUNNISON RIVER NEAR GRAND JUNCTION, COLO.--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	49	40	32	34	44	55	51	64	--	78	75
2	66	50	41	32	33	45	60	51	62	73	74	71
3	66	--	42	31	33	44	50	54	58	--	75	73
4	--	48	39	33	33	47	50	52	59	--	76	72
5	64	--	39	33	35	47	49	52	61	--	--	75
6	64	--	37	33	34	45	55	51	62	--	70	70
7	63	44	39	33	35	45	52	54	64	--	72	70
8	63	49	40	31	35	44	55	54	59	--	76	71
9	63	47	41	33	34	48	48	54	60	--	73	--
10	62	47	42	33	35	48	50	54	61	--	70	62
11	60	43	38	32	35	47	48	57	--	--	68	62
12	58	44	34	34	36	43	--	60	64	--	74	65
13	58	44	34	34	35	41	50	60	62	74	76	--
14	57	47	--	33	35	41	52	60	62	72	74	68
15	57	49	32	32	36	46	50	61	64	73	76	65
16	58	45	33	31	36	46	52	59	65	71	76	65
17	58	54	33	34	36	47	52	59	64	71	76	64
18	59	47	34	--	38	45	52	57	64	71	76	65
19	51	46	34	35	36	47	50	58	66	70	75	--
20	48	45	33	35	37	48	52	58	65	73	72	63
21	48	45	31	--	40	48	54	61	--	--	71	63
22	50	45	--	--	44	48	54	58	--	73	73	--
23	49	43	--	34	42	47	52	50	63	71	71	--
24	49	41	32	34	42	50	48	61	64	72	--	58
25	48	42	36	33	41	46	50	59	71	75	71	65
26	49	40	31	33	43	45	49	54	71	73	--	64
27	48	43	31	34	36	43	52	--	72	75	65	58
28	48	43	31	33	38	43	54	60	72	78	74	65
29	--	44	31	34	--	45	49	59	71	78	74	64
30	--	44	31	34	--	48	52	61	71	--	72	65
31	49	--	32	34	--	50	--	64	--	78	74	--
Average	56	45	35	33	37	46	52	57	64	--	73	66

DOLORES RIVER BASIN

DOLORES RIVER AT GATEWAY, COLO.

LOCATION.--At bridge on State Highway 141, 500 feet upstream from gaging station, which is 0.3 mile northwest of Gateway, Mesa County, 0.3 mile downstream from West Creek, and 8 miles upstream from Colorado-Utah State line.
DRAINAGE AREA.--4,350 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1950.
Water temperatures: April 1949 to September 1950.
EXTREMES, 1949-50.--Dissolved solids: Maximum, 4,900 ppm Sept. 11-20; minimum, 235 ppm Apr. 21-30.
Hardness: Maximum, 1,140 ppm Sept. 11-20; minimum, 142 ppm Apr. 21-30.
Water temperatures: Maximum, 73°F July 10; minimum, freezing point Dec. 22, Jan. 3, 6, 11, 14.
EXTREMES, 1947-50.--Dissolved solids: Maximum, 4,900 ppm Sept. 11-20, 1950; minimum, 198 ppm June 1-10, 1948.
Hardness: Maximum, 1,140 ppm Sept. 11-20, 1950; minimum, 130 ppm June 11-15, 17-20, 1948.
Water temperatures: 1949-50: Maximum, 75°F Sept. 1, 1949; minimum, freezing point Dec. 22, 1949, Jan. 3, 6, 11, 14, 1950.
REMARKS.--Records of specific conductance of daily samples available in regional office at Salt Lake City, Utah. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1179.

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

Date of collection	Mean discharge (second-feet)	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)	Boron (B)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 1-10, 1949....	91.8	--	5,830	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Oct. 11-12	141	--	7,160	--		--	--	--		188	--	--		--		--	--	--	--	--	--
Oct. 13-20	177	7.7	4,400	9.8		129	72	740		190	471	1,120		2.3		2,640	3.59	1,260	618	462	72
Oct. 21	267	--	5,400	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Oct. 22-23.....	206	--	2,280	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Oct. 24-31	173	--	3,910	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Nov. 1-4, 6-10.....	166	--	4,350	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Nov. 5	179	--	7,140	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Nov. 11-20	180	7.5	4,640	10		124	66	644		192	433	1,280		2.7		2,850	3.88	1,390	581	424	76
Nov. 21-30	152	--	4,580	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Dec. 1-10	142	--	5,300	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Dec. 11-20	162	7.5	5,100	9.0		124	74	913		212	404	1,420		3.6		3,050	4.15	1,330	614	440	76
Dec. 21-31	163	--	4,180	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Jan. 1-10, 1950....	163	--	4,120	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Jan. 11-20	197	7.8	3,780	12		144	58	615		220	301	1,020		3.4		2,260	3.07	1,200	598	418	69
Jan. 21-31	213	--	3,760	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Feb. 1-10	308	7.9	3,240	9.5		106	49	503		194	299	770		4.8		1,840	2.50	1,530	466	307	70
Feb. 11-19	278	7.8	3,360	9.4		112	55	538		198	368	800		4.0		1,980	2.69	1,490	506	344	70
Feb. 20-28	274	7.9	3,080	7.7		107	53	471		196	353	695		1.9		1,790	2.43	1,320	485	324	68
Mar. 1-10	319	7.7	2,960	8.7		106	52	465		212	372	660		4.6		1,770	2.41	1,520	484	310	68
Mar. 11-20.....	250	7.8	3,260	8.0		114	52	511		198	351	765		3.7		1,900	2.58	1,280	498	336	69
Mar. 21-26.....	248	7.7	3,870	7.5		121	56	629		191	357	970		3.7		2,240	3.05	1,500	532	376	72
Mar. 27-31.....	391	7.8	2,130	9.0		100	40	301		198	307	415		3.7		1,270	1.73	1,340	414	254	61

Apr. 1-3	471	7.8	2,320	9.4	86	39	353	185	272	500	4.1	1,350	1.84	1,720	375	224	67
Apr. 4-10	2,274	7.9	787	9.7	63	15	80	165	113	99	1.2	462	.63	2,840	218	84	44
Apr. 11-20	1,952	7.7	486	8.5	49	12	36	140	73	41	1.5	290	.39	1,530	172	58	31
Apr. 21-30	2,781	7.7	389	7.0	41	9.5	29	129	54	30	1.0	235	.32	1,760	142	36	31
May 1-10	1,460	7.9	523	8.1	47	13	43	131	73	56	1.8	306	.42	1,210	171	64	35
May 11-20	1,032	7.5	718	6.7	53	15	73	147	89	98	1.1	408	.55	1,140	194	73	45
May 21-31	1,295	7.5	557	6.4	48	12	47	134	68	64	1.2	313	.43	1,090	170	60	38
June 1-10	1,456	7.5	517	7.2	47	11	41	123	71	54	1.3	293	.40	1,150	162	62	36
June 11-20	1,198	7.5	543	6.3	46	11	50	112	82	63	1.8	315	.43	1,020	160	68	40
June 21-25, 27-30	721	7.5	857	6.4	50	14	104	110	107	146	1.5	483	.66	940	162	92	55
June 26	748	--	1,490	6.8	62	19	226	118	120	355	2.2	849	1.15	1,710	232	136	68
July 1-10	438	--	1,420	--	--	--	--	--	--	--	--	--	--	--	--	--	--
July 11-13, 15-21	416	8.0	1,390	9.8	84	27	170	130	247	231	1.0	834	1.13	937	320	214	54
July 14	405	--	4,140	--	--	--	--	182	216	1,160	4.8	--	--	--	--	--	--
July 22-31	192	--	2,340	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aug. 1-2	119	--	1,650	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aug. 3-10	97.5	--	3,100	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aug. 11-20	76.0	8.0	4,110	4.8	124	64	685	149	478	1,020	4.3	2,450	3.33	503	572	450	72
Aug. 21-31	40.3	--	6,580	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sept. 1-10	33.9	--	7,100	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sept. 11-20	77.9	7.5	7,700	2.9	218	144	1,370	179	1,020	2,050	11	4,900	6.66	1,030	1,140	990	72
Sept. 21, 24	219	--	2,290	--	--	--	--	--	--	270	--	--	--	--	--	--	--
Sept. 22-23, 25-29	111	--	3,650	--	--	--	--	--	--	680	--	--	--	--	--	--	--
Sept. 30	72.0	--	6,120	--	--	--	--	--	--	1,620	--	--	--	--	--	--	--
Weighted Average	523	--	a1,070	7.9	61	20	139	144	130	204	1.7	634	0.86	895	234	116	56

a Based on only those analyses for which most of the constituents were determined.

DOLORES RIVER BASIN--Continued

DOLORES RIVER AT GATEWAY, COLO.--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	44	38	33	36	44	48	52	64	70	67	64
2	62	44	36	34	35	43	51	52	65	71	67	66
3	64	45	36	32	34	44	53	54	--	69	67	65
4	62	46	34	--	33	44	48	51	61	70	66	67
5	62	44	36	33	34	45	48	49	61	71	70	66
6	61	43	35	32	33	44	48	--	63	72	67	65
7	58	42	36	34	34	41	51	52	61	69	68	66
8	56	43	37	34	34	38	--	54	59	70	66	68
9	51	43	39	35	34	44	49	52	59	70	66	66
10	48	44	40	35	34	44	46	54	70	73	66	63
11	49	44	34	31	34	42	--	56	63	72	56	59
12	57	41	33	35	34	38	48	57	63	72	67	60
13	51	41	33	35	34	37	49	54	63	69	69	61
14	53	42	33	32	33	38	54	55	64	68	65	59
15	--	43	33	34	34	41	50	56	64	68	66	59
16	59	40	35	33	34	43	50	58	64	68	68	59
17	54	41	33	--	37	46	52	60	63	68	66	57
18	54	41	34	37	36	46	55	57	64	--	67	59
19	49	40	34	36	37	45	53	59	64	--	65	60
20	46	41	34	34	39	47	51	59	63	--	66	57
21	44	39	33	34	41	43	52	59	--	--	66	56
22	44	39	32	35	42	45	59	57	65	--	65	57
23	44	38	33	34	39	47	56	62	65	71	67	58
24	45	38	33	36	40	47	52	62	65	71	65	59
25	47	43	37	33	40	47	52	62	65	69	67	53
26	48	43	33	34	43	--	52	56	65	70	64	56
27	47	40	33	33	45	42	54	57	68	72	72	58
28	49	40	33	33	46	41	52	60	69	70	66	58
29	45	39	34	36	--	43	51	58	70	70	64	57
30	44	38	36	34	--	43	52	62	70	66	--	58
31	43	--	33	33	--	48	--	64	--	68	63	--
Average	52	42	35	34	37	43	51	57	64	70	66	61

GREEN RIVER BASIN

GREEN RIVER NEAR JENSEN, UTAH

LOCATION.--At gaging station, 1 mile below Cub Creek and Chew Ranch, 4 miles southeast of Dinosaur National Monument headquarters, 6½ miles northeast of Jensen, Uintah County, and 12 miles upstream from Brush Creek.
RECORDS AVAILABLE.--Sediment records: May 1948 to September 1950.
EXTREMES, 1949-50.--Sediment loads: Maximum daily, 296,000 tons Apr. 11; minimum daily, 144 tons Sept. 7.
EXTREMES, 1948-50.--Sediment loads: Maximum daily, 367,000 tons June 5, 1949; minimum daily, less than 90 tons on several days in September 1948.
REMARKS.--For records of chemical analyses and water temperatures see Green River at Jensen, Utah, p. 80-82. Records of discharge for the water year October 1949 to September 1950 given in Water-Supply Paper 1179.

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	1,030	e100	278	2,140	817	4,720	1,760	93	442
2	1,000	e80	216	2,080	689	3,870	1,720	90	418
3	964	e100	260	2,070	490	2,740	1,700	92	422
4	964	e120	312	2,020	295	1,610	1,640	94	416
5	1,040	188	528	1,950	286	1,510	1,440	93	362
6	1,120	e250	756	1,910	310	1,600	1,330	87	312
7	1,160	e300	940	1,890	205	1,050	1,260	89	303
8	1,310	e390	1,360	1,860	307	1,540	1,210	87	284
9	1,570	e510	2,160	1,830	210	1,040	1,190	119	382
10	1,620	790	3,460	1,820	215	1,060	1,220	109	359
11	1,830	900	4,450	1,890	201	1,030	1,170	114	360
12	2,010	1,240	6,730	1,800	148	719	707	108	206
13	2,080	3,800	21,300	1,600	141	685	476	120	154
14	2,190	3,510	20,800	1,810	142	694	515	130	181
15	2,670	e4,400	31,700	1,810	133	650	510	168	229
16	3,000	e4,850	39,300	1,790	136	657	510	142	196
17	2,610	e3,900	27,500	1,710	124	573	626	131	221
18	2,270	e3,050	18,700	1,680	134	608	729	136	268
19	2,210	2,100	12,500	1,730	108	504	736	120	238
20	2,100	1,920	10,900	1,750	104	491	964	145	377
21	2,170	e1,980	11,600	1,750	85	402	948	122	312
22	2,200	1,560	9,270	1,710	92	425	960	116	301
23	2,170	1,500	8,790	1,650	80	356	960	115	298
24	2,270	900	5,520	1,580	84	358	900	183	445
25	2,340	689	4,350	1,550	193	808	900	211	513
26	2,340	682	4,310	1,480	193	771	930	204	512
27	2,330	676	4,250	1,510	e180	734	960	224	581
28	2,390	575	3,710	1,590	e170	730	1,000	160	432
29	2,370	696	4,450	1,730	e160	747	1,050	147	417
30	2,270	733	4,490	1,750	166	784	1,100	119	353
31	2,200	745	4,430	--	--	--	1,150	105	326
Total	59,798	--	269,300	53,640	--	33,470	32,271	--	10,620

e Estimated or interpolated.

GREEN RIVER BASIN--Continued

GREEN RIVER NEAR JENSEN, UTAH--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	1,180	96	306	1,460	195	769	1,600	e1,960	9,530
2	1,180	140	446	1,390	228	856	2,400	e2,700	17,500
3	1,150	144	447	1,300	206	723	4,000	e4,000	43,200
4	1,100	145	431	1,200	249	807	5,600	e4,300	65,000
5	1,050	e120	340	1,240	222	743	5,500	3,900	57,900
6	1,020	102	281	1,280	225	778	5,400	e3,800	52,500
7	990	124	331	1,350	211	769	5,500	e4,400	65,300
8	950	134	344	1,350	220	802	5,500	4,200	62,400
9	940	130	330	1,300	221	776	5,200	1,340	18,800
10	950	132	339	1,300	222	779	4,600	990	12,300
11	980	145	384	1,250	189	638	3,810	966	9,940
12	1,000	145	392	1,210	195	637	3,590	996	9,650
13	1,050	151	428	1,180	254	809	3,000	1,100	8,910
14	1,110	139	417	1,160	280	877	2,380	1,020	6,550
15	1,200	128	415	1,140	209	643	2,280	1,260	7,760
16	1,290	122	425	1,120	301	910	2,280	2,610	16,100
17	1,290	156	543	1,150	224	696	2,370	2,690	17,200
18	1,280	155	536	1,170	347	1,100	2,460	2,600	17,300
19	1,280	151	514	1,200	264	855	2,650	2,720	19,500
20	1,330	e168	603	1,230	154	511	3,030	e3,600	29,500
21	1,410	e165	628	1,270	152	521	3,140	4,000	33,900
22	1,440	e180	622	1,300	144	505	3,270	3,790	33,500
23	1,550	e166	695	1,330	251	901	3,640	4,180	41,100
24	1,610	e178	774	1,380	267	995	3,130	e2,950	24,900
25	1,680	e180	816	1,410	272	1,040	2,740	1,600	11,800
26	1,670	e185	834	1,440	e580	2,260	2,730	1,420	10,500
27	1,560	e180	758	1,500	e1,200	4,360	2,780	1,420	10,700
28	1,350	e158	576	1,600	1,700	7,340	2,790	1,390	10,500
29	1,400	e170	643	--	--	--	2,700	1,140	8,310
30	1,450	e202	791	--	--	--	2,430	1,150	7,550
31	1,480	223	891	--	--	--	2,280	1,180	7,260
Total	38,900	--	16,280	36,210	--	33,900	104,980	--	746,900
	April			May			June		
1	2,260	1,090	6,650	10,000	2,100	56,700	18,700	e2,000	101,000
2	2,550	e2,300	15,800	9,320	1,800	45,300	20,100	e2,200	119,000
3	3,250	e4,900	43,000	8,740	1,550	36,600	21,700	e2,100	123,000
4	4,570	8,860	s111,000	8,480	1,500	34,300	23,800	e2,000	129,000
5	5,930	10,200	163,000	8,940	1,840	44,400	23,400	1,920	121,000
6	5,980	9,840	159,000	9,500	2,500	64,100	21,900	1,590	94,000
7	5,000	e9,400	127,000	9,980	2,600	70,100	20,800	1,580	88,700
8	4,460	e8,600	104,000	9,440	2,700	68,900	21,000	1,530	86,800
9	4,680	e8,500	107,000	8,710	2,250	52,900	22,000	1,520	90,300
10	6,180	e9,500	159,000	8,130	2,000	43,900	21,500	1,440	83,800
11	9,860	11,100	296,000	7,600	2,460	50,500	20,500	1,470	81,400
12	10,300	9,840	274,000	7,520	2,150	43,700	20,400	1,370	75,500
13	8,160	6,320	139,000	7,490	2,000	40,400	20,000	1,560	84,300
14	6,860	e2,900	53,700	8,160	e2,100	46,300	19,600	1,340	70,900
15	7,440	e2,840	57,000	9,440	e2,250	57,300	19,300	1,320	68,600
16	9,980	4,720	127,000	11,700	e2,950	93,200	19,500	1,350	71,100
17	12,000	4,680	152,000	14,200	3,140	120,000	19,900	1,550	83,300
18	11,600	4,800	150,000	15,600	3,150	133,000	20,400	1,260	69,400
19	11,500	4,860	151,000	17,400	3,440	162,000	21,100	1,380	78,600
20	12,200	4,240	140,000	19,000	3,020	155,000	21,200	1,680	96,200
21	12,400	3,890	130,000	19,300	3,000	156,000	21,000	1,320	74,900
22	11,500	4,030	125,000	18,900	3,000	153,000	20,700	1,450	81,000
23	11,000	3,350	99,500	18,700	2,630	133,000	19,900	1,170	62,500
24	12,500	3,000	101,000	19,300	e2,360	123,000	19,400	1,390	72,600
25	14,900	4,000	161,000	20,400	2,230	123,000	19,000	1,300	66,700
26	15,100	3,920	160,000	21,600	2,380	139,000	19,000	1,090	55,900
27	13,000	3,050	107,000	22,700	2,440	150,000	19,000	1,100	56,400
28	11,700	2,620	82,800	20,700	2,360	132,000	18,200	1,170	57,500
29	10,700	2,400	69,300	18,800	2,180	111,000	17,200	1,190	55,300
30	9,950	2,000	53,700	17,800	1,980	95,200	15,900	e1,140	48,600
31	--	--	--	17,600	1,850	87,900	--	--	--
Total	267,510	--	3,624,000	425,150	--	2,822,000	605,900	--	2,447,000

e Estimated or interpolated.
s Computed by subdividing day.

GREEN RIVER BASIN--Continued

GREEN RIVER NEAR JENSEN, UTAH--Continued

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

Day	July			August			September		
	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	14,400	1,090	42,400	5,040	750	10,200	1,750	65	307
2	14,000	915	34,600	5,220	750	10,600	1,700	34	156
3	13,400	906	32,800	4,940	524	6,990	1,640	44	195
4	13,200	1,040	37,100	4,570	457	5,640	1,580	48	205
5	13,400	1,070	38,700	4,280	350	4,040	1,510	56	228
6	13,800	1,110	41,400	4,000	214	2,310	1,450	41	161
7	13,800	1,090	40,600	3,820	249	2,570	1,400	38	144
8	13,700	1,080	39,900	3,760	191	1,940	1,370	e50	185
9	13,400	1,030	37,300	3,730	190	1,910	1,380	e200	745
10	13,000	1,080	37,900	3,660	176	1,740	1,340	121	438
11	12,900	1,370	47,700	3,620	171	1,670	1,340	112	405
12	12,200	1,360	44,800	3,320	176	1,580	1,360	123	452
13	11,400	1,310	40,300	3,250	e250	2,190	1,610	298	s1,480
14	11,200	1,090	33,000	3,100	250	2,090	2,230	1,360	s8,370
15	10,800	e1,000	29,200	3,040	200	1,640	1,970	e200	1,060
16	10,000	e900	24,300	3,000	150	1,220	1,880	e220	1,120
17	9,030	840	20,500	3,020	150	1,220	1,940	e700	3,670
18	8,130	800	17,600	3,020	127	1,040	1,970	650	3,460
19	7,300	200	3,940	2,870	110	852	1,890	566	2,890
20	6,690	155	2,800	2,700	160	1,170	1,880	450	2,280
21	6,210	87	1,460	2,550	168	1,160	1,940	347	1,820
22	5,820	88	1,380	2,410	89	579	2,040	720	3,970
23	5,370	200	2,900	2,250	68	413	2,490	e3,570	24,000
24	5,120	431	5,960	2,200	151	897	2,210	e3,700	22,100
25	4,900	394	5,210	2,130	171	983	2,100	3,420	19,400
26	4,760	331	4,260	2,070	157	877	1,980	e2,700	14,400
27	4,640	306	3,830	2,010	71	385	1,940	e1,700	8,900
28	4,530	285	3,490	1,960	71	376	1,830	720	3,560
29	4,440	272	3,260	1,890	63	321	1,780	e560	2,790
30	4,530	250	3,060	1,840	57	283	1,730	560	2,620
31	4,640	500	6,260	1,810	44	215	--	--	--
Total	290,730	--	687,900	97,080	--	69,100	53,230	--	131,500

Total discharge for year (second-foot-days) 2,065,399
Total load for year (tons) 10,890,000

e Estimated or interpolated.
s Computed by subdividing day.

GREEN RIVER AT JENSEN, UTAH

LOCATION.--At bridge on U. S. Highway 40 at Jensen, Uintah County, 13 miles downstream from gaging station near Jensen.
RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1950.
Water temperatures: March 1949 to September 1950.
EXTREMES, 1949-50.--Dissolved solids: Maximum, 821 ppm Nov. 11-20; minimum, 192 ppm June 11-20.
Hardness: Maximum, 494 ppm Nov. 11-20; minimum, 138 ppm June 11-20.
Water temperatures: Maximum observed, 72°F on several days during July to September; minimum observed, 33°F on several days in January.
EXTREMES, 1947-50.--Dissolved solids: Maximum, 867 ppm Dec. 1-10, 1948; minimum, 161 ppm June 1-10, 1948.
Hardness: Maximum, 494 ppm Nov. 11-20, 1949; minimum, 111 ppm June 1-10, 1948.
Water temperatures: 1949-50. Maximum observed, 75°F on several days in August 1949; minimum observed, 33°F on several days in January 1950.
REMARKS.--For sediment records see Green River near Jensen, Utah, p. 77-79. Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Discharge records for gaging station near Jensen for water year October 1949 to September 1950 given in Water-Supply Paper 1179.

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

Date of collection	Mean discharge (second-feet)	Temperature (°F)	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)	Boron (B)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 1-10, 1949 ...	1,178		--	866	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Oct. 11-20	2,297		7.6	997	15		90	27	91		227	286	33		3.2		657	0.89	4,070	336	150	37
Oct. 21-31	2,277		--	846	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Nov. 1-10	1,957		--	921	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Nov. 11-20	1,777		7.6	1,210	12		122	46	82		258	399	31		2.1		821	1.12	3,940	494	282	27
Nov. 21-30	1,630		--	993	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Dec. 1-10	1,447		7.8	1,040	13		92	40	80		234	308	36		5.6		690	.94	2,700	394	202	31
Dec. 11-20	694		7.9	1,040	12		93	40	81		238	308	36		6.8		694	.94	1,300	396	202	31
Dec. 21-31	987		7.7	1,030	9.9		95	39	75		222	317	33		3.8		682	.93	1,820	398	216	29
Jan. 1-10, 1950	1,051		7.7	1,110	12		104	42	86		246	351	35		2.2		753	1.02	2,140	432	230	30
Jan. 11-20.....	1,179		7.9	930	12		82	35	73		230	258	34		2.3		610	.83	1,940	348	160	31
Jan. 21-31.....	1,509		7.9	1,010	13		90	37	79		228	300	34		1.8		667	.91	2,720	376	190	31
Feb. 1-10	1,317		7.9	1,050	14		92	38	87		240	312	36		1.6		699	.95	2,490	386	189	33
Feb. 11-20	1,181		7.9	990	13		90	38	76		232	294	35		1.3		662	.90	2,110	380	190	30
Feb. 21-28	1,404		8.0	890	11		78	33	69		211	253	31		1.0		530	.72	2,200	330	157	31
Mar. 1-10	4,550		7.8	670	12		51	16	59		162	163	12		1.8		395	.54	4,850	193	60	40
Mar. 11-20	2,785		8.0	827	12		63	23	85		185	227	33		1.2		535	.73	4,020	252	100	42
Mar. 21-31	2,875		8.0	791	14		67	24	75		201	211	31		1.5		522	.71	4,050	266	101	38
Apr. 1-10	4,486		8.0	659	14		58	21	57		190	163	20		3.0		430	.58	5,210	231	76	35
Apr. 11-18	9,525		8.0	577	13		50	17	53		181	131	16		2.6		372	.51	9,570	195	46	37
Apr. 19-20	11,850		8.1	364	13		40	13	18		151	58	5		2.3		224	.30	7,170	154	30	20
Apr. 21-30	12,280		7.6	433	11		48	14	24		172	69	10		2.8		264	.36	8,750	178	36	23
May 1-8	9,300		7.8	541	11		52	16	42		180	111	16		1.9		339	.46	8,510	196	48	32
May 12-20	12,280		7.8	428	12		43	14	27		156	75	12		2.1		262	.36	8,690	165	37	27
May 21-31	19,620		7.8	452	13		51	15	22		169	79	10		2.2		276	.38	14,600	188	50	20

June 1-10	21,490	7.9	433	13	47	16	20	155	78	12	2.7	265	.36	15,400	184	56	19
June 11-20	20,190	8.1	323	8.3	39	10	15	146	42	5.8	.5	192	.26	10,500	138	19	19
June 21-30	18,910	--	346	--	--	--	--	--	--	--	--	--	--	--	--	--	--
July 1-10	13,610	--	355	--	--	--	--	--	--	--	--	--	--	--	--	--	--
July 11-20	9,965	7.7	431	9.3	46	15	23	173	66	10	2.1	257	.35	6,910	176	34	22
July 21-31	4,998	--	692	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aug. 1-10	4,302	--	656	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aug. 11-20	3,094	7.6	570	6.7	51	20	41	174	124	18	2.5	349	.47	2,920	209	66	30
Aug. 21-31	2,102	--	623	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sept. 1-10	1,512	--	709	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sept. 11-20	1,807	7.3	791	9.3	68	28	63	188	214	31	1.0	507	.69	2,470	284	130	33
Sept. 21-30	2,004	--	767	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Weighted average	5,638	--	a528	12	53	17	35	172	112	14	2.1	330	0.45	5,020	202	61	27

a Based upon only those analyses for which most of the constituents were determined.

GREEN RIVER BASIN--Continued

GREEN RIVER AT JENSEN, UTAH--Continued

Temperature (°F) of water, water year October 1949 to September 1950
(Once-daily temperature measurement at approximately 12 m.)

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

GREEN RIVER BASIN--Continued

GREEN RIVER AT GREEN RIVER, UTAH

LOCATION.--At gaging station 1 mile southeast of town of Green River, Emery County, 22 miles upstream from San Rafael River, and 117 miles upstream from mouth.
DRAINAGE AREA.--40,600 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: August 1928 to September 1950.
Water temperatures: May 1949 to September 1950.
Sediment records: May 1930 to September 1950.
EXTREMES, 1949-50.--Dissolved solids: Maximum, 857 ppm Dec. 21-31; minimum, 251 ppm June 11-20.
Hardness: Maximum, 479 ppm Dec. 21-31; minimum, 178 ppm June 11-20.
Water temperatures: Maximum observed, 79°F July 14; minimum, freezing point on several days in December and January.
Sediment loads: Maximum daily, 295,000 tons May 27; minimum daily, 251 tons Sept. 7.
EXTREMES, 1928-50.--Dissolved solids: Maximum, 2,010 ppm Sept. 29, 1943; minimum, 194 ppm June 21-30, 1933.
Hardness: Maximum, 488 ppm Dec. 21-31, 1932; minimum, 128 ppm June 21-30, 1933.
Water temperatures, (May 1949 to September 1950): Maximum observed, 82°F July 31, Aug. 5-6, 1949; minimum, freezing point on several days in December 1949 and January 1950.
Sediment loads, (1930-50): Maximum daily, 2,230,000 tons July 11,1936; minimum daily, less than 100 tons on several days.
REMARKS.--Records of specific conductance of daily samples available in district office at Salt Lake City Utah. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1179.

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

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	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)	Boron (B)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Noncarbonate	Percent sodium
Oct. 1-10, 1949 ...	2,150		--	1,160	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Oct. 11-20	3,796		--	1,100	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Oct. 21-31	4,067		--	1,060	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Nov. 1-10	3,493		--	978	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Nov. 11-20	3,147		--	1,020	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Nov. 21-30	2,962		--	1,030	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Dec. 1-10	2,798		--	1,100	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Dec. 11-20	1,588		--	1,160	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Dec. 21-31	1,871		7.5	1,290	14		98	57	107		285	384	55		2.0		857	1.17	4,330	479	246	33
Jan. 1-10, 1950 ...	2,111		--	1,230	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Jan. 11-20	2,091		7.8	1,120	14		92	45	95		271	323	44		1.6		748	1.02	4,220	414	192	33
Jan. 21-31	2,635		--	1,020	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Feb. 1-10	2,679		8.0	1,070	14		86	42	96		252	306	46		5.9		720	.98	5,210	387	180	35
Feb. 11-20	2,524		8.1	1,050	15		80	40	97		252	293	42		1.9		696	.95	4,740	364	158	37
Feb. 21-28	2,734		8.1	1,200	15		84	47	118		244	382	42		2.6		811	1.10	5,990	403	203	39
Mar. 1-10	6,763		8.1	1,040	11		72	36	107		231	305	37		2.0		684	.93	12,500	328	138	42
Mar. 11-20	6,132		8.0	945	12		73	30	92		220	258	38		2.2		614	.84	10,200	306	125	39
Mar. 21-31	4,608		8.0	1,030	13		78	36	106		236	306	43		1.6		700	.95	8,710	342	149	40

GREEN RIVER BASIN--Continued

GREEN RIVER AT GREEN RIVER, UTAH--Continued

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

Date of collection	Mean discharge (second-feet)	Temperature (° F)	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)	Boron (B)	Dissolved solids			Hardness as $CaCO_3$		Percent sodium
																	Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate	
Apr. 1-10, 1950 ..	5,124		8.0	1,040	14		82	36	103		243	302	43		1.8		702	0.95	9,710	352	154	39
Apr. 11-20	10,720		8.0	806	14		67	24	78		230	199	26		2.3		524	.71	15,200	266	77	39
Apr. 21-30	15,410		8.0	566	14		59	18	40		218	104	13		2.3		358	.49	14,900	221	42	28
May 1-10	11,510		8.0	617	14		59	20	47		210	129	17		1.6		391	.53	12,200	229	57	31
May 11-20	12,260		8.1	680	14		58	22	60		210	154	22		1.7		435	.59	14,400	235	63	36
May 21-31	25,440		7.5	555	--		--	--	--		242	--	--		--		--	--	--	--	--	--
June 1-10	28,080		7.7	462	--		--	--	--		202	--	--		--		--	--	--	--	--	--
June 11-20	26,690		7.8	428	11		50	13	20		182	59	8		.7		251	.34	18,100	178	29	20
June 21-30	24,220		7.6	404	--		--	--	--		174	--	--		--		--	--	--	--	--	--
July 1-10.....	16,610		--	503	--		--	--	--		--	--	--		--		--	--	--	--	--	--
July 11-20	12,920		7.7	604	14		70	19	38		234	120	13		.6		390	.53	13,600	252	61	25
July 21-31.....	6,806		--	625	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Aug. 1-10	5,335		--	711	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Aug. 11-20	3,854		7.7	713	10		58	24	64		204	172	25		.6		454	.62	4,720	243	76	36
Aug. 21-31	2,912		--	765	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Sept. 1-10	2,137		--	858	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Sept. 11-20	2,334		7.7	1,030	11		82	33	104		247	291	42		1.7		686	.93	4,320	340	138	40
Sept. 21-30	3,038		--	1,030	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Weighted average	7,612		--	676	--		--	--	--		--	--	--		--		--	--	--	--	--	--

GREEN RIVER BASIN--Continued

GREEN RIVER AT GREEN RIVER, UTAH--Continued

Temperature (°F) of water, May to September 1949
/Once-daily temperature measurement generally between 12 m. and 6 p. m./

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

Temperature (°F) of water, water year October 1949 to September 1950
/Once-daily temperature measurement generally between 12 m. and 6 p. m./

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

GREEN RIVER BASIN--Continued

GREEN RIVER AT GREEN RIVER, UTAH--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	2,210	4,380	26,100	3,770	813	8,280	2,810	150	1,140
2	2,740	2,600	19,200	3,680	872	8,660	2,890	144	1,120
3	2,490	6,100	41,000	3,630	1,210	11,900	2,970	167	1,340
4	2,040	4,700	25,900	3,570	1,080	10,400	2,940	152	1,210
5	1,930	5,550	28,900	3,490	1,050	9,890	2,890	138	1,080
6	1,850	4,650	23,200	3,460	603	5,630	2,790	148	1,110
7	1,790	2,750	13,300	3,430	570	5,280	2,760	180	1,340
8	2,000	1,950	10,500	3,350	532	4,810	2,660	150	1,080
9	2,100	1,600	9,070	3,290	482	4,280	2,610	133	937
10	4,350	900	5,710	3,260	388	3,420	2,660	209	1,500
11	3,910	2,340	s 25,800	3,260	390	3,430	2,660	e180	1,290
12	4,050	9,600	105,000	3,160	326	2,780	2,540	153	1,050
13	3,320	10,000	89,600	3,180	287	2,460	2,350	181	1,150
14	3,130	6,350	53,700	3,240	344	3,010	1,960	198	1,060
15	3,130	3,400	28,700	3,160	250	2,130	1,480	180	573
16	3,260	1,700	15,000	3,070	283	2,350	887	175	419
17	3,320	1,210	10,800	3,070	229	1,900	854	149	344
18	3,600	1,350	13,100	3,130	203	1,720	956	120	310
19	5,080	8,230	s 129,000	3,130	212	1,790	1,090	99	291
20	4,560	4,400	54,200	3,070	207	1,720	1,380	95	354
21	4,870	4,000	52,600	2,990	168	1,360	1,520	115	472
22	5,030	7,120	96,700	2,990	154	1,240	1,760	e170	808
23	4,320	7,550	88,100	3,020	180	1,470	1,890	222	1,130
24	3,940	5,000	53,200	3,050	180	1,460	1,870	187	944
25	3,850	2,650	27,500	3,020	193	1,570	1,930	173	902
26	3,740	1,620	16,400	2,990	205	1,650	1,770	140	669
27	3,790	1,180	12,100	2,940	190	1,510	1,760	114	542
28	3,820	1,100	11,300	2,920	199	1,570	1,870	176	889
29	3,790	1,140	11,700	2,890	e180	1,400	1,960	160	847
30	3,770	857	8,720	2,810	172	1,300	2,080	171	960
31	3,820	818	8,440	--	--	--	2,170	150	879
Total	104,200	e	1,115,000	96,020	--	110,400	64,437	--	27,740

Day	January			February			March		
1	2,210	166	991	2,760	231	1,720	3,260	800	7,040
2	2,260	106	647	3,020	251	2,050	3,430	e800	7,410
3	2,250	184	1,120	3,050	207	1,700	3,680	553	5,490
4	2,200	150	891	2,840	190	1,460	4,170	1,050	11,800
5	2,100	348	1,970	2,540	143	981	7,270	4,980	s 103,000
6	2,050	246	1,360	2,370	166	1,060	8,950	5,170	125,000
7	2,000	304	1,640	2,350	185	1,170	9,320	4,750	120,000
8	2,020	360	1,960	2,490	327	2,200	8,860	3,560	85,200
9	2,020	300	1,640	2,580	336	2,340	9,240	3,300	82,300
10	2,000	246	1,330	2,790	310	2,340	9,450	3,880	99,000
11	1,870	162	818	2,610	e260	1,830	9,150	3,800	93,900
12	1,800	957	957	2,660	211	1,520	7,870	3,680	78,200
13	1,770	119	569	2,660	195	1,400	7,160	2,830	54,700
14	1,890	128	653	2,540	230	1,580	6,620	2,700	48,300
15	1,890	248	1,270	2,540	186	1,280	5,980	1,830	29,500
16	2,060	197	1,100	2,510	201	1,360	5,380	1,380	20,000
17	2,210	e240	1,430	2,460	206	1,370	5,000	1,240	16,700
18	2,490	280	1,880	2,420	163	1,070	4,840	1,620	21,200
19	2,510	345	2,340	2,400	164	1,060	4,660	1,380	17,400
20	2,420	240	1,570	2,440	168	1,110	4,660	1,420	17,900
21	2,370	289	1,850	2,490	189	1,270	4,530	1,450	17,700
22	2,460	286	1,900	2,490	198	1,330	4,500	1,330	16,200
23	2,560	308	2,130	2,560	205	1,420	4,660	1,320	16,600
24	2,580	361	2,510	2,640	250	1,780	4,840	1,560	20,400
25	2,600	465	3,260	2,740	269	1,990	4,840	1,410	18,400
26	2,700	369	2,690	2,890	500	3,900	5,160	1,330	18,500
27	2,780	350	2,630	2,990	595	4,800	4,900	1,410	18,700
28	2,600	248	1,870	3,070	690	5,640	4,630	1,960	24,500
29	2,700	354	2,580	--	--	--	4,520	e1,400	16,300
30	2,640	229	1,630	--	--	--	4,200	1,350	15,300
31	2,790	e230	1,730	--	--	--	4,110	1,320	14,500
Total	71,000	--	50,980	73,900	--	52,730	179,640	--	1,241,000

e Estimated.
s Computed by subdividing day.

GREEN RIVER BASIN--Continued

GREEN RIVER AT GREEN RIVER, UTAH--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	4,020	950	10,300	12,500	2,720	91,800	24,000	3,120	202,000
2	3,820	810	8,350	12,000	2,400	77,800	25,500	2,880	198,000
3	3,650	776	7,650	11,600	2,280	71,400	27,600	3,510	262,000
4	3,630	840	8,230	11,200	2,490	75,300	28,800	3,150	245,000
5	3,820	975	10,100	10,800	1,960	57,200	29,100	3,080	242,000
6	4,410	988	11,800	10,600	2,210	63,300	29,800	3,410	274,000
7	6,650	2,200	39,500	11,300	2,000	61,000	29,100	3,000	236,000
8	7,760	4,850	102,000	11,700	2,510	79,300	29,400	2,930	233,000
9	7,120	e8,350	161,000	12,000	2,120	68,700	29,100	3,140	247,000
10	6,360	8,180	140,000	11,400	2,060	63,400	28,400	2,580	198,000
11	6,260	5,870	99,200	10,500	2,000	56,700	28,000	2,430	184,000
12	8,140	5,010	110,000	9,880	2,540	67,800	26,900	2,900	211,000
13	12,800	8,300	287,000	9,280	2,230	55,900	26,900	2,580	187,000
14	11,500	3,380	260,000	8,910	2,090	50,300	27,000	2,320	169,000
15	9,960	6,280	169,000	8,950	2,300	55,600	26,400	2,400	171,000
16	8,860	4,500	108,000	9,490	2,000	51,200	26,100	2,200	155,000
17	9,110	4,150	102,000	11,500	2,600	80,700	25,800	2,190	153,000
18	12,200	5,750	189,000	14,500	3,650	143,000	26,200	2,030	144,000
19	14,400	6,280	244,000	18,400	4,180	208,000	26,600	2,180	157,000
20	14,000	5,910	223,000	21,200	4,600	263,000	27,000	1,940	141,000
21	14,500	5,920	232,000	22,700	4,600	282,000	27,200	1,710	126,000
22	15,400	5,780	240,000	23,800	4,160	267,000	26,700	1,970	142,000
23	14,700	4,800	191,000	24,200	4,040	264,000	26,600	1,960	141,000
24	14,000	4,470	169,000	24,400	3,830	252,000	25,600	2,190	151,000
25	14,800	4,360	174,000	25,400	3,850	264,000	24,600	2,300	153,000
26	17,200	5,220	242,000	26,600	3,800	273,000	23,800	1,860	120,000
27	18,400	4,950	246,000	27,800	3,930	295,000	23,100	1,670	104,000
28	17,000	4,400	202,000	27,900	3,350	252,000	22,400	1,770	107,000
29	14,500	3,400	133,000	27,600	3,650	272,000	21,800	1,690	99,500
30	13,600	2,940	108,000	25,400	3,710	254,000	20,400	1,770	97,500
31	--	--	--	23,900	3,340	216,000	--	--	--
Total	312,570	--	4,227,000	517,410	--	4,632,000	789,900	--	5,250,000

Day	July			August			September		
1	19,200	1,740	90,200	5,580	820	12,400	2,350	86	546
2	17,600	1,960	93,100	5,510	480	7,140	2,260	78	476
3	16,600	1,240	55,600	5,540	475	7,110	2,210	110	656
4	16,000	1,510	65,200	5,850	610	9,630	2,170	e65	381
5	15,400	1,350	56,100	5,910	695	11,100	2,100	56	318
6	15,000	1,180	47,800	5,610	566	8,570	2,080	54	303
7	15,600	1,800	82,500	5,250	580	8,220	2,020	46	251
8	17,800	5,920	s 292,000	4,940	361	4,820	2,000	81	437
9	16,900	5,760	263,000	4,690	268	3,390	2,080	370	2,080
10	16,000	3,200	138,000	4,470	246	2,970	2,100	820	4,650
11	15,600	2,140	90,100	4,350	170	2,000	2,170	e1,070	6,270
12	15,600	2,540	107,000	4,260	151	1,740	2,130	1,000	5,750
13	14,800	3,680	147,000	4,170	162	1,820	2,080	903	5,070
14	14,000	2,650	100,000	4,050	127	1,390	2,080	1,130	6,350
15	13,000	2,450	86,000	3,910	108	1,140	2,060	1,110	6,170
16	12,400	1,990	66,600	3,770	84	855	2,040	950	5,230
17	11,900	1,600	51,400	3,570	82	790	2,420	950	6,210
18	11,400	2,710	83,400	3,460	234	2,190	2,810	810	6,150
19	10,700	6,850	198,000	3,490	134	1,260	2,760	700	5,220
20	9,790	3,100	81,900	3,510	238	2,260	2,790	500	3,770
21	9,030	1,380	33,600	3,570	166	1,600	2,860	1,210	9,340
22	8,340	1,320	29,700	3,460	104	972	2,860	1,740	13,400
23	7,720	1,020	21,300	3,290	100	888	2,940	1,580	12,000
24	7,190	740	14,400	3,160	85	725	2,970	1,070	8,580
25	6,720	730	13,200	2,990	86	694	3,020	892	7,270
26	6,300	680	11,600	2,840	90	690	3,180	790	6,780
27	6,120	587	9,700	2,710	96	702	3,400	800	7,340
28	5,980	468	7,560	2,640	84	599	3,240	660	5,770
29	5,810	489	7,670	2,510	108	732	3,050	758	6,240
30	5,950	880	14,100	2,460	164	1,090	2,860	567	4,380
31	5,710	e900	13,900	2,400	92	596	--	--	--
Total	370,160	--	2,372,000	123,920	--	100,100	75,090	--	147,900

Total discharge for year (second-foot days) 2,778,247
Total load for year (tons) 19,330,000

e Estimated.
s Computed by subdividing day.

GREEN RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN GREEN RIVER BASIN

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

Date of collection	Mean discharge (second-feet)	Temperature (° F)	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)	Boron (B)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
BRUSH CREEK NEAR JENSEN, UTAH																						
Oct. 15, 1949	2.0			1,400			154	56	82		286	530	5				968	1.32	5.2	614	380	23
June 4, 1950	163			281							118	46	2.0							a131	34	
DUCHESNE RIVER AT MYTON, UTAH																						
Oct. 14, 1949	201			1,010							311		28									
June 4, 1950	2,630			390	9.7		44	14	17		173	53	5		0.5		228	0.31	1,620	167	26	18
STRAWBERRY RIVER AT DUCHESNE, UTAH																						
Oct. 14, 1949	105			772							383	86	19									
June 4, 1950	611			519	17		54	23	26		283	39	9		1.8		309	0.42	510	229	0	20
UINTA RIVER AT FORT DUCHESNE, UTAH																						
Oct. 14, 1949	6.0			1,400			98	85	123		349	483	51				1,010	1.38	16	594	308	31
June 4, 1950	442			188							75	27								a76	15	
WHITE RIVER 8.5 MILES ABOVE RANGELY, COLO.																						
Oct. 15, 1949				776							207	159	50									
June 4, 1950				372	15		49	10	14		162	42	12		1.2		223	0.30		163	31	16
WHITE RIVER NEAR WATSON, UTAH																						
Oct. 15, 1949	515			848			72	28	67		222	185	46				507	0.69	705	294	112	33
June 4, 1950	2,160			425							175	57	15							a176	32	
WHITE RIVER NEAR OURAY, UTAH																						
Oct. 14, 1949				960			73	30	94		232	237	52				600	0.82		306	116	40
June 4, 1950				456	15		46	16	25		172	71	14		0.6		272	.37		181	40	23
DOUGLAS CREEK AT RANGELY, COLO.																						
Oct. 15, 1949				2,240							393	--										
June 4, 1950				1,130	19		66	61	108		345	339	9				774	1.05		416	133	36

a Determined by Schwarzenbach method.

DIRTY DEVIL RIVER NEAR HITE, UTAH

LOCATION.--Samples collected near the mouth, above backwater of the Colorado River, about 3 miles downstream from gaging station near Hite, Garfield County.
RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1950.
Water temperatures: May 1949 to September 1950.
EXTREMES, 1949-50.--Dissolved solids: Maximum, 6,310 ppm June 21-30; minimum, 1,110 ppm Feb. 1-10.
Hardness: Maximum, 2,790 ppm June 21-30; minimum, 640 ppm Feb. 1-10.
Water temperatures: Maximum observed 97°F July 2; minimum, freezing point on several days during December to February.
EXTREMES, 1947-50.--Dissolved solids: Maximum, 6,310 ppm June 21-30,1950; minimum, 708 ppm March 21-24, 26-31, 1948.
Hardness: Maximum, 2,790 ppm June 21-30, 1950; minimum, 454 ppm Mar. 21-24, 26-31, 1948.
Water temperatures, (May 1949 to September 1950): Maximum observed, 97°F July 2, 1950; minimum, freezing point on several days during winter months .
REMARKS.--Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Prior to July 8, 1948 samples were collected at gaging station near Hanksville.

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

Date of collection	Mean discharge (second-feet)	Temperature (°F)	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)	Boron (B)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 1-10, 1949			--	3,170	--		--	--	--		--	--	135		--		--	--		--	--	--
Oct. 11-18, 20			7.7	2,820	19		496	96	111		182	1,490	120		5.0		2,430	3.30		1,630	1,480	13
Oct. 19			--	1,220	--		--	--	--		--	--	--		--		--	--		--	--	--
Oct. 21-31			--	2,480	--		--	--	--		--	--	122		--		--	--		--	--	--
Nov. 1-10			--	2,060	--		--	--	--		--	--	115		--		--	--		--	--	--
Nov. 11-20			7.8	1,950	24		292	62	89		188	828	112		2.4		1,500	2.04		984	830	16
Nov. 21-30			--	1,910	--		--	--	--		--	--	115		--		--	--		--	--	--
Dec. 1-10			--	1,700	--		--	--	--		--	--	115		--		--	--		--	--	--
Dec. 11-20			7.5	1,880	25		256	78	69		202	734	125		2.6		1,390	1.89		959	794	13
Dec. 21-31			--	1,840	--		--	--	--		--	--	--		--		--	--		--	--	--
Jan. 1-10, 1950			--	2,320	--		--	--	--		--	--	--		--		--	--		--	--	--
Jan. 11-20			7.8	1,620	37		216	49	94		238	609	80		2.5		1,200	1.65		740	546	22
Jan. 21-31			7.9	1,540	25		202	39	96		178	572	92		2.1		1,120	1.52		664	518	24
Feb. 1-10			7.8	1,570	26		184	44	109		194	542	108		2.6		1,110	1.51		640	481	27
Feb. 11-19			7.9	1,630	25		202	42	116		176	606	107		2.9		1,190	1.62		676	532	27
Feb. 20-28			8.0	1,960	26		231	50	155		186	741	136		3.9		1,430	1.94		782	630	30
Mar. 1-10			8.0	1,940	26		219	52	157		189	732	129		2.9		1,410	1.92		760	606	31
Mar. 11-20			7.7	1,700	28		190	52	121		188	607	116		1.9		1,210	1.65		688	534	28
Mar. 21-31			7.8	1,820	26		196	54	148		198	649	135		4.1		1,310	1.78		711	549	31
Apr. 1-10			7.7	2,030	27		212	62	172		198	726	170		1.3		1,470	2.00		784	622	32
Apr. 11-20			7.8	2,050	28		226	70	164		186	805	154		.7		1,540	2.09		852	700	29
Apr. 21-30			7.7	2,670	30		286	83	243		202	1,020	251		1.7		2,010	2.73		1,060	890	33

DIRTY DEVIL RIVER BASIN--Continued

DIRTY DEVIL RIVER NEAR HITE, UTAH--Continued

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

Date of collection	Mean discharge (second-feet)	Temperature (° F)	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)	Boron (B)	Dissolved solids			Hardness as $CaCO_3$		Percent sodium
																	Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate	
May 1-10, 1950			7.7	2,770	29		288	84	257		228	1,020	264		1.4		2,060	2.80		1,060	877	34
May 11-20			7.5	2,720	33		292	87	242		237	1,020	251		1.1		2,040	2.77		1,090	892	33
May 21-31			7.5	3,300	40		364	114	303		243	1,350	305		.7		2,600	3.54		1,380	1,180	32
June 1-8			7.5	3,860	41		400	128	390		273	1,470	438		.7		3,000	4.08		1,520	1,300	36
June 9-20			7.3	8,020	33		655	238	1,080		526	2,140	1,630		1.3		6,040	8.21		2,610	2,180	47
June 21-30			7.3	8,600	32		640	291	1,110		424	2,240	1,790		1.7		6,310	8.58		2,790	2,450	46
July 1-3			--	7,750	--		--	--	--		--	--	1,620		--		--	--		--	--	--
July 8-9			--	4,240	--		--	--	--		--	--	225		--		--	--		--	--	--
July 10			--	2,320	--		--	--	--		--	--	120		--		--	--		--	--	--
July 11-20			7.2	4,240	20		616	107	390		227	2,170	268		1.4		3,680	5.00		1,980	1,790	30
July 21-31			--	3,400	--		--	--	--		--	--	--		--		--	--		--	--	--
Aug. 1-10			--	4,460	--		--	--	--		--	--	--		--		--	--		--	--	--
Aug. 11-20			7.2	4,770	32		658	128	467		224	2,210	495		1.4		4,100	5.58		2,170	1,980	32
Aug. 21-31			--	3,980	--		--	--	--		--	--	--		--		--	--		--	--	--
Sept. 1-10			--	3,740	--		--	--	--		--	--	--		--		--	--		--	--	--
Sept. 11-18			7.2	3,530	20		612	103	216		195	1,950	162		1.7		3,160	4.30		1,950	1,790	19
Sept. 20			--	1,870	19		--	--	--		177	758	22		1.1		--	--		--	--	--
Sept. 21-30			--	3,050	--		--	--	--		--	--	--		--		--	--		--	--	--

DIRTY DEVIL RIVER BASIN--Continued

DIRTY DEVIL RIVER NEAR HITE, UTAH--Continued

Temperature (°F) of water, water year October 1949 to September 1950
(Once-daily temperature measurement generally between 9 a. m. and 2 p. m.)

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	65	48	45	34	36	47	58	80	78	95	--	89
2	63	50	40	36	33	49	54	61	77	97	83	76
3	65	48	40	32	32	48	48	60	80	89	81	88
4	65	50	40	32	34	53	51	60	68	86	80	81
5	65	50	38	32	34	50	48	88	73	79	83	80
6	63	49	38	32	36	48	51	89	72	95	79	81
7	--	48	41	32	42	45	53	57	75	86	77	83
8	--	49	40	33	42	44	53	57	67	76	82	75
9	52	48	42	34	--	47	58	57	87	74	81	73
10	50	48	40	35	41	48	63	57	80	78	74	71
11	50	48	36	33	41	--	53	63	--	81	--	71
12	54	45	32	--	40	--	--	62	--	83	87	71
13	58	44	32	34	39	44	54	78	83	78	80	75
14	65	44	32	34	38	45	58	89	82	78	86	67
15	58	45	35	34	38	48	58	72	77	77	93	65
16	61	45	--	36	38	48	57	94	86	--	77	66
17	60	48	--	34	39	47	61	86	83	73	85	63
18	57	45	37	36	40	45	60	73	76	--	86	66
19	50	--	38	36	42	45	58	64	75	77	--	--
20	45	45	37	36	44	47	63	--	82	72	--	65
21	--	44	33	38	44	46	61	--	87	74	87	63
22	--	45	32	36	44	51	56	71	--	89	89	70
23	--	44	32	40	42	48	59	80	89	85	84	63
24	50	43	32	40	44	51	60	85	--	87	73	64
25	53	43	32	33	--	48	63	86	86	85	75	65
26	54	44	33	32	--	49	63	70	79	83	89	63
27	50	44	33	32	50	45	59	85	95	81	89	64
28	54	43	32	33	52	47	60	70	94	81	81	65
29	--	43	33	39	--	55	--	68	96	80	83	62
30	50	43	32	37	--	--	61	72	94	75	91	60
31	50	--	32	37	--	54	--	73	--	--	88	--
Average	56	46	36	35	40	48	57	89	82	82	83	71

SAN JUAN RIVER BASIN

SAN JUAN RIVER AT ROSA, N. MEX.

LOCATION.--At gaging station about 75 feet upstream from highway bridge, a quarter of a mile downstream from Piedra River, and 1 mile north of Rosa, Rio Arriba County.
DRAINAGE AREA.--1,990 square miles, approximately.
RECORDS AVAILABLE.--Water temperatures: March 1949 to September 1950 (discontinued).
Sediment records: March 1949 to September 1950 (discontinued).
EXTREMES, 1949-50.--Water temperatures: Maximum,observed, 80°F Aug. 10; minimum, freezing point on many days during winter months.
Sediment loads: Maximum daily, 33,800 tons Apr. 21; minimum daily, 3 tons Oct. 10.
EXTREMES, March 1949 to September 1950.--Water temperatures: Maximum, 80°F Aug. 10, 1950; minimum, freezing point on many days during winter months.
Sediment loads: Maximum daily, 77,400 tons Apr. 13, 1949; minimum daily, 3 tons Oct. 10, 1949.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1179.

Temperature (°F) of water, water year October 1949 to September 1950
/Once-daily temperature measurement generally between 6 a. m. and 9 a. m./

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

a Observations made after about 5 p. m.

SAN JUAN RIVER BASIN--Continued

SAN JUAN RIVER AT ROSA, N. MEX.--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	405	171	187	257			210	11	6
2	314	21	18	260	9	6	210		
3	276	21	16	251			180		
4	251	7	5	251			175		
5	239	9	6	248			162		
6	236	6	4	248			127		
7	224	13	8	236			141	54	25
8	213	14	8	230			168		
9	222	6	4	230	14	9	224		
10	311	3	3	245			236		
11	276	8	6	294			155		
12	276	15	11	263			59		
13	282	10	8	216			93		
14	285	11	8	236			114		
15	276	9	7	257			140		
16	272			269			165	22	9
17	272			266			180		
18	291			272	11	8	200		
19	321			266			200		
20	351			260			200		
21	298	42	34	263			180		
22	288			254			150		
23	288			236			150		
24	317			219			150		
25	282			224			150		
26	279			219	11	7	160	16	7
27	282			210			160		
28	279			213			170		
29	279	9	7	216			160		
30	272			216			200		
31	263			--	--	--	200		
Total	8,720	--	681	7,325	--	232	5,189	--	397

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	200			180			567	e 2,660	4,100
2	200			180			576	2,160	3,390
3	180			190			514	1,550	2,150
4	140			220	39	23	448	1,960	2,370
5	100			250			444	942	1,130
6	100	17	8	300			523	1,780	2,490
7	130			440	448	530	421	870	989
8	160			489	485	640	355	320	307
9	190			369	310	309	358	260	271
10	200			308	225	187	365	158	158
11	200			257	88	61	348	188	177
12	200			251	112	76	327	196	173
13	200			242	150	98	272	98	72
14	180			208	210	118	251	135	91
15	160			224	270	163	294	160	127
16	160			224	232	140	311	124	104
17	200	14	7	260	302	212	341	330	304
18	200			304	528	433	444	720	863
19	200			327	925	817	458	836	1,030
20	200			351	912	864	460	470	584
21	210			409	1,220	1,350	468	390	493
22	230			358	830	802	485	222	291
23	240			304	440	361	518	266	372
24	240			334	510	460	587	444	680
25	220			365	840	828	652	790	1,390
26	200	24	13	390	1,770	1,880	581	410	643
27	160			604	4,520	7,370	472	320	408
28	160			662	3,240	5,790	409	208	230
29	200			--	--	--	387	117	122
30	200			--	--	--	405	98	105
31	200			--	--	--	497	161	216
Total	5,820	--	288	9,000	--	23,610	13,516	--	25,830

e Estimated or interpolated.

SAN JUAN RIVER BASIN--Continued

SAN JUAN RIVER AT ROSA, N. MEX.--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	755	1,080	2,200	2,230	322	1,940	2,920	380	3,000
2	1,140	4,460	13,700	2,290	374	2,310	2,920	400	3,150
3	1,500	4,680	19,000	2,360	341	2,170	2,920	305	2,400
4	1,370	2,870	10,600	2,290	276	1,710	2,550	161	1,110
5	1,170	1,360	4,300	2,000	316	1,710	2,170	136	797
6	1,330	1,750	6,280	1,690	100	456	2,060	150	834
7	1,410	1,880	7,160	1,450	100	392	2,360	174	1,110
8	1,790	4,260	20,600	1,290	73	254	2,170	124	727
9	1,900	2,160	11,100	1,170	87	275	1,950	66	347
10	1,540	1,380	5,740	1,210	68	222	1,900	62	318
11	1,290	939	3,270	1,250	74	250	1,950	80	421
12	1,330	1,140	4,090	1,370	92	340	2,000	70	378
13	1,410	826	3,140	1,370	74	274	1,900	52	267
14	1,540	1,250	5,200	1,330	62	223	1,790	42	203
15	1,540	1,520	6,320	1,410	88	335	1,690	31	141
16	1,450	850	3,330	1,540	250	1,040	1,640	39	173
17	1,370	680	2,520	1,790	430	2,060	1,590	38	163
18	1,500	1,200	4,860	1,950	254	1,340	1,450	30	117
19	1,790	1,530	7,390	2,060	214	1,190	1,370	29	107
20	2,000	2,510	13,600	1,950	116	611	1,210	26	85
21	2,420	5,180	33,800	2,170	220	1,290	1,100	21	62
22	2,760	3,660	27,300	2,420	400	2,610	1,060	29	83
23	2,920	3,930	31,000	2,620	350	2,480	1,330	54	194
24	3,070	2,980	24,700	2,690	422	3,060	1,030	17	47
25	2,920	1,820	14,300	2,760	540	4,020	964	13	34
26	2,690	1,200	8,720	2,550	309	2,130	901	14	34
27	2,620	764	5,400	2,480	190	1,270	811	12	26
28	2,550	657	4,520	2,420	100	653	730	10	20
29	2,550	942	6,490	2,290	108	668	652	12	21
30	2,290	616	3,810	2,420	150	960	628	45	76
31	--	--	--	2,690	250	1,820	--	--	--
Total	55,915	--	314,400	61,510	--	40,100	49,716	--	16,440

Day	July			August			September		
1	572	10	15	230			71		
2	536	19	20	208			70		
3	506	26	36	200	26	15	65		
4	480	28	36	205			60	48	8
5	460	35	43	199			60		
6	460	44	55	197			63		
7	448	46	56	230			65	2,780	488
8	458	26	32	208			105	2,920	828
9	586	299	473	168	19	9	98	2,410	638
10	581	1,070	1,680	160			108	2,480	723
11	777	429	975	150			98	310	82
12	652	980	1,730	140			96	138	36
13	563	320	486	140			94	135	34
14	609	550	904	134			87	50	12
15	558	1,400	2,110	127			83	e 40	9
16	554	550	823	116			81	1,210	265
17	497	108	145	116			82	1,170	259
18	480	68	84	114			105	3,300	936
19	493	73	97	105	40	12	227	6,750	4,140
20	464	114	143	98			643	14,700	s 25,600
21	417	83	93	90			436	1,600	1,880
22	383	113	117	87			304	168	138
23	387	254	265	83			327	300	265
24	362	2,000	1,950	79			351	950	900
25	348	500	470	78			341	2,500	2,300
29	355	130	125	81			288	300	233
27	331	350	313	96			254	43	29
28	301	180	146	101	48	11	224	52	31
29	311	62	52	90			205	50	28
30	291	51	40	83			186	e 50	25
31	260	26	18	78			--	--	--
Total	14,458	--	13,530	4,191	--	359	5,277	--	39,900

Total discharge for year (second-foot-days) 240,637
Total load for year (tons) 475,600

e Estimated or interpolated.
s Computed by subdividing day.

SAN JUAN RIVER AT ROSA, N. MEX.--Continued

Particle-size analyses of suspended sediment, February 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	
Feb. 9, 1950	12:30 p.m.	432	645	2,450	31	45	56	70	--	87	--	--		--		DSWCM
Feb. 20	8:00 a.m.	307	598	2,210	41	65	82	87	--	--	--	--		--		DWCM
Feb. 27	6:30 p.m.	777	5,920	3,590	38	59	73	89	94	98	100	--		--		BWCM
Mar. 2	11:00 a.m.	609	2,340	8,100	18	37	52	68	--	92	--	--		--		DSWCM
Mar. 20	6:00 p.m.	493	427	1,500	29	42	54	70	--	92	--	--		--		DSWCM
Apr. 2	8:00 a.m.	1,250	6,540	4,630	9	13	19	27	41	68	89	98		100		BSWCM
Apr. 5	11:45 a.m.	1,340	467	1,920	12	18	24	35	--	63	75	89		100		DSWCM
June 1	6:30 a.m.	3,170	762	2,500	--	--	--	--	--	37	57	78		97		S
July 11	6:30 p.m.	789	15,900	4,150	30	46	64	80	--	--	--	--		--		DWCM
July 24	6:30 p.m.	334	1,460	2,090	23	36	49	80	--	--	--	--		--		DWCM
Sept. 20	7:30 a.m.	586	20,500	2,620	44	60	76	88	94	97	98	--		--		BWCM

SAN JUAN RIVER NEAR BLANCO, N. MEX.

LOCATION.--At bridge on State Highway 17 half a mile downstream from gaging station which is 1 mile upstream from Canyon Largo and 1½ miles east of Blanco, San Juan County.
DRAINAGE AREA.--3,560 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1950.
Water temperatures: March 1949 to September 1950.
Sediment records: March 1949 to September 1950.
EXTREMES, 1949-50.--Water temperatures: Maximum observed, 77°F July 3; minimum, freezing point on several days during winter months.
Sediment loads: Maximum daily, 24,100 tons April 23; minimum daily, 10 tons Nov. 23-Dec. 2.
EXTREMES, 1949-50.--Water temperatures: Maximum observed, 78°F Aug. 1, 1949; minimum, freezing point on several days during winter months.
Sediment loads: Maximum daily, 141,000 tons July 11, 1949; minimum daily, 10 tons Nov. 23-Dec. 2, 1949.
REMARKS.--Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1179.

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

Date of collection	Mean discharge (second-feet)	Temperature (°F)	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)	Boron (B)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 1-10, 1949	420		7.9	337	12	0.02	36	8.1	26		125	67	5.2	0.4	0.4	a0.1	217	0.30	248	124	21	32
Oct. 11-20	447		7.9	335	12	.02	36	7.8	26		122	67	5.5	.4	.3	a.1	215	.29	259	122	22	32
Oct. 21-31	374		7.9	374	13	.03	38	8.1	29		128	76	5.0	.4	.5	a.1	233	.32	235	128	24	33
Nov. 1-10	273		7.8	412	13	.02	42	8.8	34		139	88	5.8	.4	.3	a.1	261	.35	192	141	27	34
Nov. 11-20	266		--	436	16	--	44	9.1	37		139	100	6.0	--	.4	--	281	.38	202	148	34	35
Nov. 21-30	228		--	449	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--
Dec. 1-10	164		--	486	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--
Dec. 11-20	159		7.7	566	17	--	58	12	48		174	138	8.0	--	1.1	--	368	.50	158	194	52	35
Dec. 21-31	197		--	506	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--
Jan. 1-10, 1950	204		--	494	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--
Jan. 11-20	224		7.7	454	16	--	49	9.3	35		144	105	6.5	--	.5	--	292	.40	177	160	42	32
Jan. 21-31	275		--	447	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--
Feb. 1-10	374		--	445	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--
Feb. 11-20	317		7.8	477	13	--	47	11	39		135	122	7.0	--	.6	--	307	.42	263	162	52	34
Feb. 21-28	525		--	482	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--
Mar. 1-10	594		--	498	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--
Mar. 11-20	422		7.9	492	15	--	54	14	32		151	126	5.0	--	.5	--	320	.44	365	192	68	27
Mar. 21-31	519		--	394	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--
Apr. 1-10	1,354		--	286	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--
Apr. 11-20	1,494		7.8	221	15	--	26	6.4	10		86	37	2.2	.3	.4	--	139	.19	561	92	21	19
Apr. 21-30	2,683		--	179	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--
May 1-10	1,859		--	183	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--
May 11-20	1,650		7.7	184	15	--	22	4.2	9.0		70	30	2.2	--	.6	--	117	.16	521	72	15	21
May 21-31	2,492		--	147	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--

a Reported boron concentration is less than figure indicated.

June 1-10	2,465		--	150	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
June 11-20	1,784		7.7	160	14	--	19	3.3	9.4	65	23	2.5	--	.9	--	104	.14	501	61	7.5	25	
June 21-30	1,102		--	232	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
July 1-10	718		--	285	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
July 11-20	749		7.3	312	15	--	35	7.7	21	127	52	3.8	--	1.8	--	199	.27	402	119	15	28	
July 21-31	498		--	328	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Aug. 1-10	280		--	378	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Aug. 11-20	220		7.7	404	10	--	40	8.0	36	147	78	6.5	--	1.2	--	252	.34	150	133	12	37	
Aug. 21-31	191		--	430	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Sept. 1-6, 9-10	200		--	467	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Sept. 7-8	332		--	811	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Sept. 11-20	343		7.4	407	12	--	43	8.0	34	152	77	6.0	--	1.0	--	256	.35	237	140	16	34	
Sept. 21-30	534		--	369	--	--	41	8.8	25	--	--	--	--	--	--	--	--	--	138	--	28	
Weighted average	739		--	266	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	

SAN JUAN RIVER BASIN--Continued

SAN JUAN RIVER NEAR BLANCO, N. MEX.--Continued

Temperature (°F) of water, water year October 1949 to September 1950
(Once-daily temperature measurement, generally between 5 p.m. and 8 p.m.; during period Oct. 19 to Dec. 10, measurement between 7 a.m. and 10 a.m.)

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	63	41	37	34	32	44	56	55	61	75	74	--
2	63	40	36	35	35	45	51	b55	61	76	73	71
3	64	41	35	32	35	50	54	55	61	77	76	72
4	65	41	35	32	35	48	52	45	56	76	75	73
5	62	41	36	b32	34	b46	52	48	60	64	74	71
6	63	42	33	b32	35	45	54	52	58	73	72	71
7	59	42	38	34	37	41	52	50	64	75	75	69
8	58	39	38	34	37	44	54	51	59	74	74	70
9	50	42	38	34	36	43	46	57	61	76	73	69
10	52	44	39	32	37	45	51	54	65	76	71	64
11	53	42	30	32	35	47	54	61	68	75	--	65
12	56	39	32	33	34	40	53	61	67	76	72	66
13	58	39	32	35	37	44	54	58	63	73	73	65
14	61	39	b33	32	37	43	53	61	67	74	72	64
15	60	38	b34	32	40	43	52	61	71	74	70	61
16	59	39	32	35	40	48	55	63	70	73	72	61
17	58	38	32	33	44	51	58	65	72	74	71	61
18	54	38	b33	35	43	49	58	60	66	70	70	60
19	50	39	34	35	45	51	55	58	68	75	70	63
20	45	39	34	35	43	49	56	59	68	76	71	63
21	41	40	34	36	40	40	57	61	71	74	71	61
22	45	38	33	35	39	49	55	60	64	a68	71	59
23	43	38	35	35	40	52	55	57	70	76	--	61
24	45	39	35	33	48	52	52	59	70	72	70	60
25	44	37	33	32	48	48	52	57	71	74	71	59
26	45	38	34	34	50	43	54	60	76	73	71	60
27	44	35	34	33	46	40	54	59	72	74	73	62
28	43	39	b33	32	46	43	55	60	73	74	72	a54
29	44	38	b35	33	--	49	54	59	73	76	72	62
30	44	37	35	32	--	50	65	62	76	73	72	62
31	42	--	34	32	--	52	--	61	--	a67	71	--
Average	52	39	34	33	40	46	54	58	67	74	72	64

a Observations made between 7 a.m. and 10 a.m.
b Observations made between 10:30 a.m. and 2:00 p.m.

SAN JUAN RIVER BASIN--Continued

SAN JUAN RIVER NEAR BLANCO, N. MEX.--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	630	2,000	3,400	303			202	17	10
2	490	297	393	287			194		
3	442	137	163	290			182		
4	417	102	115	284	(e)	15	160		
5	393	78	83	274			138		
6	366	50	49	262			128	30	13
7	352	62	59	253			130		
8	341	44	40	256			140		
9	352	42	40	265			165		
10	417	32	36	259	15	11	200		
11	490	44	58	290			190		
12	454	38	47	324			105		
13	454	34	42	284			100		
14	459	46	57	250			100		
15	446	40	48	262			120		
16	417	34	38	259			150	32	14
17	421	38	43	253			180		
18	417	39	44	247	16	11	200		
19	442			244			215		
20	472			250			230		
21	472			247			215		
22	413			247			160		
23	409			241			160		
24	430			232			165		
25	401	(e)	31	224			185		
26	348			232	17	10	205	50	26
27	341			224			200		
28	341			216			205		
29	331			210			215		
30	317			207			225		
31	314			--	--	--	230	36	20
Total	12,789	--	5,160	7,676	--	346	5,394	--	544

Day	January			February			March		
1	240			244			793	3,720	7,960
2	250			227			683	1,880	3,430
3	260			230			722	1,580	3,080
4	215			250	42	29	599	1,760	2,850
5	190			281			550	859	1,280
6	145	36	20	324			579	684	1,070
7	160			485	402	526	625	662	1,120
8	175			700	2,730	5,180	485	609	797
9	205			564	2,150	3,270	446	328	395
10	195			430	856	994	463	230	288
11	195			393	435	462	446	184	222
12	195			324	250	219	425	187	215
13	205			287	200	155	405	243	266
14	205			232	164	103	348	119	112
15	235	34	20	241	94	61	341	132	122
16	221			244	92	61	374	131	132
17	230			259	110	77	390	78	82
18	241			334	105	95	425	106	122
19	256			413	818	912	550	218	324
20	262			442	1,140	1,360	512	383	529
21	221			499	1,160	1,560	555	366	548
22	284			508	1,090	1,500	535	242	350
23	303			438	958	1,130	574	182	282
24	324	55	41	413	671	748	545	159	234
25	324			450	395	480	584	308	486
26	303			485	631	826	678	391	716
27	253			535	792	1,140	555	217	325
28	238			874	1,920	4,530	442	120	143
29	265			--	--	--	409	96	106
30	265	42	29	--	--	--	390	57	60
31	244			--	--	--	446	75	90
Total	7,304	--	848	11,106	--	25,540	15,874	--	27,740

e Estimated or interpolated.

SAN JUAN RIVER BASIN--Continued

SAN JUAN RIVER NEAR BLANCO, N. MEX.--Continued

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

Day	April			May			June		
	Mean discharge (secoad-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean coacentration (ppm)	Tons per day		Mean concentratioa (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	594	172	276	2,200	385	2,290	2,800	846	6,400
2	1,010	1,500	4,090	2,200	290	1,720	2,950	738	5,880
3	1,410	8,950	2,320	2,320	387	2,420	2,880	439	3,410
4	1,460	2,280	8,990	2,320	328	2,050	2,800	270	2,040
5	1,280	920	3,180	2,260	290	1,770	2,390	378	2,440
6	1,240	421	1,410	1,860	204	1,020	2,080	214	1,200
7	1,320	598	2,130	1,550	116	485	2,320	304	1,900
8	1,460	953	3,760	1,380	140	514	2,390	336	2,170
9	2,020	2,150	11,700	1,280	87	301	2,080	212	1,190
10	1,750	1,080	5,100	1,240	76	254	1,960	240	1,270
11	1,320	359	1,280	1,320	77	274	1,960	96	508
12	1,280	226	781	1,410	86	327	2,060	104	584
13	1,410	308	1,170	1,500	148	599	2,080	112	629
14	1,500	336	1,360	1,460	107	422	1,960	165	873
15	1,550	276	1,160	1,460	71	280	1,800	81	394
16	1,550	252	1,050	1,600	156	674	1,750	80	378
17	1,410	206	784	1,750	186	879	1,650	84	374
18	1,360	264	969	1,960	386	2,040	1,600	76	328
19	1,650	460	2,140	2,020	439	2,390	1,500	69	279
20	1,910	1,000	5,160	2,020	182	993	1,460	135	532
21	2,260	2,460	15,000	2,020	372	2,030	1,280	52	180
22	2,730	3,210	23,700	2,390	572	3,690	1,240	118	395
23	3,020	2,980	24,100	2,590	932	6,520	1,500	528	2,140
24	3,180	1,800	15,500	2,660	670	4,810	1,320	101	360
25	3,020	986	8,040	2,800	1,300	9,830	1,120	93	281
26	2,730	624	4,600	2,800	242	1,830	1,040	71	199
27	2,520	569	3,870	2,520	246	1,670	950	64	164
28	2,460	472	3,140	2,460	330	2,190	881	50	119
29	2,520	742	5,050	2,320	210	1,320	830	48	108
30	2,390	308	1,990	2,260	184	1,120	855	60	139
31	--	--	--	2,590	352	2,460	--	--	--
Total-	55,314	--	170,400	62,500	--	59,170	53,506	--	36,860
	July			August			September		
1	763	44	91	366	84	83	179	33	16
2	672	56	102	310	95	80	160	38	16
3	769	74	154	250	87	59	156	41	17
4	722	50	97	250	97	65	151	33	13
5	711	52	100	262	80	57	151	41	17
6	722	54	105	278	82	62	153	e 40	17
7	678	488	893	287	105	81	343	1,780	s 6,510
8	678	135	247	300	94	76	320	2,920	2,520
9	683	180	332	268	91	66	300	1,150	932
10	781	122	257	232	91	57	352	404	364
11	799	762	1,640	224	85	51	300	344	279
12	861	1,080	2,510	238	78	50	280	169	128
13	799	1,130	2,440	235	76	48	260	172	121
14	751	1,040	2,110	241	78	51	256	167	115
15	800	316	683	224	71	43	253	107	73
16	760	756	1,550	210	65	37	250	111	75
17	720	434	844	202	61	33	253	108	74
18	680	166	305	207	103	58	265	700	501
19	640	110	190	210	70	40	468	1,550	1,960
20	683	113	208	213	76	44	849	4,740	10,900
21	635	112	192	205	71	39	933	5,100	12,800
22	579	105	164	189	79	40	604	2,300	3,750
23	651	101	178	177	87	42	560	514	777
24	584	141	222	174	107	50	569	1,030	1,580
25	517	150	209	172	108	50	672	1,140	2,070
26	512	2,880	3,980	174	61	29	540	973	1,420
27	425	270	310	197	95	51	405	937	1,020
28	417	258	290	213	107	62	374	242	244
29	378	256	261	213	79	45	366	239	236
30	386	112	117	194	61	32	317	159	136
31	393	115	122	192	65	34	--	--	--
Total-	20,149	--	20,900	7,107	--	1,620	11,039	--	48,700

Total discharge for year (second-foot-days) 269,758
Total load for year (tons) 397,900

e Estimated or interpolated.
s Computed by subdividing day.

SAN JUAN RIVER NEAR BLANCO, N. MEX.--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. 1, 1949	5:15 p.m.	574	1,190	826	62	76	89	98	100	--	--	--		--		BWCM
Feb. 10, 1950	7:40 a.m.	421	1,090	3,340	52	67	80	89	--	--	--	--		--		DWCM
Feb. 20	9:30 a.m.	463	1,160	4,060	44	62	80	91	--	--	--	--		--		DWCM
Mar. 7	7:30 a.m.	656	717	2,260	36	53	70	85	--	--	--	--		--		DWCM
Apr. 2	8:00 a.m.	894	1,530	2,630	17	27	38	61	--	96	--	--		--		DSWCM
Apr. 4	4:20 p.m.	1,590	2,040	1,460	19	32	44	61	79	87	94	99		100		BSWCM
Apr. 10	9:50 a.m.	1,800	979	3,220	17	25	36	53	--	97	--	--		--		DSWCM
Apr. 20	9:30 a.m.	1,730	514	1,590	22	29	37	52	--	97	--	--		--		DSWCM
May 23	8:10 p.m.	2,820	1,700	--	--	--	--	--	--	33	59	86		99		S
June 23	6:00 p.m.	1,680	565	1,710	23	30	40	54	--	80	88	97		100		DSWCM a
July 12	7:30 p.m.	811	7,760	5,480	32	50	70	84	--	--	--	--		--		DWCM
July 26	8:00 a.m.	494	5,100	2,630	39	61	79	89	--	--	--	--		--		DWCM
Sept. 7	6:30 p.m.	140	13,100	1,990	58	74	88	96	98	100	--	--		--		BWCM
Sept. 21	6:25 p.m.	836	14,300	1,900	40	54	67	80	--	--	--	--		--		DWCM

a Mean of analyses of samples taken at three points in the cross section.

SAN JUAN RIVER BASIN--Continued

SAN JUAN RIVER NEAR BLUFF, UTAH

LOCATION.--At bridge on State Highway 47, 1,800 feet downstream from gaging station which is 20 miles southwest of Bluff, San Juan County.
DRAINAGE AREA.--23,000 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: February to June 1927, October 1929 to September 1950.
Water temperatures: May 1944 to September 1950.
Sediment records: August to September 1928, July 1929 to September 1950.
EXTREMES, 1949-50.--Dissolved solids: Maximum, 1,360 ppm Aug. 16-17; minimum, 240 ppm June 11-20.
Hardness: Maximum, 522 ppm Jan. 1-10; minimum, 158 ppm June 1-10.
Water temperatures: Maximum observed, 84°F Aug. 19; minimum, freezing point on many days in December and January.
Sediment loads: Maximum daily, 398,000 tons Sept. 20; minimum daily, 41 tons Sept. 7.
EXTREMES, 1929-50.--Dissolved solids: Maximum, 1,860 ppm July 21-31, 1934; minimum, 167 ppm June 11-20, 1944.
Hardness: Maximum, 874 ppm July 21-31, 1934; minimum, 109 ppm July 1-10, 1935.
Water temperatures (1944-50): Maximum observed, 85°F July 21, 1945; minimum, freezing point on many days during winter months.
Sediment loads: Maximum daily, 11,450,000 tons Sept. 23, 1929; minimum daily, (b) 0 tons July 3-13, 1934, Aug. 24-27, 29, 1939.
REMARKS.--Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1179.

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

Date of collection	Mean discharge (second-feet)	Temperature (°F)	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)	Boron (B)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 1-10, 1949	786		7.2	987	14	0.03	101	29	81		186	347	22	0.3	2.3		688	0.94	1,460	371	218	32
Oct. 11-20	940		7.3	1,030	12	.02	106	34	78		182	372	24	.4	3.1		719	.98	1,820	404	256	29
Oct. 21-31	1,001		7.5	1,070	12	.03	112	36	82		184	400	24	.4	3.3		760	1.03	2,050	428	276	29
Nov. 1-10	695		7.5	1,070	11	.04	110	36	81		184	394	24	.4	3.1		750	1.02	1,410	422	272	29
Nov. 11-20	820		7.5	1,150	12	.02	115	41	94		197	439	26	.4	3.5		828	1.13	1,830	456	294	31
Nov. 21-30	736		7.5	1,120	12	.03	114	39	88		192	422	26	.4	2.5		799	1.09	1,590	445	288	30
Dec. 1-10	597		7.6	1,130	12	.03	118	40	115		194	484	29	.4	3.5		898	1.22	1,450	459	300	35
Dec. 11-20	570		7.6	1,320	13	.04	135	44	112		220	508	33	.4	4.4		958	1.30	1,470	518	338	32
Dec. 21-31	523		7.9	1,230	15	.01	130	38	98		215	451	30	.4	4.1		872	1.19	1,230	480	304	31
Jan. 1-10, 1950	511		7.7	1,310	17	.04	140	42	98		232	476	31	.3	5.1		924	1.26	1,270	522	332	29
Jan. 11-20	550		7.8	1,210	14	.02	128	40	91		214	444	28	.3	4.6		855	1.16	1,270	464	308	29
Jan. 21-31	925		7.8	1,080	13	--	109	35	81		186	385	25	--	3.8		743	1.01	1,860	416	264	30
Feb. 1-10	841		7.8	1,220	13	--	123	43	89		198	454	28	--	4.1		852	1.16	1,930	484	322	29
Feb. 11-19	897		7.8	1,110	12	--	108	39	86		192	408	23	--	4.4		775	1.05	1,880	430	272	30
Feb. 20-28	900		7.9	1,100	12	--	110	39	82		186	405	26	--	2.9		768	1.04	1,870	435	282	29
Mar. 1-10	1,136		7.6	1,020	14	.04	106	38	69		193	364	21	.3	3.1		711	.97	2,180	420	262	26
Mar. 11-20	736		7.6	1,020	13	.03	107	37	69		185	365	25	.3	2.7		710	.97	1,410	419	268	26
Mar. 21-31	877		7.7	916	13	.02	95	31	64		174	317	21	.3	1.4		628	.85	1,490	364	222	28
Apr. 1-10	1,364		7.6	753	14	.02	79	25	49		151	245	18	.4	1.6		506	.69	1,860	300	176	26
Apr. 11-20	1,957		7.5	536	13	.04	63	19	22		132	156	7.8	.4	1.4		348	.47	1,840	235	127	17
Apr. 21-30	3,526		7.7	427	14	.12	50	13	20		122	108	5.8	.4	1.2		273	.37	2,600	178	78	20

a Less than 0.1 part per million by turmeric method.
b Reported erroneously as "19 tons per day Jan. 6, 1949", in W.S.P. 1163.

May 1-10	2,710	7.7	421	13	.10	45	13	26	108	116	8.2	.4	1.2	276	.38	2,020	166	78	26
May 11-20	1,868	7.5	581	13	.04	62	16	46	144	177	12	.2	1.3	398	.54	2,010	220	102	31
May 21-31	3,598	7.6	413	14	.06	50	11	20	128	92	8	.2	.9	259	.35	2,520	170	65	20
June 1-10	4,080	7.5	391	14	.06	47	10	22	124	88	8	.2	1.4	252	.34	2,780	158	57	23
June 11-20	3,114	7.5	385	14	.04	46	11	16	109	91	7	.2	.9	240	.33	2,020	160	70	18
June 21-30	2,438	7.4	584	15	.10	67	14	38	150	161	11	.3	1.3	382	.52	2,510	224	102	27
July 1-8	1,325	7.6	586	12	.04	63	18	32	134	164	14	.3	.8	370	.50	1,320	231	121	23
July 9-13	1,592	7.6	1,070	17	.05	114	28	88	195	379	22	.4	4.2	749	1.02	3,220	400	240	32
July 14-20	1,144	7.7	714	15	.06	74	19	72	162	251	16	.4	1.8	529	.72	1,630	262	130	37
July 21-31	718	7.6	773	13	.04	75	19	68	160	243	19	.5	.7	517	.70	1,000	265	134	36
Aug. 1-10	337	7.6	975	14	.03	82	24	103	170	332	28	.4	1.1	668	.91	608	303	164	42
Aug. 11-15, 18-20	278	7.6	1,150	13	.04	111	28	130	180	456	35	.6	2.6	865	1.18	649	392	244	42
Aug. 16-17	282	--	1,830	19	--	152	29	246	210	758	49	--	3.3	1,360	1.85	1,040	498	326	52
Aug. 21-31	108	7.6	1,440	12	.03	118	37	154	158	560	47	.5	1.7	1,010	1.37	295	446	317	43
Sept. 1-10	102	7.7	1,570	11	.03	121	43	186	144	658	55	.5	2.7	1,150	1.56	317	479	361	46
Sept. 11-20	696	7.7	1,370	13	.05	143	35	137	206	553	37	.4	2.4	1,020	1.39	1,920	501	332	37
Sept. 21-30	1,307	7.8	1,020	15	.19	110	20	94	199	349	22	.5	2.7	711	.97	2,510	356	194	36
Weighted average	1,246	--	730	14	0.06	78	22	53	154	240	16	0.3	2.0	501	0.68	1,690	285	159	29

a Less than 0.1 part per million by turmeric method.

SAN JUAN RIVER BASIN--Continued

SAN JUAN RIVER NEAR BLUFF, UTAH--Continued

Temperature (°F) of water, water year October 1949 to September 1950
/Once-daily temperature measurement usually in forenoon/

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

SAN JUAN RIVER BASIN--Continued

SAN JUAN RIVER NEAR BLUFF, UTAH--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	679	2,800	5,130	750	1,950	3,950	656	2,350	4,160
2	623	1,850	3,110	726	1,600	3,140	634	1,450	2,480
3	921	3,690	s 9,660	697	2,050	3,860	634	1,120	1,920
4	998	3,200	8,620	685	2,420	4,480	623	881	1,480
5	900	2,200	5,350	656	2,220	3,930	612	1,050	1,740
6	798	2,110	4,550	651	1,980	3,480	606	1,070	1,750
7	732	1,670	3,300	645	1,700	2,960	563	946	1,440
8	732	1,620	3,200	606	1,400	2,290	547	904	1,340
9	738	1,610	3,210	792	1,500	3,210	542	1,030	1,510
10	744	1,640	3,290	744	1,580	3,170	557	1,600	2,410
11	762	1,500	3,090	804	1,970	4,280	645	1,600	2,790
12	780	1,250	2,630	816	2,280	5,020	691	1,600	2,990
13	798	1,900	4,090	840	1,700	3,860	679	2,370	4,340
14	816	2,400	5,290	888	1,800	4,320	521	1,500	2,110
15	792	3,560	7,610	907	1,640	4,020	428	1,800	2,080
16	726	1,800	3,530	852	1,570	3,610	404	900	982
17	674	2,000	3,640	768	1,170	2,430	382	820	846
18	702	3,300	6,250	768	1,380	2,860	451	1,280	1,560
19	1,700	21,300	s 131,000	792	1,400	2,990	726	2,100	4,120
20	1,650	30,300	s 139,000	768	1,620	3,360	768	2,100	4,350
21	1,170	18,500	58,400	756	1,430	2,920	726	1,420	2,780
22	1,100	10,000	29,700	744	1,450	2,910	756	1,300	2,650
23	1,110	9,600	28,800	744	1,420	2,850	645	1,780	3,100
24	1,080	6,900	20,100	744	1,300	2,610	471	1,180	1,500
25	1,070	4,700	13,600	714	1,420	2,740	413	934	1,040
26	1,060	4,220	14,900	732	1,260	2,490	364	e 850	835
27	1,040	3,400	9,550	744	1,090	2,190	395	1,180	1,260
28	949	2,950	7,560	738	1,200	2,390	490	1,200	1,590
29	858	2,600	6,020	756	1,200	2,450	476	1,100	1,410
30	804	2,250	4,880	685	1,400	2,590	495	1,140	1,520
31	768	2,250	4,670	--	--	--	526	1,380	1,960
Total	28,274	--	553,700	22,512	--	97,380	17,426	--	66,040
	January			February			March		
1	623	1,420	2,390	726	1,510	2,960	991	2,600	6,960
2	732	e 1,600	3,160	685	1,250	3,210	1,370	4,400	16,300
3	720	2,100	4,080	656	1,650	2,920	1,470	3,500	13,900
4	606	e 1,800	2,950	645	1,620	2,820	1,340	4,250	15,400
5	413	919	1,020	634	1,750	3,000	1,220	5,300	17,500
6	408	824	908	656	1,460	2,590	1,100	3,010	8,940
7	402	173	188	726	1,600	3,140	998	4,300	11,600
8	397	186	199	1,100	4,200	12,500	977	2,220	5,860
9	390	194	204	1,180	7,000	22,300	956	2,450	6,320
10	420	900	1,020	1,400	5,650	21,400	935	1,460	3,690
11	442	1,000	1,190	1,380	4,460	16,600	822	1,750	3,880
12	500	1,450	1,960	1,190	4,100	13,200	822	2,000	4,440
13	531	1,480	2,120	1,020	3,450	9,500	840	1,760	3,990
14	536	850	1,230	870	2,400	5,640	810	1,780	3,890
15	536	1,250	1,810	804	2,180	4,730	750	1,230	2,490
16	547	1,380	2,040	738	1,500	2,990	674	1,000	1,820
17	446	1,350	1,630	668	1,420	2,560	623	662	1,110
18	505	2,200	3,000	691	1,500	2,800	651	1,100	1,930
19	691	1,500	2,800	714	1,600	3,080	691	900	1,680
20	762	2,450	5,040	744	1,700	3,410	679	1,060	1,940
21	956	2,900	7,490	852	2,300	5,290	726	998	1,960
22	991	2,960	7,920	942	2,250	5,720	907	1,420	3,480
23	1,050	2,980	8,450	935	2,200	5,550	822	1,220	2,710
24	1,280	4,000	13,800	970	2,260	5,920	858	1,200	2,780
25	1,070	3,300	9,530	907	2,200	5,390	852	1,180	2,710
26	956	2,500	6,450	858	2,500	5,790	907	1,450	3,550
27	792	1,650	3,530	894	1,970	4,760	870	1,350	3,170
28	732	1,370	2,710	1,000	2,100	5,670	1,030	1,600	4,450
29	756	1,950	3,980	--	--	--	1,000	1,620	4,370
30	792	2,680	5,730	--	--	--	882	1,300	3,100
31	804	2,000	4,340	--	--	--	792	1,100	2,350
Total	20,786	--	112,900	24,585	--	184,500	28,365	--	168,390

e Estimated.
s Computed by subdividing day.

SAN JUAN RIVER BASIN--Continued

SAN JUAN RIVER NEAR BLUFF, UTAH--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	738	1,050	2,090	3,240	3,300	28,900	3,920	3,400	36,000
2	674	1,200	2,180	2,710	2,300	16,800	4,670	4,100	51,700
3	679	910	1,670	2,670	2,220	16,000	4,800	4,000	51,800
4	876	2,100	4,970	2,890	2,380	18,600	4,880	3,520	46,400
5	1,680	5,400	24,500	3,300	2,350	20,900	4,900	3,800	50,300
6	1,800	5,750	27,900	3,380	3,800	34,700	3,980	4,000	43,000
7	1,470	4,200	16,700	2,750	3,220	23,900	3,170	2,650	22,700
8	1,550	2,900	12,100	2,450	1,980	13,100	3,300	2,580	23,000
9	1,730	2,550	11,900	1,960	1,900	10,100	3,870	2,720	28,400
10	2,440	5,000	s 35,900	1,750	1,800	8,500	3,310	2,030	18,100
11	2,550	6,950	47,900	1,630	1,600	7,040	2,970	2,580	20,700
12	2,110	5,150	29,300	1,540	2,180	9,060	3,140	1,420	12,000
13	1,790	3,400	16,400	1,560	1,900	8,000	3,390	2,200	20,100
14	1,680	3,950	17,900	1,630	1,820	8,010	3,620	2,150	21,000
15	1,780	2,220	10,700	1,780	2,100	10,100	3,370	1,780	16,200
16	1,930	2,500	13,000	1,760	1,510	7,180	3,240	2,000	17,500
17	2,060	2,420	13,500	1,650	2,100	9,360	2,960	1,700	13,600
18	1,910	2,500	12,900	2,040	2,300	12,700	2,950	1,750	13,900
19	1,830	1,800	8,890	2,370	2,850	18,200	2,820	1,900	14,500
20	1,930	4,000	20,800	2,720	2,650	19,500	2,680	1,710	12,400
21	2,330	4,600	28,900	2,840	2,700	29,700	2,460	2,020	13,400
22	2,710	5,000	36,600	2,840	1,820	14,000	3,150	5,420	s 65,600
23	3,420	5,600	51,700	3,230	e 2,750	24,000	3,840	12,300	s 131,000
24	4,050	5,350	58,500	3,700	2,100	21,000	2,890	e 5,900	46,000
25	4,240	5,450	62,400	4,230	700	7,990	2,500	e 3,780	25,500
26	4,270	5,420	62,500	4,040	845	9,220	2,200	2,780	16,500
27	3,810	4,220	43,400	3,980	2,600	27,900	2,030	2,380	13,000
28	3,540	3,520	33,600	3,700	2,250	22,500	1,910	1,950	10,100
29	3,440	3,500	32,500	3,870	2,900	30,300	1,730	1,950	9,110
30	3,450	2,800	26,100	3,800	3,000	30,800	1,670	1,570	7,080
31	--	--	--	3,350	1,160	10,500	--	--	--
Total	68,467	--	767,400	85,360	--	519,600	96,320	--	870,600

Day	July			August			September		
1	1,530	1,350	5,580	461	1,640	2,040	102	343	94
2	1,450	1,300	5,090	442	984	1,170	90	191	46
3	1,450	549	2,150	461	667	830	106	320	92
4	1,250	600	2,020	413	e 900	1,000	98	208	56
5	1,180	550	1,750	364	1,020	1,000	94	214	54
6	1,130	2,100	6,410	237	600	384	94	173	44
7	1,130	3,000	9,150	248	232	155	98	154	41
8	1,480	14,000	s 96,400	251	709	480	104	161	45
9	2,150	39,400	s 243,000	251	500	339	114	400	123
10	1,390	19,800	74,300	244	151	99	114	420	129
11	1,420	10,900	s 42,200	346	4,620	e 6,550	286	2,460	s 3,160
12	1,740	12,400	s 60,000	284	3,150	2,420	536	5,100	7,380
13	1,260	9,400	32,000	241	3,250	2,110	409	4,200	4,640
14	1,290	5,500	19,200	303	3,800	3,110	360	3,300	3,210
15	1,150	3,500	10,900	360	2,700	2,620	344	2,800	2,600
16	1,090	3,220	9,480	296	6,700	5,350	319	2,010	1,730
17	1,120	4,100	12,400	269	7,000	5,080	360	1,620	1,570
18	1,170	3,180	10,000	258	3,000	2,090	282	1,300	1,340
19	1,140	2,900	8,930	244	2,000	1,320	896	5,220	s 15,300
20	1,050	1,930	5,470	192	1,250	648	3,070	43,000	s 398,000
21	1,030	2,000	5,560	157	813	345	2,420	33,300	226,000
22	921	1,550	3,850	151	450	183	1,560	26,000	110,000
23	858	780	1,810	129	256	89	1,540	25,000	104,000
24	786	1,400	2,970	104	172	48	1,350	11,000	40,100
25	726	1,400	2,740	92	177	44	1,170	10,000	31,600
26	750	1,750	3,540	92	218	54	1,070	7,500	21,700
27	714	1,380	2,660	85	207	48	1,090	5,900	17,400
28	628	1,700	2,880	83	200	45	1,110	5,400	16,200
29	552	1,500	2,240	85	200	46	935	4,900	12,400
30	505	2,050	2,800	94	282	72	828	3,300	7,380
31	423	1,960	2,240	112	402	122	--	--	--
Total	34,463	--	689,700	7,349	--	39,890	21,051	--	1,026,000

Total discharge for year (second-foot-days) 454,958
Total load for year (tons) 5,096,000

e Estimated.
s Computed by subdividing day.

SAN JUAN RIVER NEAR BLUFF, UTAH--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 analysed (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. 2, 1949	8:45 a.m.	605	1,240	4,100	4	22	31	41	--	59	88	98		100		DSWCM
Oct. 6	8:30 a.m.	810	1,230	4,650	7	27	47	56	--	77	--	--		--		DSWCM
Oct. 12	8:55 a.m.	770	940	2,540	10	14	23	32	--	52	83	99		100		DSWCM
Oct. 16	8:30 a.m.	740	2,710	3,020	5	10	22	36	--	93	99	100		--		DSWCM
Oct. 21	9:20 a.m.	1,220	13,000	1,490	36	48	60	74	82	90	98	--		--		BWCM
Oct. 28	9:00 a.m.	985	1,510	3,200	13	20	34	50	--	79	--	--		--		DSWCM
Nov. 11	9:00 a.m.	835	2,410	9,440	2	3	4	6	--	22	50	93		100		DSWCM
Nov. 15	9:35 a.m.	920	2,160	--	--	--	--	--	--	18	44	95		100		S
Nov. 18	9:45 a.m.	775	1,580	6,600	1	2	3	5	--	17	44	94		100		DSWCM
Nov. 22	10:00 a.m.	750	1,730	--	--	--	--	--	--	15	42	94		99		S
Nov. 25	9:55 a.m.	720	1,240	--	--	--	--	--	--	15	44	96		100		S
Nov. 29	10:15 a.m.	755	1,090	--	--	--	--	--	--	16	47	96		100		S
Dec. 2	11:00 a.m.	635	845	--	--	--	--	--	--	17	38	78		99		S
Dec. 6	11:00 a.m.	600	1,060	--	--	--	--	--	--	13	35	92		100		S
Dec. 9	9:45 a.m.	525	1,530	6,600	1	1	2	4	--	15	37	94		100		DSWCM
Dec. 13	11:00 a.m.	685	2,300	--	--	--	--	--	--	9	34	91		100		S
Dec. 16	11:30 a.m.	360	812	--	--	--	--	--	--	10	23	90		100		S
Dec. 23	10:30 a.m.	705	2,130	--	--	--	--	--	--	7	26	84		100		S
Dec. 27	11:30 a.m.	435	884	--	--	--	--	--	--	11	31	86		99		S
Dec. 30	11:00 a.m.	490	1,690	--	--	--	--	--	--	6	18	69		98		S
Jan. 13, 1950	11:00 a.m.	500	1,900	--	--	--	--	--	--	5	18	81		100		S
Jan. 20	10:15 a.m.	720	2,890	--	--	--	--	--	--	12	32	89		100		S
Jan. 24	10:30 a.m.	1,330	4,320	4,440	3	5	7	13	--	36	61	90		99		DSWCM
Jan. 31	10:00 a.m.	875	2,250	--	--	--	--	--	--	22	46	93		100		S
Feb. 7	10:45 a.m.	705	1,830	--	--	--	--	--	--	19	46	93		100		S
Feb. 10	11:00 a.m.	1,460	6,220	5,440	19	26	32	39	47	55	71	94		100		BSWCM
Feb. 21	10:00 a.m.	805	2,980	12,500	2	8	13	17	--	29	50	94		100		DSWCM
Mar. 28	7:45 a.m.	950	1,540	6,680	7	10	13	16	--	35	55	95		100		DSWCM
Mar. 31	8:30 a.m.	805	1,400	4,790	8	11	15	18	--	30	50	95		100		DSWCM
Apr. 14	4:20 p.m.	1,700	2,890	5,790	6	9	13	19	--	61	86	97		100		DSWCM
Apr. 18	1:40 p.m.	2,010	2,530	4,370	6	9	13	17	--	45	70	92		100		DSWCM
Apr. 25	4:15 p.m.	3,810	6,920	4,590	11	19	22	30	37	45	59	82		99		BSWCM
Apr. 28	10:00 a.m.	3,690	2,810	5,190	9	13	18	25	--	55	76	96		100		DSWCM

SAN JUAN RIVER BASIN--Continued

SAN JUAN RIVER NEAR BLUFF, UTAH--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 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	
May 2, 1950	9:00 a. m.	2,880	3,300	4,140	6	9	13	16	--	37	55	84		100		DSWCM
May 5	6:15 a. m.	3,740	1,730	3,810	7	10	15	22	--	65	87	98		100		DSWCM
May 9	9:15 a. m.	2,110	1,890	5,350	3	6	9	15	--	32	52	89		100		DSWCM
May 16	10:15 a. m.	1,810	2,350	7,890	3	5	7	10	--	27	50	91		--		DSWCM
May 19	9:40 a. m.	2,110	2,210	8,690	2	3	5	8	--	27	48	91		--		DSWCM
May 26	10:00 a. m.	4,200	1,110	4,070	8	15	24	37	--	83	95	98		100		DSWCM
June 6	10:45 a. m.	4,080	3,520	9,420	4	6	10	16	--	35	48	71		95		DSWCM
June 9	2:00 p. m.	3,840	3,480	8,350	3	5	7	10	--	35	50	78		100		DSWCM
June 16	12:15 p. m.	3,250	1,840	--	--	--	--	--	--	21	43	82		98		S
June 30	10:30 a. m.	2,790	1,730	--	--	--	--	--	--	17	35	81		100		S
June 23	8:25 a. m.	2,450	14,200	2,060	45	57	69	76	86	91	98	--		--		BWCM
June 23	4:45 p. m.	4,240	12,400	1,600	31	41	53	60	71	83	90	97		100		BSWCM
June 27	9:15 a. m.	2,040	2,630	8,160	8	12	17	24	--	49	67	93		99		DSWCM
June 30	9:30 a. m.	1,700	1,540	4,890	7	10	15	21	--	57	72	92		100		DSWCM
July 4	9:30 a. m.	1,310	483	1,940	11	18	26	39	--	72	92	98		99		DSWCM
July 7	9:15 a. m.	1,200	1,190	4,990	4	6	9	15	--	60	97	99		99		DSWCM
July 14	10:15 a. m.	1,500	5,300	2,730	7	13	18	25	--	39	77	98		--		DSWCM
July 18	9:05 a. m.	1,180	4,000	1,770	12	18	22	29	--	39	71	97		--		DSWCM
July 21	8:45 a. m.	1,010	2,140	6,680	10	16	22	28	--	43	70	98		99		DSWCM
July 25	11:50 a. m.	705	2,110	2,650	5	8	11	14	--	24	57	98		--		DSWCM
July 28	9:15 a. m.	635	1,740	2,500	11	19	24	33	--	43	70	97		--		DSWCM
Aug. 1	11:10 a. m.	465	1,480	1,150	25	38	48	55	--	69	--	--		--		DSWCM
Aug. 8	9:40 a. m.	255	564	1,270	27	41	66	80	--	--	--	--		--		DWCM
Aug. 11	11:45 a. m.	230	420	1,660	15	29	36	51	--	83	--	--		--		DSWCM
Aug. 29	8:40 a. m.	76	215	801	41	59	74	85	--	--	--	--		--		DWCM
Sept. 1	10:30 a. m.	104	357	1,290	34	55	67	84	--	--	--	--		--		DWCM
Sept. 5	6:25 p. m.	92	280	975	21	44	52	66	--	86	--	--		--		DSWCM
Sept. 12	9:00 a. m.	520	5,290	4,110	25	37	48	61	--	75	--	--		--		DSWCM
Sept. 26	12:30 p. m.	1,140	8,600	2,720	39	48	56	63	67	74	84	98		100		BSWCM

SAN JUAN RIVER BASIN--Continued

ANIMAS RIVER AT FARMINGTON, N. MEX.

LOCATION.--At gaging station at bridge on State Highway 17, 0.6 mile southeast of Farmington, San Juan County, and 1.1 miles upstream from mouth.
DRAINAGE AREA.--1,360 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: June 1940 to September 1950.
REMARKS.--Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1179.

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

Date of collection	Mean discharge (second-feet)	Temperature (° F)	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)	Boron (B)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Noncarbonate	Percent sodium
Oct. 1-10, 1949	186		--	799	--		--	--	--		--	--	--	--	--		--	--	--	--	--	--
Oct. 11-13, 20	276		--	771	12		103	17	71		193	217	24	--	1.0		540	0.73	402	264	106	37
Oct. 21-31	350		--	755	--		--	--	--		--	--	--	--	--		--	--	--	--	--	--
Nov. 1-10	308		--	787	--		--	--	--		--	--	--	--	--		--	--	--	--	--	--
Nov. 11-20	296		--	767	10		102	16	72		193	217	23	--	.9		536	.73	428	261	103	37
Nov. 21-30	256		--	764	--		--	--	--		--	--	--	--	--		--	--	--	--	--	--
Dec. 1-10	219		--	561	--		--	--	--		--	--	--	--	--		--	--	--	--	--	--
Dec. 11-20	220		7.4	839	12		111	19	46		210	235	26	--	1.7		554	.75	329	355	183	22
Dec. 21-31	290		--	829	--		--	--	--		--	--	--	--	--		--	--	--	--	--	--
Jan. 1-10, 1950	291		--	805	--		--	--	--		--	--	--	--	--		--	--	--	--	--	--
Jan. 11-20	353		7.6	761	11		105	16	39		191	215	22	--	1.6		504	.69	480	328	172	21
Jan. 21-31	339		--	749	--		--	--	--		--	--	--	--	--		--	--	--	--	--	--
Feb. 1-10	356		--	748	--		--	--	--		--	--	--	--	--		--	--	--	--	--	--
Feb. 11-20	319		7.7	788	9.0		103	17	48		194	227	24	--	1.0		525	.71	452	327	168	24
Feb. 21-28	326		--	767	--		--	--	--		--	--	--	--	--		--	--	--	--	--	--
Mar. 1-10	301		--	731	--		--	--	--		--	--	--	--	--		--	--	--	--	--	--
Mar. 11-20	302		7.9	727	9.1		101	18	29		180	201	22	--	1.0		470	.64	383	328	178	16
Mar. 21-31	336		--	659	--		--	--	--		--	--	--	--	--		--	--	--	--	--	--
Apr. 1-10	609		--	525	--		--	--	--		--	--	--	--	--		--	--	--	--	--	--
Apr. 11-18, 20	735		7.8	454	7.8		64	12	9.0		132	103	8.0	0.4	1.0		270	.37	536	209	101	9
Apr. 21-30	1,542		--	322	--		--	--	--		--	--	--	--	--		--	--	--	--	--	--
May 1-10	963		--	403	--		--	--	--		--	--	--	--	--		--	--	--	--	--	--
May 11-20	805		7.8	450	6.9		60	10	18		122	108	11	.3	.5		276	.38	600	190	90	17
May 21-31	1,890		--	302	--		--	--	--		--	--	--	--	--		--	--	--	--	--	--

SAN JUAN RIVER BASIN--Continued

ANIMAS RIVER AT FARMINGTON, N. MEX.--Continued

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

Date of collection	Mean discharge (second-feet)	Temperature (° F)	pH	Specific conductance (micromhos at 25° C)	Silica (SiO_2)	Iron (Fe)	Calcium (Cn)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids			Hardness as $CaCO_3$		Percent sodium
																	Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate	
June 1-10, 1950	2,068		--	296	--		--	--	--		--	--	--	--	--		--	--	--	--	--	--
June 12-20	1,905		8.1	273	5.6		36	5.2	9.4		75	59	5.8	--	1.2		159	0.22	818	112	50	16
June 21-30	1,223		--	362	--		--	--	--		--	--	--	--	--		--	--	--	--	--	--
July 1-10	741		--	466	--		--	--	--		--	--	--	--	--		--	--	--	--	--	--
July 11-20	619		7.3	501	7.3		66	10	26		130	130	14	--	1.7		319	.43	533	206	99	22
July 21-31	302		--	681	--		--	--	--		--	--	--	--	--		--	--	--	--	--	--
Aug. 1-10	83.6		--	888	--		--	--	--		--	--	--	--	--		--	--	--	--	--	--
Aug. 11-20	47.8		7.7	986	12		130	23	58		222	316	24	--	.9		673	.92	87	419	237	23
Aug. 21-31	20.9		--	1,010	--		--	--	--		--	--	--	--	--		--	--	--	--	--	--
Sept. 1-10	33.0		--	1,080	--		--	--	--		--	--	--	--	--		--	--	--	--	--	--
Sept. 12-20	257		7.7	935	13		116	19	69		220	286	28	--	.9		640	.87	444	368	187	29
Sept. 21-30	450		--	741	--		--	--	--		--	--	--	--	--		--	--	--	--	--	--
Weighted average	546		--	496	--		--	--	--		--	--	--	--	--		--	--	--	--	--	--

PARIA RIVER AT LEES FERRY, ARIZ.

LOCATION.--At gaging station, half a mile upstream from mouth and 1 mile northwest of Less Ferry, Coconino County.
DRAINAGE AREA.--1,570 square miles approximately.
RECORDS AVAILABLE.--Chemical analyses; October 1947 to February 1950.
Sediment Records: October 1947 to September 1950 (discontinued).
EXTREMES, 1949-50.--Sediment loads: Maximum daily, 440,000 tons July 19; minimum daily, less than 0.5 ton on many days.
EXTREMES, 1947-50.--Dissolved solids: Maximum, 2,360 ppm Sept. 15, 1949; minimum, 337 ppm July 15, 1948.
Hardnese: Maximum, 1,320 ppm Sept. 15,1949; minimum, 212 ppm July 15, 1948.
Sediment loads: Maximum daily, 775,000 tons Aug. 5, 1948; minimum daily, less than 0.5 ton on many days.
REMARKS.--Samples for chemical analyses collected twice monthly. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1179.

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

Date of collection	Mean discharge (second-feet)	Temperature (° F)	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)	Boron (B)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Noncarbonate	Percent sodium
Oct. 1, 1949	36			1,720			210	54	130		242	770	19	0.8	0.8		1,300	1.77	126	746	548	28
Oct. 15	14			1,470			131	65	116		169	843	25		3.7		1,070	1.46	40	594	456	30
Nov. 1	16			1,340			107	62	111		172	563	23		3.6		954	1.30	41	522	381	32
Nov. 15	18			1,600			128	71	145		197	693	29		3.0		1,170	1.59	57	612	450	34
Dec. 1	15			1,250			104	57	100		177	511	22		3.5		884	1.20	36	494	349	31
Dec. 15	8.6			1,290			114	56	101		200	516	22		3.9		912	1.24	21	515	351	30
Jan. 1, 1950	30			1,500			132	65	125		243	600	31		2.9		1,080	1.47	87	597	398	31
Jan. 15	24			1,370			120	63	110		220	557	23		4.8		986	1.24	64	556	378	30
Feb. 1	32			1,390			120	61	116		212	570	23		3.4		997	1.36	86	550	377	31

PARIA RIVER BASIN--Continued

PARIA RIVER AT LEES FERRY, ARIZ.--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	36	58,000	5,640	16			15		
2	24	33,800	2,190	16			15		
3	18	13,000	632	16			17		
4	15	2,000	81	16			16		
5	12	641	21	16			18		
6	10	219	6	16	15	1	16	29	1
7	8.6	208	5	16			17		
8	7.8	253	5	16			19		
9	7.5	267	5	16			20		
10	7.3			16			25		
11	12			17			44	1,470	175
12	15			22			15	507	21
12	14			18			11	610	18
14	14	123	4	17			8.2	418	9
15	14			18			8.6	307	7
16	14			17	75	4	14	289	11
17	14			17			19	460	24
18	12			16			25	132	9
19	30	1,090	s248	16			31	260	22
20	60	8,290	s1,070	16			53	821	117
21	34	8,260	758	14			23	846	53
22	28	16,000	1,210	14			15	636	26
23	26	3,040	213	16			9.7	323	8
24	23	506	31	16			8.2	279	6
25	22	413	25	16			14	e250	9
26	22	e500	30	16	12	1	14	222	8
27	22	583	35	16			17	478	22
28	20	274	15	16			24	702	45
29	18			16			24	319	21
30	16	126	5	15			28	1,130	85
31	16			--	--	--	27	414	30
Total	582.2	--	12,270	489	--	60	610.7	--	736

Day	January			February			March		
1	30	161	13	32	611	s55	36	6,600	642
2	33	782	70	22	275	s16	28	5,680	429
3	32	646	56	19	277	s19	26	5,460	383
4	8	161	3	23	402	s25	27	1,860	136
5	10	282	8	26	405	s31	24	928	60
6	15	162	7	40	492	53	21	719	41
7	15	182	7	90	15,200	s5,640	20	e650	35
8	16	121	5	115	18,400	s5,670	17	e570	26
9	17	120	6	54	9,600	1,400	30	505	27
10	19	180	9	39	2,510	s289	19	561	29
11	21	286	16	38	1,900	s216	18	578	26
12	23	295	18	38	1,410	145	17	461	21
13	26	232	16	28	600	45	16	183	8
14	25	137	9	25	955	s85	16	135	6
15	24	321	21	34	1,140	s107	20	212	11
16	27	368	27	43	634	74	18	215	10
17	29	376	29	40	982	106	16	222	10
18	28	755	57	39	971	102	16	346	15
19	28	461	35	40	1,540	166	15	116	5
20	30	259	21	37	2,010	201	15		
21	35	484	46	38	3,020	310	15		
22	37	471	47	33	3,290	293	15	53	2
23	38	857	88	26	3,270	230	13		
24	63	3,620	s724	28	1,760	133	14		
25	81	10,700	s2,410	29	1,080	84	17	2,890	133
26	43	3,610	s448	29	1,280	100	28	197	15
27	21	1,230	s79	29	643	50	24	1,560	101
28	26	875	s68	30	5,540	449	17	874	40
29	27	e900	s72	--	--	--	16	591	26
30	34	954	s94	--	--	--	14	350	13
31	34	522	48	--	--	--	14	204	8
Total	895	--	4,560	1,064	--	16,070	592	--	2,270

e Estimated or interpolated.
s Computed by subdividing day.

PARIA RIVER BASIN--Continued

PARIA RIVER AT LEES FERRY, ARIZ.--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	15	30	1	4.2			4.0		
2	14	e40	2	4.0			3.8		
3	12	47	2	3.7			3.8		
4	10	e40	1	3.8			3.7		
5	8.2	86	2	4.0			4.0		
6	7.5			4.2	2	0	3.8	1	0
7	6.4			4.0			3.5		
8	6.4			4.0			3.7		
9	5.9			4.0			4.2		
10	5.9			4.4			4.0		
11	6.2	27	0	4.7			3.8		
12	6.4			5.1			3.8		
13	5.6			4.9			3.8		
14	5.1			4.7			3.8		
15	4.9			4.6			3.8		
16	4.9			4.4	7	0	3.8	2	0
17	4.9			4.4			3.8		
18	4.6			4.2			3.7		
19	4.4			3.8			3.8		
20	4.4			3.8			3.8		
21	4.4	4	0	3.8			4.0		
22	4.4			3.8			3.7		
23	4.2			4.0			3.3		
24	3.8			3.7			3.5		
25	4.0			3.7			3.3		
26	4.4			3.5	6	0	3.7	8	0
27	4.4			3.5			3.8		
28	4.2	6	0	3.7			3.7		
29	4.0			3.7			3.7		
30	4.0			3.8			3.8		
31	--	--	--	4.0			--	--	--
Total	184.5	--	8	126.1	--	0	112.9	--	0

Day	July			August			September		
1	4.0			4.2	112	1	4.4	1,000	12
2	4.0			4.2	112	1	4.4	471	6
3	4.0			4.2	91	1	4.4	343	4
4	4.2	4	0	3.9	70	1	4.4	242	3
5	4.2			5.0	90	1	4.4	191	2
6	5.1			4.4	74	1	4.4	231	3
7	15	1,630	300	4.2	128	1	161	193,000	s2[illegible].000
8	70	29,500	s6,680	3.9	79	1	56	184,000	s32,800
9	217	228,000	s228,000	3.9	45	0	64	154,000	s31,700
10	194	284,000	s257,000	3.9	55	1	32	71,200	7,280
11	50	168,000	s28,400	34	10,800	s5,310	18	16,900	821
12	20	102,000	5,920	90	68,600	s23,900	15	22,500	911
13	12	66,100	2,220	26	75,500	s5,870	10est	15,800	427
14	11	42,100	1,300	13	31,000	1,090	6.7	1,060	19
15	9.7	6,370	167	7.4	10,900	218	5.0	886	12
16	7.4	989	30	4.7	1,220	15	4.7	231	3
17	23	26,000	s3,640	4.7	501	6	4.7	76	1
18	78	71,400	s30,900	4.7	109	2	4.4	55	1
19	404	225,000	s440,000	4.2	199	2	4.4	94	1
20	48	147,000	s24,000	4.2	148	2	4.4	85	1
21	23	102,000	6,800	4.4	87	1	4.4	24	0
22	19	78,100	4,150	6.7	3,170	s104	5.7		
23	15	43,000	1,810	4.4	665	8	5.4		
24	14	2,360	89	4.4	105	1	5.4		
25	8.5	614	14	7.2	94	2	7.1		
26	11	682	20	14	554	21	7.1	12	0
27	16	2,770	120	35	31,500	s4,730	6.7		
28	12	1,010	33	18	62,200	s3,170	6.7		
29	8.1	845	18	8.9	48,600	1,210	6.1		
30	6.4	206	4	6.1	24,600	405	5.0		
31	4.4	147	2	4.7	7,680	94	--	--	--
Total	1,322.0	--	1,042,000	348.5	--	46,170	476.3	--	313,000

Total discharge for year (second-foot-days) 6,803.2
Total load for year (tons) 1,437,000

e Estimated or interpolated.
s Computed by subdividing day.

LITTLE COLORADO RIVER BASIN

LITTLE COLORADO RIVER AT WOODRUFF, ARIZ.

LOCATION.--At county bridge in Woodruff, Navajo County, 3¼ miles downstream from Silver Creek.
DRAINAGE AREA.--8,100 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: June to September 1950.
Water temperatures: June to September 1950.
Sediment records: June to September 1950.
REMARKS.--Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1179.

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

Date of collection	Mean discharge (second-feet)	Temperature (° F)	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)	Boron (B)	Dissolved solids			Hardness as $CaCO_3$		Percent sodium
																	Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate	
June 1-10, 1950	0.55		7.8	542	17	0.01	40	26	36	4.6	217	73	25	0.3	0.5	a0.1	329	0.45	0.49	207	29	27
June 11-20	.50		8.0	525	17	.02	37	26	38	4.2	204	74	26	.3	.4	a.1	323	.44	.44	200	32	29
June 21-30	.70		8.0	523	16	.01	35	26	37	3.6	194	78	26	.3	.3	n.1	318	.43	.60	194	36	29
July 1-7	6.90		7.5	489	19	.01	37	24	28	5.4	197	65	21	.4	1.8	.1	299	.41	5.6	191	30	24
July 8-10	154		7.3	693	32	.02	25	5.6	110	4.8	219	85	41	.8	.8	.5	403	.55	168	86	0	72
July 11-12	25		7.8	1,330	24	.11	53	11	233		291	226	146	.7	1.1	.4	838	1.14	57	177	0	74
July 13-20	117		7.9	713	19	.07	58	14	74	6.2	228	127	39	.5	3.3	n.1	453	.62	143	202	15	43
July 23-26	88		7.9	760	20	.02	61	11	90	6.6	237	138	40	.5	3.8	.2	488	.66	116	197	3	49
July 21-22, 28-31 b	19.5		8.0	441	19	.02	40	9.0	40	6.0	168	54	22	.3	3.5	a.1	277	.36	15.6	137	0	38
Aug. 1-10	3.14		8.0	480	20	.01	44	17	31	6.4	204	50	22	.3	1.5	n.1	292	.40	2.5	180	13	26
Aug. 11-20	6.99		7.9	467	16	.02	44	10	37	7.0	141	97	16	.3	1.5	n.1	298	.41	5.6	151	36	33
Aug. 21-31	.85		7.8	506	18	.03	42	15	41	5.8	176	80	23	.3	2.2	.1	314	.43	.72	166	22	34
Sept. 1-3, 8-10	4.00		7.9	438	17	.04	40	16	27	6.2	183	50	17	.2	3.8	n.1	267	.36	2.9	166	16	25
Sept. 11-20	13.6		7.9	418	16	.05	40	14	24	6.6	166	54	16	.4	1.7	a.1	255	.35	9.4	158	22	24
Sept. 21-30	10.3		7.8	378	15	.04	27	7.5	42	5.8	163	40	14	.4	.9	a.1	233	.32	6.5	98	0	46

a Reported boron concentration is less than figure indicated.
b Includes discharge for July 27.

LITTLE COLORADO RIVER BASIN--Continued

LITTLE COLORADO RIVER AT WOODRUFF, ARIZ.--Continued

Temperature (°F) of water, June to September 1950
[Once-daily temperature measurement except as noted]

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

a Average of 2 observations.
b Average of 3 observations.

LITTLE COLORADO RIVER BASIN--Continued

LITTLE COLORADO RIVER AT WOODRUFF, ARIZ.--Continued

Suspended sediment, June 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							0.8	164	(t)
2							.8		
3							.6		
4							.5	105	(t)
5							.4		
6							.9		
7							.8	101	(t)
8							.4		
9							.2		
10							.3		
11							.4	84	(t)
12							.5		
13							.6		
14							.6		
15							.6		
16							.6	99	(t)
17							.5		
18							.4		
19							.4	78	(t)
20							.4		
21							.5		
22							.5		
23							.6	98	(t)
24							.6		
25							.8		
26							.8		
27							.8		
28							.8	68	(t)
29							.8		
30							.8		
31							--	--	--
Total							17.5	--	5

Day	July			August			September		
1	0.6	58	(t)	3.1	494	4	0.4	115	(t)
2	.6			2.4	319	2	.3	101	(t)
3	.7			1.9	199	1	.2	92	(t)
4	.7			1.3	179	1	.5	158	(t)
5	.7			5.3	875	41	.6	141	(t)
6	28	2,250	s 239	9.3	300	8	.8	135	(t)
7	17	4,000	184	3.1	170	1	23	10,100	s 1,235
8	384	42,000	s 47,700	2.1	142	1	10	1,100	30
9	55	34,900	s 5,770	1.6	160	1	2.6	613	4
10	22	32,200	s 1,920	1.3	145	1	1.6	700	3
11	34	53,400	s 6,450	5.6	1,770	s 61	.9	255	1
12	16	47,100	2,110	20	6,110	s 1,690	2.9	1,000	8
13	11	3,800	113	30	9,680	s 1,810	4.4	500	6
14	10	700	19	5.3	2,000	29	4.0	262	3
15	6.4	384	7	3.4	302	3	4.0	235	3
16	3.7	233	2	1.6	528	2	4.4	218	3
17	12	9,550	s 562	1.4	260	1	4.8	214	3
18	59	13,300	s 6,080	1.0	257	1	72	18,400	s 3,100
19	766	59,400	s 161,000	.8	241	1	18	14,600	710
20	67	16,600	s 3,240	.8	228	(t)	21	1,000	57
21	12	3,900	126	.6	273	(t)	8.6	750	17
22	15	2,160	363	.5	230	(t)	53	7,280	s 1,600
23	27	7,270	s 565	.5	199	(t)	23	12,700	789
24	12	5,100	165	.6	189	(t)	7.8	4,700	99
25	151	47,300	s 25,300	1.6	209	1	3.4	537	5
26	160	30,900	s 15,600	1.6	173	1	2.1	282	2
27	30	3,050	s 787	.9	196	(t)	1.7	194	1
28	33	3,100	276	.8	156	(t)	1.3	155	1
29	22	3,100	184	.8	143	(t)	.9	99	(t)
30	16	4,000	173	.8	120	(t)	.9	140	(t)
31	8.6	1,100	26	.6	110	(t)	--	--	--
Total	1,981.0	--	279,000	110.6	--	3,660	279.1	--	7,860

Total discharge for period (second-foot-days) 2,388.2
Total load for period (tons) 290,300

s Computed by subdividing day.
t Less than 0.50 ton.

LITTLE COLORADO RIVER AT WOODRUFF, ARIZ.--Continued

Particle-size analyses of suspended sediment, July 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	
July 11, 1950	6:30 a.m.	12	17,600	2,710	52	68	79	84	92	100	--					DSWCM
July 17	6:45 a.m.	2.0	183	693	55	72	88	91	98	98	100					DSWCM
July 18	6:40 a.m.	12	16,100	3,110	40	61	81	90	94	100	--					DSWCM
July 19	7:30 a.m.	950	70,700	2,980	25	37	54	69	79	92	100					DSWCM
July 19	9:35 a.m.	545	57,200	3,100	26	40	58	72	82	96	99	100				DSWCM
July 20	7:30 a.m.	111	29,800	2,140	34	49	69	85	93	99	100					DSWCM
July 25	12:10 p.m.	305	58,600	5,630	41	58	76	88	98	100	--					BWCM
Aug. 14	6:40 a.m.	2.0	1,320	998	75	93	98	99	100	--	--					BN
Aug. 14	6:40 a.m.	2.0	1,320	714	76	80	92	97	99	100	--					BWCM
Aug. 22	6:45 a.m.	.5	232	500	63	96	100	--	--	--	--					BN
Aug. 30	6:30 a.m.	.8	118	252	74	82	90	97	100	--	--					BN
Sept. 20	6:30 a.m.	19	541	1,210	82	93	100	--	--	--	--					BWCM

LITTLE COLORADO RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN LITTLE COLORADO RIVER BASIN IN ARIZONA

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

Date of collection	Mean discharge (second-feet)	Temperature (° F)	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)	Boron (B)	Dissolved solids			Hardness as $CaCO_3$		Percent sodium
																	Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate	
LITTLE COLORADO RIVER ABOVE BLUE SPRING, 13.5 MILES ABOVE MOUTH																						
June 14, 1950				6,000	16		221	80	1,000	32	698	233	1,580	0.4	1.3		3,510	4.77		880	308	70
Oct. 21		68		6,200							556		1,690									
LITTLE COLORADO RIVER BELOW BLUE SPRING, 10.5 MILES ABOVE MOUTH																						
June 14, 1950	196			4,730	17		253	77	724	27	874	221	1,110	0.4	2.2		2,860	3.89	1,510	945	229	62
LITTLE COLORADO RIVER BELOW BLUE SPRING, 13.0 MILES ABOVE MOUTH																						
Oct. 21, 1950				4,150	16		255	78	559		924	151	890	0.2	2.2		2,410	3.28		956	200	56

VIRGIN RIVER AT LITTLEFIELD, ARIZ.

LOCATION.--At gaging station three-eighths of a mile downstream from Beaverdam Wash and three-eighths of a mile upstream from Littlefield, Mohave County.
DRAINAGE AREA.--5,090 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: July 1949 to September 1950.
Water temperatures: October 1947 to September 1950.
Sediment records: October 1947 to September 1950.
EXTREMES, 1949-50.--Dissolved solids: Maximum, 2,630 ppm Aug. 11-20; minimum, 1,380 ppm Mar. 1-10.
Hardness: Maximum, 1,530 ppm Aug. 11-20; minimum, 774 ppm Mar. 1-10.
Water temperatures: Maximum observed, 90°F June 30; minimum observed, 35°F Jan. 4.
Sediment loads: Maximum daily, 431,000 tons July 18; minimum daily, 70 tons Sept. 22.
EXTREMES, 1947-50.--Water temperatures: Maximum observed, 90°F June 30, 1950; minimum observed, 35°F Jan. 4, 1949, Jan. 4, 1950.
Sediment loads: Maximum daily, 431,000 tons July 18, 1950; minimum daily, 36 tons Oct. 1, 3, 5, 1947.
REMARDS.--Records of specific conductance of daily samples available in district office at Salt Lake City, Utah. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1179.

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

Date of collection	Mean discharge (second-feet)	Temperature (°F)	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)	Boron (B)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 1-10, 1949	97.2		--	3,380	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Oct. 11-20	143		7.8	3,200	22		336	100	288		336	1,010	388		3.2		2,310	3.14	892	1,250	974	33
Oct. 21-31	176		--	2,810	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Nov. 1-10	149		--	2,980	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Nov. 11-20	224		7.5	2,580	24		290	99	164		288	769	318		2.8		1,810	2.46	1,090	1,130	894	24
Nov. 21-30	181		--	2,690	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Dec. 1-10	174		--	2,820	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Dec. 11-20	245		7.4	2,500	21		274	95	163		322	710	300		2.9		1,720	2.34	1,140	1,070	810	25
Dec. 21-31	235		--	2,500	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Jan. 10, 1950	237		8.0	2,440	21		239	75	211		311	670	290		2.9		1,660	2.26	1,060	905	650	34
Jan. 11-20	229		7.9	2,460	21		236	76	222		317	682	292		2.5		1,690	2.30	1,040	902	642	35
Jan. 21-31	259		8.0	2,240	20		220	69	196		303	615	260		3.1		1,530	2.08	1,070	832	584	34
Feb. 1-10	304		7.4	2,180	20		205	65	201		288	599	252		2.0		1,490	2.03	1,220	779	543	36
Feb. 11-19	291		7.8	2,170	21		212	66	192		308	586	250		2.4		1,480	2.01	1,160	800	548	34
Feb. 20-28	269		7.8	2,140	30		206	66	184		292	578	242		2.2		1,440	1.96	1,050	786	546	34
Mar. 1-10	294		7.8	2,060	19		303	65	168		288	551	232		4.1		1,380	1.88	1,100	774	538	32
Mar. 11-20	203		7.7	2,610	22		260	85	227		306	766	312		3.3		1,830	2.49	1,000	998	748	33
Mar. 21-31	182		7.6	2,670	21		276	89	224		308	812	312		3.2		1,890	2.57	929	1,050	802	32

VIRGIN RIVER BASIN--Continued

VIRGIN RIVER AT LITTLEFIELD, ARIZ.--Continued

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

Date of collection	Mean discharge (second-feet)	Temperature (° F)	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)	Boron (B)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Noncarbonate	Percent sodium
Apr. 1-10, 1950	259		7.6	2,240	18		216	75	187		278	644	250		2.7		1,530	2.08	1,070	848	620	32
Apr. 11-20	249		7.7	2,240	18		214	74	197		288	623	270		2.5		1,540	2.09	1,040	838	602	34
Apr. 21-30	263		7.7	2,150	17		210	71	178		284	584	255		2.5		1,460	1.99	1,040	816	584	32
May 1-10	167		7.4	2,620	21		259	82	242		306	775	320		1.4		1,850	2.52	834	983	732	35
May 11-20	85.0		7.2	3,200	26		339	111	272		319	1,060	375		.5		2,340	3.18	537	1,300	1,040	31
May 21-31	71.3		7.2	3,250	26		355	116	264		304	1,110	378		.2		2,400	3.26	462	1,360	1,110	30
June 1-10	67.1		7.6	3,210	26		337	117	280		270	1,130	378		1.3		2,400	3.26	435	1,320	1,100	32
June 11-20	67.3		7.7	3,230	26		345	120	271		289	1,130	375		.8		2,410	3.28	438	1,350	1,120	30
June 21-30	68.6		7.7	3,230	28		340	120	280		265	1,150	380		.6		2,430	3.30	450	1,340	1,120	31
July 1-10	223		7.5	3,100	26		377	104	248		251	1,200	320		.5		2,400	3.26	1,450	1,370	1,160	28
July 11-20	241		7.5	3,260	26		437	100	238		301	1,270	318		1.1		2,540	3.45	1,650	1,500	1,260	26
July 21-31	121		7.5	3,290	25		413	107	250		324	1,230	332		.9		2,520	3.43	823	1,470	1,200	27
Aug. 1-10	67.8		--	3,130	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Aug. 11-20	144		7.5	3,390	28		438	106	257		312	1,310	332		1.4		2,630	3.58	1,020	1,530	1,270	27
Aug. 21-31	64.9		--	3,260	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Sept. 1-10	160		--	3,270	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Sept. 11-20	71.5		7.9	3,280	25		375	113	280		317	1,180	368		1.3		2,500	3.40	483	1,400	1,140	30
Sept. 21-30	66.5		--	3,240	--		--	--	--		--	--	--		--		--	--	--	--	--	--
Weighted average	175		--	2,570	22		272	84	212		298	794	293		2.3		1,830	2.49	865	1,020	780	31

VIRGIN RIVER BASIN--Continued

VIRGIN RIVER AT LITTLEFIELD, ARIZ.--Continued

Temperature (°F) of water, water year October 1949 to September 1950
(Once-daily temperature measurement generally 9 a.m. or earlier)

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

VIRGIN RIVER BASIN--Continued

VIRGIN RIVER AT LITTLEFIELD, ARIZ.--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 concentrntion (ppm)	Tons per day
1	108	16,200	4,720	150	2,210	895	167	1,770	798
2	101	2,080	567	148	2,110	843	159	1,960	841
3	94	1,430	363	148	2,260	903	159	1,460	627
4	92	2,200	546	142	1,720	659	153	1,430	591
5	92	1,630	405	145	1,730	677	170	2,130	978
6	84	520	118	134	1,500	543	170	1,780	817
7	84	790	179	145	1,310	513	170	1,910	877
8	80	830	179	156	1,850	779	173	1,700	794
9	103	1,020	284	153	1,750	723	179	1,870	904
10	134	4,450	1,610	170	2,140	982	241	3,120	2,030
11	124	4,990	1,670	453	22,200	s 38,100	279	5,470	4,120
12	122	2,970	978	271	6,300	4,610	207	2,510	1,400
13	122	2,170	715	201	3,450	1,870	194	2,130	1,120
14	117	1,940	613	185	3,280	1,640	188	1,530	777
15	124	1,910	639	188	2,860	1,450	204	2,800	1,540
16	117	1,930	610	210	3,890	2,210	204	2,760	1,520
17	124	1,950	653	179	2,480	1,200	210	2,930	1,660
18	122	3,240	1,070	191	2,630	1,360	227	2,980	1,830
19	222	6,660	s 4,490	182	2,230	1,100	302	5,450	4,440
20	238	7,950	5,110	179	2,630	1,270	435	12,500	14,700
21	245	6,530	4,310	182	2,350	1,150	252	5,660	3,850
22	201	5,390	2,930	185	2,020	1,010	224	3,090	1,870
23	176	5,550	2,640	188	2,320	1,180	231	2,660	1,660
24	179	3,890	1,880	185	2,210	1,100	231	2,580	1,610
25	179	3,330	1,610	179	1,830	884	231	3,270	2,040
26	173	3,070	1,430	176	1,980	941	234	2,230	1,410
27	164	2,560	1,130	182	1,730	850	234	2,180	1,380
28	159	2,560	1,100	182	1,570	771	227	2,180	1,340
29	159	2,040	876	182	2,140	1,050	234	2,410	1,520
30	153	2,120	876	173	1,510	705	241	2,370	1,540
31	148	2,230	891	--	--	--	241	2,440	1,590
Total	4,340	--	45,190	5,544	--	71,970	6,771	--	62,170
	January			February			March		
1	256	2,450	1,690	231	2,210	1,380	298	2,660	2,140
2	267	2,950	2,130	217	1,860	1,090	298	4,280	3,440
3	271	3,400	2,940	207	1,890	1,060	286	3,560	2,750
4	227	2,220	1,360	217	1,770	1,040	302	3,220	2,630
5	204	1,440	793	241	2,170	1,410	298	3,010	2,420
6	220	1,950	1,160	271	2,500	1,830	315	4,060	3,450
7	224	1,530	925	524	6,820	s 11,100	319	3,600	3,100
8	231	2,590	1,620	440	7,820	11,600	279	3,380	2,550
9	238	2,550	1,640	302	4,300	3,510	286	3,450	2,660
10	234	2,250	1,420	282	4,570	3,480	259	2,370	1,660
11	220	2,250	1,340	306	4,240	3,500	249	2,120	1,430
12	234	1,880	1,190	332	4,210	3,770	249	2,850	1,920
13	245	2,690	1,780	286	3,750	2,890	245	2,150	1,420
14	234	2,570	1,620	267	2,840	2,050	238	2,780	1,790
15	227	2,310	1,420	267	2,770	2,000	224	2,750	1,660
16	227	1,780	1,090	282	2,890	2,200	231	1,900	1,240
17	224	2,020	1,220	282	2,670	2,030	197	1,360	723
18	220	1,830	1,090	302	3,360	2,740	153	1,160	479
19	227	2,420	1,480	298	4,640	3,730	127	950	326
20	231	2,350	1,470	302	3,940	3,210	117	890	281
21	241	2,460	1,600	294	2,930	2,330	122	1,130	372
22	259	2,980	2,080	286	3,540	2,730	124	940	315
23	267	3,450	2,490	252	2,650	1,800	120	1,600	518
24	290	3,060	2,400	241	2,200	1,430	122	890	293
25	363	6,290	6,160	238	2,040	1,310	150	e 1,100	446
26	263	2,890	2,050	241	2,780	1,810	400	6,130	6,620
27	220	2,200	1,310	271	3,260	2,390	275	2,710	2,010
28	224	1,680	1,020	294	3,120	2,480	214	2,180	1,260
29	234	2,490	1,570	--	--	--	185	1,910	954
30	241	2,420	1,570	--	--	--	145	1,690	662
31	249	2,410	1,620	--	--	--	145	1,610	630
Total	7,512	--	53,250	8,083	--	81,900	6,972	--	52,150

e Estimated or interpolated.
s Computed by subdividing day.

VIRGIN RIVER BASIN--Continued

VIRGIN RIVER AT LITTLEFIELD, ARIZ.--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	137	1,120	414	153	1,340	554	67	1,300	235
2	137	1,180	436	161	1,370	596	68	1,010	185
3	164	2,230	987	148	1,590	635	68	1,120	206
4	271	3,850	2,820	197	1,910	1,020	68	e800	147
5	271	3,310	2,420	245	2,370	1,570	67	785	142
6	259	2,550	1,780	220	1,900	1,130	67	750	136
7	279	2,220	1,670	207	1,320	738	67	832	150
8	319	e3,000	2,580	134	1,300	470	65	917	161
9	368	3,710	3,690	110	1,730	514	67	852	154
10	381	4,050	4,170	92	903	224	67	845	153
11	286	2,450	1,890	86	738	171	67	872	158
12	259	2,390	1,670	82	893	198	68	850	158
13	238	2,000	1,280	84	573	130	68	843	155
14	241	2,840	1,850	84	767	174	68	852	156
15	263	2,530	1,800	86	1,070	248	68	894	164
16	217	1,630	955	86	686	159	65	e870	153
17	185	1,780	889	88	1,040	247	68	876	161
18	245	2,160	1,430	92	1,690	420	67	787	142
19	275	2,350	1,740	82	1,240	275	67	799	145
20	282	2,460	1,870	80	1,340	289	67	646	117
21	275	2,320	1,720	78	1,150	242	67	850	154
22	302	2,780	2,270	76	1,090	224	67	1,040	188
23	311	2,800	2,350	72	807	157	68	945	174
24	315	2,730	2,320	72	716	139	70	931	176
25	286	2,250	1,740	70	938	177	68	934	171
26	238	2,070	1,330	72	813	158	70	1,040	197
27	234	3,380	2,140	72	881	172	70	999	189
28	249	2,080	1,400	70	833	157	68	569	104
29	256	2,120	1,470	68	717	132	68	e570	105
30	167	1,710	771	67	912	165	70	627	118
31	--	--	--	67	619	112	--	--	--
Total	7,710	--	53,850	3,301	--	11,800	2,030	--	4,752
	July			August			September		
1	68	1,030	189	71	698	134	65	600	105
2	68	842	155	68	881	162	64	763	132
3	70	806	152	71	866	166	62	1,030	172
4	68	967	178	68	695	128	64	795	137
5	70	894	189	66	1,110	198	65	511	90
6	72	873	170	66	793	141	64	931	161
7	289	25,600	s70,500	68	1,060	195	117	9,790	s 7,500
8	659	57,500	s149,000	68	1,070	196	678	70,000	s 164,000
9	656	30,700	s 64,600	66	1,590	283	267	35,400	s 27,600
10	213	27,500	15,800	66	1,080	192	155	14,500	6,070
11	132	18,500	6,590	68	1,470	270	85	4,200	964
12	82	3,870	857	552	55,400	s 136,000	74	1,800	360
13	68	859	158	225	36,200	s 24,100	68	1,060	195
14	68	988	181	194	30,200	s 18,300	71	766	147
15	68	783	144	77	5,000	1,040	69	681	127
16	66	665	122	66	1,020	182	69	524	98
17	89	1,090	203	64	991	171	68	613	113
18	1,470	84,600	s 431,000	66	794	141	71	611	117
19	277	34,800	s 28,600	65	720	126	71	730	140
20	114	9,000	2,770	66	942	168	69	1,010	188
21	86	3,000	897	64	801	138	66	847	151
22	77	1,080	220	65	e780	137	66	392	70
23	77	1,140	237	65	762	134	66	646	115
24	75	849	172	64	906	157	66	1,020	182
25	196	32,500	s 27,400	65	1,170	205	66	858	153
26	278	49,200	s 41,900	65	948	166	68	686	126
27	187	25,500	12,900	65	867	156	68	759	139
28	104	7,730	2,170	65	808	142	68	506	93
29	85	1,470	337	66	870	155	66	751	134
30	85	940	216	65	946	166	65	884	155
31	80	1,020	220	65	633	111	--	--	--
Total	5,977	--	858,000	2,835	--	184,000	2,981	--	209,700

Total discharge for year (second-foot-days) 64,056
Total load for year (tons) ..... 1,6[illegible],000

e Estimated or interpolated.
s Computed by subdividing day.

VIRGIN RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN VIRGIN RIVER BASIN IN UTAH

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

Date of collectioa	Mean discharge (second-feet)	Temperature (°F)	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)	Boron (B)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Noncarbonate	Percent sodium
VIRGIN RIVER AT VIRGIN																						
Aug. 15, 1950	74			862			81	37	52		224	182	64		3.3		530	0.72	106	354	170	24
Aug. 22-31	57.6			861			--	--	--		--	--	--		--		--	--	--	--	--	--
Sept. 1-6, 8-10	73.8			912			--	--	--		--	--	--		--		--	--	--	--	--	--
Sept. 7	76			2,570			--	--	--		--	--	--		--		--	--	--	--	--	--
Sept. 11-20	66.9		7.4	899	15		86	35	50		212	190	67		1.3		549	.75	99	358	185	23
Sept. 21-30	66.4			907			--	--	--		--	--	--		--		--	--	--	--	--	--
VIRGIN RIVER NEAR ST. GEORGE																						
Apr. 21, 1950				1,230	12		106	33	112		248	221	148		2.4		757	1.03		400	197	38
Aug. 26, Sept. 2				4,530	24		371	141	518		229	1,400	698		3.5		3,270	4.45		1,510	1,320	43
Sept. 8, 10				3,200	19		274	81	351		268	848	478		3.2		2,190	2.98		1,020	797	43
Sept. 18, 24			7.2	4,360	25		330	122	559		285	1,170	770		4.1		3,120	4.24		1,320	1,090	48
WASHINGTON FIELD CANAL NEAR WASHINGTON																						
Aug. 15, 1950				3,210	--		177	69	445		229	601	620		4.7		2,030	2.76		725	538	57
Aug. 26, Sept. 2				3,850	26		222	75	525		211	698	780		4.5		2,430	3.30		862	690	57
Sept. 10, 18, 24			7.3	3,170	24		194	63	441		253	614	605		3.6		2,070	2.82		743	536	56
SANTA CLARA RIVER ABOVE WINSOR DAM, NEAR SANTA CLARA																						
Aug. 26, 1950	7.7			457	38						183	36	25							a176	26	
Sept. 3	4.8			396	33						219	36	24							a164	0	
Sept. 10, 18, 25	9.87		7.5	468	38		54	14	16		195	30	25		0.7		274	0.37	7.3	192	32	15
SANTA CLARA RIVER NEAR ST. GEORGE																						
Aug. 26, Sept. 2, 1950				2,430	44		319	112	136		346	1,100	88		0.3		1,970	2.68		1,260	973	19
Sept. 9				2,780	--		--	--	--		466	1,290	92		--		--	--		a1,520	1,140	--
Sept. 18, 24	0.3		7.3	2,530	42		370	110	144		475	1,120	94		.1		2,110	2.87	1.7	1,380	986	18

a Determined by Schwarzenbach method.

SALTON SEA BASIN

MISCELLANEOUS ANALYSES OF STREAMS IN SALTON SEA BASIN IN CALIFORNIA

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

Date of collection	Discharge (second-feet)	Temperature (° F)	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)	Boron (B)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Noncarbonate	Percent sodium
ALAMO RIVER NEAR CALIPATRIA																						
Oct. 17, 1949	1,268	--		2,230	15		134	55	296	190	459	400		9.6			1,460	1.99	5,000	560	405	53
Nov. 28	800.9	--		2,690	12		144	73	356	174	516	530		6.9			1,720	2.34	3,720	660	517	54
Dec. 29	817.0	48		2,680	16		150	60	312	192	490	500		11			1,650	2.24	3,640	704	546	49
Jan. 23, 1950	837.9	58		2,730	16		159	77	321	202	514	498		9.7			1,690	2.30	3,820	713	548	49
Feb. 9	795.7	57		2,770	12		159	76	342	198	520	525		9.3			1,740	2.37	3,740	709	547	51
Mar. 6	844.2	64		3,040	11		164	87	375	194	544	605		4.6			1,890	2.57	4,310	766	608	52
Apr. 13	614.0	66		2,810	11		158	76	342	203	527	518		5.8			1,740	2.37	2,880	706	540	51
May 11	735.3	71		2,930	--		127	83	382	118	544	585		2.0			1,780	2.42	3,530	658	562	56
June 16	740.6	74		3,040	14		153	85	391	198	547	598		8.2			1,890	2.57	3,780	731	569	54
July 13	748.0	85		3,060	14		149	85	405	188	553	615		6.6			1,920	2.61	3,880	722	568	55
Aug. 10	804	--		3,170	20		152	88	443	191	583	680		4.4			2,040	2.77	4,430	741	584	57
Sept. 11	828.9	76		3,030	6.9		135	81	439	166	541	655		2.3			1,940	2.64	4,340	670	534	59
NEW RIVER NEAR WESTMORELAND																						
Oct. 17, 1949	589	--		2,950	16		155	62	405	200	487	610		14			1,830	2.49	2,910	642	478	58
Nov. 28	584.8	--		2,860	15		136	57	406	202	431	595		4.9			1,740	2.37	2,750	574	408	61
Dec. 29	484.8	49		3,400	10		153	74	488	208	472	765		6.8			2,070	2.82	2,710	666	516	61
Jan. 23, 1950	--	58		2,970	11		148	68	395	206	433	625		9.0			1,790	2.43	--	649	480	57
Feb. 9	479.4	57		3,160	12		159	73	424	210	444	695		4.2			1,910	2.60	2,470	696	524	57
Mar. 6	499.4	64		4,300	13		201	90	615	218	523	1,050		5.5			2,600	3.54	3,510	872	693	61
Apr. 13	437.4	66		4,040	12		175	89	577	225	521	940		5.2			2,430	3.30	2,870	802	618	61
May 11	510.5	71		3,270	--		130	72	470	a 140	484	725		1.6			1,950	2.65	2,690	620	506	62
June 16	539.9	74		2,560	15		138	57	332	201	423	490		5.2			1,560	2.12	2,270	579	414	55
July 13	474.5	86		3,240	15		151	71	444	197	459	702		4.8			1,940	2.64	2,490	668	507	59
Aug. 10	492.7	--		2,830	13		140	60	407	204	446	600		4.1			1,770	2.41	2,350	596	429	60

a Includes equivalent of 9.9 parts per million of carbonate (CO_3).

PART 12. PACIFIC SLOPE BASINS IN WASHINGTON AND UPPER COLUMBIA RIVER BASIN

UPPER COLUMBIA RIVER BASIN

COLUMBIA RIVER MAIN STEM

MISCELLANEOUS ANALYSES OF STREAMS IN COLUMBIA RIVER MAIN STEM IN WASHINGTON

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

Date of collection	Mean discharge (second-feet)	Temperature (° F)	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)	Boron (B)	Dissolved solids			Hardness as $CaCO_3$		Percent sodium
																	Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate	
COLUMBIA RIVER AT GRAND COULEE DAM																						
Oct. 11, 1949	47,700		7.8	145	4.1	0.04	--	--	--	--	72	14	0.9	0.1	0.9		--	--	--	--	--	--
Dec. 4	64,700		7.6	145	7.0	.02	20	4.9	1.6	1.0	76	13	.8	.1	2.2		68	0.12	15,400	70	8	5
Jan. 7, 1950	53,400		7.8	154	4.5	.03	22	5.0	1.6	1.4	79	14	.8	.3	.6		89	.12	12,800	75	11	4
Apr. 14	82,200		7.7	147	8.9	.26	20	5.5	2.1	1.1	74	15	1.1	.2	1.1		92	.13	20,400	72	12	6
June 15	320,800		7.8	138	8.2	.01	19	5.0	1.3	1.0	71	11	.8	.2	.6		82	.11	71,000	68	10	4
Aug. 20	120,300		7.4	130	5.4	.01	19	4.3	1.7	1.4	71	8.8	1.2	.2	1.0		78	.11	25,300	65	7	5

KOOTENAI RIVER AT PORTHILL, IDAHO

LOCATION.--At gaging station, 300 feet south of international boundary at Porthill, Boundary County.
DRAINAGE AREA.--13,700 square miles.
RECORDS AVAILABLE.--Chemical analyses: January 1949 to September 1950.
Water temperatures: January 1949 to September 1950.
EXTREMES, 1949-50.--Dissolved solids: Maximum, 155 ppm Oct. 11-20; minimum, 85 ppm May 21-31.
Hardness: Maximum, 135 ppm Oct. 11-20, Sept. 21-30; minimum, 68 ppm May 21-31.
Water temperatures: Maximum, 65°F Sept. 8-9; minimum, freezing point on many days during winter months.
EXTREMES, January 1949 to September 1950.--Dissolved solids: Maximum, 185 ppm Jan. 21-31, 1949; minimum, 85 ppm May 21-31, 1950.
Hardness: Maximum, 161 ppm Jan. 21-31, 1949; minimum, 68 ppm May 21-31, 1950.
Water temperatures: Maximum, 69°F Aug. 5-7, 10, 16, 1949; minimum, freezing point on many days during winter months.
REMARKS.--Records of specific conductance of daily samples available in regional office at Salt Lake City, Utah. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1182.

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

Date of collection	Mean discharge (second-feet)	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)	Boron (B)	Dissolved solids			Hardness as $CaCO_3$		Percent sodium
																Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate	
Oct. 1-10, 1949	5,550	--	262	--	--	--	--	--	--	138	--	--	--	--		--	--	--	--	--	--
Oct. 11-20	5,256	7.7	260	7.9	0.02	36	11	3.3	1.6	136	26	2.2	0.2	0.1		155	0.21	2,200	135	24	5
Oct. 21-31	5,208	--	269	--	--	--	--	--	--	140	--	--	--	--		--	--	--	--	--	--
Nov. 1-10	5,240	--	251	--	--	--	--	--	--	130	--	--	--	--		--	--	--	--	--	--
Nov. 11-20	6,333	7.9	247	8.3	.03	33	10	3.3	1.4	130	24	1.8	.1	.1		146	.20	2,500	123	17	5
Nov. 21-30	9,072	7.2	218	7.9	.05	28	9.4	2.5	2.2	112	19	1.8	.2	.2		126	.17	3,090	108	17	5
Dec. 1-10	8,744	7.2	176	7.9	.11	23	8.0	2.0	2.1	92	16	1.4	.2	.3		106	.14	2,500	90	15	4
Dec. 11-20	5,122	7.3	205	8.4	.05	26	9.3	2.3	2.7	107	17	1.7	.2	.3		121	.16	1,680	103	15	4
Dec. 21-31	4,825	7.4	226	8.5	.04	29	10	2.7	1.8	119	19	1.9	.2	.2		132	.18	1,720	113	16	5
Jan. 1-10, 1950	3,903	7.7	233	7.8	.03	31	9.4	2.9	2.4	124	20	1.5	.3	.6		137	.19	1,440	116	14	5
Jan. 11-20	3,337	7.6	244	8.6	.04	32	10	3.1	3.2	130	22	1.6	.3	.5		145	.20	1,310	121	14	5
Jan. 21-31	4,744	7.5	243	9.1	.03	33	11	2.8	.8	127	21	2.2	.4	.4		142	.19	1,820	125	21	5
Feb. 1-10	4,239	7.8	240	10	.06	31	10	3.2	1.6	123	21	1.7	.2	.6		140	.19	1,600	118	18	5
Feb. 11-19	4,690	7.8	256	9.2	.07	34	11	3.3	1.8	130	23	2.2	.1	.6		149	.20	1,890	130	24	5
Feb. 20-28	5,618	7.1	252	8.6	.05	33	11	2.9	1.9	124	23	2.6	.2	.6		145	.20	2,200	128	26	5
Mar. 1-10	9,124	7.3	228	9.5	.08	30	9.6	2.6	2.2	112	24	2.0	.3	1.3		137	.19	3,370	114	22	5
Mar. 11-20	7,236	7.5	216	9.8	.09	28	9.2	2.3	1.9	104	21	1.7	.2	1.4		127	.17	2,480	108	22	4
Mar. 21-31	7,699	7.6	224	9.8	.05	29	8.8	2.8	3.0	110	22	2.1	.3	2.0		134	.18	2,790	109	18	5
Apr. 1-10	10,130	7.7	215	9.8	.09	29	8.9	2.7	3.5	109	21	1.7	.3	1.5		132	.18	3,610	109	20	5
Apr. 11-20	17,610	7.8	182	11	.11	23	7.8	2.7	3.2	95	15	1.6	.3	.6		112	.15	5,330	89	12	6
Apr. 21-30	21,670	7.8	165	11	.13	21	6.8	2.4	2.6	90	12	1.3	.3	.3		102	.14	5,970	80	7	6

a Less than 0.1 part per million by turmeric method.

UPPER COLUMBIA RIVER BASIN--Continued

KOOTENAI RIVER BASIN--Continued

KOOTENAI RIVER AT PORTHILL, IDAHO--Continued

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

Date of collection	Mean discharge (second-feet)	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)	Boron (B) a	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Noncarbonate	Percent sodium
May 1-10, 1950 ..	19,030	7.7	177	11	0.09	22	7.0	2.3	2.6	94	12	1.3	0.3	0.2		105	0.14	5,390	84	7	5
May 11-20	57,950	7.8	148	10	.21	23	4.8	1.5	1.4	80	9.6	1.3	.3	.3		92	.13	14,400	77	12	4
May 21-31	56,750	7.9	144	8.0	.10	30	4.5	1.8	1.3	78	8.6	1.4	.3	.3		85	.12	13,000	68	4	5
June 1-10.....	60,770	7.5	164	9.4	.03	24	5.6	1.7	1.1	96	7.7	.9	.2	.3		98	.13	16,100	83	4	4
June 11-20	77,040	7.5	180	8.0	.03	28	5.6	1.4	1.0	108	7.7	.9	.3	.4		107	.15	22,300	93	4	3
June 21-30	82,190	7.5	187	7.3	.09	29	5.8	1.5	1.0	110	7.6	.8	.3	.3		108	.15	24,000	96	6	3
July 1-10	62,200	7.5	180	7.5	.04	28	5.9	1.6	1.0	104	8.6	1.0	.3	.3		105	.14	17,600	94	9	4
July 11-20	36,880	7.5	198	6.8	.03	28	6.7	1.8	1.0	108	12	1.2	.2	.3		111	.15	11,100	97	9	4
July 21-31	23,600	7.8	203	6.8	.02	29	7.2	1.8	2.4	112	13	1.8	.2	.3		118	.16	7,520	102	10	4
Aug. 1-10	15,900	7.8	217	6.5	.01	30	8.5	2.2	2.4	119	16	2.4	.2	.4		127	.17	5,450	110	12	4
Aug. 11-20	12,390	7.8	230	6.8	.01	31	9.2	2.4	2.1	124	17	2.4	.2	.2		132	.18	4,420	115	14	4
Aug. 21-31	11,040	7.8	228	6.9	.01	31	9.8	2.4	2.1	125	18	2.3	.2	.2		135	.18	4,020	118	15	4
Sept. 1-10	8,495	7.8	238	6.6	.01	33	9.8	2.4	1.9	128	18	2.5	.2	.7		138	.19	3,170	123	18	4
Sept. 11-20	6,570	7.8	349	6.6	.01	34	10	2.8	1.8	134	30	2.4	.2	.2		144	.20	2,550	126	16	5
Sept. 21-30	5,996	7.9	258	7.9	.01	36	11	3.0	1.9	142	21	2.3	.2	.2		154	.21	2,490	135	19	5
Weighted average	20,540	--	186	8.3	0.07	27	6.7	1.9	1.5	103	12	1.3	0.3	0.4		110	0.15	6,100	92	8	4

a Less than 0.1 part per million by turmeric method.

UPPER COLUMBIA RIVER BASIN--Continued

KOOTENAI RIVER BASIN--Continued

KOOTENAI RIVER AT PORTHILL, IDAHO--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	39	40	32	32	32	41	44	49	61	61	63
2	56	41	40	32	32	32	41	45	49	62	61	64
3	61	41	39	32	32	32	41	45	49	60	62	64
4	56	42	38	32	32	32	42	44	49	57	62	64
5	55	42	38	32	32	32	41	44	51	57	62	64
6	54	42	38	32	32	32	41	44	50	57	62	64
7	54	41	37	32	32	32	42	45	49	58	63	64
8	53	40	38	32	32	32	41	45	47	58	62	65
9	52	40	35	32	32	32	41	46	46	58	62	65
10	50	40	35	32	32	32	42	46	48	58	63	64
11	50	40	34	32	32	32	42	47	49	58	63	64
12	49	40	33	32	32	32	42	47	51	58	63	64
13	48	40	33	32	32	32	43	--	52	58	64	64
14	48	40	32	32	32	32	43	--	50	58	64	64
15	47	40	32	32	32	32	44	--	51	58	64	62
16	46	39	32	32	32	32	44	--	50	58	64	62
17	45	39	32	32	32	32	43	--	50	58	64	60
18	45	39	32	32	32	32	43	--	50	59	64	59
19	45	39	32	32	32	32	43	--	50	60	64	59
20	45	39	32	32	32	32	43	--	52	60	64	58
21	44	39	32	32	32	32	44	--	52	59	64	58
22	43	40	33	32	32	32	44	--	51	60	63	57
23	43	40	33	32	32	32	44	--	51	60	62	56
24	43	39	32	32	32	33	44	--	50	62	62	56
25	42	39	32	32	32	36	44	48	50	64	63	56
26	42	39	32	32	32	38	44	48	50	64	63	56
27	41	39	32	32	32	38	44	49	52	64	63	56
28	40	39	32	32	32	38	44	49	55	64	62	56
29	39	39	32	32	--	38	44	49	56	64	62	56
30	39	40	32	32	--	39	44	49	57	64	63	55
31	40	--	32	32	--	40	--	49	--	62	63	--
Average	47	40	34	32	32	33	43	--	51	60	63	61

UPPER COLUMBIA RIVER BASIN--Continued

KOOTENAI RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN KOOTENAI RIVER BASIN

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

Date of collection	Mean discharge (second-feet)	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)	Boron (B)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Noncarbonate	Percent sodium
KOOTENAY RIVER AT NEWGATE, BRITISH COLUMBIA																					
May 9, 1950	8,600	7.6	269	5.6	0.09	39	12	2.1	0.6	148	25	1.9	0.2	0.1		159	0.22	3,690	147	25	3
June 19	65,400	8.2	190	5.7	.04	28	6.1	2.9		108	11	.3	.1	.8		108	.15	19,100	95	6	6
MOYIE RIVER AT EASTPORT, IDAHO																					
Oct. 20, 1949	81	7.7	48.4	11	0.06	5.8	1.8	1.5	2.4	28	4.0	0.5	0.1	0.1		41	0.06	9.0	22	0	12
Dec. 2	526	7.4	40.9	8.5	.04	4.6	1.4	4.1		24	3.4	.5	.2	2.1		37	.05	53	17	0	34
Dec. 22	240	7.7	46.6	9.5	.07	5.3	1.6	1.6	1.9	26	4.0	.4	.1	1.8		39	.05	25	20	0	14
Feb. 28, 1950	255	7.7	51.8	11	.06	4.9	1.6	1.9	2.1	26	3.5	.5	.2	.2		39	.05	27	19	0	16
Mar. 16	290	7.9	47.8	9.7	.06	5.1	1.6	1.7	1.8	24	3.2	.6	.2	.1		36	.05	28	19	0	15
Apr. 18	1,760	7.4	36.3	12	.14	3.6	1.8	1.8	.5	20	3.4	.3	.3	.4		34	.05	162	16	0	19
May 12	4,960	7.3	29.4	10	.08	2.9	1.3	1.3	.6	15	2.4	.6	.3	.3		27	.04	362	13	0	18
June 21	4,280	7.0	32.7	8.1	.05	3.7	1.1	1.0	.6	17	1.9	.4	.2	.4		26	.04	300	14	0	13
July 12	1,050	7.2	34.9	8.5	.04	4.4	.7	1.9		18	2.6	.1	.1	.1		27	.04	77	14	0	23
Aug. 10	234	7.1	39.0	9.6	.03	4.4	1.3	1.7	1.6	23	2.1	.4	.3	.1		33	.04	21	16	0	17
Sept. 26	109	7.2	42.8	11	.02	4.8	1.4	1.7	2.1	24	2.4	.6	.3	.0		36	.05	11	18	0	15
BOUNDARY CREEK NEAR PORTHILL, IDAHO																					
Oct. 20, 1949	29	7.9	52.7	11	0.11	6.3	1.7	5.2		32	6.7	0.4	0.1	0.1		47	0.06	3.7	23	0	33
Nov. 22	64	7.7	37.5	9.9	.04	4.1	1.3	1.4	1.6	19	4.4	.4	.1	1.4		34	.05	5.9	16	0	15
Dec. 20	70	7.9	36.7	9.3	.05	3.6	1.5	2.9		19	3.7	.4	.1	1.4		32	.04	6.0	15	0	29
Feb. 28, 1950	53	7.7	46.3	10	.05	4.8	1.5	1.8	1.3	23	3.6	.4	.2	.2		35	.05	5.0	18	0	16
Mar. 14	58	7.7	42.0	11	.05	4.4	1.6	1.5	2.1	22	3.6	.6	.2	.0		36	.05	5.6	18	0	14
Apr. 13	122	7.3	39.0	11	.18	4.6	1.9	1.7	.6	21	3.8	.3	.2	.2		35	.05	12	19	2	16
May 12	705	7.5	25.0	8.6	.12	2.4	1.5	.9	.8	12	3.3	.3	.4	.3		25	.03	48	12	2	13
June 21	1,470	6.6	17.1	5.8	.10	1.5	.6	.6	.7	8.0	2.3	.2	.1	.2		16	.02	64	6	0	15
July 11	365	7.6	21.8	6.8	.05	2.4	.7	.8	1.5	10	2.2	.2	.3	.1		20	.03	20	9	1	14
Aug. 10	73	7.3	35.7	9.1	.09	4.0	1.4	1.4	1.1	19	4.0	.3	.2	.0		31	.04	6.1	16	0	15
Sept. 26	78	7.4	35.7	8.8	.08	4.0	1.2	1.5	1.3	18	3.9	.2	.2	.2		30	.04	6.3	15	0	16

PEND OREILLE RIVER BASIN

PEND OREILLE RIVER AT METALINE FALLS, WASH.

LOCATION.--At highway bridge west of Metaline Falls, Pend Oreille County, 5 miles upstream from Slate Creek, and 10 miles upstream from International Gaging Station below Z Canyon.
DRAINAGE AREA.--25,200 square miles (above gaging station).
RECORDS AVAILABLE.--Chemical analyses: January 1949 to September 1950.
Water temperatures: January 1949 to September 1950.
EXTREMES, 1949-50.-- Dissolved solids: Maximum, 110 ppm Oct. 11-20, Nov. 11-20; minimum, 83 ppm June 21-30.
Hardness: Maximum, 88 ppm Oct. 11-20, Nov. 21-30; minimum, 67 ppm June 21-30.
Water temperatures: Maximum, 78°F July 30, Sept. 4; minimum, freezing point Dec. 21.
EXTREMES, January 1949 to September 1950.--Dissolved solids: Maximum, 116 ppm Jan. 1-10, 21-30, 1949; minimum, 83 ppm June 21-30, 1950.
Hardness: Maximum, 93 ppm Jan. 21-30, 1949; minimum, 67 ppm Apr. 11-20, 1949, June 21-30, 1950.
Water temperatures: Maximum, 78°F July 30, Sept. 4, 1950; minimum, freezing point on many days in January and on Dec. 21, 1949.
REMARKS --Records of specific conductance of daily samples available in regional office at Salt Lake City, Utah. Discharge records for gaging station near Metaline Falls for water year October 1949 to September 1950 given in Water-Supply Paper 1182.

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

Date of collection	Mean discharge (second-feet)	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)	Boron (B) a	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Oct. 1-10, 1949 ..	9,363	--	185	--	--	--	--	--	--	98	--	--	--	--		--	--	--	--	--	--
Oct. 11-20.....	11,240	7.6	184	9.5	0.07	25	6.3	3.4	1.9	100	13	0.8	0.1	0.2		110	0.15	3,340	88	6	8
Oct. 21-31	11,660	--	185	--	--	--	--	--	--	102	--	--	--	--		--	--	--	--	--	--
Nov. 1-10	11,820	--	183	--	--	--	--	--	--	100	--	--	--	--		--	--	--	--	--	--
Nov. 11-20	13,720	7.5	180	9.3	.05	24	6.5	3.2	2.6	98	14	1.4	.1	.1		110	.15	4,070	87	6	7
Nov. 21-30	14,590	7.3	178	8.6	.04	24	6.9	3.0	1.3	96	12	1.3	.4	.5		105	.14	4,140	88	10	7
Dec. 1-10	17,210	7.4	172	9.1	.03	23	6 9	3.1	1.6	92	11	1.5	.4	.4		102	.14	4,740	86	10	7
Dec. 11-20	16,810	7.4	173	8.3	.03	22	6.8	4.2	1.3	92	11	1.4	.3	.4		101	.14	4,580	83	7	10
Dec. 21-28	17,490	7.4	172	8.5	.03	23	7.0	3.0	1.3	94	13	1.3	.4	.3		104	.14	4,910	86	9	7
Mar. 3-10, 1950 .	23,480	7.1	172	9.5	.06	23	6.8	3.0	1.8	90	11	1.5	.2	.2		101	.14	6,400	85	12	7
Mar. 11-20	24,560	7.6	163	9.2	.06	21	6.3	2.4	2.6	86	11	1.7	.2	.3		97	.13	6,430	78	8	6
Mar. 21-31	25,850	7.6	158	9.3	.07	21	6.6	2.2	2.1	84	11	1.3	.3	.2		95	.13	6,630	80	11	6
Apr. 1-10	26,660	7.7	157	11	.06	21	6.7	3.0	.8	83	11	1.4	.3	.3		96	.13	6,910	80	12	7
Apr. 11-20	30,210	7.8	157	10	.05	21	6.4	2.4	1.1	84	12	1.4	.3	.2		96	.13	7,830	79	10	6
Apr. 21-30	37,060	7.7	156	9.9	.06	21	6.4	3.0	1.3	84	12	1.0	.3	.3		97	.13	9,710	79	10	7
May 1-10	39,190	7.0	158	11	.04	20	5.5	3.1	1.1	82	10	1.4	.2	.6		93	.13	9,840	72	5	8
May 11-20	47,470	7.0	152	9.8	.06	20	5.1	2.6	1.1	80	9.5	1.2	.2	.6		90	.12	11,500	71	5	8
May 21-31	74,920	7.2	154	12	.04	20	5.2	2.6	.8	81	10	1.2	.3	.5		93	.13	19,900	71	5	7

a Less than 0.1 part per million by turmeric method.

UPPER COLUMBIA RIVER BASIN--Continued

PEND OREILLE RIVER BASIN--Continued

PEND OREILLE RIVER AT METALINE FALLS, WASH.--Continued

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

Date of collection	Mean discharge (second-feet)	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)	Boron (B)	Dissolved solids			Hardness as $CaCO_3$		Percent sodium
																Parts per million	Tons per acre-foot	Tons per day	Total	Noncarbonate	
June 1-10, 1950	94,690	7.4	151	9.1	0.05	20	5.2	2.3	0.8	81	8.5	1.4	0.3	0.6		88	0.12	22,500	71	5	6
June 11-20	107,200	7.2	154	8.7	.05	20	5.2	2.3	1.1	82	8.4	1.4	.3	.6		88	.12	25,500	71	4	6
June 21-30	124,900	7.2	146	7.9	.05	19	4.8	2.0	1.3	78	7.6	1.2	.3	.5		83	.11	28,000	67	3	6
July 1-10	120,200	7.0	148	10	.03	20	5.7	2.4	5.1	85	7.2	1.2	.2	.5		94	.13	30,500	73	4	6
July 11-20	95,910	7.1	147	9.2	.02	21	5.9	2.1	4.5	85	7.7	.9	.3	.6		94	.13	24,300	77	7	5
July 21-31	56,230	7.4	150	9.1	.02	21	5.9	2.3	3.8	89	7.3	.9	.1	.6		95	.13	14,400	77	4	6
Aug. 1-10	36,100	7.4	180	9.0	.03	22	6.0	2.7	4.6	92	8.2	1.3	.2	1.4		101	.14	9,840	80	4	6
Aug. 11-20	27,760	7.2	162	8.6	.02	22	6.2	2.5	3.5	94	8.5	1.0	.2	.4		99	.13	7,420	80	3	6
Aug. 21-31	21,720	7.4	166	8.9	.01	23	6.6	2.5	2.2	95	9.1	1.2	.2	.3		101	.14	5,920	85	7	6
Sept. 1-10	16,410	7.5	157	8.7	.02	21	6.4	2.3	1.9	91	7.7	1.0	.2	.2		94	.13	4,180	79	4	6
Sept. 11-21	13,280	7.5	150	9.2	.04	21	6.0	1.9	1.6	89	6.7	1.0	.2	.1		92	.13	3,300	77	4	5
Weighted average	40,400	--	b155	9.4	0.04	21	5.7	2.5	2.2	b85	9.0	1.2	0.3	0.5		94	0.13	10,300	76	6	6

a Less than 0.1 part per million by turmeric method.
b Based on only those analyses for which most of the constituents were determined.

UPPER COLUMBIA RIVER BASIN--Continued

PEND OREILLE RIVER BASIN--Continued

PEND OREILLE RIVER AT METALINE FALLS, WASH.--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	57	46	45			--	43	49	56	65	70	75
2	57	46	45			--	43	52	56	65	72	76
3	57	45	44			40	43	45	57	66	71	72
4	54	45	43			40	43	46	53	65	72	78
5	54	45	43			37	43	47	54	67	75	75
6	51	44	43			38	42	46	54	69	69	76
7	51	44	41			39	43	52	52	66	73	72
8	51	45	39			39	43	50	54	68	70	73
9	51	44	38			34	43	51	56	70	72	72
10	52	43	38			34	43	53	57	71	72	73
11	52	44	38			35	43	54	55	70	76	73
12	51	44	37			36	44	54	56	68	70	71
13	51	43	37			35	44	54	57	68	71	72
14	51	42	39			38	44	54	56	67	71	69
15	50	45	35			38	44	55	58	67	68	70
16	50	44	36			39	44	58	59	70	70	68
17	48	44	34			39	44	53	56	68	72	70
18	49	43	35			39	45	53	59	70	70	69
19	49	43	36			39	45	56	60	71	73	69
20	48	43	35			41	45	54	58	73	71	66
21	47	43	32			41	45	51	55	77	74	65
22	47	43	36			40	44	51	56	70	71	--
23	46	43	34			40	44	52	58	71	--	--
24	46	44	35			40	44	58	56	73	76	--
25	46	44	36			40	44	57	59	71	75	--
26	45	44	35			40	--	69	61	71	72	--
27	46	44	34			39	45	56	60	73	74	--
28	45	43	33			40	45	57	63	68	70	--
29	45	44	--			40	48	57	63	71	72	--
30	45	44	--			40	50	55	64	78	70	--
31	45	--	--			43	--	56	--	68	72	--
Average	50	44	38			39	44	53	57	70	72	--

UPPER COLUMBIA RIVER BASIN--Continued

PEND OREILLE RIVER BASIN--Continued

FLATHEAD RIVER AT COLUMBIA FALLS, MONT.

LOCATION.--At highway bridge 200 feet upstream from gaging station at Columbia Falls, Flathead County, which is 5 miles downstream from South Fork.
DRAINAGE AREA.--4,440 square miles.
RECORDS AVAILABLE.--Chemical analyses: January 1949 to September 1950.
Water temperatures: January 1949 to September 1950.
EXTREMES, 1949-50.--Dissolved solids: Maximum, 120 ppm Mar. 11-20; minimum, 77 ppm July 1-10.
Hardness: Maximum, 108 ppm Feb. 1-10, Mar. 11-20, Sept. 11-30; minimum, 70 ppm July 1-10.
Water temperatures: Maximum, 65°F Sept. 7-10; minimum, freezing point Oct. 20-24 and on many days during winter months.
EXTREMES, January 1949 to September 1950.--Dissolved solids: Maximum, 135 ppm Jan. 11-20, 1949; minimum, 77 ppm July 1-10, 1950.
Hardness: Maximum, 119 ppm Jan. 11-31, 1949; minimum, 67 ppm June 1-10, 1949.
Water temperatures: Maximum, 68°F Aug. 3-4, 1949; minimum, freezing point on many days during winter months.
REMARKS.--Records of specific conductance of daily samples available in regional office at Salt Lake City, Utah. Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1182.

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

Date of collection	Mean discharge (second-feet)	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)	Boron (B)	Dissolved solids			Hardness as $CaCO_3$		Percent sodium
																Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate	
Oct. 1-10, 1949	2,392	--	201	--	--	--	--	--	--	122	--	--	--	--		--	--	--	--	--	--
Oct. 11-20	2,256	8.0	205	7.1	0.04	29	7.3	1.5	1.8	122	8.7	0.8	0.1	0.7		117	0.16	713	102	2	3
Oct. 21-31	2,533	--	203	--	--	--	--	--	--	122	--	--	--	--		--	--	--	--	--	--
Nov. 1-10	3,228	--	193	--	--	--	--	--	--	116	--	--	--	--		--	--	--	--	--	--
Nov. 11-20	3,789	8.0	192	5.7	.24	26	6.6	2.7	1.9	114	8.4	1.0	.1	.3		109	.15	1,120	92	0	6
Nov. 21-30	6,108	--	175	--	--	--	--	--	--	104	--	--	--	--		--	--	--	--	--	--
Dec. 1-10	6,063	7.3	174	5.7	.13	24	8.1	1.4	2.2	104	6.3	1.3	.1	.5		101	.14	1,650	93	8	3
Dec. 11-20	3,598	7.3	197	4.1	.03	25	7.7	1.8	4.2	118	6.3	1.3	.1	.2		109	.15	1,060	94	0	4
Dec. 21-31	3,254	7.4	197	5.8	.03	28	8.0	1.4	2.2	118	6.9	.5	.1	.4		111	.15	975	103	6	3
Jan. 1-10, 1950	2,665	7.2	210	5.8	.02	28	9.1	1.7	1.6	124	7.3	.4	.3	.7		116	.16	835	107	6	3
Jan. 11-20	2,260	7.2	200	6.6	.05	28	7.9	3.5		122	7.6	.5	.3	.7		115	.16	702	102	2	7
Jan. 21-31	2,745	7.4	204	7.0	.03	29	8.0	1.9	2.2	126	6.7	.7	.2	.4		118	.16	875	105	2	4
Feb. 1-10	2,350	7.8	207	6.8	--	29	8.7	1.5	1.3	124	6.3	.8	.1	.5		116	.16	742	108	6	3
Feb. 11-19	2,378	7.8	204	5.9	--	29	8.4	1.7	1.3	124	7.1	1.0	.1	.2		116	.16	745	107	5	3
Feb. 20-28	2,411	7.8	207	6.0	.03	29	8.4	1.5	1.4	123	6.3	.9	.1	.2		114	.16	742	107	6	3
Mar. 1-10	3,360	7.2	177	5.8	.03	25	7.4	1.5	2.1	108	6.1	1.0	.2	.2		103	.14	934	93	4	3
Mar. 11-20	3,070	7.5	208	6.1	.05	29	8.7	1.8	2.2	126	8.3	1.2	.2	.2		120	.16	995	108	5	3
Mar. 21-31	2,970	7.7	198	5.7	.07	28	8.4	1.6	1.6	120	6.1	.9	.2	.2		112	.15	898	104	6	3
Apr. 1-10	3,850	7.6	193	6.1	.03	27	8.0	1.5	1.4	113	6.5	1.2	.2	.4		108	.15	1,120	100	8	3
Apr. 11-20	8,541	7.7	185	5.7	.03	26	7.3	1.2	1.9	113	5.8	.8	.2	.1		105	.14	2,420	95	2	3
Apr. 21-30	12,730	7.8	176	5.8	.04	26	7.1	1.2	2.1	108	4.9	.9	.2	.2		102	.14	3,510	94	6	3
May 1-10	10,190	7.5	182	6.6	.02	27	7.0	1.0	1.3	112	4.9	.7	.2	.5		104	.14	2,860	96	4	2

a Less than 0.1 part per million by turmeric method.

May 11-20	43,250	7.5	165	6.9	.03	24	5.9	.9	1.3	98	4.3	.8	.2	.6	93	.13	10,900	84	4	2
May 21-31	43,760	7.5	156	5.6	.03	23	5.8	.7	1.0	94	4.0	.7	.2	.6	88	.12	10,400	81	4	2
June 1-10	45,320	7.6	143	4.8	.03	22	5.5	.8	1.1	88	6.7	.5	.2	.5	85	.12	10,400	78	5	2
June 11-20	56,120	7.6	138	4.9	.05	21	5.2	.9	1.3	87	3.5	.6	.2	.5	81	.11	12,300	74	2	3
June 21-30	53,580	7.6	142	5.0	.06	21	5.3	1.0	1.3	86	3.5	1.0	.2	.4	81	.11	11,700	74	4	3
July 1-10	42,510	7.5	131	5.4	.02	19	5.6	1.3	.8	83	2.9	.7	.2	.2	77	.10	8,840	70	2	4
July 11-20	20,830	7.5	139	5.1	.01	21	5.7	1.4	.8	87	3.4	1.0	.2	.1	82	.11	4,610	76	5	4
July 21-31	13,260	7.5	148	5.6	.01	22	5.8	1.4	1.0	94	3.9	1.2	.3	.4	88	.12	3,150	79	2	4
Aug. 1-10	8,751	7.5	159	6.0	.02	23	6.5	1.1	1.1	102	4.0	.7	.3	.3	93	.13	2,200	84	1	3
Aug. 11-20	6,681	7.5	164	5.6	.02	25	6.7	1.2	1.1	108	4.1	1.0	.3	.2	98	.13	1,770	90	1	3
Aug. 21-31	5,373	7.5	179	5.5	.02	26	7.2	1.3	1.0	112	4.5	.7	.3	.2	102	.14	1,480	94	3	3
Sept. 1-10	3,963	7.5	186	5.1	.01	28	7.4	1.3	1.0	118	5.0	.8	.3	.4	107	.15	1,140	100	4	3
Sept. 11-20	3,070	7.8	192	5.5	.01	30	8.0	1.2	1.0	122	5.6	.6	.3	.3	113	.15	937	108	8	2
Sept. 21-30	2,598	7.8	202	5.8	.02	30	8.1	1.2	1.1	128	6.3	.7	.3	1.0	118	.16	828	108	3	2
Weighted average	12,290	--	b155	5.5	0.04	23	6.0	1.1	1.3	b95	4.5	0.8	0.2	0.4	90	0.12	2,990	82	4	3

a Less than 0.1 part per million by turmeric method.
b Based on only those analyses for which most of the constituents were determined.

UPPER COLUMBIA RIVER BASIN--Continued

PEND OREILLE RIVER BASIN--Continued

FLATHEAD RIVER AT COLUMBIA FALLS, MONT.--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	48	38	38	32	32	32	34	40	49	51	60	62
2	48	38	37	31	31	32	35	40	49	50	61	63
3	47	37	35	31	31	32	35	40	50	52	61	63
4	47	34	35	31	31	33	36	40	50	52	61	63
5	46	37	36	31	31	32	37	41	50	52	61	63
6	44	36	35	31	31	32	39	41	50	52	61	63
7	41	38	34	32	32	33	39	41	50	52	62	65
8	41	36	34	32	32	33	39	42	51	52	61	65
9	40	35	33	32	32	32	39	42	51	53	62	65
10	40	35	35	32	32	32	40	43	51	53	61	65
11	40	37	35	32	32	32	40	45	49	53	61	61
12	40	37	35	32	32	32	41	45	50	53	62	60
13	42	36	33	--	32	32	41	46	51	53	62	60
14	40	35	33	32	32	33	41	46	51	53	60	60
15	40	39	33	32	32	32	41	46	51	53	61	60
16	41	38	33	32	32	32	41	47	51	53	62	60
17	40	40	34	31	32	33	41	41	50	55	61	59
18	35	39	32	32	32	33	39	40	50	55	61	59
19	33	38	33	31	32	33	40	40	51	56	62	59
20	32	36	32	32	32	33	40	40	51	56	62	58
21	31	37	33	31	32	33	40	41	50	57	62	58
22	31	35	32	--	32	34	40	41	45	58	62	58
23	31	35	32	32	32	34	40	42	45	59	61	57
24	32	39	33	32	32	34	41	43	49	59	60	57
25	39	35	32	31	32	34	40	43	49	60	60	56
26	39	39	32	31	32	34	41	44	49	61	61	54
27	38	39	32	31	32	34	39	44	49	61	62	49
28	41	38	32	31	32	34	39	44	50	61	62	48
29	40	37	32	32	--	35	40	44	51	59	62	45
30	41	37	32	31	--	35	40	45	51	55	63	45
31	41	--	32	32	--	35	--	45	--	55	63	--
Average	40	37	34	32	32	33	39	43	50	55	61	59

MISCELLANEOUS ANALYSES OF STREAMS IN PEND OREILLE RIVER BASIN

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

Date of collection	Mean discharge (second-feet)	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)	Boron (B)	Dissolved solids			Hardness as $CaCO_3$		Percent sodium
																Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate	
FLATHEAD RIVER AT FLATHEAD, BRITISH COLUMBIA																					
June 18, 1950	4,930	8.0	161	4.7	0.07	24	5.3	0.5	0.5	101	3.0	0.2	0.3	0.2		89	0.12	1,180	82	0	1
FLATHEAD RIVER NEAR COLUMBIA FALLS, MONT.																					
May 1, 1950	2,760	8.0	196	5.8	0.05	27	8.7	1.2	1.0	120	7.0	0.4	0.2	0.5		111	0.15	827	103	5	2
MIDDLE FORK FLATHEAD RIVER NEAR WEST GLACIER, MONT.																					
Nov. 3, 1949	1,150	7.6	190	5.2	0.01	--	--	--		116	7.7	0.3	0.2	0.6		--	--	--	--	--	--
Dec. 3	2,370	8.0	192	6.7	.03	27	8.9	2.3		120	6.9	.6	.1	3.0		115	0.16	736	104	6	5
May 28, 1950	18,100	8.0	148	5.5	.04	22	4.4	3.3		91	3.7	.4	.1	1.2		85	.12	4,150	73	0	9
July 17	5,550	8.0	170	5.0	.02	25	5.5	3.2		104	5.7	.3	.1	.1		96	.13	1,440	85	0	8
SOUTH FORK FLATHEAD RIVER NEAR COLUMBIA FALLS, MONT.																					
Oct. 29, 1949	1,380	7.5	182	5.0	0.06	28	3.7	7.4		114	5.8	0.3	0.2	0.8		107	0.15	399	85	0	16
Dec. 3	2,210	7.8	159	4.7	.03	23	7.8	0.9	0.8	100	3.9	.4	.1	3.7		95	.13	567	89	8	2
May 15, 1950	23,000	8.0	147	6.2	.10	23	5.7	.9	1.0	92	3.2	.4	.2	.5		86	.12	5,340	81	5	2
July 15	7,440	7.8	140	4.3	.03	21	4.9	1.6		88	2.7	.6	.1	.1		79	.11	1,590	73	0	5

UPPER COLUMBIA RIVER BASIN--Continued

KETTLE RIVER BASIN

MISCELLANEOUS ANALYSES OF STREAMS IN KETTLE RIVER BASIN IN WASHINGTON

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

Date of collection	Mean discharge (second-feet)	Temperature (° F)	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)	Boron (B)	Dissolved solids			Hardness as $CaCO_3$		Percent sodium
																	Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate	
KETTLE RIVER NEAR FERRY																						
Oct. 25, 1949	190		7.2	170	14	0.03	24	4.6	4.3	4.5	94	12	0.6	0.2	1.9		112	0.15	57	79	2	10
Nov. 30	484		7.4	117	13	.03	16	3.2	3.0	3.8	64	8.7	.6	.2	2.9		83	.11	108	53	1	10
Jan. 20, 1950	155		7.7	188	14	.02	26	5.0	4.9	1.9	103	13	.8	.3	.3		117	.16	49	85	1	11
May 6	2,280		7.6	111	14	.07	15	3.0	3.4	1.6	59	6.2	.9	.4	.2		74	.10	456	50	1	12
June 7	8,360		6.9	53.1	10	.05	6.9	.9	1.7	3.2	26	3.5	.4	.3	1.8		42	.06	948	21	0	13
Aug. 31	276		7.9	139	13	.02	20	3.8	4.0	2.1	80	8.1	1.2	.3	.2		92	.13	69	66	0	11
KETTLE RIVER NEAR LAURIER																						
Oct. 25, 1949	320		7.9	201	14	0.04	28	6.2	5.1	4.0	112	15	0.7	0.2	2.8		131	0.18	113	95	4	10
Nov. 30	975		7.8	125	12	.03	17	3.5	3.4	3.0	70	9.6	.6	.2	2.8		87	.12	229	57	0	11
Jan. 19, 1950	350		7.7	184	15	.02	24	5.2	5.2	3.0	98	14	1.1	.3	.6		117	.16	111	81	1	12
May 5	5,450		7.6	93.3	12	.07	13	2.9	2.5	.8	51	6.4	.7	.4	.2		64	.09	942	44	3	11
June 7	14,400		7.1	48.9	10	.04	6.5	1.6	1.0	1.1	25	2.8	.5	.5	.4		37	.05	1,440	23	2	8
Aug. 31	550		7.8	146	13	.02	20	4.2	4.1	1.8	82	9.2	.5	.2	.2		94	.13	140	67	0	11

OKANOGAN RIVER BASIN

SIMILKAMEEN RIVER AT OROVILLE, WASH.

LOCATION.--At the bridge on U. S. Highway 97 at Oroville, Okanogan County, about 10 miles downstream from gaging station near Nighthawk.
DRAINAGE AREA.--3,420 square miles (above gaging station near Nighthawk).
RECORDS AVAILABLE.--Chemical analyses: January 1949 to September 1950.
Water temperatures: January 1949 to September 1950.
EXTREMES, 1949-50.--Dissolved solids: Maximum, 145 ppm Sept. 21-30; minimum; 65 ppm June 11-20, July 3-7, 10.
Hardness: Maximum, 110 ppm Sept. 21-30; minimum, 41 ppm June 11-20.
Water temperatures: Maximum, 72°F Aug. 22; minimum, freezing point on several days in December and January.
EXTREMES, January 1949 to September 1950.--Dissolved solids: Maximum, 145 ppm Sept. 21-30, 1950; minimum, 65 ppm June 11-20, July 3-7, 10, 1950.
Hardness: Maximum, 110 ppm Sept. 21-30, 1950; minimum, 41 ppm June 11-20, 1950.
Water temperatures: Maximum, 72°F Aug. 2-3, 1949, Aug. 22, 1950; minimum, freezing point on many days during winter months.
REMARKS.--Records of specific conductance of daily samples avsilable in regional office at Salt Lake City, Utah. Discharge records for gaging station near Nighthawk for water year October 1949 to September 1950 given in Water-Supply Paper 1182.

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

Date of collection	Mean discharge (second-feet)	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)	Boron (B) a	Dissolved solids			Hardness as $CaCO_3$		Percent sodium
																Parts per million	Tons per acre-foot	Tons per day	Total	Noncarbonate	
Oct. 1-10, 1949....	612	--	216	--	--	--	--	--	--	112	--	--	--	--		--	--	--	--	--	--
Oct. 11-18.....	732	8.0	208	12	0.03	29	4.6	5.3	3.5	102	20	0.5	0.1	0.6		126	0.17	249	91	8	11
Oct. 19, 21.....	850	--	173	--	--	--	--	--	--	88	--	--	--	--		--	--	--	--	--	--
Oct. 22-29.....	791	--	201	--	--	--	--	--	--	100	--	--	--	--		--	--	--	--	--	--
Nov. 1-10.....	1,020	--	166	--	--	--	--	--	--	86	--	--	--	--		--	--	--	--	--	--
Nov. 11-20.....	1,002	7.9	177	11	.03	25	5.2	4.5	2.9	94	17	1.6	.2	.4		114	.16	308	84	7	10
Nov. 21-26.....	1,442	--	152	--	--	--	--	--	--	76	--	--	--	--		--	--	--	--	--	--
Nov. 28-30.....	6,333	--	93.8	--	--	--	--	--	--	48	--	--	--	--		--	--	--	--	--	--
Dec. 1-10.....	2,987	7.2	139	11	.10	19	3.9	3.4	2.9	69	12	1.2	.2	.6		88	.12	710	63	7	10
Dec. 11-20.....	1,648	7.1	169	12	.04	23	4.8	4.5		85	14	1.4	.2	.4		102	.14	454	77	8	11
Dec. 21-31.....	1,135	7.2	192	13	.04	26	6.1	5.0		98	17	1.3	.2	.5		117	.16	359	90	10	11
Jan. 6-7, 9-12, 14, 1950.....	707	7.2	208	14	.03	32	5.4	5.1	2.9	112	20	1.9	.2	.5		137	.19	262	102	10	9
Jan. 16-17, 19-21, 23-27.....	757	7.3	211	13	.04	32	5.9	4.8	2.7	116	18	1.4	.2	.3		135	.18	276	104	9	9
Feb. 7-11.....	712	7.3	203	12	.04	31	6.0	3.0		104	19	1.8	.3	.3		125	.17	240	102	17	6
Feb. 20-28.....	773	7.3	206	11	.03	30	5.7	4.6	2.7	108	18	2.4	.2	.3		128	.17	267	98	10	9
Mar. 1-10.....	771	8.1	207	13	.06	29	5.5	4.7	2.4	104	19	1.4	.2	.4		127	.17	264	95	10	9
Mar. 11-20.....	736	8.0	215	13	.07	31	5.9	4.9	2.1	109	21	1.8	.2	.2		134	.18	266	102	12	9
Mar. 21-31.....	701	7.7	225	12	.07	32	6.1	5.4	2.7	113	22	2.0	.2	.6		139	.19	263	105	12	10

a Less than 0.1 part per million by turmeric method.

UPPER COLUMBIA RIVER BASIN--Continued

OKANOGAN RIVER BASIN--Continued

SIMILKAMEEN RIVER AT OROVILLE, WASH.--Continued

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

Date of collection	Mean discharge (second-feet)	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)	Boron (B)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Non-carbonate	Percent sodium
Apr. 1-10, 1950	690	7.6	227	12	0.08	32	6.7	5.5	1.4	113	22	2.1	0.2	0.2		138	0.19	257	107	15	10
Apr. 11-20	857	7.7	219	12	.08	31	6.7	5.0	1.2	112	21	1.9	.2	.2		134	.18	310	105	13	9
Apr. 21-30	1,491	7.1	208	13	.06	29	5.6	4.8	2.2	107	17	2.2	.3	.5		127	.17	511	95	8	10
May 1-10	2,124	7.3	200	14	.06	29	5.5	5.0	2.2	106	16	2.2	.3	.4		127	.17	728	95	8	10
May 11-20	9,291	7.3	140	12	.08	21	3.6	3.3	2.4	74	13	2.0	.4	.6		95	.13	2,380	67	7	9
May 21-31	11,110	7.3	120	13	.09	16	3.5	3.0	1.9	62	7.9	1.9	.4	.9		79	.11	2,370	54	4	10
Juns 1-10	14,750	6.6	112	12	.19	14	3.2	2.9	2.6	55	6.7	2.8	.3	.6		72	.10	2,870	48	3	11
June 11-20	23,440	6.7	93.4	12	.29	12	2.8	2.2	2.2	49	5.8	2.2	.3	.8		65	.09	4,110	41	1	10
June 21-30	15,740	6.9	99.0	11	.16	13	3.2	2.7	2.1	52	5.2	1.8	.3	1.1		66	.09	2,800	46	3	11
July 3-7, 10	8,812	6.7	103	10	.06	14	3.3	2.6	54	6.6	1.2	.3	.8			65	.09	1,550	48	4	11
July 11-20	4,310	7.1	132	11	.09	19	4.4	3.4	70	11	1.9	.3	.7			86	.12	1,000	66	8	10
July 21-31	2,818	7.3	147	12	.03	21	4.1	4.2	4.6	78	13	2.0	.3	.7		100	.14	761	69	5	11
Aug. 1-10	1,894	7.0	166	13	.03	23	4.9	4.6	4.8	87	14	1.9	.3	.9		110	.15	563	78	6	11
Aug. 11-20	1,366	7.3	183	14	.02	26	5.3	4.7	5.0	95	16	1.7	.2	.6		120	.16	443	87	9	10
Aug. 21-31	1,034	7.3	198	13	.04	28	5.4	5.4	5.4	101	17	2.2	.2	.6		127	.17	355	92	9	11
Sept. 1, 5-9	717	7.4	215	14	.02	30	5.7	8.8	112	18	3.8	.3	.8			137	.19	265	98	6	16
Sept. 11-20	579	7.5	224	13	.02	32	5.8	5.8	2.9	114	20	2.7	.3	.6		139	.19	217	104	10	10
Sept. 21-30	547	7.7	225	13	.02	34	6.1	5.7	2.1	122	21	2.8	.3	.2		145	.20	214	110	10	10
Weighted average	3,585	--	b127	12	0.14	17	3.7	3.2	2.5	b66	9.4	2.0	0.3	0.7		83	0.11	803	58	4	10

a Less than 0.1 part per million by turmeric method.
b Based on only those analyses for which most of the constituents were determined.

UPPER COLUMBIA RIVER BASIN--Continued

OKANOGAN RIVER BASIN--Continued

SIMILKAMEEN RIVER AT OROVILLE, WASH.--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	44	40	--	--	36	48	53	52	--	66	70
2	--	43	40	--	--	36	--	51	51	--	67	--
3	57	42	38	--	--	36	47	51	49	61	65	--
4	54	45	--	--	--	40	48	51	--	61	64	--
5	53	43	36	--	--	--	48	50	51	61	64	70
6	52	--	36	33	--	39	48	--	47	61	--	70
7	51	41	35	33	33	39	47	--	47	61	63	67
8	49	42	34	--	33	38	48	53	48	--	65	67
9	--	42	35	33	33	39	--	55	52	--	66	61
10	50	43	35	34	33	39	48	57	--	58	67	--
11	50	42	--	34	33	40	--	54	--	60	65	65
12	50	43	32	33	--	--	52	51	54	61	67	65
13	50	--	33	--	--	37	51	48	54	63	--	65
14	49	45	33	33	--	39	--	--	52	63	66	65
15	49	45	34	--	--	40	51	50	52	--	65	65
16	--	45	34	32	--	40	--	49	52	--	61	64
17	46	44	--	33	--	42	50	47	52	63	65	--
18	44	44	--	--	--	42	49	49	--	63	66	64
19	42	44	32	33	--	--	54	44	56	64	65	64
20	--	--	32	33	33	42	55	47	--	65	--	65
21	43	40	32	33	33	43	53	--	57	67	71	60
22	43	39	33	--	33	44	51	50	53	64	72	61
23	--	39	33	33	33	44	--	49	52	--	70	60
24	46	40	33	32	33	44	46	50	--	66	70	--
25	47	--	--	--	33	45	49	52	--	71	69	61
26	48	41	--	33	--	--	45	51	55	70	67	60
27	47	--	33	33	--	45	47	--	57	69	--	58
28	47	37	--	--	33	45	51	--	55	65	68	56
29	48	38	35	--	--	46	52	48	58	60	70	54
30	--	39	35	--	--	46	--	51	58	--	69	51
31	--	--	35	--	--	45	--	52	--	66	70	--
Average	--	42	--	--	--	41	--	51	--	--	67	63

UPPER COLUMBIA RIVER BASIN--Continued

OKANOGAN RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN OKANOGAN RIVER BASIN IN WASHINGTON.

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

Date of collection	Mean discharge (second-feet)	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)	Boron (B)	Dissolved solids			Hardness as $CaCO_3$		Percent sodium
																Parts per million	Tons per acre-foot	Tons per day	Total	Noncarbonate	
OKANOGAN RIVER AT OROVILLE																					
Oct. 28, 1949	526	7.9	281	9.3	0.03	34	11	9.8	5.0	145	28	1.5	0.2	4.0		174	0.24	247	130	11	13
Dec. 2	500	7.8	281	10	.03	35	10	9.6	5.1	148	28	1.6	.2	2.7		175	.24	236	128	7	13
Jan. 21, 1950	395	7.7	290	8.7	.02	36	10	10	2.9	152	29	1.5	.4	.3		174	.24	186	131	6	14
May 9	1,010	8.0	275	8.1	.05	34	10	9.8	1.9	142	28	1.6	.2	.2		164	.22	447	126	10	14
June 6	1,050	7.4	278	8.1	.03	34	8.0	8.5	5.3	138	27	2.2	.2	2.5		164	.22	465	118	5	13
Sept. 2	532	8.0	253	12	.03	31	8.9	8.9	2.4	133	25	2.0	.4	.2		156	.21	224	114	5	14
OKANOGAN RIVER NEAR TONASKET																					
Oct. 29, 1949	1,310	7.8	270	11	0.04	36	9.3	5.7	2.2	132	31	1.3	0.1	0.9		162	0.22	573	128	20	9
Dec. 2	4,030	7.5	143	11	.14	20	4.2	3.5	5.0	74	15	.7	.3	2.7		99	.13	1,080	67	6	9
Jan. 23, 1950	1,300	7.7	269	12	.03	35	8.6	8.1	1.1	135	28	1.5	.3	.2		161	.22	565	123	12	12
May 9	3,450	7.7	227	11	.22	30	7.7	6.8	1.4	120	19	2.4	.4	.0		138	.19	1,290	106	8	12
June 7	18,500	7.6	115	11	.15	15	2.1	2.6	3.8	59	8.4	1.0	.3	1.9		75	.10	3,750	46	0	10
Sept. 4	1,200	7.7	265	12	.02	35	9.4	8.8	1.4	137	30	1.6	.2	.0		166	.23	538	126	14	13

SNAKE RIVER MAIN STEM

SNAKE RIVER AT MORAN, WYO.

LOCATION.--At gaging station at Moran, 1,000 feet downstream from Jackson Lake Dam.
DRAINAGE AREA.--816 square miles.
RECORDS AVAILABLE.--Water temperatures: October 1949 to September 1950.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1183.

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	--	--
2	--	--	--	--	--	--	--	--	--	--	--	62
3	--	--	33	--	--	--	--	--	42	56	--	--
4	--	--	--	--	33	33	--	--	--	--	--	--
5	--	37	--	--	--	--	36	--	--	--	58	--
6	--	--	--	--	--	--	--	37	--	--	--	--
7	--	--	--	33	--	--	--	--	--	--	--	--
8	50	--	--	--	--	--	34	--	--	56	--	--
9	--	--	--	--	--	--	--	--	--	--	--	61
10	--	--	33	--	--	--	--	--	46	--	--	--
11	--	--	--	--	33	33	--	--	--	--	--	--
12	--	37	--	--	--	--	--	--	--	--	58	--
13	--	--	--	--	--	--	--	39	--	--	--	--
14	--	--	--	33	--	--	--	--	--	--	--	--
15	45	--	--	--	--	--	36	--	--	52	--	55
16	--	--	--	--	--	--	--	--	--	--	--	53
17	--	--	33	--	--	--	--	--	46	--	--	--
18	--	--	--	--	33	35	--	--	--	--	62	--
19	--	35	--	--	--	--	--	--	--	--	61	--
20	--	--	--	--	--	--	--	38	--	--	--	--
21	--	--	--	33	--	--	--	--	--	--	--	--
22	42	--	--	--	--	--	38	--	--	--	--	--
23	--	--	--	--	--	--	--	--	--	--	--	58
24	--	--	33	--	--	--	--	--	48	--	--	--
25	--	--	--	--	33	--	--	--	--	--	--	--
26	--	37	--	--	--	--	--	--	--	--	61	--
27	--	--	--	--	--	--	--	41	--	--	--	--
28	--	--	--	33	--	--	--	--	--	--	--	--
29	42	--	--	--	--	--	37	--	--	59	--	--
30	--	--	--	--	--	--	--	--	--	--	--	48
31	--	--	33	--	--	34	--	--	--	--	--	--
Average	--	--	--	--	--	--	--	--	--	--	--	--

SNAKE RIVER MAIN STEM--Continued

SNAKE RIVER AT NEELEY, IDAHO

LOCATION.--At gaging station 0.9 mile downstream from American Falls Dam.
RECORDS AVAILABLE.--Water temperatures: October 1949 to September 1950.
EXTREMES, 1949-50.--Water temperatures: Maximum 68°F Sept. 4, 1950; minimum, freezing point on many days in December, January, and February.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1183.

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	--	40	39	33	32	34	39	44	53	6[illegible]	65	66
2	--	40	39	33	32	36	39	45	52	60	66	66
3	--	38	37	32	32	37	39	45	54	6[illegible]	67	67
4	--	38	38	32	33	38	39	45	54	6[illegible]	67	68
5	--	41	39	32	35	39	39	44	54	6[illegible]	66	67
6	--	--	38	33	36	36	40	44	55	6[illegible]	66	67
7	--	40	35	33	34	36	40	45	54	6[illegible]	66	66
8	--	43	36	33	33	36	40	46	53	6[illegible]	66	66
9	--	43	37	32	34	36	40	46	55	6[illegible]	66	65
10	--	41	33	32	34	36	40	46	56	6[illegible]	66	66
11	--	41	--	32	34	34	41	46	56	6[illegible]	66	65
12	--	41	35	32	33	34	41	49	56	6[illegible]	66	65
13	--	40	35	32	33	34	41	49	57	6[illegible]	67	54
14	--	41	34	32	34	35	42	49	57	6[illegible]	66	65
15	49	40	34	32	34	35	42	49	57	6[illegible]	67	62
16	--	39	34	32	34	37	43	49	57	6[illegible]	67	62
17	44	38	32	32	34	38	44	49	57	6[illegible]	66	63
18	45	36	--	32	33	37	43	49	57	6[illegible]	66	62
19	37	38	33	33	33	36	44	48	59	6[illegible]	67	63
20	--	--	32	34	36	36	44	48	61	6[illegible]	67	63
21	44	35	32	35	34	37	44	49	62	6[illegible]	67	63
22	42	36	33	34	34	37	44	50	59	6[illegible]	67	63
23	--	41	33	35	38	37	44	50	56	6[illegible]	66	62
24	42	43	33	33	37	37	44	50	59	6[illegible]	66	62
25	44	43	--	32	37	37	44	50	56	6[illegible]	66	62
26	43	40	32	32	36	36	44	51	59	6[illegible]	66	61
27	44	41	32	33	37	38	45	53	60	6[illegible]	66	60
28	45	42	32	32	34	36	44	52	60	6[illegible]	66	59
29	45	39	32	32	--	37	44	52	60	6[illegible]	66	59
30	--	41	32	32	--	37	44	53	61	6[illegible]	66	58
31	42	--	32	32	--	39	--	53	--	6[illegible]	66	--
Average	44	40	34	32	34	38	42	49	57	6[illegible]	66	64

HENRYS FORK BASIN

HENRYS FORK NEAR ISLAND PARK, IDAHO

LOCATION.--At gaging station an eighth of a mile upstream from Buffalo River, an eighth of a mile downstream from Island Park Dam, and 2 miles west of Island Park post office.
DRAINAGE.--478 square miles.
RECORDS AVAILABLE.--Water temperatures: October 1949 to September 1950.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1183.

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	--	40	--	--	--	--	--	--	--	--	--	59
2	--	40	46	--	--	--	--	--	48	--	--	--
3	--	40	--	--	41	44	--	--	--	--	--	--
4	--	40	--	--	--	--	--	39	--	--	56	--
5	--	--	--	--	--	--	--	--	--	--	--	--
6	51	--	--	--	--	--	--	--	--	--	--	--
7	--	40	--	--	--	--	39	--	--	--	--	--
8	--	--	--	--	--	--	--	--	--	60	--	60
9	--	--	46	--	33	--	39	--	--	--	--	--
10	--	--	--	--	--	39	--	--	--	--	61	--
11	--	--	--	--	45	--	--	39	--	--	--	--
12	--	--	--	--	--	--	--	--	--	--	--	--
13	--	40	--	45	--	--	--	--	--	66	--	--
14	--	40	--	--	--	--	--	--	--	--	--	60
15	--	46	--	--	--	--	--	--	--	--	--	--
16	--	46	46	--	--	--	--	--	--	--	--	--
17	--	46	--	--	45	39	--	--	58	--	--	--
18	--	46	--	--	--	--	--	--	--	--	59	--
19	--	--	--	--	--	--	38	--	--	--	--	--
20	--	--	--	--	--	--	--	43	--	--	--	54
21	--	--	--	--	--	--	39	--	--	60	--	--
22	--	--	--	--	--	--	--	45	--	--	--	54
23	--	--	--	--	--	--	--	--	59	--	--	--
24	--	--	45	--	45	38	--	--	--	--	--	--
25	--	46	--	--	--	--	--	--	--	--	62	--
26	--	--	--	--	--	--	--	42	--	--	--	--
27	--	--	--	45	--	--	--	--	--	--	--	--
28	--	--	--	--	--	--	39	--	--	58	--	--
29	--	--	--	--	--	--	--	--	--	--	--	54
30	40	--	45	--	--	39	--	--	62	--	--	--
31	40	--	--	--	--	--	--	--	--	--	---	--
Average	--	--	--	--	--	--	--	--	--	--	--	--

DESCHUTES RIVER BASIN

WARM SPRINGS AT HEHE MILL NEAR WARM SPRINGS, OREG.

LOCATION.--Temperature recorder at gaging station a quarter of a mile east of abandoned Hehe Mill, 10 miles south of Bear Springs ranger station, and 18 miles northwest of Warm Springs, Jefferson County.
DRAINAGE AREA.--108 square miles.
RECORDS AVAILABLE.--Water temperatures: May to September 1950.
EXTREMES.--Water temperatures: Maximum, 59°F July 5, 6, 25.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1184.

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

Day	March		April		May		June		July		August		September	
	max	min	max	min	max	min	max	min	max	min	max	min	max	min
1					--	--	52	46	58	50	57	48	53	47
2					--	--	52	45	58	49	58	49	53	47
3					--	--	52	45	58	49	55	48	55	49
4					--	--	50	46	58	50	52	47	54	48
5					--	--	50	47	59	50	54	48	52	47
6					--	--	50	45	59	50	53	47	51	45
7					--	--	47	45	57	49	53	47	51	46
8					--	--	50	44	55	48	55	47	50	45
9					48	42	50	45	58	49	56	48	51	47
10					48	43	51	46	55	48	55	48	51	46
11					51	43	48	46	56	47	55	48	51	45
12					51	43	46	45	56	47	55	48	49	45
13					50	44	51	44	58	48	54	47	50	46
14					49	43	49	46	58	49	55	48	50	45
15					48	42	48	46	57	49	55	48	49	44
16					47	42	50	46	57	48	55	47	48	45
17					45	42	51	47	57	48	55	48	48	44
18					46	41	53	47	56	48	55	48	48	44
19					48	42	51	47	55	49	55	47	50	45
20					50	43	53	48	56	47	55	48	50	45
21					50	43	54	48	57	48	55	48	49	43
22					50	44	49	47	57	49	55	48	48	44
23					49	43	48	46	58	49	52	48	48	45
24					49	43	51	45	58	50	53	47	48	46
25					50	43	49	45	59	50	52	45	48	46
26					50	44	50	46	58	50	52	46	48	45
27					48	45	53	47	55	49	54	48	46	42
28					49	43	55	48	53	48	53	46	45	41
29					48	45	57	49	54	47	53	47	45	41
30					49	44	57	49	56	47	53	47	43	41
31					51	44	--	--	56	48	53	46	--	--
Average					--	--	51	45	57	49	54	47	49	45

HOOD RIVER BASIN

GREEN POINT CREEK BELOW NORTH FORK NEAR DEE, OREG.

LOCATION.--Temperature recorder at gaging station three-quarters of a mile upstream from mouth, 1½ miles downstream from North Fork, and 1½ miles west of Dee, Hood River County.
DRAINAGE AREA.--20.0 square miles.
RECORDS AVAILABLE.--Water temperatures: May to September 1950.
EXTREMES.--Water temperatures: Maximum, 58°F July 25.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1184.

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

Day	March		April		May		June		July		August		September	
	max	min	max	min	max	min	max	min	max	min	max	min	max	min
1					--	--	45	43	50	49	56	54	56	54
2					--	--	45	43	51	49	56	54	56	54
3					--	--	46	43	53	50	54	53	56	55
4					--	--	46	44	53	51	54	52	55	54
5					--	--	45	43	53	51	53	53	54	52
6					--	--	43	43	54	52	54	52	54	52
7					--	--	43	43	53	51	55	53	54	52
8					44	43	45	43	52	50	55	53	54	52
9					43	42	45	43	52	51	55	53	54	53
10					44	42	45	44	51	50	55	53	54	53
11					44	42	45	44	51	49	56	54	54	53
12					44	42	44	44	52	50	55	54	54	52
13					43	42	45	43	53	51	54	53	53	52
14					43	41	45	44	55	53	55	54	53	52
15					42	41	44	44	54	53	56	54	51	50
16					43	41	46	44	54	52	56	54	51	51
17					43	41	46	46	57	53	56	54	51	50
18					41	40	47	45	55	54	57	55	51	50
19					43	41	47	45	55	53	56	55	52	51
20					44	42	49	46	54	52	57	55	51	50
21					45	42	48	46	55	53	57	55	52	50
22					43	43	46	45	56	54	56	55	52	51
23					43	41	45	44	57	55	56	55	52	51
24					44	41	44	44	57	55	55	54	53	53
25					44	41	45	44	58	56	54	53	53	53
26					44	42	46	45	57	56	55	53	53	51
27					44	43	48	46	56	55	56	54	51	50
28					43	41	50	48	55	53	55	53	50	49
29					43	43	51	48	53	52	56	54	49	48
30					43	41	51	49	54	52	55	54	48	47
31					45	42	--	--	55	53	55	54	--	--
Average					--	--	46	45	54	52	55	54	53	52

LEWIS RIVER BASIN

EAST FORK LEWIS RIVER NEAR HEISSON, WASH.

LOCATION.--Temperature recorder at gaging station just downstream from Basket Creek, 1½ miles northeast of Heisson, Clark County, and 20 miles upstream from mouth.
DRAINAGE AREA.--125 square miles.
RECORDS AVAILABLE.--Water temperatures: June to September 1950.
EXTREMES, 1950.--Water temperatures: Maximum, 69°F Sept. 2, 3.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1184.

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

Day	March		April		May		June		July		August		September	
	max	min	max	min	max	min	max	min	max	min	max	min	max	min
1							--	--	64	61	--	--	68	63
2							--	--	63	61	--	--	69	64
3							--	--	64	61	--	--	69	65
4							--	--	65	63	--	--	67	64
5							--	--	65	63	--	--	66	61
6							--	--	65	63	--	--	64	60
7							51	49	64	62	--	--	64	59
8							53	49	62	61	--	--	63	59
9							54	50	61	59	--	--	63	59
10							55	53	60	59	--	--	62	59
11							55	52	61	57	--	--	62	58
12							52	50	65	61	--	--	63	59
13							50	50	65	63	--	--	61	59
14							50	50	65	63	--	--	59	57
15							53	50	64	61	--	--	60	57
16							53	53	63	59	--	--	59	57
17							53	53	66	61	--	--	61	57
18							55	52	67	65	--	--	59	57
19							59	55	66	65	--	--	59	57
20							59	55	66	62	--	--	57	55
21							55	53	--	--	--	--	59	55
22							53	52	--	--	--	--	60	57
23							52	51	--	--	--	--	59	57
24							51	51	--	--	--	--	58	58
25							52	51	--	--	--	--	58	57
26							57	52	--	--	--	--	57	55
27							58	56	--	--	67	64	55	53
28							62	57	--	--	67	63	53	51
29							64	61	--	--	67	63	51	50
30							64	61	--	--	67	63	50	49
31							--	--	--	--	67	62	--	--
Average							55	53	--	--	--	--	60	58

COWLITZ RIVER BASIN

CISPUS RIVER NEAR RANDLE, WASH.

LOCATION.--Temperature recorder at gaging station 60 feet upstream from bridge to Tower Rock Ranger station, 4 miles downstream from North Fork, and 8 miles southeast of Randle, Lewis County.
DRAINAGE AREA.--323 square miles.
RECORDS AVAILABLE.--Water temperatures: May to September 1950.
EXTREMES, 1950.--Water temperatures: Maximum, 57°F Aug. 20.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1184.

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

Day	March		April		May		June		July		August		September	
	max	min	max	min	max	min	max	min	max	min	max	min	max	min
1					--	--	47	43	50	47	--	--	55	51
2					--	--	47	43	50	47	--	--	55	51
3					--	--	47	44	51	47	--	--	55	52
4					--	--	47	44	51	47	--	--	5[illegible]	51
5					--	--	46	44	51	48	--	--	5[illegible]	51
6					--	--	45	44	52	48	--	--	5[illegible]	49
7					--	--	44	44	51	48	--	--	53	49
8					--	--	46	44	49	47	--	--	5[illegible]	49
9					--	--	46	44	50	48	--	--	5[illegible]	49
10					--	--	45	45	49	47	55	50	5[illegible]	49
11					--	--	45	44	51	47	55	50	5[illegible]	49
12					--	--	45	44	51	48	55	51	5[illegible]	49
13					--	--	45	44	52	49	53	50	5[illegible]	49
14					--	--	45	44	52	49	51	51	5[illegible]	49
15					--	--	46	44	51	49	51	51	5[illegible]	48
16					--	--	47	45	53	49	55	50	5[illegible]	49
17					--	--	46	44	53	49	56	51	5[illegible]	48
18					--	--	48	44	52	49	56	51	5[illegible]	47
19					--	--	48	45	52	50	56	51	5[illegible]	49
20					--	--	49	45	53	49	57	52	5[illegible]	48
21					--	--	47	45	54	50	56	51	5[illegible]	48
22					--	--	46	45	55	51	52	51	5[illegible]	48
23					--	--	45	45	55	51	51	51	5[illegible]	48
24					--	--	45	45	56	51	51	50	4[illegible]	49
25					--	--	46	45	56	51	55	50	4[illegible]	49
26					45	43	47	45	56	51	55	50	4[illegible]	48
27					45	44	49	46	55	51	56	51	4[illegible]	47
28					45	43	49	46	52	49	55	50	4[illegible]	47
29					45	44	50	47	53	49	55	50	4[illegible]	45
30					46	43	50	47	--	--	54	50	45	44
31					47	43	--	--	--	--	54	49	--	--
Average					--	--	47	45	52	49	--	--	51	49

ABERNETHY CREEK BASIN

ABERNETHY CREEK NEAR LONGVIEW, WASH.

LOCATION.--Temperature recorder at gaging station 1 mile upstream from mouth and 11 miles northwest of Longview, Cowlitz County.
DRAINAGE AREA.--20.3 square miles.
RECORDS AVAILABLE.--Water temperatures: June to September 1950.
EXTREMES, 1950.--Water temperatures: Maximum, 68°F Aug. 19-21.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1184.

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

Day	March		April		May		June		July		August		September	
	max	min	max	min	max	min	max	min	max	min	max	min	max	min
1							--	--	62	56	65	59	65	59
2							59	51	63	56	63	60	66	62
3							60	53	63	57	60	57	65	61
4							58	54	63	58	60	54	62	58
5							55	51	63	57	59	57	61	56
6							51	49	61	58	59	58	62	56
7							51	50	60	53	62	59	62	57
8							56	50	57	55	63	57	62	56
9							55	51	57	55	63	57	61	58
10							58	53	58	55	65	59	60	57
11							59	55	60	54	65	61	62	58
12							57	54	63	55	63	58	61	58
13							54	53	62	58	62	59	60	59
14							54	53	63	59	63	61	61	57
15							57	53	59	56	62	62	59	54
16							60	54	62	55	66	61	59	57
17							58	55	64	56	67	61	60	56
18							59	55	62	59	67	63	58	57
19							61	56	63	59	68	64	58	56
20							59	57	63	56	68	63	58	54
21							57	55	64	58	68	62	60	54
22							55	53	65	60	66	63	60	56
23							54	52	66	60	63	61	58	57
24							54	51	66	61	61	60	58	58
25							54	52	66	62	64	59	58	57
26							59	52	64	61	65	59	57	55
27							58	56	62	60	66	63	55	51
28							63	56	60	58	64	59	53	49
29							64	57	59	57	64	59	52	48
30							64	58	61	55	63	58	51	48
31							--	--	64	58	63	57	--	--
Average							57	53	62	57	64	60	59	56

CLATSKANIE RIVER BASIN

CLATSKANIE RIVER NEAR CLATSKANIE, OREG.

LOCATION.--Temperature recorder at gaging station 2 miles downstream from Carcus Creek, and 5½ miles southeast of Clatskanie, Columbia County.
DRAINAGE AREA.--52 square miles.
RECORDS AVAILABLE.--Water temperatures: May to September 1950.
EXTREMES.--Water temperatures: Maximum, 75°F July 24.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1184.

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

Day	March		April		May		June		July		August		September	
	max	min	max	min	max	min	max	min	max	min	max	min	max	min
1					--	--	63	56	70	60	73	59	65	61
2					--	--	63	55	71	60	71	61	66	64
3					--	--	64	56	71	60	69	59	66	64
4					--	--	62	58	71	63	69	57	64	62
5					--	--	59	56	71	61	63	59	62	57
6					--	--	56	54	70	63	64	58	61	59
7					--	--	55	54	69	60	70	58	61	58
8					--	--	60	53	63	59	70	54	60	58
9					--	--	60	55	63	60	71	56	60	59
10					59	54	63	57	61	59	72	57	60	59
11					60	53	65	59	66	56	67	61	61	58
12					59	56	62	58	70	57	67	62	61	59
13					59	54	58	57	68	60	65	61	60	59
14					58	53	58	57	70	62	64	63	60	58
15					58	53	60	56	64	59	67	64	60	57
16					56	52	64	57	69	57	70	66	58	57
17					55	53	62	59	72	60	69	66	60	58
18					54	50	65	59	69	62	70	67	60	59
19					53	52	66	60	69	62	71	68	59	59
20					58	51	66	62	71	59	71	67	59	56
21					56	53	62	60	73	60	70	66	58	56
22					57	54	60	58	73	63	69	65	59	57
23					57	51	58	57	74	63	65	64	59	58
24					59	51	57	55	75	62	65	64	59	59
25					61	53	57	55	74	63	66	63	59	59
26					59	55	62	56	72	64	66	62	59	58
27					58	56	62	58	65	62	67	65	58	54
28					56	52	68	60	62	60	67	62	55	52
29					59	54	71	61	65	58	65	62	53	50
30					59	52	71	61	69	60	65	61	52	50
31					61	53	--	--	72	61	64	60	--	--
Average					--	--	62	57	69	60	68	62	60	58

ELOKOMIN RIVER BASIN

ELOKOMIN RIVER NEAR CATHLAMET, WASH.

LOCATION.--Temperature recorder at gaging station 2 miles northeast of Cathlamet, Wahkiakum County, and 4 miles upstream from mouth.
DRAINAGE AREA.--66 square miles.
RECORDS AVAILABLE.--Water temperatures: June to September 1950.
EXTREMES, 1950.--Water temperatures: Maximum, 71°F Aug. 19-21.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1184.

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

Day	March		April		May		June		July		August		September	
	max	min	max	min	max	min	max	min	max	min	max	min	max	min
1							--	--	67	59	69	59	66	58
2							--	--	68	58	67	61	68	61
3							--	--	68	59	64	59	64	61
4							--	--	67	60	65	57	61	58
5							--	--	68	59	60	58	63	53
6							54	52	64	61	60	57	63	53
7							53	52	65	57	65	57	62	55
8							59	52	60	57	65	57	62	55
9							58	54	60	57	66	57	63	53
10							63	56	60	57	67	59	62	53
11							63	57	65	54	66	61	65	56
12							58	56	67	56	67	59	61	58
13							58	55	66	60	63	58	59	57
14							56	55	66	60	63	60	61	57
15							60	54	61	59	62	61	60	56
16							63	55	66	56	67	59	60	56
17							60	57	68	59	69	62	62	57
18							62	56	61	60	70	63	60	57
19							64	58	65	59	71	63	59	57
20							62	59	67	58	71	63	61	58
21							60	56	68	59	71	63	61	58
22							57	55	68	61	66	63	62	57
23							58	54	69	61	63	61	61	57
24							56	53	70	62	61	59	60	58
25							56	54	70	63	65	59	58	56
26							62	54	67	63	67	59	56	54
27							62	57	64	61	68	61	55	52
28							67	57	61	57	66	59	52	49
29							70	61	60	57	65	59	52	48
30							69	61	65	58	65	58	52	48
31							--	--	69	59	65	57	--	--
Average							60	56	65	59	66	60	60	56

BIG CREEK BASIN

BIG CREEK NEAR KNAPPA, OREG.

LOCATION.--Temperature recorder at gaging station 0.3 mile downstream from fish hatchery, and 2½ miles south of Knappa.
DRAINAGE AREA.--31.9 square miles.
RECORDS AVAILABLE.--Water temperatures: May to September 1950.
EXTREMES.--Water temperatures: Maximum, 59°F Aug. 18.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1184.

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

Day	March		April		May		June		July		August		September	
	max	min	max	min	max	min	max	min	max	min	max	min	max	min
1					--	--	53	51	57	54	57	54	59	54
2					--	--	54	50	57	54	56	55	59	54
3					--	--	55	52	57	54	56	54	59	55
4					--	--	55	53	57	55	56	54	59	53
5					--	--	53	51	57	54	55	54	54	52
6					--	--	51	50	56	54	54	53	54	52
7					--	--	50	50	55	54	54	53	59	51
8					--	--	53	50	54	53	54	52	59	51
9					--	--	52	51	54	53	54	53	59	51
10					53	52	54	52	53	53	56	53	59	52
11					54	50	55	53	55	52	56	54	59	51
12					53	51	54	52	56	53	56	53	59	52
13					51	49	52	52	55	55	55	53	59	52
14					51	48	52	51	56	55	55	53	59	52
15					51	48	52	51	55	54	56	54	59	51
16					50	48	55	52	56	53	58	55	59	52
17					49	48	54	53	56	54	58	56	59	52
18					48	47	53	53	55	54	59	57	59	52
19					48	48	55	53	54	54	58	56	59	52
20					51	48	55	54	55	52	58	56	59	52
21					51	49	54	52	56	53	58	56	54	52
22					50	49	52	52	57	54	57	56	54	53
23					50	47	52	51	57	54	56	55	54	53
24					51	48	51	51	58	55	56	55	59	53
25					53	49	51	51	58	56	57	55	59	53
26					52	50	54	51	57	56	57	55	59	52
27					51	51	54	53	56	54	58	56	59	51
28					51	49	56	53	54	54	57	54	51	50
29					51	50	57	54	54	53	56	54	59	48
30					51	48	57	55	55	53	56	54	49	48
31					52	49	--	--	56	54	55	53	--	--
Average					--	--	54	52	56	54	56	54	59	52

GRAYS RIVER BASIN

WEST BRANCH GRAYS RIVER NEAR GRAYS RIVER, WASH.

LOCATION.--Temperature recorder at gaging station 1 mile upstream from mouth and 3¼ miles northeast of Grays River, Wahkiakum County.
DRAINAGE AREA.--16.3 square miles.
RECORDS AVAILABLE.--Water temperatures: June 1950 to September 1950
EXTREMES, 1950.--Water temperatures: Maximum, 65°F July 24, 25.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1184.

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

Day	March		April		May		June		July		August		September	
	max	min	max	min	max	min	max	min	max	min	max	min	max	min
1							--	--	63	56	6[illegible]	57	60	56
2							58	51	63	56	6[illegible]	57	60	57
3							59	53	64	57	6[illegible]	57	58	57
4							59	54	64	59	6[illegible]	56	58	55
5							55	53	64	57	5[illegible]	57	58	54
6							53	51	62	58	5[illegible]	57	58	54
7							53	52	62	56	5[illegible]	57	58	54
8							57	52	58	57	6[illegible]	55	58	54
9							57	52	58	57	6[illegible]	55	58	56
10							58	54	58	56	6[illegible]	56	58	56
11							59	55	61	54	6[illegible]	58	59	56
12							57	55	63	55	6[illegible]	56	58	56
13							55	54	62	58	5[illegible]	56	57	56
14							55	54	63	58	6[illegible]	57	58	56
15							57	54	60	57	5[illegible]	55	57	54
16							60	55	62	56	5[illegible]	54	58	56
17							58	56	64	58	6[illegible]	56	58	56
18							57	55	61	59	6[illegible]	57	58	56
19							60	56	61	59	6[illegible]	58	58	56
20							60	57	63	56	6[illegible]	58	58	55
21							57	56	64	58	6[illegible]	58	58	56
22							56	55	64	60	6[illegible]	58	58	57
23							55	54	64	59	5[illegible]	56	58	57
24							55	53	65	59	5[illegible]	55	58	57
25							55	53	65	60	5[illegible]	54	57	56
26							60	54	63	60	5[illegible]	54	56	54
27							57	56	61	59	5[illegible]	56	54	52
28							61	55	59	55	5[illegible]	54	54	52
29							63	57	57	55	5[illegible]	55	54	51
30							63	57	60	54	5[illegible]	54	52	51
31							--	--	61	57	5[illegible]	54	--	--
Average							58	54	62	57	6[illegible]	56	57	55

YOUNGS RIVER BASIN

NORTH FORK KLASKANINE RIVER NEAR OLNEY, OREG.

LOCATION.--Temperature recorder at gaging station half a mile downstream from Barth Falls, 2 miles upstream from North Fork of North Fork, and 4 miles southeast of Olney.
DRAINAGE AREA.--14.0 square miles.
RECORDS AVAILABLE.--Water temperatures: May to September 1950.
EXTREMES.--Water temperatures: Maximum, 64°F Aug. 18.
REMARKS.--Records of discharge for water year October 1949 to September 1950 given in Water-Supply Paper 1184.

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

Day	March		April		May		June		July		August		September	
	max	min	max	min	max	min	max	min	max	min	max	min	max	min
1					--	--	54	51	58	56	60	57	60	56
2					--	--	56	50	58	55	59	57	62	58
3					--	--	58	53	58	56	57	55	60	59
4					--	--	58	54	57	57	58	56	59	57
5					--	--	55	52	58	56	57	56	57	54
6					--	--	52	50	58	56	56	56	56	54
7					--	--	50	50	56	55	57	56	58	52
8					--	--	54	50	56	54	58	54	58	53
9					--	--	54	51	55	55	59	56	58	55
10					--	--	55	53	55	55	59	56	58	56
11					--	--	55	54	56	54	59	58	57	54
12					55	51	55	54	57	54	58	55	58	54
13					51	49	53	52	57	57	56	55	57	55
14					50	49	53	52	57	56	59	56	57	55
15					53	49	53	52	56	55	61	59	58	52
16					52	48	55	53	57	54	63	59	57	53
17					50	48	55	55	58	56	63	60	57	54
18					50	47	55	54	58	57	64	61	58	55
19					50	49	56	55	57	57	63	60	58	55
20					54	49	56	55	57	54	63	60	57	54
21					53	50	55	53	58	56	62	58	58	54
22					51	50	53	53	58	57	60	59	58	56
23					52	47	53	52	59	57	59	59	57	55
24					54	48	52	51	61	58	59	59	57	57
25					56	50	53	52	61	59	60	58	57	56
26					56	52	55	52	60	59	61	58	58	54
27					53	51	55	55	59	57	62	60	54	51
28					51	49	58	55	57	55	59	56	52	50
29					52	51	58	56	55	55	60	57	50	48
30					52	48	59	58	57	55	58	55	48	47
31					54	49	--	--	60	57	58	54	--	--
Average					--	--	55	55	58	56	60	57	56	54

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