Quality of Surface Waters of the United States 1954

Parts 7–8. Lower Mississippi River Basin and Western Gulf of Mexico Basins

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

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PREFACE

This report was prepared by the Geological Survey in cooperation with the States of Arkansas, Louisiana, New Mexico, Oklahoma, and Texas, and with other agencies by personnel of the Water Resources Division under the direction of:

C. G. Paulsen ..... Chief Hydraulic Engineer
S. K. Love ..... Chief, Quality of Water Branch

P. C. Benedict, regional engineer ..... Lincoln, Nebr.
J. W. Geurin, district chemist .... Fayetteville, Ark.
J. M. Stow, district chemist ... Albuquerque, N. Mex.
Burdge Irelan, district chemist ..... Austin, Tex.
T. B. Dover, district chemist ... Oklahoma City, Okla.

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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, 1953 , to September 30, 1954 . 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, hardness, sediment loads, water temperature, and other pertinent data.

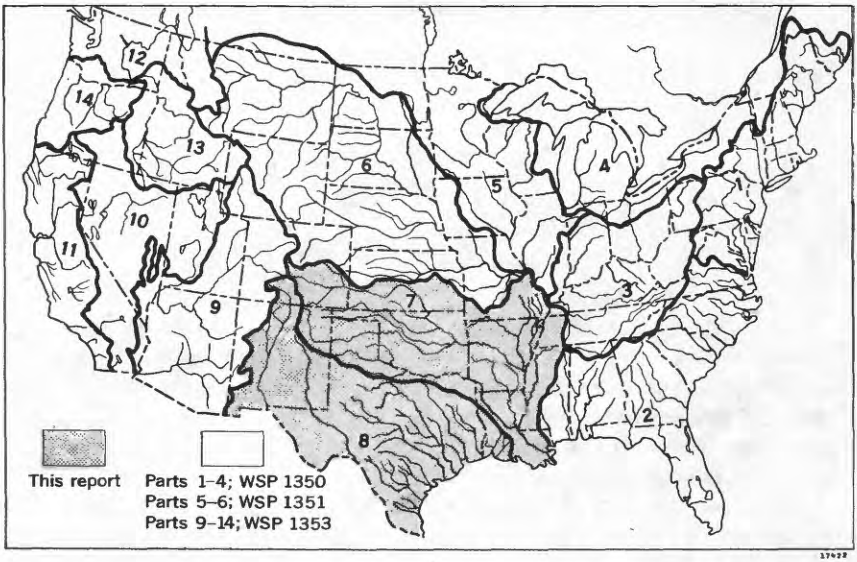

Figure 1. Map of the United States showing basins covered by the four water-supply papers on quality of surface waters in 1954. The shaded portion represents the section of the country covered by this volume; the unshaded portion represents the section of the country covered by other water-supply papers.

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.

Beginning with the series of reports for the water year ending September 30, 1951, the order of listing station records has been changed. In this report, stations on tributary streams are listed between stations on the main stream in the order in which those tributaries enter the main stem. Stations on tributaries to tributaries are inserted in a similar manner.

During the year ended September 30, 1954, 109 regular sampling stations on 70 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 96 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 page 19.

Quantities of suspended sediment are reported for 27 stations during the year ended September 30, 1954. The sediment samples were collected one or more 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 27 of the stations. As noted under "Remarks" in the table headings, suspended-sediment concentrations also were determined from the samples collected for chemical analyses 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 analyses 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 sediment 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 may 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 5,000 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 or pipette cylinder was often different from the concentration in the original suspension. The concentration at which analyses were made is indicated in the appropriate tables.

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, and the monthly averages of the maximum daily and 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 quan-

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

Specific conductance values are expressed in reciprocal ohms times 10^6 (micromhos at 25°C). The discharge of the streams is reported in cubic feet-per second (see Streamflow, p. 21) 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 is expressed in terms of pH units. By definition the pH value of a solution is the negative logarithm of the concentration of gram ions of hydrogen. However, the pH meter which is generally used in Survey laboratories, determines the activity of the hydrogen ions as distinguished from concentration.

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. A part per million of sediment is computed as

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1,000,000 times the ratio of the weight of sediment to the weight of water-sediment mixture. Daily sediment loads are expressed in tons per day, and except for subdivided days are usually obtained by multiplying daily mean sediment concentration in parts per million by the daily mean discharge, and the appropriate conversion factor, normally 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 United 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 increasing 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 dis-

solved 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 units usually passes unnoticed. Some swamp waters have natural color of 200 to 300 units 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. 7 .) 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).

Sodium-adsorption-ratio

Sodium-adsorption-ratio (SAR) is the relative proportion of sodium to other cations in an irrigation water.

$$SAR = \frac{Na^{+}}{\sqrt{(Ca^{++}+Mg^{++})/2}}$$

where the ionic concentrations are expressed in milliequivalents per liter (or equivalents per million for most irrigation waters).

The term is used for soil extracts and irrigation waters to ex-

press the relative activity of sodium ions in exchange reactions with soil. SAR provides an estimate of the sodium or alkali hazard and reportedly is more significant for interpreting water quality than percent sodium because it relates more directly to the exchangeable sodium percentage the soil will attain when it and the water are in equilibrium.

The U. S. Salinity Laboratory diagram for classifying waters for irrigation divides water into four classes with respect to sodium hazard, the dividing points being at SAR values of 10, 18, and 26. They range from low-sodium water that can be used for irrigation on almost all soils to very high-sodium water which is generally unsatisfactory for irrigation.

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 (larger than 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 charac-

teristics, 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 many of the stations listed in this report for the water years ending September 30, 1941-1954 are listed below.

Numbers of water-supply papers containing records for Parts 7 and 8, 1941-1954

Year	WSP	Year	WSP	Year	WSP	Year	WSP
1941	942	1945	1030	1949	1163	1953	1292
1942	950	1946	1050	1950	1188	1954	1352
1943	970	1947	1102	1951	1199	--	--
1944	1022	1948	1133	1952	1252	--	--

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.
1048. Discharge and sediment loads in the Boise River drainage basin, Idaho, 1939-40, 1948.
1110-C. Quality of water of Conchas Reservoir, New Mexico, 1939-49, 1952.

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

COOPERATION

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

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

State	Cooperating agency	Drainage basin	District or regional office
Arkansas	Institute of Science and Technology, University of Arkansas, Dr. W. W. Grigorieff, director.	Lower Mississippi River.	P. P. Box 32, University Station 205 Ozark St. Fayetteville, Ark.
Louisiana	Louisiana Department of Public Works, Roy T. Sessums, director.	Lower Mississippi River, Western Gulf of Mexico.	807 Brazos St., Austin 14, Tex.
Missouri	--	Lower Mississippi River (sedimentation investigations at St. Louis).	510 Rudge-Guenzel Bldg., Lincoln, Nebr.
New Mexico	New Mexico Interstate Stream Commission, John H. Bliss, secretary to Nov. 15, 1953, John R. Erickson, secretary beginning Nov. 15, 1953, and Pecos River Commission, Sherman O. Decker, secretary.	Lower Mississippi River, Western Gulf of Mexico	P. O. Box 4217, Albuquerques, N. Mex.

State	Cooperating agency	Drainage basin	District or regional office
Oklahoma	Oklahoma Planning and Resources Board, Division of Water Resources, Ira C. Husky, director, and Oklahoma A. & M. College, Research Foundation, Dr. O. M. Smith, director.	Lower Mississippi River.	P. O. Box 4355, Oklahoma City, Okla.
Texas	Texas State Board of Water Engineers, consisting of H. A. Beckwith, chairman, A. P. Rollins, and O. F. Dent; Red Bluff Water Power Control District, Lower Colorado River Authority, the Canadian River Municipal Water Authority, the Colorado River Municipal Water District, Brazos River Authority, Lower Neches Valley Authority, San Jacinto River Authority, Sabine River Authority, and the Texas Electric Company. Cities of Abilene, Amarillo, Fort Worth, Midland and Wichita Falls. Chambers - Liberty Counties Navigation District.	Lower Mississippi River Western Gulf of Mexico.	807 Brazos St., Austin 14, Tex.

Financial assistance was also furnished by the Corps of Engineers, Department of Army, in the operation of some stations in Texas. The Corps also provided financial assistance and made determinations in their laboratory of particle-size analyses of bed material and of sediment concentrations in connection with the sedimentation investigations of the Mississippi River at St. Louis. Assistance in collecting records was given by many municipal, State, and Federal agencies

In addition to these cooperative programs, many of the stations were operated from funds appropriated directly to the Geological Survey for quality-of-water investigations. Studies of suspended-sediment loads in the middle Rio Grande in New Mexico were initated as a Federal project in 1948.

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 or regional chemists and engineers as follows: In Arkansas -- J. W. Geurin; in Missouri -- P. C. Benedict; in Oklahoma, and in the Arkansas River basin in Kansas -- T. B. Dover; in New Mexico, and in the Rio Grande and Arkansas River basins in Colorado -- J. M. Stow; and in Texas and Louisiana -- Burdge Irelan. Any additional information on file can be obtained by writing the responsible Survey district office.

STREAMFLOW

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 are either daily mean discharges or discharges for the time at which samples were collected, computed from a stage-discharge relation or from a discharge measurement.

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PART 7. LOWER MISSISSIPPI RIVER BASIN

MISSISSIPPI RIVER MAIN STEM

MISSISSIPPI RIVER AT ST. LOUIS, MO.

LOCATION.--At MacArthur Bridge, 1.1 miles below gaging station, which is 15 miles downstream from the Missouri River and 180 miles upstream from the Ohio River.
DRAINAGE AREA.--701,000 square miles, approximately.
RECORDS AVAILABLE.--Water temperatures: October 1950 to September 1954.
Sediment records: April 1948 to September 1954.
EXTREMES, 1953-54.--Water temperatures: Maximum, 84°F July 21, 22; minimum, freezing point on several days during December and January.
Sediment concentrations: Maximum daily, 2,450 ppm June 7; minimum daily, 50 ppm Jan. 24.
Sediment loads: Maximum daily, 1,860,000 tons June 7; minimum daily, 6,760 tons Jan. 28.
EXTREMES, 1948-54.--Water temperatures (1950-54): Maximum, 86°F July 31, 1953; minimum, freezing point on several days during winter months.
Sediment concentrations: Maximum daily, 6,420 ppm June 7, 1951; minimum daily, 38 ppm Feb. 2, 3, 1951.
Sediment loads: Maximum daily, 7,010,000 tons May 5, 1951; minimum daily, 4,340 tons Feb. 3, 1951.
REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Temperature (°F) of water, water year October 1953 to September 1954
/Once-daily measurement generally between 9 a.m. and 3 p.m./

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

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MISSISSIPPI RIVER MAIN STEM--Continued

MISSISSIPPI RIVER AT ST. LOUIS, MO.--Continued

Suspended sediment, water year October 1953 to September 1954

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Tons per day	Mean discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Tons per day	Mean discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Tons per day
1	71,500	194	37,500	68,000	224	41,100	66,600	150	27,000
2	71,500	198	38,200	68,700	220	a40,800	61,000	189	31,100
3	70,800	224	42,800	70,100	220	a41,600	61,000	133	21,900
4	70,100	180	a34,100	69,400	222	41,600	61,700	132	22,000
5	74,300	182	36,500	68,700	234	43,400	62,400	133	22,400
6	72,200	196	38,200	68,000	221	40,600	65,900	136	a24,200
7	73,600	199	39,500	68,000	210	38,600	68,000	150	27,500
8	71,500	194	37,500	68,000	207	a38,000	66,600	163	29,300
9	72,900	188	37,000	68,000	206	37,800	70,800	175	a33,500
10	71,500	156	30,100	68,000	199	36,500	73,600	184	36,600
11	67,300	160	a29,100	68,000	212	38,900	70,800	186	35,600
12	65,900	192	34,200	67,300	218	39,600	81,400	168	36,900
13	66,600	212	38,100	67,300	206	37,400	70,800	186	a35,600
14	68,000	210	38,600	67,300	192	34,900	66,600	183	32,900
15	69,400	199	37,300	67,300	189	a34,300	66,600	182	32,700
16	69,400	200	37,500	66,600	201	36,100	67,300	201	36,500
17	68,000	216	a39,700	66,600	206	37,000	70,100	187	35,400
18	67,300	245	44,500	66,600	176	31,600	66,600	182	32,700
19	66,600	202	36,300	65,900	176	31,300	67,300	173	a31,400
20	66,600	185	33,300	66,600	163	29,300	72,200	161	31,400
21	65,900	195	a34,700	70,800	146	a27,900	75,800	161	33,000
22	66,600	198	35,600	67,300	147	26 700	79,800	144	a31,000
23	68,000	182	33,400	67,300	158	28,700	78,200	136	28,700
24	70,100	180	a34,100	65,900	213	37,900	65,900	132	23,500
25	68,000	194	35,600	65,900	181	32,200	62,400	127	a21,400
26	69,400	212	39,700	65,200	166	29,200	63,800	113	19,500
27	75,800	233	47,700	65,200	155	27,300	63,100	98	16,700
28	72,900	227	44,700	65,200	161	28,300	62,400	83	14,000
29	69,400	237	44,400	63,100	176	a30,000	61,700	57	9,500
30	71,500	223	43,100	64,500	215	37,400	61,700	64	10,700
31	69,400	232	43,500	--	--	--	60,400	78	12,700
Total	2,162,000	--	1,176,500	2,014,800	--	1,056,000	2,092,500	--	837,300
	January			February			March		
1	59,000	71	a11,300	49,900	64	8,620	82,200	305	67,700
2	57,000	57	8,770	50,400	53	7,210	78,400	313	66,300
3	57,000	54	8,310	50,400	56	7,620	79,900	329	71,000
4	52,200	81	11,400	51,000	58	7,990	82,200	362	80,300
5	58,300	76	12,000	52,200	74	10,400	80,600	378	82,300
6	58,300	70	11,000	52,200	74	10,400	78,400	349	a73,900
7	58,300	68	10,700	52,200	64	a9,020	76,200	341	70,200
8	58,300	64	10,100	52,200	64	9,020	77,600	392	82,100
9	60,200	62	a10,100	52,200	79	11,100	77,600	614	129,000
10	60,200	67	10,900	53,400	93	13,400	80,600	482	105,000
11	60,900	89	14,600	54,600	114	16,800	83,600	380	85,800
12	59,000	103	a16,400	55,200	123	18,300	82,200	286	63,500
13	54,600	90	13,300	54,600	98	a14,400	77,600	232	a48,600
14	53,400	90	13,000	54,600	81	a11,900	76,200	217	44,600
15	55,800	90	13,600	55,200	84	12,500	68,300	185	34,100
16	56,400	90	a13,700	56,400	105	16,000	66,200	175	31,300
17	57,000	92	14,200	57,000	193	29,700	65,500	150	26,500
18	55,800	96	14,500	56,400	231	35,200	64,800	162	28,300
19	54,600	102	15,000	54,800	216	32,700	67,600	194	35,400
20	54,600	105	15,500	57,000	211	a32,500	76,900	237	a49,300
21	54,000	90	13,100	59,600	207	33,300	82,200	319	70,800
22	52,800	77	11,000	67,600	180	32,900	79,900	313	67,500
23	52,800	62	8,840	69,000	175	32,600	78,400	271	57,400
24	52,200	50	7,050	71,800	130	25,200	81,400	240	52,700
25	52,200	70	9,870	76,200	145	29,800	91,500	234	57,800
26	53,400	68	9,800	83,600	234	52,800	110,000	312	92,700
27	48,800	68	8,960	85,900	321	a74,400	131,000	340	a120,000
28	45,500	55	6,760	87,500	403	95,200	140,000	396	150,000
29	49,400	68	9,070	--	--	--	147,000	827	328,000
30	49,900	71	a9,570	--	--	--	147,000	1,290	512,000
31	48,800	71	9,350	--	--	--	138,000	996	371,000
Total	1,700,700	--	351,750	1,674,100	--	690,980	2,749,000	--	3,155,100

a Computed from estimated concentration graph.

MISSISSIPPI RIVER MAIN STEM--Continued

MISSISSIPPI RIVER AT ST. LOUIS, MO.--Continued

Suspended sediment, water year October 1953 to September 1954--Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	133,000	688	247,000	180,000	343	a167,000	157,000	326	138,000
2	128,000	570	197,000	188,000	666	a338,000	187,000	331	167,000
3	126,000	521	a177,000	198,000	1,190	636,000	215,000	485	282,000
4	127,000	471	162,000	202,000	1,030	562,000	222,000	854	512,000
5	131,000	432	153,000	216,000	1,370	799,000	262,000	1,650	a1,170,000
6	132,000	404	144,000	240,000	1,430	927,000	289,000	2,330	a1,820,000
7	137,000	385	142,000	246,000	1,650	1,100,000	281,000	2,450	1,860,000
8	160,000	428	185,000	240,000	1,200	a778,000	262,000	2,180	1,540,000
9	145,000	383	150,000	232,000	1,100	a689,000	250,000	1,770	a1,190,000
10	128,000	387	a134,000	225,000	1,070	650,000	240,000	1,530	991,000
11	126,000	504	a171,000	222,000	970	581,000	222,000	1,380	827,000
12	133,000	493	177,000	220,000	858	510,000	208,000	1,230	a691,000
13	133,000	450	162,000	225,000	770	468,000	195,000	1,060	a558,000
14	132,000	438	156,000	228,000	710	437,000	192,000	940	487,000
15	133,000	461	166,000	228 000	663	a408,000	185,000	828	414,000
16	132,000	588	210,000	230,000	639	a397,000	190,000	727	373,000
17	130,000	502	a176,000	235,000	617	391,000	208,000	1,630	915,000
18	136,000	443	a163,000	235,000	622	395,000	205,000	1,550	858,000
19	137,000	428	158,000	235,000	737	468,000	194,000	1,140	a597,000
20	130,000	359	126,000	238,000	795	511,000	188,000	1,020	a518,000
21	134,000	313	113,000	238,000	563	362,000	184,000	1,020	507,000
22	167,000	385	174,000	232,000	456	a286,000	187,000	1,390	702,000
23	185,000	428	214,000	226,000	412	a251,000	185,000	1,500	749,000
24	173,000	430	a201,000	226,000	495	302,000	183,000	2,050	1,010,000
25	164,000	464	a205,000	218,000	730	430,000	192,000	1,950	1,010,000
26	162,000	570	a249,000	197,000	662	352,000	229,000	1,580	a977,000
27	164,000	546	242,000	176,000	490	233,000	256,000	1,730	a1,200 000
28	173,000	438	205,000	156,000	398	168,000	260,000	2,170	1,520,000
29	188,000	468	238,000	137,000	336	a124,000	254,000	2,180	1,500,000
30	181,000	356	174,000	131,000	288	a102,000	250,000	1,960	1,320,000
31	--	--	--	138,000	288	a107,000	--	--	--
Total	4,360,000	--	5,371,000	6,538,000	--	13,929,000	6,532,000	--	26,403,000

Day	July			August			September		
1	247,000	1,660	1,110,000	84,400	193	a44,000	159,000	1,520	a653,000
2	254,000	1,380	946,000	83,600	176	39,700	147,000	1,310	520,000
3	259,000	1,160	a811,000	83,600	181	40,900	135,000	1,110	405,000
4	254,000	966	a662,000	85,200	218	50,100	130,000	779	a273,000
5	244,000	788	a519,000	87,500	207	48,900	126,000	533	a181,000
6	228,000	678	417,000	96,300	258	67,100	113,000	441	a135,000
7	212,000	590	338,000	104,000	235	a66,000	108,000	477	139,000
8	192,000	572	297,000	108,000	232	a67,700	97,100	449	118,000
9	180,000	505	245,000	115,000	446	138,000	86,700	391	91,500
10	177,000	440	a210,000	111,000	714	214,000	89,900	323	78,400
11	176,000	397	a189,000	103,000	654	a182,000	79,200	293	a62,700
12	173,000	387	181,000	105,000	697	198,000	74 600	343	a69,100
13	173,000	394	184,000	114,000	834	257,000	76,200	320	65,800
14	172,000	380	176,000	110,000	779	a231,000	79,900	273	58,900
15	168,000	342	155,000	106,000	1,230	a352,000	83,600	236	53,300
16	164,000	287	127,000	102,000	1,800	496,000	85,200	210	a48,300
17	159,000	251	a108,000	96,300	1,900	494,000	88,300	205	48,900
18	154,000	239	a99,400	96,300	1,330	a346,000	91,500	210	a51,900
19	151,000	235	95,800	96,300	871	226,000	91,500	222	a54,800
20	147,000	239	94,900	104,000	560	157,000	103,000	307	85,400
21	143,000	230	88,800	106,000	389	a111,000	107,000	363	105,000
22	138,000	220	82,000	114,000	376	a116,000	99,500	337	a90,500
23	142,000	214	82,000	103,000	328	91,200	99,500	278	74,700
24	136,000	207	a76,000	89,100	291	70,000	103,000	243	67,600
25	128,000	196	a67,700	94,700	270	a69,000	103,000	227	a63,100
26	116,000	203	63,600	98,700	265	70,600	102,000	221	a60,900
27	104,000	258	72,400	118,000	302	96,200	96,300	222	57,700
28	96,300	272	70,700	166,000	433	a194,000	94,700	220	56,300
29	95,500	261	a67,300	190,000	711	a365,000	94,700	212	a54,200
30	87,500	252	59,500	180,000	1,060	515,000	97,900	206	54,500
31	77,600	225	a47,100	169,000	1,410	643,000	--	--	--
Total	5,147,900	--	7,742,200	3,420,000	--	6,056,400	3,042,300	--	3,877,500

Total discharge for year (cfs-days) 41,433,300
Total load for year (tons) 70,646,730

a Computed from estimated concentration graph.

MISSISSIPPI RIVER MAIN STEM--Continued

MISSISSIPPI RIVER AT ST. LOUIS, MO.--Continued

Particle-size analyses of suspended sediment, water year October 1953 to September 1954
(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 (cfs)	Water temperature (°F)	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. 20, 1953	12:40 p. m.	66,600	65	188		49	58	69	81	91	94	97	99		100		BSW
Dec. 4	3:40 p. m.	62,400	44	138		40	48	61	71	84	88	93	98		99		BSW
Feb. 10, 1954	10:40 a. m.	53,400	38	65		28	38	48	61	75	83	91	99		100		BSW
Mar. 22	12:55 p. m.	80,600	42	289		32	42	51	64	87	89	93	99		100		BSW
Apr. 19	1:50 p. m.	137,000	61	431		41	55	67	76	82	83	87	99		100		BSW
Apr. 27	11:07 a. m.	164,000	65	560		49	58	68	74	80	82	86	97		99		BW
June 7	12:00 m.	289,000	67	2,460		45	59	70	81	90	94	96	99		100		BW
July 26	11:20 a. m.	115,000	80	169		37	49	59	71	85	90	93	98		100		BSW
Sept. 21	1:50 p. m.	97,900	70	376		36	47	59	72	88	93	96	99		100		BSW

Particle-size analyses of bed material, water year October 1953 to September 1954
(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	Number of sampling points	Discharge (cfs)	Water temperature (°F)	Bed material										Methods of analysis
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters								
						0.002	0.004	0.062	0.125	0.250	0.500	1.000	2.000	4.000	7.93	12.7	
Oct. 20, 1953	4	66,600						--	0	45	70	90	97	100	--	--	S
Dec. 4	4	61,700						0	1	48	68	86	95	99	100	--	S
Dec. 30	4	62,400						0	1	52	69	82	86	90	98	100	S
Jan. 29, 1954	4	49,400						0	2	57	77	88	92	95	99	100	S
Feb. 8	4	52,200						0	1	54	77	93	98	100	--	--	S
Mar. 22	4	80,600						0	2	59	77	92	98	100	--	--	S
Apr. 19	4	138,000						0	1	59	92	98	100	--	--	--	S
June 8	4	262,000						0	1	55	80	93	97	99	99	100	S
July 12	4	173,000						0	1	45	68	88	96	99	100	--	S
July 26	4	115,000						0	1	41	70	86	95	98	100	--	S
Sept. 21	4	105,000						0	1	43	70	85	92	97	100	--	S

ST. FRANCIS RIVER AT MARKED TREE, ARK.

LOCATION.--At gaging station at bridge on U. S. Highway 63, at Marked Tree, Poinsett County, 4.8 miles downstream from Little River, and 7 miles downstream from dam of Poinsett County Drainage District 7.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1946, November 1949 to September 1954.
Water temperatures: October 1945 to September 1946, November 1949 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 312 ppm Apr. 9-30; minimum, 143 ppm Jan. 18-19, 22-23.
Hardness: Maximum, 242 ppm Apr. 9-30; minimum, 80 ppm Jan. 18-19, 22-23.
Specific conductance: Maximum daily, 545 micromhos Nov. 29; minimum daily, 159 micromhos Jan. 18-19.
Water temperatures: Maximum, 88°F Aug. 19; minimum, 36°F Jan. 11-14.
EXTREMES, 1945-46, 1949-53.--Dissolved solids: Maximum, 329 ppm Nov. 21-30, 1949; minimum, 87ppm Jan. 15-18, 1951.
Hardness: Maximum, 262 ppm Aug. 1-10, 1952; minimum, 64 ppm Feb. 14-19, 1950.
Specific conductance: Maximum daily, 746 micromhos Sept. 1, 1953; minimum daily, 99.3 micromhos Jan. 27, 1951.
Water temperatures: Maximum, 89°F June 29, July 1, 1952; minimum, freezing point Feb. 1-2, 1951.
REMARKS.--Records of specific conductance of daily samples available in district office at Fayetteville, Ark. Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, magnesium	Noncarbonate			
Oct. 1-31, 1953	229	18	0.02	54	15	12	1.6	a 237	20	8.5	0.1	0.8	266	196	2	417	8.4	7
Nov. 1-30	114	12	.00	53	16	11	2.2	b 225	20	7.5	.2	.5	253	198	14	404	8.4	8
Dec. 1-31	131	16	.04	61	15	11	2.2	b 251	24	6.0	.1	1.0	276	214	8	437	8.4	8
Jan. 1-16, 1954	295	15	.07	47	14	9.9	2.2	b 206	24	6.0	.1	.8	242	175	6	387	8.4	17
Jan. 17, 20-21, 24-26 29	927	12	.13	34	7.7	5.4	2.5	128	19	3.0	.1	3.6	174	116	12	276	8.0	37
Jan. 18-19, 22-23 ...	923	11	.19	21	6.8	3.7	3.0	90	13	2.0	.3	3.6	143	80	7	179	8.1	20
Jan. 27-28, 30-31 ...	735	16	.07	52	8.8	7.5	2.5	c 189	25	3.5	.1	2.6	232	166	11	351	8.3	22
Feb. 1-10	447	21	.04	41	15	11	2.9	184	29	5.5	.3	1.7	238	164	13	366	8.0	12
Feb. 11-20, 28	519	20	.00	47	15	11	2.8	d 212	27	5.5	.2	1.6	256	179	5	389	8.3	8
Feb. 21-27	717	15	.08	52	12	7.6	2.9	e 202	24	4.2	.1	3.0	242	179	13	362	8.5	15
Mar. 1-31	444	20	.00	64	17	11	2.5	b 269	26	6.8	.2	1.7	300	230	9	456	8.3	10
Apr. 1-8	1,315	13	.06	47	13	9.5	2.3	b 192	28	7.8	.0	3.0	242	171	13	363	8.4	20
Apr. 9-30	374	18	.00	66	19	13	3.0	e 288	28	5.5	.0	1.1	312	242	6	483	8.4	12
May 1-4, 6-7, 15-31.	1,221	14	.00	51	14	12	3.0	e 216	20	8.5	.1	1.2	242	185	8	388	8.5	20

a Includes the equivalent of 6 parts per million of carbonate (CO_3).
b Includes the equivalent of 4 parts per million of carbonate (CO_3).
c Includes the equivalent of 2 parts per million of carbonate (CO_3).
d Includes the equivalent of 5 parts per million of carbonate (CO_3).
e Includes the equivalent of 7 parts per million of carbonate (CO_3).

ST. FRANCIS RIVER BASIN--Continued

ST. FRANCIS RIVER AT MARKED TREE, ARK.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, magnesium	Noncarbonate			
May 5, 8-14, 1954	1,674	14	0.00	41	9.7	8.2	2.3	160	14	6.5	0.1	3.8	192	142	11	310	7.6	20
June 1-7, 9-10, 12-16 25-27	1,394	14	.03	44	14	14	2.7	198	18	11	.1	1.1	237	167	5	371	8.1	7
June 8, 11, 17-24, 28-30	1,324	6.7	.01	39	12	11	3.0	170	15	10	.1	1.4	212	147	7	328	7.5	10
July 1-31	1,157	12	.02	48	13	12	2.3	207	14	10	.1	1.2	258	173	4	372	8.2	9
Aug. 1-31	563	11	.00	44	12	12	2.3	f189	11	11	.5	1.5	222	159	4	329	8.6	7
Sept. 1-30	186	11	.00	53	13	14	2.6	g222	16	10	.4	1.9	258	186	3	388	8.7	7
Average	607	14	0.04	48	13	10	2.5	202	21	6.9	0.2	1.9	240	173	8	368	--	14

f Includes the equivalent of 9 parts per million of carbonate (CO_3).
g Includes the equivalent of 15 parts per million of carbonate (CO_3).

ST. FRANCIS RIVER BASIN--Continued

ST. FRANCIS RIVER AT MARKED TREE, ARK.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

ST. FRANCIS RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN ST. FRANCIS RIVER BASIN IN ARKANSAS

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH
														Calcium, magnesium	Noncarbonate		
ST. FRANCIS RIVER AT ST. FRANCIS																	
Feb. 11, 1954	438							169	2.0	5.0		0.5		144	5	279	8.0
Aug. 19	143							a124	9.0	3.8		3.8		107	5	216	8.4
ST. FRANCIS RIVER AT LAKE CITY																	
Feb. 11, 1954	854							167	3.0	3.0		0.4		134	0	271	8.2
Aug. 19	214							130	9.0	3.2		2.0		104	0	220	7.6
RIGHT HAND CHUTE OF LITTLE RIVER AT RIVERVALE.																	
Feb. 12, 1954	1,020							a177	32	9.0		1.1		159	14	319	8.4
Aug. 20	269							177	18	14		1.5		157	12	340	7.8
ST. FRANCIS RIVER FLOODWAY NEAR MARKED TREE																	
Feb. 3 1954	2,930							105	30	7.5		2.6		106	20	234	7.6
Aug. 4	8.32							b184	16	4.0		1.3		154	3	319	8.5
ST. FRANCIS RIVER AT PARKIN																	
Feb. 10, 1954	869							c241	36	3.8		1.1		213	15	422	8.3
Aug. 18	829							d180	18	7.2		3.0		152	4	316	8.4
ST. FRANCIS BAY NEAR RIVERFRONT																	
Feb. 10, 1954	2,430							139	22	6.8		1.5		127	13	281	7.4
Aug. 18	130							e265	23	6.2		3.4		224	7	460	8.3

a Includes equivalent of 6 parts per million of carbonate (CO_3).
b Includes equivalent of 8 parts per million of carbonate (CO_3).
c Includes equivalent of 5 parts per million of carbonate (CO_3).
d Includes equivalent of 7 parts per million of carbonate (CO_3).
e Includes equivalent of 2 parts per million of carbonate (CO_3).

WAR EAGLE CREEK NEAR HINDSVILLE, ARK.

LOCATION.--At gaging station at bridge on State Highway 45, 4 miles downstream from Poyner Hollow Creek, and 4 miles north of Hindsville, Madison County.
DRAINAGE AREA.--262 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1954.
REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, magnesium	Noncarbonate			
Oct. 12, 1953	8.25	7.1	0.01	40	3.1	2.7	1.3	134	2.6	4.2	0.1	1.0	134	113	3	234	7.7	6
Nov. 10	7.91	7.7	.02	43	1.2	2.9	.9	a 138	1.6	4.8	.1	.8	141	112	0	243	8.4	4
Dec. 9	11.4	6.7	.01	44	1.9	2.5	1.0	138	1.6	4.8	.0	1.1	145	118	4	235	7.4	4
Jan. 7, 1954	10.1	5.0	.01	44	1.8	2.6	.9	136	3.6	4.8	.0	1.1	143	117	6	235	7.5	4
Feb. 8	32.2	5.7	.01	23	1.4	2.1	.8	69	7.2	3.8	.0	2.0	98	63	7	146	7.8	10
Mar. 9	28.9	4.7	.03	23	1.4	2.1	.9	70	4.8	4.0	.0	.6	92	63	6	139	7.7	7
Apr. 5	53.0	2.4	.00	19	3.0	2.1	.9	63	10	3.5	.1	1.0	84	60	8	127	7.5	7
May 4	534	5.2	.15	14	.8	1.5	1.2	39	4.8	2.5	.3	1.0	64	38	6	82.4	7.4	33
May 18	59.4	4.2	.04	20	1.0	1.8	.9	62	5.8	2.2	.2	.3	73	54	3	121	7.4	8
June 8	44.2	4.8	.11	21	3.6	2.2	1.0	77	4.4	2.5	.1	.3	88	67	4	142	7.5	6
July 7	2.72	4.3	.00	33	2.6	2.5	.9	108	2.8	4.2	.1	1.0	118	93	5	187	7.4	5
Aug. 17	.44	2.9	.00	39	1.7	2.9	1.1	126	2.8	5.5	.0	.4	137	104	1	236	7.6	5
Sept. 16	.75	4.8	.01	39	4.2	3.7	1.3	129	6.8	7.5	.3	.8	137	115	9	233	8.2	5

a Includes equivalent of 4 parts per million of carbonate (CO_3).

WHITE RIVER BASIN--Continued

KINGS RIVER NEAR BERRYVILLE, ARK.

LOCATION.--At gaging station at bridge on County road 1¼ miles downstream from Bee Creek, 2¼ miles upstream from Clabber Creek, and 5¼ miles northwest of Berryville, Carroll County.
DRAINAGE AREA.--532 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1954.
REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium magnesium	Noncarbonate			
Oct. 13, 1953	8.3	8.3	0.01	33	13	2.0	1.2	164	3.8	2.8	0.1	0.4	149	136	1	275	7.7	5
Nov. 9	11.2	4.4	.01	40	11	3.1	1.4	171	4.4	4.5	.0	.6	161	145	5	280	7.8	4
Dec. 8	36.2	5.2	.00	38	11	2.2	1.2	166	4.6	4.0	.0	.4	160	140	4	269	7.8	5
Jan. 8, 1954	18.3	4.5	.01	40	10	2.3	1.2	163	6.2	3.8	.0	.1	156	141	7	272	7.8	4
Feb. 9	54.4	3.6	.00	26	13	2.0	1.1	131	8.4	4.2	.0	.9	140	118	11	233	7.8	5
Mar. 9	47.1	3.2	.00	30	9.1	1.7	1.2	122	10	3.0	.1	1.7	129	112	12	216	7.6	5
Apr. 5	107	4.0	.00	32	7.1	1.8	1.1	128	7.0	3.5	.0	.8	132	109	4	221	8.2	5
May 4	1,210	5.7	.07	22	5.4	1.4	1.2	84	6.0	2.2	.3	1.4	102	77	8	154	7.6	22
June 9	288	6.2	.06	26	4.6	1.0	1.4	91	5.0	2.0	.5	1.5	108	84	9	168	7.6	20
July 8	11.1	5.3	.04	30	7.9	1.9	1.4	a130	4.6	2.5	.1	.5	134	107	1	220	8.4	5
Aug. 17	.29	1.2	.02	36	8.5	2.7	1.5	152	4.2	4.0	.0	.9	150	125	0	257	7.6	5
Sept. 16	.84	6.2	.00	34	15	2.6	1.6	a169	5.6	4.0	.2	.8	157	147	8	280	8.3	5

a Includes equivalent of 3 parts per million of carbonate (CO_3).

WHITE RIVER AT COTTER, ARK.

LOCATION.--At bridge on U. S. Highway 62 at Cotter, Baxter County, about 5 miles downstream from gaging station near Flippin.
DRAINAGE AREA.--6,067 square miles (above gaging station).
RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1954.
Water temperatures: October 1947 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 344 ppm Feb. 3, 7; minimum, 148 ppm June 1-30.
Hardness: Maximum, 161 ppm Feb. 3, 7; minimum, 130 ppm Nov. 1-30.
Specific conductance: Maximum daily, 577 micromhos Feb. 3; minimum daily, 244 micromhos Nov. 21, Jan. 20.
Water temperatures: Maximum, 79°F Sept. 20; minimum, 41°F Mar. 21.
EXTREMES, 1951-54.--Dissolved solids: Maximum, 344 ppm Feb. 3, 7, 1954; minimum, 146 ppm Feb. 11-15, 17, 19-20, Mar. 21-27, 29-31,1953.
Hardness: Maximum, 191 ppm Feb. 11-29, Mar. 11-19,1952; minimum, 128 ppm June 11-20,1952, Sept. 11-20, 21-30, 1953.
Specific conductance: Maximum daily, 577 micromhos Feb. 3, 1954; minimum daily, 212 micromhos Mar. 11,1952.
Water temperatures: Maximum, 79°F Sept. 20, 1954; minimum, 41°F Mar. 21, 1954.
REMARKS.--Records of specific conductance of daily samples available in district office at Fayetteville, Ark. Records of discharge for gaging station near Flippin, for water year October 1953 to September 1954 given in WSP 1341. No appreciable inflow between sampling point and gaging station. Flow regulated by Bull Shoals Reservoir since July 23, 1951.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Specific conductance (micromhos at 25°C)	pH	Color
Oct. 1-31, 1953	3,882	5.7	0.01	37	9.7	2.1	1.5	150	5.2	3.0	0.0	2.4	150	132	9	253	8.1	7
Nov. 1-30	3,745	5.1	.00	36	9.9	3.2	1.4	154	2.6	4.8	.1	.6	158	130	4	268	8.0	8
Dec. 1-4, 6-31	2,301	6.5	.00	38	10	4.0	1.4	a157	4.2	7.0	.2	.9	162	136	7	275	8.3	5
Jan. 1-31, 1954	2,861	8.6	.00	34	12	2.5	1.3	b158	5.4	4.0	.1	1.4	172	134	5	258	8.4	7
Feb. 1-2, 4-6, 8-28	2,768	7.8	.01	35	12	3.2	1.5	a159	4.0	5.0	.0	1.9	158	137	6	271	8.3	6
Feb. 3, 7	2,745	--	--	43	13	45	--	b158	5.0	92	--	.9	344	161	32	556	8.4	6
Mar. 1, 3-12, 14-31	2,886	7.7	.00	35	12	2.9	1.4	160	2.8	4.8	.4	1.7	159	137	6	275	7.9	8
Apr. 1-30	3,916	4.8	.00	34	12	2.2	1.2	158	6.0	3.8	.1	1.3	160	134	5	258	7.8	15
May 1-4, 6-31	3,073	5.0	.07	36	11	3.2	1.4	c159	5.8	4.0	.2	2.2	158	135	5	273	8.3	5
June 1-30	3,007	5.3	.00	37	11	2.9	1.3	d163	10	3.5	.1	1.5	148	138	4	267	8.4	5
July 1-31	2,461	5.8	.02	34	12	4.0	1.4	159	1.2	5.2	.1	1.6	160	134	4	273	8.0	4
Aug. 1-31	2,915	3.3	.00	36	12	4.0	1.3	165	5.2	6.2	.1	1.5	168	139	4	286	8.0	5
Sept. 1-30	553	7.1	.06	37	14	4.5	1.6	e173	6.4	6.8	.1	1.1	178	150	8	302	8.4	8
Average	f 2,866	6.1	0.01	36	12	6.4	1.4	159	4.9	12	0.1	1.5	175	139	9	293	--	7

a Includes equivalent of 1 part per million of carbonate (CO_3).
b Includes equivalent of 4 parts per million of carbonate (CO_3).
c Includes equivalent of 2 parts per million of carbonate (CO_3).
d Includes equivalent of 6 parts per million of carbonate (CO_3).
e Includes equivalent of 5 parts per million of carbonate (CO_3).
f Mean discharge for water year October 1953 to September 1954 was 2,862 second feet.

WHITE RIVER BASIN--Continued

WHITE RIVER AT COTTER, ARK.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

BUFFALO RIVER NEAR ST. JOE, ARK.

LOCATION.--At gaging station at bridge on U. S. Highway 65, 1¼ miles downstream from Mill Creek, 4 miles upstream from Bear Creek, and 4½ miles southeast of St. Joe, Searcy County.
DRAINAGE AREA.--225 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1954.
REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, Magnesium	Noncarbonate			
Oct. 26, 1953	26.3	4.9	0.02	43	4.6	2.0	1.0	145	3.8	3.0	0.0	0.3	148	126	7	242	8.0	3
Nov. 30	43.5	4.0	.03	46	5.1	2.1	1.0	156	5.4	3.0	.0	.3	156	136	8	260	7.8	3
Dec. 28	52.8	4.1	.00	45	5.1	2.1	.8	149	8.4	3.2	.0	.3	150	133	11	250	7.7	3
Jan. 25, 1954	670	4.5	.03	27	2.9	1.3	.8	84	7.0	2.5	.1	2.4	108	79	10	157	7.4	18
Feb. 22	1,590	5.3	.00	23	1.5	1.9	1.0	71	4.8	2.5	.0	1.8	95	64	5	138	7.0	18
Mar. 22	214	1.2	.00	31	3.7	1.6	.7	106	7.8	2.2	.1	.8	109	93	6	186	7.2	5
Apr. 19	1,940	4.8	.00	25	1.6	3.7	1.0	80	4.0	5.8	.2	.6	92	69	3	152	7.2	6
May 17	361	3.6	.10	32	2.8	1.5	1.0	108	3.6	3.0	.3	1.0	116	91	3	195	7.3	5
June 14	103	3.6	.03	35	3.6	1.6	.9	a122	5.4	2.2	.1	.7	125	102	2	207	8.4	5
Aug. 3	17.9	3.1	.02	37	3.5	1.8	.8	129	3.4	1.8	.1	.2	132	107	1	226	7.6	5
Aug. 30	17.8	6.2	.00	35	4.1	2.0	1.0	120	6.0	2.0	.0	.1	116	104	6	203	7.7	5
Sept. 29	11.4	4.8	--	35	4.7	4.2	1.3	b128	3.2	3.0	--	.9	127	107	2	219	8.4	5

a Includes equivalent of 3 parts per million of carbonate (CO_3).
b Includes equivalent of 4 parts per million of carbonate (CO_3).

NORTH FORK RIVER AT NORFORK DAM NEAR NORFORK, ARK.

LOCATION.--At gaging station at Norfork Dam, 4.3 miles northeast of Norfork, Baxter County.
DRAINAGE AREA.--1,806 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1954.
REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, Magnesium	Noncarbonate			
Oct. 2, 1953	2,100	5.3	0.03	34	21	1.8	1.5	209	3.4	2.0	0.0	1.9	175	171	0	324	7.6	5
Nov. 4	2,030	4.0	.01	34	21	1.4	1.4	206	4.0	2.0	.0	1.1	175	171	2	334	7.6	6
Jan. 8, 1954	1,670	4.1	.01	35	21	1.3	1.2	204	2.4	2.0	.0	.6	182	174	7	324	8.0	4
Jan. 18	2,070	4.7	.03	37	20	1.3	1.2	205	4.0	2.2	.0	.8	175	175	7	322	7.9	4
Mar. 3	1,510	4.2	.00	31	23	1.3	1.2	208	6.4	2.0	.1	1.2	181	172	1	322	7.8	5
Apr. 6	2,120	1.9	.00	30	24	1.3	1.2	211	2.0	2.0	.1	1.0	184	174	1	328	7.9	5
May 4	690	3.3	.00	31	24	1.5	1.2	212	6.8	2.5	.1	.6	184	176	2	328	8.0	4
June 22	1,210	5.7	.08	33	23	1.2	1.2	211	4.4	3.0	.2	.4	190	177	4	340	7.8	8
July 6	1,430	4.4	.04	34	23	1.6	1.2	a 210	4.2	2.2	.1	1.8	172	179	7	333	8.4	5
Aug. 16	2,340	4.3	.00	34	24	1.4	1.4	215	5.4	2.2	.1	1.4	174	184	7	343	7.9	5
Sept. 8	680	2.7	.05	34	24	1.6	1.4	210	4.8	3.0	.1	1.5	174	184	11	344	7.3	5

a Includes equivalent of 4 parts per million of carbonate (CO_3).

SPRING RIVER AT IMBODEN, ARK.

LOCATION.--At gaging station at bridge on U. S. Highway 62, at Imboden, Lawrence County, 3.9 miles downstream from James Creek, 8.5 miles upstream from Eleven Point River, and 12.1 miles upstream from mouth.
DRAINAGE AREA.--1,162 square miles.
RECORDS AVAILABLE.--Chemcial analyses: October 1953 to September 1954.
REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, Magnesium	Noncarbonate			
Oct. 30, 1953	289	8.3	0.01	50	29	2.2	1.3	300	2.8	2.8	0.0	1.1	246	244	0	464	7.9	4
Dec. 2	342	5.9	.09	52	29	1.6	1.3	295	3.2	2.2	.0	.9	247	249	7	441	7.8	5
Dec. 29	260	7.6	.04	52	30	1.7	1.4	303	2.2	2.2	.0	1.0	246	254	5	447	7.8	5
Jan. 28, 1954	630	7.7	.01	48	27	1.5	1.3	270	5.8	2.0	.1	4.3	243	231	10	420	7.9	8
Feb. 25	767	6.2	.01	44	25	1.4	.9	a 252	8.4	2.5	.0	4.4	226	213	6	383	8.3	9
Mar. 24	2,640	4.2	.00	33	18	1.0	1.2	183	6.4	2.0	.2	2.9	175	156	6	293	7.4	22
Apr. 21	844	6.0	.00	45	22	1.7	1.2	b 242	5.0	2.5	.1	2.0	205	203	4	367	8.6	7
May 19	675	7.2	.07	43	25	1.5	1.4	250	8.0	2.0	.2	4.1	219	210	5	389	8.0	4
June 16	435	2.6	.00	44	26	2.0	1.4	263	3.2	2.5	.1	4.7	227	217	1	416	7.7	5
July 14	332	7.1	.02	39	28	1.4	1.1	c 264	3.2	2.0	.1	1.1	218	212	0	392	8.3	2
Aug. 4	322	5.0	.00	43	29	1.8	1.1	274	2.0	4.5	.0	1.2	246	227	2	429	7.8	5
Sept. 1	269	7.6	.00	41	34	1.6	1.7	279	3.6	2.2	.3	.5	226	242	14	420	7.6	5
Sept. 28	269	7.7	.00	42	32	1.6	1.2	277	2.8	2.0	.3	.5	228	236	9	408	7.7	5

a Includes equivlaent of 4 parts per million of carbonate (CO_3).
b Includes equivalent of 10 parts per million of carbonate (CO_3).
c Includes equivalent of 3 parts per million of carbonate (CO_3).

ELEVEN POINT RIVER NEAR RAVENDEN SPRINGS, ARK.

LOCATION.--At gaging station at bridge on State Highway 90, 4½ miles downstream from small tributary, 6¼ miles northeast of Ravenden Springs, Randolph County, and 21 miles upstream from mouth.
DRAINAGE AREA.--1,123 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1954.
REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium magnesium	Noncarbonate			
Oct. 29, 1953	379	7.6	0.01	45	24	3.2	1.2	260	2.2	4.2	0.0	2.8	221	211	0	409	7.8	5
Dec. 3	396	4.4	.01	46	25	1.4	1.0	260	2.6	1.8	.0	.7	216	218	4	388	8.0	3
Dec. 30	347	7.6	.04	47	24	1.5	1.0	258	2.4	2.2	.0	1.2	221	216	5	388	8.0	6
Jan. 27, 1954	434	8.3	.00	45	26	1.6	1.1	258	3.4	2.2	.0	2.2	227	219	8	395	8.0	5
Feb. 24	556	7.1	.01	45	24	2.0	1.1	249	3.8	3.0	.0	4.3	222	211	7	392	7.6	7
Mar. 25	2,440	6.8	.00	30	17	1.4	1.5	173	4.0	2.0	.3	3.0	167	145	3	282	7.4	18
Apr. 21	1,020	7.3	.00	39	19	2.2	1.3	198	13	3.0	.1	2.3	203	175	13	319	8.1	5
May 20	658	5.9	.06	33	21	1.2	1.0	203	2.8	1.8	.2	4.4	180	169	2	327	8.0	3
June 16	491	5.9	.00	38	22	1.3	.9	224	3.0	1.5	.0	3.3	194	185	2	353	7.5	5
July 13	377	5.6	.00	40	25	1.6	.9	a 245	2.2	2.2	.1	3.1	208	203	2	381	8.5	3
Aug. 5	320	6.2	.00	41	25	1.7	.9	b 250	.6	2.2	.1	1.6	213	205	0	388	8.4	5
Sept. 2	301	5.3	.01	41	29	4.2	1.4	262	3.2	6.5	.2	.3	218	222	7	413	7.5	5
Sept. 28	289	4.3	.00	41	29	1.5	1.0	257	6.4	2.0	.2	.4	216	222	11	393	7.7	5

a Includes equivalent of 10 parts per million of carbonate (CO_3).
b Includes equivalent of 7 parts per million of carbonate (CO_3).

STRAWBERRY RIVER NEAR POUGHKEEPSIE, ARK.

LOCATION.--At gaging station at bridge on State Highway 58, half a mile downstream from Hurrican Creek, and 2½ miles northeast of Poughkeepsie, Sharp County.
DRAINAGE AREA.--476 square miles.
RECORDS AVAILABLE.--Chemical analyses: November 1953 to September 1954.
REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, November 1953 to September 1954

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Specific conductance (micromhos at 25°C)	pH	Color
Nov. 24, 1953	61.6	6.2	0.01	65	17	1.6	1.3	275	5.4	2.2	0.0	1.0	229	232	7	405	7.8	4
Dec. 8	59.0	6.0	.09	49	25	1.5	1.0	263	5.2	2.5	.0	.7	226	225	10	404	7.8	4
Jan. 7, 1954	55.8	5.2	.01	49	25	1.6	.9	272	4.6	2.5	.0	.6	226	225	2	403	8.1	5
Feb. 17	325	4.5	.00	39	23	1.5	1.1	218	8.4	2.8	.0	4.0	203	192	13	353	7.8	8
Mar. 10	129	4.1	.06	43	25	1.6	1.0	246	7.6	4.0	.2	3.0	218	210	8	402	7.8	6
Apr. 29	128	6.5	.04	44	25	1.6	1.2	252	11	2.5	.3	2.2	218	213	6	400	7.9	6
May 12	264	4.5	.00	41	22	1.6	.9	a230	2.8	2.0	.1	3.1	206	193	4	366	8.3	3
June 30	131	4.8	.00	35	19	1.5	1.4	200	2.6	1.5	.1	1.0	183	165	2	320	8.0	5
July 27	50.6	3.8	.00	37	23	1.3	.9	226	3.8	2.2	.1	.4	194	187	2	350	8.0	5
Aug. 18	37.8	4.8	.00	38	23	1.6	1.1	233	4.4	2.0	.1	.8	192	189	0	364	8.2	5
Sept. 9	43.1	3.4	.01	36	29	1.5	1.0	240	10	2.0	.0	.3	201	209	12	368	8.0	5

a Includes equivalent of 2 parts per million of carbonate (CO_3).

WHITE RIVER BASIN--Continued

WHITE RIVER AT NEWPORT, ARK.

LOCATION.--At gaging station at bridge on U. S. Highway 67 at Newport, Jackson County, 7.2 miles downstream from Black River, and at mile 257.6.
DRAINAGE AREA.--19,812 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1954.
Water temperatures: October 1945 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 388 ppm Jan. 20-21, 23, 30; minimum, 164 ppm Feb. 21-28.
Hardness: Maximum, 183 ppm Sept. 1-8; minimum, 140 ppm Mar. 21-31.
Specific conductance: Maximum daily, 695 micromhos Jan. 30; minimum daily, 217 micromhos Feb. 21.
Water temperatures: Maximum, 85°F on several days during July and August; minimum, 39°F Dec. 24-26.
EXTREMES, 1945-54.--Dissolved solids: Maximum, 388 ppm Jan. 20-21, 23, 30, 1954; minimum, 98 ppm Feb. 13, 1949.
Hardness: Maximum, 189 ppm Oct. 1-10, 1952; minimum, 51 ppm Jan. 25-31, 1949.
Specific conductance: Maximum daily, 695 micromhos Jan. 30, 1954; minimum daily, 103 micromhos Jan. 28, 1949.
Water temperatures: Maximum, 87°F Aug. 4, 9, 1947, Aug. 1, 1952; minimum, 34°F Feb. 2-4, 1951.
REMARKS.--Records of specific conductance of daily samples available in district office at Fayetteville, Ark. Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, magnesium	Noncarbonate			
Oct. 1-10, 1953	8,595	7.1	0.00	38	16	4.1	1.4	191	4.4	5.8	0.0	1.9	179	161	4	315	8.2	5
Oct. 11-20.....	8,311	--	--	37	16	2.7	--	a191	5.4	3.5	--	1.7	176	158	2	298	8.4	8
Oct. 21-30	8,765	--	--	37	16	2.7	--	a190	4.0	4.0	--	2.0	178	158	2	304	8.3	9
Nov. 1-10	8,828	--	--	37	17	5.5	--	b190	4.8	8.5	--	2.5	182	162	6	334	8.5	10
Nov. 11-20	8,857	--	--	37	18	6.6	--	196	2.4	12	--	.3	185	166	6	339	7.7	10
Nov. 21-30	8,329	--	--	37	18	4.1	--	200	3.8	6.2	--	.3	175	166	2	323	8.1	8
Dec. 1-10	7,016	--	--	37	19	2.7	--	203	4.0	3.5	--	.5	228	170	4	324	6.8	23
Dec. 11-20	7,192	--	--	38	17	3.2	--	200	6.6	4.8	--	.6	182	165	1	326	8.0	15
Dec. 21-31	6,289	--	--	37	19	3.2	--	198	8.4	5.2	--	1.4	176	170	8	326	7.9	12
Jan. 1-10, 1954	7,304	5.4	.09	39	16	3.1	1.2	197	3.6	3.5	.0	.7	202	163	2	315	8.2	8
Jan. 11-19.....	9,214	--	--	35	18	2.7	--	190	6.6	2.5	--	1.7	168	161	6	311	7.9	10
Jan. 20-21, 23, 30...	14,460	--	--	38	17	77	--	194	7.4	123	--	3.6	388	165	6	669	7.7	12
Jan. 22, 24-29, 31...	14,090	--	--	34	17	3.0	1.4	c187	8.4	3.5	--	2.4	182	155	1	310	8.3	8
Feb. 1-5, 19	10,840	--	--	34	19	39	--	192	13	60	--	2.0	286	163	6	508	7.7	10
Feb. 6-15	8,752	--	--	38	14	2.6	1.2	179	11	3.5	--	2.0	174	152	6	298	8.2	10
Feb. 16-18, 20	11,860	--	--	34	17	2.7	--	180	3.6	3.5	--	2.6	180	155	7	304	7.7	6
Feb. 21-28.....	15,500	--	--	33	16	2.1	--	172	8.8	3.0	--	2.2	164	148	7	282	8.2	12
Mar. 1-10	10,800	--	--	34	16	3.6	--	c180	5.6	5.5	--	2.8	176	151	3	307	8.3	10
Mar. 11-20	8,873	--	--	32	15	2.8	--	168	4.4	4.2	--	2.6	169	142	4	286	8.1	8
Mar. 21-31	14,600	--	--	33	14	2.2	--	167	5.2	3.2	--	3.7	170	140	3	281	8.0	10

a Includes equivalent of 4 parts per million of carbonate (CO_3).
b Includes equivalent of 5 parts per million of carbonate (CO_3).
c Includes equivalent of 2 parts per million of carbonate (CO_3).

Apr. 1-10, 1954.....	13,370	6.8	11	35	15	4.0	1.3	171	11	6.0	.2	3.8	178	149	9	303	8.1	5
Apr. 11-20	13,670	--	--	34	16	3.7	--	c178	4.8	6.0	--	3.9	182	151	5	303	8.3	12
Apr. 21-30	14,730	--	--	34	15	3.0	--	173	4.8	5.0	--	3.5	171	147	5	294	7.9	8
May 1-10	30,690	--	--	34	14	2.4	--	170	4.4	3.5	--	4.3	168	142	3	290	7.9	15
May 11-20	13,840	--	--	34	15	5.4	--	d172	4.8	7.8	--	1.6	170	147	5	299	8.5	5
May 21-31	10,870	--	--	34	18	4.6	--	e185	6.0	5.5	--	1.9	175	159	7	318	8.4	5
June 1-10.....	10,900	--	--	36	16	4.2	--	191	4.8	4.5	--	1.2	174	156	0	319	7.8	5
June 11-20	9,314	--	--	35	16	4.6	--	d184	4.4	3.5	--	1.8	170	153	2	299	8.6	5
June 21-30.....	9,646	--	--	35	17	3.4	--	d176	9.2	4.0	--	.9	171	157	13	310	8.6	5
July 1-10	7,816	5.9	.04	38	21	3.8	1.2	215	2.4	4.5	.3	1.0	196	181	5	343	7.9	7
July 11-20	6,888	--	--	38	20	4.9	--	214	4.8	6.0	--	.7	194	177	2	354	8.1	5
July 21-31	6,567	--	--	38	18	4.6	--	a207	4.6	6.0	--	.7	185	169	0	337	8.4	5
Aug. 1-10	6,953	--	--	37	19	4.2	--	204	4.8	5.0	--	1.5	184	170	3	334	8.2	5
Aug. 11-20	6,856	--	--	37	18	6.0	--	f198	8.6	7.2	--	1.7	196	166	4	333	8.4	7
Aug. 21-31.....	6,921	--	--	38	21	6.2	--	213	4.4	8.5	--	.6	200	181	7	361	8.2	5
Sept. 1-8	4,424	--	--	42	19	4.8	--	211	7.2	5.8	--	1.2	199	183	10	355	8.2	5
Sept. 9-20	3,787	--	--	39	14	4.9	--	a169	14	6.2	--	2.1	184	155	16	307	8.3	10
Sept. 21-30	3,048	--	--	38	20	4.1	--	b204	8.2	4.5	--	1.0	183	177	10	334	8.4	7
Average	9,782	--	--	36	17	6.7	--	189	6.2	9.7	--	1.9	189	160	5	330	--	9

a Includes equivalent of 4 parts per million of carbonate (CO_3).
b Includes equivalent of 5 parts per million of carbonate (CO_3).
c Includes equivalent of 2 parts per million of carbonate (CO_3).
d Includes equivalent of 8 parts per million of carbonate (CO_3).
e Includes equivalent of 3 parts per million of carbonate (CO_3).
f Includes equivalent of 6 parts per million of carbonate (CO_3).

WHITE RIVER BASIN--Continued

WHITE RIVER AT NEWPORT, ARK.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

CACHE RIVER AT PATTERSON, ARK.

LOCATION.--250 feet north of bridge on U. S. Highway 64, just west of Patterson, Woodruff County.
DRAINAGE AREA.--1,041 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1952 to September 1954.
Water temperatures: October 1952 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 224 ppm Nov. 1-30; minimum, 99 ppm Apr. 1-13.
Hardness: Maximum, 155 ppm Nov. 1-30; minimum, 18 ppm Feb. 21-25, 27-28.
Specific conductance: Maximum daily, 516 micromhos Dec. 7; minimum daily, 43.9 micromhos May 5.
Water temperatures: Maximum, 86 °F July 7; minimum, 36 °F Jan. 23.
EXTREMES, 1952-54.--Dissolved solids: Maximum, 224 ppm Nov. 21-24, 1952, Nov. 1-30, 1953; minimum, 71 ppm Dec. 9-11, 14, 16-20, 1952.
Hardness: Maximum, 155 ppm Nov. 1-30, 1953; minimum, 15 ppm Jan. 24-31, Feb. 1-9, 21-28, Mar. 21-31, 1953.
Specific conductance: Maximum daily, 516 micromhos Dec. 7, 1953; minimum daily, 36.5 micromhos Mar. 24, 1953.
Water temperatures: Maximum, 86 °F July 7, 1954; minimum, 36 °F Jan. 23, 1954.
REMARKS.--Records of specific conductance of daily samples available in district office at Fayetteville, Ark. Records of discharge for water year October 1953 to September 1954 furnished by the District Office, Corps of Engineers, Memphis, Tenn.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Specific conductance (micromhos at 25°C)	pH	Color
Oct. 1-31, 1953	59.0	18	0.01	41	10	18	3.0	a205	4.8	9.0	0.0	1.1	221	143	0	346	8.4	14
Nov. 1-30	39.9	25	.00	39	14	18	2.9	b222	2.0	8.2	.0	1.7	224	155	0	337	8.6	15
Dec. 1-31	67.3	19	.00	38	10	16	2.9	c190	5.2	8.4	.0	1.2	207	136	0	323	8.5	15
Jan. 1-10, 1954	67.1	22	.04	48	3.0	16	2.6	d191	5.0	8.2	.1	.3	215	132	0	324	8.4	12
Jan. 11-15	309	16	.12	20	4.8	11	3.2	93	7.8	7.0	.2	2.2	162	70	0	196	7.9	17
Jan. 16-31	2,735	7.3	.08	4.4	2.1	4.6	3.0	19	9.0	3.2	.5	2.1	130	20	4	70.1	7.1	28
Feb. 1-11	1,071	9.7	.25	4.2	2.5	5.0	3.6	21	9.2	3.8	.4	2.1	139	21	4	75.4	7.3	30
Feb. 12-20, 26	638	9.7	.26	6.7	2.8	5.7	3.5	30	9.6	4.5	.3	2.0	137	28	4	93.4	7.3	27
Feb. 21-25, 27-28	2,311	7.3	.17	4.5	1.6	3.9	3.0	20	7.0	2.5	.0	1.6	121	18	1	65.9	7.0	35
Mar. 1-16	896	1.8	.19	4.1	3.1	3.8	2.9	24	9.6	2.2	.4	1.7	131	23	3	65.0	7.0	45
Mar. 17-31	368	10	.39	12	4.0	5.7	2.8	61	4.6	3.0	.4	2.0	144	46	0	120	7.4	40
Apr. 1-13	925	9.7	.68	6.0	2.6	4.9	3.0	27	7.2	3.2	.6	7.4	99	26	4	80.0	7.4	28
Apr. 14-30	453	7.7	.65	8.6	3.8	5.8	3.1	45	6.8	4.2	.5	2.4	130	37	0	105	7.2	28
May 1-2, 8	1,011	--	--	10	4.0	8.2	--	52	4.8	7.0	--	2.2	123	41	0	124	7.0	25
May 3-7, 9-17	1,891	5.3	.44	4.8	2.0	4.2	2.7	25	4.6	2.0	.7	2.8	122	20	0	65.9	6.7	20
May 18-23	298	--	--	9.4	2.6	5.0	--	43	3.0	2.0	--	3.8	124	34	0	98.4	6.8	25
May 24-31	139	12	.59	17	4.8	8.4	2.9	85	2.6	4.0	.9	2.0	142	62	0	160	7.8	25

a Includes equivalent of 3 parts per million of carbonate (CO_3).
b Includes equivalent of 12 parts per million of carbonate (CO_3).
c Includes equivalent of 6 parts per million of carbonate (CO_3).
d Includes equivalent of 4 parts per million of carbonate (CO_3).

WHITE RIVER BASIN--Continued

CACHE RIVER AT PATTERSON, ARK.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, magnesium	Noncarbonate			
June 1-7, 1954	271	15	0.36	19	5.6	11	3.0	e101	5.6	5.0	0.7	1.6	145	70	0	191	8.3	20
June 8-17	165	10	.51	15	4.9	9.7	3.1	81	3.2	5.0	.6	2.0	151	58	0	162	7.7	20
June 18-30	133	14	.10	22	6.9	12	3.0	118	5.0	6.0	.5	2.3	156	83	0	220	8.1	20
July 1-31	57.6	17	.12	26	8.2	13	2.9	137	5.6	6.0	.2	.9	180	99	0	249	7.7	22
Aug. 1-31	74.7	16	.05	34	9.9	19	4.0	178	7.2	8.0	.5	1.0	210	126	0	311	8.0	10
Sept. 1-30	68.2	14	.04	35	11	20	4.3	d193	5.2	9.8	.7	1.7	222	133	0	333	8.4	10
Average	463	13	0.24	19	5.4	10	3.1	94	5.9	5.3	0.4	2.1	158	70	0	179	--	23

d Includes equivalent of 4 parts per million of carbonate (CO_3).
e Includes equivalent of 2 parts per million of carbonate (CO_3).

WHITE RIVER BASIN--Continued

CACHE RIVER AT PATTERSON, ARK.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

WHITE RIVER AT CLARENDON, ARK.

LOCATION.--At gaging station on Cottonbelt Railroad bridge at Clarendon, Monroe County.
DRAINAGE AREA.--25,497 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1954.
Water temperatures: October 1948 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 192 ppm Dec. 21-31, Sept. 21-30; minimum, 104 ppm May 4-12.
Hardness: Maximum, 173 ppm Sept. 21-30; minimum, 60 ppm Jan. 22-23, 26-30.
Specific conductance: Maximum daily, 484 micromhos Dec. 29; minimum daily, 114 micromhos Jan. 29.
Water temperatures: Maximum, 90°F on several days during June and July; minimum, 34°F Dec. 23.
EXTREMES, 1947-54.--Dissolved solids: Maximum, 225 ppm July 1-10, 1953; minimum, 38 ppm Feb. 1-9, 1950.
Hardness: Maximum, 186 ppm Oct. 11-20, 1952; minimum, 29 ppm Mar. 1-10, 1948.
Specific conductance: Maximum daily, 484 micromhos Dec. 29, 1953; minimum daily, 60.7 micromhos Feb. 3, 1950.
Water temperatures (1948-54): Maximum, 90°F on several days during June and July 1954; minimum, 34°F Dec. 23, 1953.
REMARKS.--Records of specific conductance of daily samples available in district office at Fayetteville, Ark. Records of discharge for water year October 1953 to September 1954 furnished by District Office, Corps of Engineers, Memphis, Tenn.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, magnesium	Noncarbonate			
Oct. 1-10, 1953	8,619	7.0	0.01	37	15	3.9	1.3	a 188	5.2	5.2	0.1	1.4	187	154	0	308	8.4	5
Oct. 11-20	8,705	--	--	37	17	3.4	--	b 189	4.2	4.8	--	1.1	172	162	7	297	8.6	10
Oct. 21-31	8,795	--	--	37	16	2.2	--	188	5.6	5.0	--	1.4	174	158	4	305	8.2	12
Nov. 1-10	9,001	7.3	.01	39	17	4.4	1.3	c 198	2.4	6.0	.0	2.3	180	167	5	353	8.4	8
Nov. 11-20	8,824	--	--	38	18	3.2	--	a 195	4.0	4.5	--	.9	174	169	9	310	8.4	8
Nov. 21-30	8,656	--	--	37	17	3.4	--	c 197	4.4	4.5	--	.7	174	162	0	310	8.5	7
Dec. 1-10	7,485	--	--	38	16	4.4	--	d 197	8.0	3.5	--	1.0	164	161	0	324	8.4	5
Dec. 11-20	7,277	--	--	38	17	3.9	--	199	6.8	5.2	--	1.5	188	165	2	332	7.1	6
Dec. 21-31	6,455	--	--	39	18	6.6	--	204	7.8	10	--	1.2	192	171	4	354	7.9	8
Jan. 1-10, 1954	6,562	4.5	.01	38	18	5.6	1.3	a 198	3.2	8.8	.0	1.0	184	169	6	333	8.3	6
Jan. 11-15, 31	11,280	--	--	32	16	4.1	--	174	6.4	5.8	--	1.2	168	146	3	293	8.2	10
Jan. 16-21, 24-25	19,000	--	--	20	9.2	5.3	2.0	d 101	10	7.0	--	1.6	150	88	5	198	8.3	22
Jan. 22-23, 26-30	26,740	--	--	13	6.7	3.6	2.1	66	11	3.8	--	2.2	115	60	6	137	7.4	25
Feb. 1-7	21,270	--	--	16	6.5	3.5	--	72	5.4	4.2	--	1.7	128	67	8	148	7.7	28
Feb. 8-20	15,020	--	--	19	11	3.2	--	107	4.8	2.8	--	2.0	139	93	5	199	7.8	25
Feb. 21-28	28,850	--	--	16	6.8	2.5	--	73	9.6	4.0	--	1.9	116	68	8	147	7.6	30
Mar. 1-8	20,720	--	--	19	9.3	3.1	--	100	3.6	3.2	--	1.2	131	86	4	181	7.9	45
Mar. 9-20	14,130	--	--	25	13	3.8	--	138	5.2	3.8	--	1.1	151	116	3	234	7.9	15
Mar. 21-31	14,190	--	--	30	14	3.5	--	158	3.0	4.5	--	1.2	151	132	3	267	7.9	5

a Includes equivalent of 4 parts per million of carbonate (CO_3).
b Includes equivalent of 8 parts per million of carbonate (CO_3).
c Includes equivalent of 6 parts per million of carbonate (CO_3).
d Includes equivalent of 2 parts per million of carbonate (CO_3).

Apr. 1-10, 1954	18,230	--	--	28	11	3.7	--	132	3.0	4.5	--	3.2	136	115	7	237	7.5	8
Apr. 11-20	15,730	--	--	30	12	3.6	--	148	5.2	4.5	--	2.4	145	124	3	254	7.7	8
Apr. 21-30	19,080	--	--	30	12	3.0	--	143	5.8	3.5	--	2.2	139	124	7	248	7.5	6
May 1-3	18,630	--	--	27	11	4.1	--	131	7.0	5.5	--	2.2	136	113	5	232	8.0	9
May 4-12	45,900	--	--	17	4.7	3.7	--	71	8.4	3.2	--	2.3	104	62	4	139	8.1	65
May 13-22	34,870	--	--	21	7.5	3.3	--	d94	3.0	5.2	--	2.0	117	83	6	169	8.4	45
May 23-31	15,330	9.3	0.02	31	12	4.9	1.4	152	4.6	5.5	0.3	1.4	157	127	2	269	8.2	9
June 1-10	13,720	--	--	34	14	4.4	--	171	3.8	4.5	--	2.4	166	142	2	279	8.1	5
June 11-20	10,790	--	--	35	15	4.4	--	175	4.6	4.5	--	1.4	168	149	6	287	8.0	5
June 21-30	10,340	--	--	33	15	4.3	--	175	5.8	5.0	--	2.7	167	144	1	291	7.9	5
July 1-10	9,774	--	--	34	15	5.6	--	172	5.4	7.0	--	2.7	172	147	6	302	7.7	5
July 11-20	7,406	8.3	.01	33	17	4.8	1.4	182	3.6	5.5	.2	1.7	176	152	3	303	8.0	6
July 21-31	7,432	--	--	32	18	5.1	--	c182	4.0	6.5	--	.7	170	154	5	306	8.5	5
Aug. 1-10	6,850	--	--	35	18	6.2	--	189	4.8	9.0	--	1.1	182	157	2	328	8.2	5
Aug. 11-20	7,264	--	--	32	17	4.6	--	e180	5.2	5.5	--	1.0	167	150	2	300	8.5	5
Aug. 21-31	7,650	--	--	35	17	5.3	--	b189	5.6	7.5	--	1.2	182	157	2	320	8.5	5
Sept. 1-10	5,814	--	--	36	19	6.4	--	c196	4.6	9.0	--	.8	181	168	7	334	8.5	5
Sept. 11-20	4,441	--	--	36	18	5.8	--	c199	4.6	7.2	--	.9	188	164	1	329	8.5	5
Sept. 21-30	3,762	--	--	38	19	5.7	--	f210	5.0	6.5	--	.1	192	173	1	341	8.6	5
Average	13,000	--	--	31	14	4.3	--	159	5.4	5.4	--	1.6	160	135	5	271	--	13

b Includes equivalent of 8 parts per million of carbonate (CO_3).
c Includes equivalent of 6 parts per million of carbonate (CO_3).
d Includes equivalent of 2 parts per million of carbonate (CO_3).
e Includes equivalent of 7 parts per million of carbonate (CO_3).
f Includes equivalent of 10 parts per million of carbonate (CO_3).

WHITE RIVER BASIN--Continued

WHITE RIVER AT CLARENDON, ARK.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

LAGRUE BAYOU NEAR STUTTGART, ARK.

LOCATION.--At gaging station at bridge on State Highway 146, 7½ miles downstream from small tributary, 11 miles east of Stuttgart, Arkansas County, and 24 miles upstream from Little Lagrue Bayou.
DRAINAGE AREA.--175 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1954.
REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, magnesium	Noncarbonate			
Oct. 13, 1953	6.46	15	0.06	33	11	36	3.3	208	5.6	24	0.4	1.2	250	128	0	420	7.6	20
Nov. 10	a.01	3.0	.10	29	12	37	3.4	189	6.6	28	.1	1.0	223	122	0	377	7.1	12
Dec. 8	55.4	6.7	.11	21	8.3	27	5.3	124	13	22	.0	2.1	194	87	0	288	6.8	35
Jan. 4, 1954	18.6	7.2	.36	11	3.9	15	4.8	62	8.2	13	.3	1.7	181	44	0	166	6.8	32
Feb. 2	b670	6.5	.44	5.6	2.0	6.4	2.8	32	3.8	4.5	.4	1.5	130	22	0	79.3	6.6	28
Mar. 2	89.3	5.3	.16	6.0	3.1	6.3	2.8	39	8.4	3.5	.3	1.9	158	28	0	88.0	6.5	25
Apr. 6	6.37	5.2	.20	8.9	3.5	8.3	3.2	52	6.8	6.0	.3	2.0	159	37	0	115	6.9	21
May 3	68.6	5.0	.49	11	3.8	11	3.1	62	2.4	8.5	.7	1.4	143	43	0	140	7.0	20
June 1	9.25	4.5	.54	12	5.8	14	3.2	80	5.8	8.5	--	1.8	135	54	0	173	7.0	30
June 29	0	11	.00	32	9.3	61	3.8	230	3.2	39	.4	2.0	306	118	0	502	7.3	30
Aug. 3	1.27	8.3	.00	33	14	39	3.8	c224	12	22	.4	1.2	268	140	0	438	8.3	15
Aug. 31	.06	13	.01	39	16	57	4.9	282	7.2	34	.4	.8	321	164	0	535	7.4	20
Sept. 28	0	6.7	.00	37	19	59	5.9	290	6.8	39	.4	.3	337	170	0	558	7.5	25

a Estimated.
b Mean daily discharge (cfs).
c Includes equivalent of 2 parts per million of carbonate (CO_3).

WHITE RIVER BASIN--Continued

LITTLE LAGRUE BAYOU NEAR STUTTGART, ARK.

LOCATION.--At bridge on county road, 8¾ miles east of Stuttgart, Arkansas County, three quarters of a mile due east of University of Arkansas Rice Branch Experiment Station.
RECORDS AVAILABLE.--Chemical analyses: February 1954 to September 1954.
Water temperatures: February 1954 to September 1954.
REMARKS.--Records of specific conductance of daily samples available in district office at Fayetteville, Ark. No discharge records available for this station.

Chemical analyses, in parts per million, February 1954 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Specific conductance (micromhos at 25°C)	pH	Color
Feb. 2-3, 1954		--	--	7.1	3.3	10		44	8.0	6.0	--	1.2	228	31	0	103	7.0	30
Feb. 4-14		7.7	0.43	14	5.0	13	3.4	85	1.8	9.0	0.3	1.8	179	56	0	175	7.4	24
Feb. 16-17, 21, 28		7.6	.67	8.2	1.7	12	4.5	37	4.4	12	--	2.6	233	27	0	115	7.5	40
Feb. 18-20, 22-27		7.0	.09	5.8	1.3	7.6	3.6	26	5.0	6.8	.3	2.0	75	20	0	77.9	7.0	22
Mar. 1-4, 7		4.9	.96	8.3	2.5	25	3.6	44	4.2	31	--	2.3	293	31	0	190	7.0	38
Mar. 11-13, 15-20		7.7	.23	7.5	3.5	19	3.6	50	3.2	21	.3	2.3	149	33	0	163	7.1	25
Mar. 22-28, 30-31		5.9	.24	8.5	3.6	22	3.5	52	4.4	24	.3	2.2	164	36	0	185	7.0	24
Apr. 1-7		4.0	.34	10	3.0	22	3.5	56	7.4	2.3	.4	3.2	190	37	0	186	7.5	20
Apr. 8-17		4.5	.23	8.5	3.3	19	3.8	46	8.8	20	.4	3.5	150	35	0	168	7.5	20
Apr. 18-23		4.2	.22	5.8	3.3	11	3.5	38	6.0	10	.4	3.0	138	28	0	123	7.2	20
Apr. 24-30		6.2	.13	7.5	3.0	15	4.2	38	7.6	19	.4	2.8	151	31	0	150	7.2	18
May 1, 3-8		5.0	.68	8.7	2.5	17	4.0	42	8.2	18	.9	2.2	214	32	0	163	7.4	10
May 11-15, 17		3.8	.70	10	1.9	16	3.6	48	7.2	14	.9	1.5	187	33	0	150	7.2	10
May 18-21, 24-25		5.0	.45	13	3.8	28	4.6	86	6.4	22	.9	1.4	173	48	0	227	7.8	10
May 26-29, 31		4.6	.97	17	5.2	39	3.6	112	11	32	.7	1.3	220	64	0	302	7.8	10
June 16-17		--	--	17	6.0	105	--	155	11	102	--	3.1	382	67	0	594	7.5	--
June 18-19, 22-26, 28-30		5.3	.96	12	3.9	31	6.3	80	8.8	30	.7	2.3	213	46	0	256	7.6	10
July 1-3, 8, 19		7.7	.17	13	4.6	35	5.6	82	9.6	36	--	4.2	226	51	0	277	7.6	25
Sept. 1-4, 7		12	.60	16	5.8	48	5.6	133	8.4	34	.7	2.5	238	64	0	341	8.2	10
Sept. 8-9, 29		--	--	48	24	82	--	a 348	33	61	--	.9	486	218	0	744	8.8	35
Sept. 11, 14, 16, 18, 20		14	.33	20	7.7	72	5.9	b 193	11	48	.8	1.9	306	82	0	472	8.4	10
Sept. 21-23, 28		--	--	21	6.8	65	--	c 182	10	41	--	7.0	291	80	0	451	8.3	45

a Includes equivalent of 22 parts per million of carbonate (CO_3).
b Includes equivalent of 6 parts per million of carbonate (CO_3).
c Includes equivalent of 2 parts per million of carbonate (CO_3).

WHITE RIVER BASIN--Continued

LITTLE LAGRUE BAYOU NEAR STUTTGART, ARK.--Continued

Temperature (°F) of water, February 1954 to September 1954

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

WHITE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN WHITE RIVER BASIN IN ARKANSAS

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH
														Calcium, magnesium	Noncarbonate		
WHITE RIVER AT BEAVER																	
Feb. 9, 1954	206							82	9.0	3.8		0.9		75	8	164	7.1
July 8	21.3							117	2.0	3.5		.1		95	0	205	7.8
BUFFALO RIVER NEAR RUSH																	
Jan. 25, 1954	807							88	4.0	2.5		2.6		73	1	167	8.2
Aug. 18	17.6							105	3.0	3.2		.7		88	2	178	8.2
WHITE RIVER AT CALICO ROCK																	
Jan. 26, 1954	a6,630							b160	8.0	5.0		3.4		142	11	275	8.4
Aug. 3	a5,020							c168	6.0	4.5		.2		141	3	285	8.5
WHITE RIVER AT BATESVILLE																	
Jan. 28, 1954	7,620							162	4.0	7.2		3.3		142	9	270	8.2
Sept. 1	1,680							d159	8.0	3.8		1.6		138	8	258	8.3
BLACK RIVER NEAR CORNING																	
Jan. 27, 1954	920							148	7.0	2.5		6.8		130	9	251	8.2
Aug. 5	297							e176	3.0	3.0		.8		134	0	279	8.6

a Mean daily discharge (cfs).
b Includes equivalent of 4 parts per million of carbonate (CO_3).
c Includes equivalent of 6 parts per million of carbonate (CO_3).
d Includes equivalent of 2 parts per million of carbonate (CO_3).
e Includes equivalent of 8 parts per million of carbonate (CO_3).

BLACK RIVER AT POCAHONTAS

Jan. 27, 1954	2,710							d168	3.0	3.8		2.6		147	9	280	8.4	
Aug. 4	1,390							e196	2.0	2.5		.1		162	1	311	8.6	

PINEY FORK STRAWBERRY RIVER AT EVENING SHADE

Jan. 26, 1954	46.7							182	7.0	3.0		2.2		160	11	300	7.2	
July 27	3.32							d170	3.0	2.5		.0		144	5	293	8.3	

WHITE RIVER AT DE VALLS BLUFF

Feb. 1, 1954	18,700							110	4.0	8.8		3.7		104	14	212	8.2	
Aug. 2	6,950							e188	4.0	6.0		2.2		170	16	315	8.5	

BAYOU DE VIEW NEAR BRINKLEY

Jan. 6, 1954		9.8	0.34	6.9	2.2	16	2.4	20	15	22	0.4	1.3	86	26	10	143	6 2	50
Feb. 2		5.4	.45	3.2	1.5	4.8	2.8	18	5.8	3.5	.3	1.2	38	14	0	55.2	7.0	50
Mar. 4		3.7	.19	2.6	2.2	4.0	3.1	20	6.4	3.5	.4	1.4	37	16	0	58.0	6.2	35
Apr. 8		4.6	.72	6.6	3.2	6.7	3.5	35	10	5.8	.7	1.3	60	30	1	86.5	6.6	35
May 4		4.8	.76	6.9	1.7	6.5	2.9	30	4.0	6.2	.8	1.2	51	24	0.	76.8	6.8	35

d Includes equivalent of 2 parts per million of carbonate (CO_3).
e Includes equivalent of 8 parts per million of carbonate (CO_3).

ARKANSAS RIVER BASIN

ARKANSAS RIVER BELOW JOHN MARTIN RESERVOIR, COLO.

LOCATION.--At gaging station 1 mile upstream from Caddoa Creek, 1¾ miles downstream from John Martin Dam, Bent County, and 3 miles southeast of Hasty.
DRAINAGE AREA.--18,917 square miles, (revised) of which 785 square miles is probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: August 1942 to August 1943, October 1945 to July 1949 (intermittent and weekly samples); January 1951 to September 1954 (daily samples).
Water temperatures: January 1951 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 3,560 ppm Dec. 21-31, Feb. 1-10; minimum, 824 ppm May 24, 25.
Hardness: Maximum, 1,650 ppm Mar. 11-20; minimum, 382 ppm May 24, 25.
Specific conductance: Maximum observed, 4,740 micromhos Dec. 23; minimum observed, 1,060 micromhos May 25.
Water temperatures: Maximum observed, 78°F Sept.5; minimum observed, freezing point on several days during November, December, January, and March.
EXTREMES. 1951-54.--Dissolved solids: Maximum, 3,640 ppm Feb. 1-10, 1953; minimum, 712 ppm June 21-30, 1953.
Hardness: Maximum, 1,710 ppm Feb. 1-10, 1952; minimum, 382 ppm May 24, 25, 1954.
Specific conductance: Maximum observed, 4,740 micromhos Dec. 23, 1953; minimum observed, 830 micromhos June 19, 1952.
Water temperatures: Maximum observed, 85°F Aug. 6, 1951; minimum observed, freezing point on several days during winter months.
REMARKS.--Values reported for dissolved solids are sums of determined constituents. Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-10, 1953....	23.4	22	--	369	148	440	--	302	2,030	106		4.6		3,270	4.45	207	1,530	1,280	38	4.9	3,820	7.6
Oct. 11-20.....	26.5	20	--	357	150	450	--	301	2,010	106		4.7		3,250	4.42	233	1,510	1,260	39	5.0	3,780	7.6
Oct. 21-31.....	34.4	17	--	361	148	431	--	307	1,990	106		5.6		3,210	4.37	298	1,510	1,260	38	4.8	3,780	7.7
Nov. 1-10.....	46.9	20	--	341	136	405	--	323	1,800	99		6.0		2,970	4.04	376	1,410	1,150	38	4.7	3,550	7.6
Nov. 11-20	48.2	18	--	349	148	409	--	325	1,910	101		6.2		3,100	4.22	403	1,480	1,210	38	4.6	3,680	7.6
Nov. 21-24	69.0	16	--	214	86	190	--	289	960	53		3.5		1,660	2.26	309	888	650	32	2.8	2,170	7.8
Nov. 25-30	1.83	20	--	337	162	484	--	329	2,010	121		5.4		3,300	4.49	16.3	1,510	1,240	41	5.4	3,880	7.7
Dec. 1-10	1.99	17	--	322	173	480	--	350	2,010	125		3.1		3,300	4.49	17.7	1,520	1,230	41	5.4	3,920	7.7
Dec. 11-20	1.90	17	--	330	166	484	--	377	2,010	124		3.1		3,320	4.52	17.0	1,510	1,200	41	5.4	3,930	7.7
Dec. 21-31.....	2.25	---	--	345	174	505	--	362	2,140	129		4.5		3,560	4.84	21.6	1,580	1,280	41	5.5	4,150	7.7
Jan. 1-10, 1954....	2.60	25	--	302	181	466	--	409	1,940	119		2.1		3,240	4.41	22.7	1,500	1,160	40	5.2	3,880	7.7
Jan. 11-20.....	1.95	21	--	337	188	500	--	410	2,150	128		4.2		3,530	4.80	18.6	1,610	1,280	40	5.4	4,170	7.6
Jan. 21-31.....	1.62	39	--	303	183	495	8.2	396	2,030	122		3.3		3,390	4.61	18.5	1,520	1,200	41	5.5	4,000	7.6
Feb. 1-10	1.62	57	--	312	191	520	8.5	398	2,140	130		4.0		3,560	4.84	15.6	1,560	1,240	42	5.7	4,140	7.7
Feb. 11-20	1.54	23	--	312	193	495	--	399	2,100	126		3.1		3,450	4.69	14.3	1,570	1,240	41	5.4	4,090	7.8
Feb. 21-28	1.76	58	--	276	205	495	--	376	2,050	124		1.9		3,390	4.61	16.1	1,530	1,220	41	5.5	4,020	7.8
Mar. 1-10.....	1.72	22	--	314	190	490	--	415	2,010	121		1.6		3,350	4.56	15.6	1,560	1,220	41	5.4	3,970	7.7
Mar. 11-20.....	1.55	22	--	349	190	510	--	410	2,140	130		3.0		3,550	4.83	14.9	1,650	1,320	40	5.5	4,160	7.8
Mar. 21-31.....	2.26	25	--	337	183	492	--	405	2,050	123		2.3		3,410	4.64	20.8	1,590	1,260	40	5.4	4,020	7.8

Apr. 1-10, 1954	271	21	--	345	176	480	--	349	2,060	118		2.7		3,370	4.58	2,470	1,580	1,300	40	5.2	3,940	7.8
Apr. 11-20	535	11	--	345	155	425	--	245	1,950	103		3.2		3,110	4.23	4,490	1,500	1,300	38	4.8	3,650	7.6
Apr. 21-30	34.0	12	--	385	143	437	--	287	2,030	107		4.4		3,260	4.43	299	1,550	1,310	38	4.8	3,830	7.1
May 1-10	36.7	13	--	389	135	437	--	304	2,030	106		4.0		3,260	4.43	323	1,530	1,280	38	4.9	3,820	7.6
May 11-16	60.7	14	--	349	140	398	--	270	1,920	95		3.9		3,050	4.15	500	1,450	1,230	37	4.6	3,620	7.6
May 17-20	201	20	--	208	72	220	--	236	1,010	52		2.1		1,700	2.31	923	815	622	37	3.4	2,200	7.5
May 21-23,26-31, June 1-2	326	16	--	163	51	154	--	205	715	37		3.3		1,240	1.69	1,090	616	448	35	2.7	1,680	7.5
May 24-25	712	19	--	107	28	116	--	201	430	24		.9		824	1.12	1,580	382	218	40	2.6	1,190	7.3
June 3-5	79.3	17	--	240	77	244	--	261	1,080	64		7.4		1,860	2.53	398	916	702	37	3.5	2,470	7.6
June 6-10	27.6	17	--	349	140	415	--	275	1,910	103		5.3		3,070	4.18	229	1,450	1,220	38	4.7	3,640	7.7
June 11-15	33.2	13	--	341	138	405	--	235	1,890	104		3.6		3,010	4.09	270	1,420	1,230	38	4.7	3,560	7.6
June 16-19	63.8	18	--	234	84	236	--	226	1,130	62		3.6		1,880	2.56	324	930	744	36	3.4	2,380	7.7
June 20-28	20.9	18	--	365	159	458	--	256	2,100	111		3.3		3,340	4.54	188	1,560	1,350	39	5.0	3,870	7.7
June 29-30, July 1-7	201	24	--	202	62	157	--	227	832	40		3.1		1,430	1.94	776	759	573	31	2.5	1,860	7.6
July 8-20	26.6	19	--	282	105	310	--	226	1,460	81		5.1		2,370	3.22	170	1,140	950	37	4.0	2,900	7.8
July 21-22, 27	85.0	28	--	244	94	250	--	296	1,150	63		2.2		1,980	2.69	454	996	753	35	3.4	2,470	7.7
July 23-26, 28-31	703	19	--	154	47	97	--	230	565	17		4.5		1,020	1.39	1,940	578	389	27	1.8	1,380	7.5
Aug. 1-10	833	15	--	148	45	95	--	168	580	17		3.4		986	1.34	2,220	554	417	27	1.8	1,330	7.6
Aug. 11-20	922	15	--	152	44	95	--	138	599	17		4.5		994	1.35	2,470	560	447	27	1.7	1,340	7.6
Aug. 21-31	776	13	--	173	42	104	--	146	653	20		3.8		1,080	1.47	2,260	604	484	27	1.8	1,450	7.8
Sept. 1-8	716	15	--	189	55	136	--	162	791	27		2.9		1,300	1.77	2,510	698	565	30	2.2	1,680	7.9
Sept. 9-10	41.0	16	--	318	128	352	--	250	1,680	86		3.8		2,710	3.69	300	1,320	1,120	37	4.2	3,200	7.5
Sept. 11-20	27.9	16	0.20	357	147	425	8.4	277	1,950	108		3.7		3,150	4.28	237	1,500	1,270	38	4.8	3,670	7.5
Sept. 21-30	18.9	14	.01	373	150	440	7.8	297	2,020	113		2.7		3,270	4.45	167	1,550	1,300	38	4.9	3,780	7.7
Weighted average	161	16	--	203	71	183	--	198	937	41		3.7		1,550	2.11	674	798	636	33	2.8	1,960	--

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ARKANSAS RIVER BASIN--Continued

ARKANSAS RIVER BELOW JOHN MARTIN RESERVOIR, COLO.--Continued

Temperature (°F) of water, water year October 1953 to September 1954
(Once-daily measurement, generally about 8 a. m.)

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

ARKANSAS RIVER AT ARKANSAS CITY, KANS.

LOCATION.--At gaging station at Chestnut Avenue highway bridge, half a mile west of Arkansas City, Cowley County, and 5.9 miles (revised) upstream from Walnut River, and at mile 701.9.
DRAINAGE AREA.--43,713 square miles (revised), of which about 7,607 square miles does not contribute directly to surface runoff.
RECORDS AVAILABLE.--Chemical analyses: October 1951 to September 1954.
Water temperatures: October 1951 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 2,770 ppm Oct. 5; minimum, 285 ppm May 29.
Hardness: Maximum, 545 ppm Aug. 11-20; minimum, 117 ppm May 29.
Specific conductance: Maximum daily, 4,720 micromhos Oct. 5; minimum daily, 470 micromhos May 29.
Water temperatures: Maximum observed daily, 82°F July 16; minimum observed daily, freezing point on several days during December and January.
EXTREMES, 1951-54.--Dissolved solids: Maximum, 2,770 ppm Oct. 5, 1953; minimum, 285 ppm May 29, 1954.
Hardness: Maximum, 561 ppm Dec. 22-23, 1951; minimum, 117 ppm May 29, 1954.
Specific conductance: Maximum daily, 4,720 micromhos Oct. 5, 1953; minimum daily, 438 micromhos Aug. 9, 1953.
Water temperatures: Maximum observed daily, 82°F July 16, 1954; minimum observed daily, freezing point on many days during winter months.
REMARKS.--Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-4, 1953	154	--	--	118	30	449	--	244	5	181	720	--	12	--	1,690	2.30	703	418	210	70	9.5	2,930	8.4
Oct. 5	264	--	--	137	40	810	--	235	5	280	1,280	--	11	--	2,770	3.77	1,970	505	304	78	16	4,720	8.3
Oct. 6	190	--	--	86	22	299	--	186	2	138	462	--	11	--	1,160	1.58	595	306	150	68	7.4	2,100	8.3
Oct. 7-10	166	--	--	114	30	434	--	245	0	173	690	--	13	--	1,610	2.19	722	408	207	70	9.3	2,820	8.1
Oct. 11-20	165	10	0.00	110	31	431	8.9	245	0	168	655	0.5	9.8	0.26	1,580	2.15	704	402	201	69	9.4	2,760	7.9
Oct. 21-25	198	--	--	98	25	384	--	234	0	153	585	--	13	--	1,400	1.90	748	348	156	71	8.9	2,520	7.7
Oct. 26	513	--	--	76	18	297	--	173	0	116	452	--	13	--	1,100	1.50	1,520	264	122	71	7.9	1,950	7.8
Oct. 27	681	--	--	66	16	234	--	164	0	102	348	--	12	--	886	1.20	1,630	232	98	69	6.7	1,600	8.0
Oct. 28	513	--	--	60	14	178	--	152	0	96	258	--	9.7	--	711	.97	985	206	82	65	5.4	1,290	8.0
Oct. 29-31	383	--	--	80	20	297	--	200	0	121	448	--	10	--	1,110	1.51	1,150	280	116	70	7.7	2,000	7.6
Nov. 1-10	327	11	.00	95	24	348	7.5	219	0	146	515	.5	11	.18	1,290	1.75	1,140	336	156	69	8.3	2,260	7.3
Nov. 11-20	453	--	--	94	23	365	--	218	0	152	545	--	11	--	1,370	1.86	1,680	329	150	71	8.7	2,360	7.9
Nov. 21-22	634	--	--	72	17	229	--	182	0	119	330	--	6.3	--	910	1.24	1,560	250	100	67	6.3	1,580	7.4
Nov. 23-30	428	--	--	94	22	345	--	225	0	154	495	--	9.2	--	1,290	1.75	1,490	325	140	70	8.3	2,230	7.7
Dec. 1-4	591	--	--	96	23	362	--	213	0	168	535	--	8.5	--	1,380	1.88	2,200	334	160	70	8.6	2,360	8.1
Dec. 5	694	--	--	74	16	231	--	191	0	117	330	--	4.0	--	923	1.26	1,730	250	94	67	6.4	1,570	8.0
Dec. 6-10	665	--	--	89	21	316	--	214	0	153	445	--	7.7	--	1,200	1.63	2,150	308	133	69	7.8	2,050	7.9
Dec. 11-20	539	14	.00	102	24	370	7.5	229	0	175	535	.5	9.2	.17	1,380	1.88	2,010	353	166	69	8.5	2,370	8.0
Dec. 21-31	492	14	.00	110	28	384	7.2	239	0	193	565	.5	11	.17	1,460	1.99	1,940	390	194	68	8.5	2,510	8.0

ARKANSAS RIVER BASIN--Continued

ARKANSAS RIVER AT ARKANSAS CITY, KANS.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Jan. 1-10, 1954	478	--	--	106	26	362	--	241	0	206	510	--	10	--	1,420	1.93	1,830	372	174	68	8.2	2,380	7.7
Jan. 11-15, 17-19	370	--	--	134	34	481	--	270	0	249	710	--	14	--	1,830	2.49	1,830	474	254	69	9.6	3,120	7.5
Jan. 16, 20	335	--	--	110	28	363	--	246	0	202	510	--	17	--	1,400	1.90	1,270	390	188	67	8.0	2,390	8.1
Jan. 21-22, 25-31	379	--	--	116	29	391	--	262	0	206	565	--	15	--	1,500	2.04	1,530	408	194	68	8.4	2,580	7.5
Jan. 23-24	375	--	--	148	38	562	--	284	0	230	860	--	12	--	2,080	2.83	2,110	526	293	70	11	3,500	8.2
Feb. 1-10	647	--	--	106	26	321	--	218	0	218	445	--	9.1	--	1,290	1.75	2,250	372	193	65	7.3	2,200	7.9
Feb. 11-20	548	--	--	117	32	388	--	236	0	282	520	--	8.6	--	1,520	2.07	2,250	424	230	67	8.2	2,540	7.8
Feb. 21-28	666	--	--	102	25	339	--	221	0	232	480	--	6.4	--	1,340	1.82	2,410	358	176	67	7.8	2,300	8.0
Mar. 1-10	548	--	--	112	32	369	--	237	0	256	525	--	8.3	--	1,470	2.00	2,180	411	217	66	7.9	2,510	8.0
Mar. 11-20	522	--	--	113	32	385	--	232	0	267	545	--	8.0	--	1,520	2.07	2,140	414	224	67	8.2	2,580	7.8
Mar. 21-25	530	--	--	113	29	410	--	222	0	258	595	--	7.0	--	1,590	2.16	2,280	400	218	69	8.9	2,660	7.9
Mar. 26-27	1,040	--	--	75	18	187	--	175	0	142	265	--	5.8	--	884	1.20	2,480	261	118	61	5.0	1,430	8.0
Mar. 28-31	620	--	--	98	27	316	--	216	0	219	450	--	.2	--	1,320	1.80	2,210	354	177	66	7.3	2,180	8.1
Apr. 1-10,	462	6.4	0.00	102	29	393	6.2	226	0	247	552	0.4	2.4	0.30	1,450	1.97	1,810	372	187	69	8.9	2,490	8.0
Apr. 11-20	409	--	--	110	29	414	--	231	0	242	610	--	6.8	--	1,560	2.12	1,720	392	202	70	9.1	2,710	7.9
Apr. 21-22	472	--	--	112	32	489	--	214	0	230	750	--	.2	--	1,840	2.50	2,340	410	234	72	11	3,090	8.2
Apr. 23-29	420	--	--	98	34	391	--	217	0	212	575	--	.7	--	1,490	2.03	1,690	385	207	69	8.7	2,550	7.9
Apr. 30	579	--	--	112	31	664	--	181	3	272	960	--	6.4	--	2,190	2.98	3,420	405	252	78	14	3,700	8.3
May 1-3	798	--	--	87	21	341	--	198	0	185	460	--	4.2	--	1,240	1.69	2,670	302	141	71	8.6	2,160	8.1
May 4-7	1,472	--	--	62	12	168	--	168	0	97	230	--	3.0	--	693	.94	2,750	202	64	64	5.2	1,190	8.1
May 8-10	942	--	--	83	17	285	--	182	0	156	415	--	3.3	--	1,110	1.51	2,820	278	69	69	7.4	1,920	8.2
May 11-20	526	--	--	96	23	367	--	205	0	202	545	--	2.8	--	1,380	1.88	1,960	334	166	70	8.7	2,420	7.8
May 21-25	542	--	--	98	27	430	--	212	0	222	630	--	3.3	--	1,570	2.14	2,300	355	182	72	9.9	2,720	8.2
May 26-27	1,960	--	--	53	7.5	90	--	156	0	62	134	--	1.3	--	463	.63	2,450	163	35	55	3.1	802	7.6
May 28	3,850	--	--	56	16	122	--	147	4	88	180	--	5.5	--	602	.82	6,260	205	78	56	3.7	1,020	8.3
May 29	5,020	--	--	38	5.4	45	--	121	0	30	62	--	5.2	--	285	.39	3,860	117	18	46	1.8	470	8.2
May 30-31	2,250	--	--	53	8.8	105	--	144	4	68	149	--	2.9	--	499	.68	3,030	168	44	58	3.5	856	8.4
June 1	1,450	--	--	62	13	139	--	167	0	81	210	--	12	--	659	.90	2,580	207	70	59	4.2	1,100	7.9
June 2	1,150	--	--	75	16	202	--	188	0	108	300	--	5.2	--	855	1.16	2,650	252	98	64	5.6	1,420	8.1
June 3-10	795	--	--	99	29	501	--	189	0	211	770	--	6.5	--	1,750	2.38	3,760	366	211	75	11	3,030	8.1
June 11-20	714	18	.01	90	28	359	7.8	207	0	182	540	.5	2.2	.04	1,330	1.81	2,560	340	170	69	8.5	2,320	8.0
June 21-25	830	--	--	77	17	310	--	182	0	132	455	--	4.2	--	1,120	1.52	2,510	260	111	72	8.4	1,960	7.7
June 26-30	450	--	--	102	24	425	--	223	0	191	625	--	4.5	--	1,530	2.08	1,860	354	172	72	9.8	2,640	7.7

July 1-2, 1954	446	--	--	102	30	412	--	208	8	179	650	--	4.8	--	1,490	2.03	1,790	378	194	70	9.2	2,590	8.6
July 3-10	290	--	--	96	22	336	--	214	0	165	500	--	4.8	--	1,230	1.67	963	328	152	69	8.0	2,120	8.0
July 11-20	161	--	--	112	35	556	--	186	0	200	870	--	6.0	--	1,890	2.57	822	425	272	74	12	3,240	8.1
July 21-31	98.3	--	--	112	35	561	--	170	0	188	910	--	9.1	--	1,940	2.64	515	425	286	74	12	3,320	7.9
Aug. 1-10	99.2	--	--	116	34	589	--	216	0	181	902	--	7.0	--	1,980	2.69	530	430	253	75	12	3,550	8.0
Aug. 11-20.....	46.4	--	--	150	41	648	--	272	2	176	1,100	--	3.6	--	2,310	3.14	289	545	318	72	12	4,100	8.3
Aug. 21-31.....	71.5	--	--	120	39	586	--	256	0	183	900	--	7.7	--	2,020	2.75	390	460	250	73	12	3,550	7.9
Sept. 1-10	83.9	--	--	108	34	520	--	238	0	168	825	--	6.3	--	1,870	2.54	424	410	215	73	11	3,330	8.0
Sept. 11, 13-20	75.9	--	--	118	31	508	--	265	2	150	800	--	8.4	--	1,800	2.45	369	420	200	72	11	3,190	8.3
Sept. 12	139	--	--	92	23	307	--	199	8	121	492	--	10	--	1,190	1.62	447	325	148	67	7.4	2,100	8.5
Sept. 21-30	33.9	16	0.01	136	43	575	12	273	0	180	962	0.9	9.1	0.03	2,130	2.90	195	515	292	70	11	3,950	8.0
Weighted average..	457	--	--	94	24	340	--	a 209	--	180	497	--	6.8	--	1,300	1.77	1,600	333	162	69	8.1	2,230	--

a Includes equivalent of individual carbonate values shown above.

ARKANSAS RIVER BASIN--Continued

ARKANSAS RIVER AT ARKANSAS CITY, KANS.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

ARKANSAS RIVER AT RALSTON, OKLA.

LOCATION.--At gaging station at bridge on State Highway 18 at Ralston, Pawnee County, 2 miles downstream from Salt Creek, 2 miles upstream from Grayhorse Creek, and at mile 594.0.
DRAINAGE AREA.--54,465 square miles (revised), of which 7,615 square miles is probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: January 1950 to September 1954.
Water temperatures: January 1950 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 3,230 ppm May 30; minimum, 694 ppm Aug. 11.
Hardness: Maximum, 550 ppm Oct. 30; minimum, 180 ppm Nov. 19.
Specific conductance: Maximum daily, 5,800 micromhos May 30; minimum daily, 1,120 micromhos May 2.
Water temperatures: Maximum observed daily, 97°F July 14, 19; minimum observed daily, 33°F on several days during December and January.
EXTREMES, January 1950 to September 1954.--Dissolved solids: Maximum, 3,230 ppm May 30, 1954; minimum, 208 ppm July 15-17, 1951.
Hardness: Maximum, 582 ppm Jan. 5, 1951; minimum, 90 ppm July 15-17, 1951.
Specific conductance: Maximum daily, 5,800 micromhos May 30, 1954; minimum daily, 319 micromhos July 16, 1951.
Water temperatures: Maximum observed daily, 97°F June 13-14, 1953, July 14, 19, 1954; minimum observed daily, freezing point on many days during winter months.
REMARKS.--Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-9, 1953	195	--	--	99	30	428	--	199	0	173	700	--	1.2	--	1,530	2.08	806	372	209	71	9.7	2,740	7.8
Oct. 10	262	--	--	114	37	579	--	175	0	213	960	--	3.3	--	2,020	2.75	1,430	435	292	74	12	3,580	8.2
Oct. 11-14	204	--	--	107	36	523	--	206	0	195	860	--	1.7	--	1,840	2.50	1,010	414	245	73	11	3,310	8.0
Oct. 15-20	185	--	--	106	31	440	--	218	0	169	730	--	.8	--	1,580	2.15	789	392	214	71	9.7	2,830	8.1
Oct. 21-29	304	--	--	104	29	407	--	212	0	157	680	--	.5	--	1,490	2.03	1,220	380	206	70	9.1	2,680	8.0
Oct. 30	990	--	--	152	42	532	--	191	0	166	990	--	6.8	--	2,160	2.94	5,770	550	394	68	9.9	3,590	8.0
Oct. 31	1,030	--	--	65	18	272	--	161	0	105	412	--	6.9	--	987	1.34	2,740	236	104	71	7.7	1,770	8.1
Nov. 1-10	468	--	--	88	24	319	--	202	0	133	495	--	3.6	--	1,240	1.69	1,570	318	152	69	7.8	2,120	8.0
Nov. 11-18	331	--	--	94	28	400	--	205	0	159	610	--	2.5	--	1,460	1.99	1,300	350	182	71	9.3	2,530	8.2
Nov. 19	1,740	--	--	54	11	168	--	87	0	34	310	--	7.5	--	750	1.02	3,520	180	108	67	5.4	1,230	7.4
Nov. 20	1,240	--	--	63	16	246	--	146	0	92	370	--	4.5	--	947	1.29	3,170	223	104	71	7.1	1,620	7.9
Nov. 21-30	1,259	--	--	84	22	294	--	177	0	118	460	--	6.0	--	1,150	1.56	3,910	300	155	68	7.4	1,990	7.8
Dec. 1-5	1,039	--	--	90	24	328	--	193	0	127	515	--	5.8	--	1,270	1.73	3,560	323	165	69	7.9	2,190	8.1
Dec. 6-10	1,548	--	--	62	16	194	--	148	0	84	308	--	6.3	--	789	1.07	3,300	220	99	66	5.7	1,370	7.8
Dec. 11-20	789	--	--	100	24	359	--	219	0	154	540	--	8.2	--	1,360	1.85	2,900	348	168	69	8.3	2,340	7.9
Dec. 21-31	651	--	--	112	28	382	--	233	0	167	600	--	8.5	--	1,500	2.04	2,640	394	204	68	8.4	2,570	8.2
Jan. 1-10, 1954	768	--	--	113	29	382	--	236	0	184	580	--	8.7	--	1,480	2.01	3,070	401	208	67	8.3	2,570	8.0
Jan. 11-20	559	--	--	121	32	394	--	250	0	202	595	--	8.4	--	1,550	2.11	2,340	434	228	66	8.2	2,640	8.2
Jan. 21-31	518	--	--	124	33	398	--	250	0	194	635	--	9.8	--	1,600	2.18	2,240	445	240	66	8.2	2,750	7.7
Feb. 1-10	680	--	--	107	28	358	--	227	0	187	550	--	9.1	--	1,400	1.90	2,570	382	196	67	8.0	2,430	7.7
Feb. 11-20	634	--	--	111	31	375	--	223	0	235	545	--	5.2	--	1,460	1.99	2,500	404	222	67	8.1	2,480	7.7

ARKANSAS RIVER BASIN--Continued

ARKANSAS RIVER AT RALSTON, OKLA.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Feb. 21-28, 1954	690	--	--	106	31	373	--	208	0	221	570	--	4.3	--	1,460	1.99	2,720	392	222	67	8.2	2,540	7.9
Mar. 1-10	640	--	--	112	32	394	--	221	0	220	600	--	5.0	--	1,530	2.08	2,640	411	230	68	8.5	2,650	7.9
Mar. 11-20	619	--	--	114	35	439	--	224	0	253	655	--	3.1	--	1,630	2.22	2,720	428	245	69	9.2	2,860	7.8
Mar. 21-27	684	--	--	104	34	480	--	193	0	243	730	--	3.2	--	1,770	2.41	3,270	400	250	72	10	3,290	7.3
Mar. 28-31	1,388	--	--	87	25	298	--	178	0	163	440	--	5.0	--	1,160	1.58	4,350	320	174	67	7.2	2,000	7.7
Apr. 1-10	788	--	--	98	32	417	--	168	0	216	640	--	1.9	--	1,550	2.11	3,300	376	238	71	9.4	2,690	7.4
Apr. 11-14	574	--	--	100	31	422	--	172	0	214	665	--	.5	--	1,630	2.22	2,530	375	234	71	9.5	2,740	7.9
Apr. 15-20	551	--	--	108	34	473	--	175	0	219	770	--	.1	--	1,810	2.46	2,690	410	266	71	10	3,080	7.5
Apr. 21-29	638	--	--	92	31	465	--	164	0	199	740	--	2.9	--	1,670	2.27	2,880	355	220	74	11	2,940	7.6
Apr. 30	1,120	--	--	77	22	283	--	159	3	122	455	--	.2	--	1,220	1.66	3,690	282	147	69	7.4	1,950	8.3
May 1-3	6,530	--	--	58	13	175	--	144	0	69	275	--	.2	--	716	.97	12,620	196	78	66	5.4	1,260	7.9
May 4, 8	2,500	--	--	70	15	281	--	146	0	104	440	--	.8	--	1,080	1.47	7,290	238	118	72	7.9	1,860	8.1
May 5, 9	2,100	--	--	88	21	406	--	155	0	142	640	--	.5	--	1,470	2.00	8,330	304	177	74	10	2,530	8.0
May 6-7, 10	1,890	--	--	102	23	547	--	171	0	182	860	--	.2	--	1,920	2.61	9,800	350	210	77	13	3,280	8.0
May 11-20	1,078	12	0.02	110	38	784	5.7	172	0	249	1,230	0.5	1.7	0.01	2,520	3.43	7,330	430	289	80	16	4,380	7.5
May 21-25	769	--	--	102	30	728	--	163	0	252	1,110	--	2.5	--	2,350	3.20	4,880	378	244	81	16	4,120	8.2
May 26-27	3,200	--	--	74	16	363	--	159	0	132	555	--	2.0	--	1,290	1.75	11,150	252	122	76	10	2,290	8.2
May 28	6,340	--	--	76	16	430	--	143	0	132	655	--	3.0	--	1,560	2.12	26,700	254	137	79	12	2,580	8.2
May 29	5,500	--	--	89	13	706	--	130	2	177	1,070	--	6.5	--	2,170	2.95	32,220	302	192	82	18	3,940	8.3
May 30	5,160	--	--	114	28	1,090	--	157	4	259	1,650	--	5.1	--	3,230	4.39	45,000	400	265	86	24	5,800	8.3
May 31	7,620	--	--	90	20	715	--	152	0	177	1,100	--	5.1	--	2,260	3.07	46,500	306	182	84	18	4,020	8.1
June 1-10	2,801	14	.02	110	37	806	7.6	167	0	242	1,300	.5	1.6	.09	2,630	3.58	19,890	425	288	80	17	4,580	7.7
June 11-20	934	14	.01	120	24	621	7.2	185	0	225	1,020	.5	1.0	.09	2,130	2.90	5,370	400	248	77	14	3,700	7.8
June 21-30	863	22	.01	78	43	534	8.2	185	2	199	830	.7	1.8	.13	1,810	2.46	4,220	370	215	75	12	3,190	8.3
July 1-10	477	14	.00	108	32	572	11	172	0	203	950	.5	2.8	.23	1,980	2.69	2,550	400	259	75	12	3,580	8.2
July 11-20	240	--	--	90	32	526	--	151	0	198	830	--	1.0	--	1,870	2.54	1,210	355	232	76	12	3,230	7.6
July 21-31	140	--	--	94	33	513	--	152	0	178	900	--	1.9	--	1,810	2.46	684	370	246	75	12	3,320	8.1
Aug. 1-10	135	--	--	92	32	496	--	148	0	164	780	--	2.2	--	1,700	2.31	620	360	238	75	11	3,140	8.1
Aug. 11	260	--	--	58	13	188	--	140	4	72	282	--	6.0	--	694	.94	487	200	79	67	5.8	1,260	8.5
Aug. 12-20	153	--	--	83	30	434	--	150	0	156	700	--	2.0	--	1,520	2.07	628	330	207	74	10	2,860	8.0
Aug. 21-31	126	--	--	80	32	416	--	137	0	136	710	--	1.6	--	1,520	2.07	517	330	218	73	10	2,820	7.8
Sept. 1-10	90.7	10	.01	90	32	466	12	156	0	147	745	.5	1.7	.00	1,600	2.18	392	355	227	73	11	2,990	7.9
Sept. 11-20	72.0	--	--	100	17	465	--	169	0	157	775	--	2.4	--	1,710	2.33	332	320	182	76	11	3,100	7.4
Sept. 21-30	61.9	--	--	108	29	466	--	190	0	156	800	--	1.7	--	1,680	2.28	281	390	234	72	10	3,030	7.4
Weighted average	772	--	--	96	27	473	--	a181	--	179	741	--	3.7	--	1,670	2.27	3,480	350	202	75	11	2,920	--

a Includes equivalent of individual carbonate values shown above.

ARKANSAS RIVER BASIN--Continued

ARKANSAS RIVER AT RALSTON, OKLA.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	80	64	52	43	50	52	56	64	79	90	89	90
2	80	64	56	45	52	42	65	58	77	89	95	90
3	75	65	50	43	51	42	68	58	71	89	90	85
4	63	57	48	45	54	45	--	63	75	92	88	88
5	68	54	50	43	53	43	--	71	75	93	88	89
6	66	43	55	45	48	50	80	73	76	90	88	86
7	66	44	48	49	46	57	70	70	80	89	89	84
8	70	43	45	53	50	55	65	65	85	93	81	87
9	72	51	--	41	50	61	68	62	85	95	87	83
10	71	54	--	33	57	67	75	60	85	93	88	80
11	75	57	--	35	47	65	60	61	86	92	88	80
12	74	58	--	33	45	55	60	70	77	95	88	87
13	74	58	--	33	59	43	66	75	82	96	87	78
14	73	60	--	37	62	42	68	77	80	97	89	76
15	68	62	40	43	64	52	69	79	83	96	88	83
16	80	60	43	39	58	52	66	74	88	95	88	86
17	70	62	38	33	55	55	72	70	90	94	89	84
18	71	61	40	35	53	57	76	77	85	96	86	87
19	72	59	41	48	55	56	75	75	91	97	85	87
20	72	46	41	33	48	49	75	73	89	92	85	87
21	70	47	43	33	55	57	70	75	89	85	--	70
22	70	48	33	33	57	55	60	80	93	92	89	75
23	64	44	33	33	55	60	75	--	94	95	85	75
24	65	50	33	33	59	64	79	80	90	95	88	76
25	60	47	35	49	56	65	--	72	90	94	88	77
26	52	48	39	35	58	54	78	77	90	89	87	77
27	53	50	40	37	41	64	73	78	91	91	90	78
28	60	49	40	39	50	68	78	75	90	92	93	80
29	63	50	41	40	--	50	80	77	92	95	94	76
30	61	50	39	45	--	43	66	78	85	90	91	74
31	63	--	42	--	--	51	--	78	--	85	89	--
Average	68	54	43	40	53	54	70	72	85	92	88	82

SKELETON CREEK NEAR LOVELL, OKLA.

LOCATION.--At gaging station at bridge on State Highway 74, 2 miles upstream from Otter Creek, 2¾ miles east of Lovell, Logan County, and at mile 14.6
DRAINAGE AREA.--410 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1954.
Water temperatures: October 1950 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 1,580 ppm Mar. 10; minimum, 121 ppm Aug. 31.
Hardness: Maximum, 450 ppm Mar. 10; minimum, 44 ppm Dec. 4.
Specific conductance: Maximum daily, 2,580 micromhos Mar. 11; minimum daily, 141 micromhos Nov. 19.
Water temperatures: Maximum observed daily, 94°F July 12; minimum observed daily, 33°F on several days during December and January.
EXTREMES, 1950-54.--Dissolved solids: Maximum, 2,100 ppm Dec. 7-8, 1950; minimum, 121 ppm Aug. 31, 1954.
Hardness: Maximum, 670 ppm Dec. 7-8, 1950; minimum, 44 ppm Dec. 4, 1953.
Specific conductance: Maximum daily, 3,610 micromhos Dec. 7, 1950; minimum daily, 141 micromhos Nov. 19, 1953.
Water temperatures: Maximum observed daily, 94°F July 12, 1954; minimum observed daily, freezing point on many days during winter months.
REMARKS.--Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year October 1953 to September 1954 given in WSP 1341. No flow, Oct. 1-6, July 19-31, Aug. 1.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-8, 1953	0.44	--	--	82	25	256	--	346	10	113	315		2.2	--	1,000	1.36	1.2	308	8	64	6.3	1,730	8.4
Oct. 9-10	.75	--	--	65	19	213	--	288	6	56	285		2.3	--	825	1.12	1.7	242	0	66	6.0	1,460	8.4
Oct. 11-15	.72	--	--	66	20	221	--	318	0	70	280		2.3	--	848	1.15	1.6	248	0	66	6.1	1,490	8.2
Oct. 16	.80	--	--	53	15	143	--	263	5	42	173		3.2	--	594	.81	1.3	192	0	62	4.5	1,060	8.4
Oct. 17	.80	--	--	67	19	211	--	298	11	71	275		3.2	--	834	1.13	1.8	247	0	65	5.9	1,460	8.5
Oct. 18-19	.80	--	--	53	14	139	--	271	0	44	170		1.9	--	583	.79	1.3	189	0	62	4.3	1,030	8.2
Oct. 20	.70	--	--	14	5.4	20		69	0	14	18		4.9	--	144	.20	.3	57	0	43	1.2	208	7.7
Oct. 21-24	222	--	--	15	4.7	21	--	73	0	14	20		4.5	--	146	.20	88	57	0	44	1.2	215	7.4
Oct. 25-28	40.2	--	--	24	5.8	42	--	106	0	24	42		4.8	--	220	.30	24	84	0	52	2.0	364	7.9
Oct. 29-31	8.23	--	--	27	7.2	51	--	126	0	27	55		5.1	--	258	.35	5.7	97	0	53	2.3	440	8.0
Nov. 1-10	1.94	9.6	0.30	30	11	62	5.4	135	0	32	73		4.3	0.59	300	.41	1.6	121	10	51	2.5	516	7.6
Nov. 11-18	4.00	--	--	38	9.0	69	--	156	0	32	87		4.3	--	339	.46	3.7	132	4	53	2.6	590	7.8
Nov. 19	523	--	--	14	6.1	8.3		65	0	9.7	8.0		3.7	--	122	.17	172	60	6	23	.5	141	7.6
Nov. 20	1,070	--	--	22	7.5	45		100	0	25	50		6.8	--	220	.30	636	86	4	53	2.1	379	7.8
Nov. 21-24	52.8	--	--	26	7.3	45	--	107	0	24	56		5.0	--	237	.32	34	95	8	51	2.0	410	7.8
Nov. 25-26	7.95	--	--	38	10	81	--	165	0	42	100		4.0	--	382	.52	8.2	136	1	56	3.0	664	8.0
Nov. 27-28	6.05	--	--	20	5.8	29	--	84	0	16	38		3.7	--	183	.25	3.0	74	5	46	1.5	298	7.6
Nov. 29-30	5.80	--	--	28	8.5	49	--	107	0	26	69		4.3	--	256	.35	4.0	105	18	50	2.1	456	7.7
Dec. 1-3	6.17	--	--	26	6.3	43	--	96	0	24	60		4.0	--	225	.31	3.7	91	12	51	2.0	404	7.9
Dec. 4	707	--	--	12	3.4	18	--	64	0	15	14		4.3	--	132	.18	252	44	0	47	1.2	178	7.7
Dec. 5-7	51.3	--	--	25	6.2	40	--	92	0	23	52		4.5	--	209	.28	29	88	12	50	1.9	374	7.8
Dec. 8-9	10.8	--	--	71	21	138	--	216	3	89	212		8.3	--	670	.91	20	264	82	53	3.7	1,190	8.3

Dec. 10, 1953	8.00	--	--	45	12	75	--	146	0	50	114	4.4	--	377	.51	8.1	160	40	50	2.6	694	8.2
Dec. 11-18	5.55	--	--	59	15	113	--	183	0	71	158	5.7	--	526	.72	7.9	208	58	54	3.4	937	8.0
Dec. 19-20	4.90	--	--	86	23	186	--	274	0	119	252	14	--	827	1.12	11	310	86	57	4.6	1,470	8.2
Dec. 21-31	4.19	17	0.00	98	35	251	11	355	0	163	308	30	0.43	1,110	1.51	13	388	98	58	5.5	1,840	7.8
Jan. 1-10, 1954	4.63	--	--	101	31	285	--	372	0	168	352	38	--	1,210	1.65	15	380	75	62	6.4	2,030	7.8
Jan. 11-20	4.58	--	--	97	32	293	--	369	0	171	352	39	--	1,210	1.65	15	372	70	63	6.6	2,040	7.8
Jan. 21-31	4.69	--	--	97	34	311	--	376	0	174	378	39	--	1,270	1.73	16	380	72	64	6.9	2,140	7.6
Feb. 1-10	4.47	--	--	110	21	303	--	369	3	176	360	40	--	1,240	1.69	15	362	54	65	6.9	2,060	8.3
Feb. 11-18	4.32	--	--	90	30	291	--	356	0	158	352	31	--	1,180	1.60	14	346	54	65	6.8	1,990	7.8
Feb. 19	115	--	--	31	7.7	63	--	121	0	38	77	5.9	--	304	.41	94	109	10	56	2.6	528	7.6
Feb. 20	256	--	--	20	5.4	25	--	91	0	22	21	5.2	--	177	.24	122	72	0	43	1.3	250	7.6
Feb. 21-25	15.3	--	--	26	8.7	54	--	105	0	41	62	5.7	--	265	.36	11	101	15	54	2.3	475	7.6
Feb. 26-28	3.70	--	--	40	14	101	--	162	0	53	127	6.5	--	444	.60	4.4	158	25	58	3.5	776	7.9
Mar. 1-2	3.25	--	--	84	23	250	--	338	7	137	295	26	--	1,120	1.52	9.8	305	16	64	6.2	1,750	8.3
Mar. 3	4.20	--	--	34	11	74	--	132	2	43	101	.8	--	380	.52	4.3	130	18	55	2.8	624	8.3
Mar. 4-5	4.40	--	--	60	21	163	--	228	8	91	205	.7	--	726	.99	8.6	234	34	60	4.6	1,220	8.4
Mar. 6-9	4.88	--	--	74	24	216	--	300	6	114	255	18	--	929	1.26	12	284	28	62	5.6	1,540	8.3
Mar. 10	5.30	--	--	116	39	366	--	366	20	167	530	14	--	1,580	2.15	23	450	116	64	7.5	2,570	8.5
Mar. 11-20	4.13	--	--	117	33	352	--	401	6	162	465	--	--	1,390	1.89	15	426	88	64	7.4	2,350	8.3
Mar. 21-23	4.10	--	--	109	36	339	--	402	12	167	450	17	--	1,450	1.97	16	420	70	64	7.2	2,340	8.4
Mar. 24	65.0	--	--	56	21	190	--	216	8	125	205	3.0	--	853	1.16	150	224	34	65	5.5	1,360	8.4
Mar. 25	100	--	--	24	8.6	26	--	105	0	33	22	.5	--	227	.31	61	96	10	48	1.2	317	8.1
Mar. 26	52.0	--	--	73	25	256	--	319	29	152	278	3.1	--	1,120	1.52	157	286	0	66	6.6	1,740	8.6
Mar. 27-31	11.8	--	--	44	15	120	--	192	0	72	147	.1	--	560	.76	18	170	12	61	4.0	933	8.0
Apr. 1-8	3.71	--	--	46	16	122	--	221	0	71	139	6.2	--	541	.74	5.4	180	0	60	4.0	939	8.2
Apr. 9-10	3.20	--	--	70	24	205	--	340	3	111	228	9.7	--	834	1.13	7.2	274	0	62	5.4	1,400	8.3
Apr. 11-14	3.38	--	--	77	26	229	--	360	0	120	258	11	--	926	1.26	8.5	298	3	63	5.7	1,590	8.2
Apr. 15-20	4.03	--	--	91	32	290	--	483	0	119	325	13	--	1,140	1.55	12	358	0	64	6.6	1,950	7.9
Apr. 21-28	6.32	--	--	92	27	261	--	492	0	109	272	14	--	1,060	1.44	18	341	0	62	6.2	1,780	8.2
Apr. 29	8.70	--	--	44	14	115	--	196	0	67	137	9.0	--	490	.67	12	168	8	60	3.9	891	7.8
Apr. 30	26.0	--	--	24	5.8	42	--	103	0	30	37	12	--	220	.30	15	84	0	52	2.0	380	8.1

ARKANSAS RIVER BASIN--Continued

SKELETON CREEK NEAR LOVELL, OKLA.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
May 1, 1954	216	--	--	25	6.7	39	--	101	0	30	36		9.7	--	264	0.36	154	90	7	49	1.8	361	8.1
May 2-8, 10	32.8	--	--	36	11	64	--	147	0	43	74		9.0	--	339	.46	30	134	14	51	2.4	585	7.8
May 9	175	--	--	52	21	121	--	152	5	142	142		5.2	--	622	.85	294	215	82	55	3.6	955	8.4
May 11-15	11.5	--	--	48	18	111	--	164	0	123	125		6.6	--	552	.75	17	195	60	55	3.5	928	8.2
May 16-20	5.00	--	--	65	27	162	--	258	0	108	215		8.5	--	766	1.04	10	275	64	56	4.2	1,300	8.2
May 21-23	4.93	--	--	33	13	58	--	136	0	46	65		8.8	--	360	.49	4.8	135	24	48	2.2	542	8.2
May 24-29	239	--	--	30	6.1	40	--	119	0	31	43		5.0	--	235	.32	152	100	2	47	1.7	409	8.0
May 30-31	31.0	--	--	35	10	58	--	126	0	37	84		3.8	--	328	.45	27	130	27	49	2.2	562	7.7
June 1	17.0	--	--	36	12	60	--	141	6	42	71		6.2	--	414	.56	19	139	14	48	2.2	538	8.5
June 2	10.0	--	--	50	17	81	--	172	8	42	118		7.9	--	488	.66	13	194	40	48	2.5	777	8.6
June 3-4	5.50	--	--	36	12	53	--	135	5	38	68		6.6	--	300	.41	4.5	138	19	47	2.0	532	8.5
June 5-6	3.95	--	--	49	18	81	--	168	10	56	117		7.8	--	454	.62	4.8	197	43	47	2.5	778	8.6
June 7	3.70	--	--	56	21	100	--	204	9	82	140		9.0	--	518	.70	5.2	224	42	49	2.9	900	8.6
June 8	3.30	--	--	51	17	78	--	174	7	38	120		7.9	--	472	.64	4.2	195	41	47	2.4	784	8.5
June 9-10	7.50	--	--	68	24	144	--	232	13	88	200		7.6	--	712	.97	14	267	56	54	3.8	1,150	8.6
June 11	18.0	--	--	60	22	112	--	196	10	69	172		12	--	576	.78	28	239	62	50	3.1	980	8.5
June 12-14	62.0	--	--	34	8.5	50	--	128	3	34	56		5.4	--	294	.40	49	120	10	47	2.0	466	8.4
June 15	35.0	--	--	37	12	82	--	150	4	52	100		1.6	--	414	.56	39	140	10	56	3.0	680	8.4
June 16-20	20.7	--	--	30	10	48	--	123	3	36	55		5.5	--	278	.38	16	116	10	48	1.9	446	8.4
June 21	4.00	--	--	37	14	60	--	153	6	17	84		5.0	--	346	.47	3.7	150	14	47	2.1	591	8.5
June 22	3.50	--	--	44	16	81	--	180	7	22	108		5.9	--	432	.59	4.1	174	15	50	2.7	704	8.5
June 23-25	2.83	--	--	34	12	55	--	159	0	12	75		4.2	--	323	.44	2.5	135	4	47	2.1	541	8.2
June 26-30	2.20	--	--	46	15	82	--	183	8	12	125		3.9	--	436	.59	2.6	178	14	50	2.7	753	8.5
July 1	1.50	--	--	51	19	97	--	214	8	46	130		3.5	--	511	.69	2.1	204	15	51	3.0	818	8.4
July 2	1.20	--	--	74	22	139	--	252	22	61	198		2.6	--	699	.95	2.3	274	31	52	3.6	1,190	8.7
July 3	1.20	--	--	57	21	107	--	216	10	50	147		5.9	--	558	.76	1.8	228	34	50	3.1	939	8.5
July 4-10	.79	--	--	74	23	136	--	274	8	60	197		3.0	--	683	.93	1.5	280	42	51	3.5	1,210	8.5
July 11-31	.06	--	--	78	27	150	--	292	10	61	220		2.8	--	747	1.02	.1	304	48	52	3.7	1,310	8.5
Aug. 1-6	1.42	--	--	72	40	315	--	291	12	95	488		3.1	--	1,190	1.62	4.6	345	86	67	7.4	2,270	8.5
Aug. 7-10	22.0	--	--	24	3.6	57	--	108	0	35	46		1.4	--	238	.32	14	75	0	62	2.9	417	8.1
Aug. 11	5.30	--	--	26	5.4	43	--	113	0	24	42		13	--	248	.34	3.5	87	0	52	2.0	386	8.0
Aug. 12-20	.11	--	--	33	7.2	53	--	155	0	31	54		7.0	--	292	.40	.1	112	0	51	2.2	509	8.2
Aug. 21-22, 25	6.87	--	--	46	10	60	--	192	6	36	64		3.7	--	353	.48	6.5	156	0	46	2.1	603	8.5
Aug. 23-24, 28-30	9.06	--	--	28	3.4	36	--	110	0	26	30		6.8	--	222	.30	5.4	84	0	48	1.7	344	8.1
Aug. 26-27	4.60	--	--	50	14	120	--	208	8	85	126		8.5	--	578	.79	7.2	182	0	59	3.9	918	8.4
Aug. 31	580	--	--	20	1.5	20	--	76	0	21	12		9.0	--	121	.16	189	56	0	44	1.2	201	8.0

Sept. 1-8, 1954.....	84.4	--	--	30	7.1	38	--	112	0	29	47		5.8	--	250	.34	57	104	12	44	1.6	429	8.1
Sept. 9-10	2.10	--	--	38	4.9	49	--	135	2	35	68		8.7	--	317	.43	1.8	115	1	48	2.0	529	8.3
Sept. 11-15	1.92	--	--	38	11	49	--	138	0	39	68		4.6	--	303	.41	1.6	140	27	43	1.8	541	8.1
Sept. 16-20	1.28	--	--	53	15	78	--	177	0	58	115		3.0	--	440	.60	1.5	194	49	47	2.4	799	8.2
Sept. 21-26.....	.75	--	--	56	11	86	--	148	2	62	122		1.6	--	466	.63	.9	185	60	50	2.7	853	8.3
Sept. 27, 29.....	.30	--	--	94	28	208	--	325	15	152	240		2.4	--	940	1.28	.8	350	58	56	4.8	1,640	8.4
Sept. 28, 30.....	5.15	--	--	58	16	101	--	213	5	79	128		2.4	--	507	.69	7.0	210	27	51	3.0	901	8.4
Weighted average...	25.7	--	--	30	8.3	55		a122	--	37	62		6.5	--	290	0.39	20	109	9	52	2.3	475	--

a Includes equivalent of individual carbonate values shown above.

ARKANSAS RIVER BASIN--Continued

SKELETON CREEK NEAR LOVELL, OKLA.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	--	54	44	37	37	55	52	53	77	86	--	85
2	--	62	44	36	37	49	53	52	75	83	86	86
3	--	62	44	37	37	42	55	52	77	85	83	86
4	--	39	42	38	37	42	56	54	73	86	85	86
5	--	58	42	38	37	43	58	55	75	84	85	86
6	--	48	45	38	37	43	59	58	79	89	--	86
7	63	45	50	37	38	44	61	58	78	84	86	86
8	60	47	--	36	--	45	61	61	79	88	85	85
9	61	48	45	35	--	46	62	61	79	87	85	85
10	61	50	45	36	40	46	62	64	80	93	85	84
11	61	50	45	35	42	47	62	70	79	93	85	82
12	62	50	45	34	44	47	62	70	80	94	86	83
13	63	50	45	34	46	48	62	70	78	85	85	82
14	62	53	46	37	52	48	63	72	83	92	85	83
15	63	55	46	38	50	46	63	72	75	84	86	82
16	68	55	45	34	51	46	63	73	79	85	86	82
17	68	57	46	40	52	49	64	74	80	85	86	82
18	70	55	45	34	52	49	64	74	80	86	86	80
19	70	58	45	34	52	50	64	73	81	--	86	80
20	68	45	45	35	48	51	53	70	84	--	86	81
21	65	44	33	34	45	51	54	--	82	--	87	82
22	63	44	33	33	48	51	54	65	84	--	86	--
23	62	45	33	34	49	51	55	65	84	--	87	80
24	62	45	33	35	49	51	55	69	83	--	89	78
25	62	45	33	35	51	53	55	73	85	--	85	76
26	59	45	33	35	55	54	56	68	86	--	87	77
27	58	45	34	35	55	54	53	73	85	--	87	77
28	57	45	34	36	51	55	--	--	81	--	87	78
29	57	45	35	36	--	54	53	73	83	--	87	78
30	55	45	35	38	--	54	54	74	85	--	86	80
31	55	--	36	--	--	53	--	77	--	--	87	--
Average	62	50	41	36	46	49	58	66	80	--	86	82

CIMARRON RIVER AT PERKINS, OKLA.

LOCATION.--At gaging station at bridge on State Highway 40, 1 mile south of Perkins, Payne County, 1½ miles upstream from Dugout Creek, 4 miles downstream from Wildhorse Creek, and at mile 87.3.
DRAINAGE AREA.--17,825 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1952 to September 1954.
Water temperatures: October 1952 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 15,200 ppm Aug. 27-29; minimum, 389 ppm Nov. 21-22.
Hardness: Maximum, 1,880 ppm Aug. 27-29; minimum, 118 ppm Nov. 21-22.
Specific conductance: Maximum daily, 24,600 micromhos Aug. 28; minimum daily, 601 micromhos Nov. 22.
Water temperatures: Maximum observed daily, 87°F Aug. 9; minimum observed daily, freezing point on several days during December and January.
EXTREMES, 1952-54.--Dissolved solids: Maximum, 17,600 ppm Jan. 11-12, 1953; minimum, 389 ppm Nov. 21-22, 1953.
Hardness: Maximum, 1,880 ppm Aug. 27-29, 1954; minimum, 118 ppm Nov. 21-22, 1953.
Specific conductance: Maximum daily, 27,400 micromhos Jan. 11, 12, 1953; minimum daily, 601 micromhos Nov. 22, 1953.
Water temperatures: Maximum observed daily, 87°F Aug. 9, 1954; minimum observed daily, freezing point on many days during winter months.
REMARKS.--Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-6, 1953	26.7			219	64	2,180		239	0	406	3,490		--		6,650	9.04	479	808	612	85	33	11,100	7.8
Oct. 7	214			150	41	1,330		318	0	308	2,020		--		4,060	5.52	2,350	545	284	84	25	6,980	7.5
Oct. 8	224			82	19	846		163	0	203	1,260		--		2,540	3.45	1,540	282	148	87	22	4,540	7.7
Oct. 9-10	96.0			74	18	570		130	0	195	840		3.0		1,800	2.45	467	258	152	83	15	3,220	7.8
Oct. 11	61.0			100	26	613		166	0	205	960		3.7		2,060	2.80	339	356	220	79	14	3,730	8.1
Oct. 12-14	43.0			119	34	843		220	0	201	1,300		--		2,740	3.73	318	437	256	81	18	4,650	7.9
Oct. 15	45.0			138	44	1,200		178	0	280	1,920		--		3,770	5.13	458	526	380	83	23	6,630	8.0
Oct. 16	140			82	25	670		123	0	151	1,050		--		2,130	2.90	805	308	206	83	17	3,910	7.8
Oct. 17	99.0			174	53	1,660		187	0	346	2,600		--		4,970	6.76	1,330	652	499	85	28	8,660	8.0
Oct. 18-19	82.0			90	28	623		206	0	165	940		1.2		2,010	2.73	445	340	170	80	15	3,490	8.1
Oct. 20	41.0			107	31	791		204	0	165	1,230		--		2,550	3.47	282	394	228	81	17	4,530	8.1
Oct. 21-22	54.0			134	37	1,070		185	0	207	1,760		--		3,350	4.56	488	485	334	83	21	5,980	8.0
Oct. 23	220			66	17	493		119	0	95	810		3.2		1,540	2.09	915	234	136	82	14	2,860	7.9
Oct. 24	910			89	22	616		181	0	129	1,010		--		2,000	2.72	4,910	314	166	81	15	3,550	8.1
Oct. 25-28	764			38	7.8	158		109	0	40	245		3.3		564	.77	1,160	127	38	73	6.1	1,050	7.8
Oc . 29	446			53	16	323		112	0	66	525		3.6		1,090	1.48	1,310	196	104	78	10	1,980	7.8
Oct. 30-31	287			115	31	1,350		137	0	233	2,120		--		3,960	5.39	3,070	415	302	88	29	7,030	7.8
Nov. 1	210			82	19	630		141	0	170	1,000		4.8		2,030	2.76	1,150	282	166	83	16	3,630	8.0
Nov. 2-3	146			122	29	926		170	0	248	1,460		--		2,920	3.97	1,150	425	286	83	20	5,140	8.0
Nov. 4-6	107			191	50	2,280		187	0	371	3,690		--		6,780	9.22	1,960	683	530	88	38	11,500	8.0
Nov. 7-9	85.7			201	61	3,220		223	0	382	5,120		--		9,280	12.62	2,150	751	568	90	51	15,400	8.1
Nov. 10-15	63.0			197	55	2,340		266	0	349	3,690		--		6,780	9.22	1,150	717	499	88	38	11,600	8.2
Nov. 16-19	230			225	63	2,770		274	0	417	4,430		--		8,050	10.95	5,000	821	596	88	42	13,600	8.1

ARKANSAS RIVER BASIN--Continued

CIMARRON RIVER AT PERKINS, OKLA.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Nov. 20, 1953	5,500			38	7.1	154		141	0	33	215		6.0		524	0.71	7,780	124	8	73	6.0	1,020	8.0
Nov. 21-22	3,505			36	6.8	94		135	0	28	136		1.9		389	.53	3,680	118	8	63	3.8	717	8.0
Nov. 23	635			38	8.5	182		108	0	43	280		3.9		634	.86	1,090	130	42	75	6.9	1,170	7.9
Nov. 24	410			109	35	1,300		165	0	213	2,060		--		3,800	5.17	4,210	415	280	87	28	6,740	8.0
Nov. 25-26	305			86	20	635		182	0	129	1,020		--		1,990	2.71	1,640	298	149	82	16	3,620	8.1
Nov. 27-28	224			126	34	1,220		220	0	220	1,950		--		3,660	4.98	2,210	455	274	85	25	6,520	8.1
Nov. 29-30	192			158	43	1,880		206	0	318	2,980		--		5,490	7.47	2,850	570	401	88	34	9,360	8.0
Dec. 1-2	228			187	55	2,920		211	0	368	4,650		--		8,440	11.48	5,200	692	519	90	48	14,300	8.0
Dec. 3	622			89	24	848		207	0	114	1,340		--		2,590	3.52	4,350	322	152	85	21	4,720	8.1
Dec. 4	1,230			146	39	1,990		254	0	222	3,180		--		5,820	7.92	19,330	525	317	89	38	9,760	8.2
Dec. 5-8	1,290			76	18	765		129	0	137	1,190		--		2,320	3.16	8,080	262	156	86	21	4,180	7.9
Dec. 9-10	283			58	13	483		127	0	114	740		4.2		1,500	2.04	1,150	200	96	84	15	2,750	7.9
Dec. 11-20	188			185	49	2,470		239	0	345	3,880		--		7,150	9.72	3,630	662	466	89	42	12,100	8.1
Dec. 21-22	148			189	54	2,190		319	0	332	3,460		--		6,500	8.84	2,600	693	432	87	36	11,000	8.2
Dec. 23-31	123			227	61	2,900		284	0	433	4,560		--		8,460	11.51	2,810	817	584	89	44	14,000	8.1
Jan. 1-7, 10, 1954	133			229	64	3,200		282	5	451	5,120		--		9,340	12.70	3,350	836	596	89	48	15,500	8.3
Jan. 8-9	144			258	72	4,420		282	0	511	7,040		--		12,500	17.00	4,860	938	707	91	63	20,300	8.2
Jan. 11-20	116			223	63	2,930		295	0	439	4,630		--		8,600	11.70	2,690	816	574	89	45	14,200	8.2
Jan. 21-31	104			225	66	2,940		280	0	441	4,680		--		8,640	11.75	2,430	831	602	88	44	14,300	8.0
Feb. 1-4	116			210	71	3,350		242	0	468	5,270		--		9,710	13.21	3,040	816	618	90	51	16,000	8.1
Feb. 5	158			246	86	4,680		231	0	567	7,140		--		13,100	17.82	5,590	968	778	91	65	20,700	8.2
Feb. 6-8	163			179	64	3,370		255	0	450	5,070		--		9,360	12.73	4,120	710	500	91	55	15,600	8.2
Feb. 9-10	146			157	56	2,540		267	3	381	3,880		--		7,290	9.91	2,870	622	403	90	44	12,200	8.3
Feb. 11-19	117			192	71	3,210		248	0	442	4,830		--		8,960	12.19	2,830	771	568	90	50	14,800	8.1
Feb. 20	389			100	35	1,380		164	0	195	2,120		--		3,990	5.43	4,190	394	259	88	30	6,970	8.2
Feb. 21	595			108	34	1,150		228	4	212	1,780		--		3,480	4.73	5,590	410	216	86	25	6,050	8.3
Feb. 22	363			149	50	2,270		181	4	331	3,440		--		6,370	8.66	6,240	578	422	90	41	10,800	8.3
Feb. 23	227			82	30	601		192	3	198	890		11		1,930	2.62	1,180	328	166	80	14	3,440	8.3
Feb. 24-25	149			145	52	1,890		226	0	342	2,950		--		5,640	7.67	2,270	576	391	88	34	9,550	8.0
Feb. 26-28	106			206	68	2,920		241	0	414	4,530		--		8,410	11.44	2,410	794	596	89	45	13,900	7.8

Mar. 1-4, 1954	98.5			224	74	3,520	245	0	492	5,520	--	10,300	14.01	2,740	861	662	90	52	16,600	8.2
Mar. 5-6	115			247	90	4,520	257	0	550	7,150	--	13,100	17.82	4,070	983	772	91	63	20,800	8.2
Mar. 7-10	109			196	73	3,300	248	4	459	5,270	--	9,690	13.18	2,850	786	580	90	51	15,700	8.3
Mar. 11-20	84.3			216	80	3,470	253	4	481	5,510	--	9,930	13.50	2,260	869	655	90	51	16,700	8.3
Mar. 21-26	148			205	81	3,190	258	0	465	5,070	--	9,490	12.91	3,790	841	630	89	48	15,400	8.1
Mar. 27	650			125	41	1,320	214	7	306	2,100	--	4,070	5.54	7,140	480	293	86	26	7,010	8.4
Mar. 28	460			70	21	650	142	0	137	1,000	1.7	2,000	2.72	2,480	261	144	84	18	3,520	8.1
Mar. 29	241			93	30	958	152	4	194	1,520	--	2,970	4.04	1,930	356	224	85	22	5,140	8.3
Mar. 30-31	154			164	45	1,900	230	0	333	3,000	--	5,700	7.75	2,370	595	406	87	34	9,590	8.1
Apr. 1-2	116			152	46	1,770	240	9	330	2,750	--	5,340	7.26	1,670	570	358	87	32	9,080	8.4
Apr. 3-5	110			179	63	2,830	196	0	438	4,330	--	8,160	11.10	2,420	707	546	90	46	13,600	8.1
Apr. 6-9	79.2			201	75	3,780	238	0	469	5,820	--	10,900	14.82	2,330	811	616	91	58	17,700	8.0
Apr. 10	66.0			116	15	1,210	143	3	192	1,900	--	3,540	4.81	631	350	228	88	28	6,570	8.3
Apr. 11-16	85.0			209	65	2,940	264	0	433	4,530	--	8,630	11.74	1,980	787	570	89	46	14,300	8.0
Apr. 17-20	96.2			160	57	2,050	253	0	374	3,190	--	6,040	8.21	1,570	634	426	88	35	10,300	8.2
Apr. 21-28	93.6			221	69	3,030	216	0	540	4,730	--	8,980	12.21	2,270	837	710	89	46	14,700	7.9
Apr. 29-30	133			228	45	1,600	186	0	674	2,350	--	5,080	6.91	1,820	755	602	82	25	8,440	8.2
May 1	466			176	34	1,350	182	0	404	2,100	--	4,340	5.90	5,460	580	431	83	24	7,180	8.2
May 2-3	3,380			116	16	546	148	0	306	775	2.0	1,920	2.61	17,520	354	232	77	13	3,240	8.2
May 4-5	1,500			113	16	388	120	0	295	550	2.5	1,470	2.00	4,950	348	250	71	9.0	2,520	8.2
May 6-10	563			259	45	2,650	146	0	594	4,080	--	8,020	10.91	12,190	831	712	87	40	13,300	8.1
May 11	438			116	24	1,240	127	0	240	1,900	--	3,720	5.06	4,400	390	286	87	27	6,320	8.2
May 12-13	337			124	32	932	266	0	207	1,430	--	2,980	4.05	2,710	442	224	82	19	5,270	8.2
May 14	262			162	40	1,720	209	10	331	2,650	--	5,230	7.11	3,700	570	382	87	31	8,630	8.5
May 15-16, 19	208			195	49	2,340	221	0	428	3,540	--	6,840	9.30	3,840	688	507	88	39	11,500	8.2
May 17-18, 20	182			241	63	3,270	209	0	524	5,020	--	9,390	12.77	4,610	861	690	89	48	15,900	8.1
May 21	196			244	75	4,160	178	0	590	6,550	--	12,100	16.46	6,400	919	773	91	60	19,800	8.2
May 22	182			195	49	2,440	179	7	451	3,740	--	7,160	9.74	3,520	688	530	89	40	12,000	8.4
May 23-25	271			245	65	4,140	196	5	543	6,410	--	11,800	16.05	8,630	880	711	91	61	19,300	8.3
May 26	8,210			118	22	1,270	166	0	261	1,950	--	3,810	5.18	84,460	385	249	88	28	6,600	8.2
May 27	9,250			70	18	721	127	0	146	1,110	--	2,220	3.02	55,440	248	144	86	20	3,980	8.1
May 28-29	3,800			116	18	1,060	138	0	254	1,650	--	3,290	4.47	33,760	365	252	86	24	5,680	8.1
May 30-31	1,905			140	31	2,020	146	0	299	3,110	--	5,830	4.93	29,990	479	360	90	40	10,100	7.9

ARKANSAS RIVER BASIN--Continued

CIMARRON RIVER AT PERKINS, OKLA.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
June 1, 1954	1,410			128	37	1,920		164	2	291	3,020		--		5,590	7.60	21,280	470	332	90	39	9,480	8.4
June 2-3	872			128	39	1,740		170	0	284	2,620		--		4,970	6.76	11,700	480	340	89	35	8,450	--
June 4-5	485			122	34	1,440		166	2	277	2,180		--		4,290	5.83	5,620	444	304	88	30	7,220	8.4
June 6	330			164	49	1,900		196	6	364	2,950		--		5,610	7.63	5,000	610	440	87	33	9,350	8.5
June 7	280			162	48	1,970		188	6	372	3,000		--		5,820	7.92	4,400	600	436	88	35	9,630	8.4
June 8-10	223			193	54	2,000		220	7	402	3,180		--		6,460	8.79	3,890	703	511	86	33	10,700	8.5
June 11-12	190			175	60	2,330		149	0	423	3,610		--		6,790	9.23	3,480	682	560	88	39	11,200	--
June 13	794			140	51	1,670		174	0	287	2,600		--		5,020	6.83	10,760	560	418	87	31	8,430	8.2
June 14	358			189	60	2,260		199	8	386	3,610		--		6,680	9.08	6,460	718	542	87	37	11,200	8.5
June 15	273			126	36	1,220		208	8	227	1,870		--		3,710	5.05	2,730	464	280	85	25	6,310	8.5
June 16-17	251			142	43	1,430		214	10	268	2,250		--		4,500	6.12	3,050	532	340	85	27	7,400	8.5
June 18	760			79	36	859		168	6	164	1,330		--		2,650	3.60	5,440	346	198	84	20	4,600	8.4
June 19	705			109	31	932		140	0	240	1,460		--		2,930	3.98	5,580	398	284	84	20	5,040	8.2
June 20	541			191	53	2,310		167	0	443	3,590		--		6,710	9.13	9,800	693	556	88	38	11,300	--
June 21-24	232			166	38	986		150	0	455	1,480		--		3,310	4.50	2,070	570	447	79	18	5,470	--
June 25	94.0			206	49	1,280		164	0	473	1,990		--		4,230	5.75	1,070	715	580	80	21	6,920	--
June 26-28	72.7			234	57	1,650		202	4	490	2,650		--		5,290	7.19	1,040	820	648	81	25	8,790	8.4
June 29	64.0			200	72	1,970		102	0	499	3,100		--		5,890	8.01	1,020	795	712	84	30	9,910	8.1
June 30	56.0			209	59	2,110		100	0	490	3 340		--		6,320	8.60	956	763	681	86	33	10,600	8.0
July 1	50.0			213	38	2,210		124	0	476	3,390		--		6,390	8.69	863	688	588	87	37	10,800	8.1
July 2	46.0			170	67	1,840		128	0	403	2,900		--		5,610	7.63	697	700	595	85	30	9,320	8.2
July 3-6	39.2			207	76	2,290		163	0	447	3,590		--		6,830	9.29	723	827	694	86	35	11,300	8.2
July 7	29.0			215	83	2,550		167	0	481	4,030		--		7,440	10.12	583	876	739	86	37	12,500	--
July 8	25.0			249	50	2,370		160	0	438	3,770		--		6,960	9.47	470	828	697	86	36	11,700	8.2
July 9-10	19.5			213	79	2,440		159	0	444	3,830		--		7,230	9.83	381	857	726	86	36	12,000	8.2
July 11-12	19.0			233	84	2,580		163	0	461	4,150		--		7,650	10.40	392	925	792	86	37	12,800	8.2
July 13	19.0			173	82	2,240		100	0	392	3,550		--		6,490	8.83	333	768	686	86	35	11,200	8.1
July 14-20	17.9			243	87	2,620		185	0	433	4,160		--		7,860	10.69	380	965	814	86	37	12,800	8.1
July 21-24	15.2			255	96	2,630		191	0	425	4,270		--		8,080	10.99	332	1,030	874	85	36	13,000	8.2
July 25-27	13.0			239	87	2,260		187	0	369	3,830		--		7,360	10.01	258	956	803	84	32	12,100	8.2
July 28-29	11.5			239	97	2,610		163	0	400	4,330		--		8,080	10.99	251	996	862	85	36	13,000	8.2
July 30	9.50			162	76	1,930		110	0	318	3,160		--		5,760	7.83	148	718	628	85	31	10,000	8.0
July 31	8.30			239	79	2,420		173	4	398	4,030		--		7,560	10.28	169	922	774	85	35	12,400	8.4

Aug. 1, 1954	13.0			184	98	1,650		136	2	272	2,850		--		5,230	7.11	184	860	745	81	24	8,910	8.3
Aug. 2	32.0			191	80	2,400		117	0	396	3,930		--		7,270	9.89	628	806	710	87	37	12,500	8.1
Aug. 3	13.0			184	66	1,650		132	0	272	2,750		--		5,170	7.03	181	730	622	83	27	9,070	8.2
Aug. 4-10	5.83			207	90	2,130		153	0	337	3,540		--		6,540	8.89	103	886	760	84	31	11,400	8.0
Aug. 11-12	4.45			223	97	2,200		155	4	352	3,780		--		6,930	9.42	83	955	822	83	31	11,800	8.3
Aug. 13-18	4.30			100	54	1,060		268	2	217	1,650		--		3,350	4.56	39	470	247	83	21	6,110	8.3
Aug. 19-20	3.60			76	49	998		132	0	198	1,600		--		3,060	4.16	30	390	282	85	22	5,560	8.2
Aug. 21-23	2.17			132	54	1,080		240	0	214	1,800		--		3,590	4.88	21	550	354	81	20	6,430	8.1
Aug. 24	1.50			56	63	679		136	0	147	1,120		--		2,230	3.03	9.0	400	288	79	15	3,900	8.2
Aug. 25-26	11.0			84	73	1,190		126	0	228	1,950		--		3,670	4.99	109	510	407	84	23	6,530	8.2
Aug. 27-29	77.0			392	219	5,000		289	0	709	8,420		--		15,200	20.67	3,160	1,880	1,640	85	50	23,800	8.2
Aug. 30-31	89.5			132	24	2,180		189	4	283	3,340		--		6,060	8.24	1,460	429	268	92	46	10,400	8.3
Sept. 1	559			119	33	2,240		197	0	266	3,300		--		6,190	8.42	9,340	433	272	92	47	10,400	8.2
Sept. 2-3	686			44	12	181		135	0	39	288		5.7		668	.91	1,240	158	48	71	6.3	1,260	8.2
Sept. 4-6	64.3			74	23	717		157	0	106	1,150		--		2,210	3.01	384	280	152	85	19	4,100	8.0
Sept. 7-8	29.5			120	23	1,280		176	0	177	2,000		--		3,830	5.21	305	395	251	88	28	6,900	8.1
Sept. 9-10	20.5			174	34	1,960		188	2	254	3,100		--		5,820	7.92	822	575	418	88	36	9,790	8.3
Sept. 11-14	12.1			215	27	2,290		179	3	282	3,670		--		6,600	8.98	216	648	496	88	39	11,400	8.3
Sept. 15-20	3.92			145	95	2,600		155	0	321	4,030		--		7,300	9.93	77	752	625	88	41	12,500	8.2
Sept. 21-30	1.86	10	0.07	191	80	2,500	15	168	0	323	4,160	0.3	3.1	0.12	7,370	10.02	37	806	668	87	38	12,800	7.9
Weighted average	305	--	--	123	31	1,369		a170	--	257	2,100	--	--	--	4,060	5.52	3,340	434	295	87	28	6,890	--

a Includes equivalent of individual carbonate values shown above.

ARKANSAS RIVER BASIN--Continued

CIMARRON RIVER AT PERKINS, OKLA.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	66	57	46	40	47	43	43	71	70	83	81	81
2	66	58	54	41	48	35	50	56	69	84	82	79
3	65	59	50	39	47	35	56	54	70	82	82	79
4	65	60	52	43	48	34	58	52	71	84	80	77
5	63	57	54	42	47	48	60	56	72	84	80	77
6	60	54	54	42	46	49	65	60	74	85	81	77
7	59	48	49	--	45	43	67	62	74	84	82	76
8	60	49	46	42	45	45	58	66	76	83	80	77
9	60	45	48	38	45	50	58	65	76	84	87	76
10	59	46	--	32	46	55	68	66	76	83	81	--
11	62	48	50	32	45	49	66	64	77	85	82	69
12	63	48	45	32	46	48	58	63	78	85	82	69
13	65	48	44	34	46	34	60	67	78	84	82	68
14	65	51	42	36	44	33	64	71	78	84	82	70
15	65	51	43	36	45	38	66	78	79	84	83	69
16	66	51	42	36	44	42	67	68	80	85	83	69
17	64	56	40	32	47	49	66	67	82	84	83	67
18	65	59	38	37	48	50	68	68	82	85	85	68
19	65	69	36	39	48	48	68	69	84	851	85	57
20	66	48	36	38	48	49	69	70	85	84	86	--
21	65	46	37	32	52	50	69	71	85	85	83	70
22	66	44	32	32	53	53	66	72	84	85	84	64
23	64	45	32	32	53	51	67	74	84	85	84	65
24	62	44	32	38	54	54	68	71	85	85	84	65
25	62	45	32	32	53	56	70	71	85	83	84	--
26	60	45	32	35	49	52	70	70	85	82	84	67
27	57	46	32	36	47	56	74	71	85	82	84	68
28	58	46	32	38	44	56	73	73	84	81	83	71
29	60	45	32	40	--	48	69	74	85	81	84	72
30	57	46	32	41	--	48	70	71	84	81	81	73
31	57	--	32	48	--	46	--	73	--	81	79	--
Average	62	50	41	37	48	47	64	67	79	84	83	72

ARKANSAS RIVER AT SAND SPRINGS BRIDGE NEAR TULSA, OKLA.

LOCATION.--At bridge on State Highway 33 in Sand Springs, 7 miles downstream from Cimarron River, and 10 miles above gaging station at Tulsa, Tulsa County.
DRAINAGE AREA.-- 74,350 squares miles at gaging station.
RECORDS AVAILABLE.-- Chemical analyses: October 1946 to September 1954.
Water temperatures: October 1946 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 10,900 ppm Sept. 4; minimum, 682 ppm May 2-3.
Hardness: Maximum, 2,010 ppm Sept. 4; minimum, 161 ppm May 2-3.
Specific conductance: Maximum daily, 16,900 micromhos Sept. 4; minimum daily, 1,130 micromhos May 2.
Water temperatures: Maximum observed daily, 94°F July 29; minimum observed daily, freezing point on several days during December and January.
EXTREMES, 1946-54.--Dissolved solids: Maximum, 10,900 ppm Sept. 4, 1954; minimum, 232 ppm July 18-20, 1950.
Hardness: Maximum, 2,010 ppm Sept. 4, 1954; minimum, 106 ppm July 2, 1947.
Specific conductance: Maximum daily, 16,900 micromhos Sept. 4, 1954; minimum daily, 379 micromhos July 19, 1950.
Water temperatures: Maximum observed daily, 96°F Aug. 7, 1947; minimum observed daily, freezing point on many days during winter months.
REMARKS.--Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for gaging station at Tulsa for water year October 1953 to September 1954 given in WSP 1341. No appreciable inflow between sampling station and gaging station except during periods of heavy local runoff.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-5, 1953	306	--	--	220	50	1,150		162	0	184	2,080	--	1.3	--	4,260	5.79	3,520	755	622	77	18	6,840	7.8
Oct. 6	330	--	--	343	79	1,890		164	0	195	3,510	--	1.4	--	7,250	9.86	6,460	1,180	1,050	78	24	10,800	7.4
Oct. 7-9	310	--	--	188	53	979		168	0	158	1,780	--	1.9	--	3,690	5.02	3,090	685	548	76	16	5,920	7.6
Oct. 10	310	--	--	212	56	1,120		164	0	167	2,050	--	.4	--	4,270	5.81	3,570	760	626	76	18	6,710	7.4
Oct. 11	362	--	--	262	72	1,490	--	152	0	189	2,750	--	1.6	--	5,340	7.26	5,220	950	826	77	21	8,460	8.1
Oct. 12	410	--	--	288	78	1,750	--	156	0	212	3,200	--	2.4	--	6,170	8.39	6,830	1,040	912	79	24	9,760	7.9
Oct. 13	398	--	--	204	60	1,400	--	162	0	260	2,420	--	2.2	--	4,750	6.46	5,100	755	622	80	22	7,830	8.1
Oct. 14-18	332	--	--	186	51	1,030	--	163	0	186	1,880	--	1.6	--	3,690	5.02	3,310	675	542	77	17	6,090	7.8
Oct. 19-20	416	--	--	160	42	919	--	165	0	179	1,610	--	2.2	--	3,210	4.37	3,610	570	435	78	17	5,480	8.1
Oct. 21-24	394	--	--	174	44	877	--	147	0	146	1,620	--	1.4	--	3,250	4.42	3,460	615	494	76	15	5,360	7.7
Oct. 25	526	--	--	232	61	1,300	--	134	0	173	2,400	--	1.0	--	4,710	6.41	6,690	830	720	77	20	7,560	7.9
Oct. 26-27	1,059	--	--	170	42	893	--	147	0	99	1,650	--	2.4	--	3,290	4.47	9,410	595	474	77	16	5,410	7.8
Oct. 28-31	1,130	--	--	89	23	422	--	142	0	90	740	--	3.1	--	1,520	2.07	4,640	316	200	74	10	2,700	7.8
Nov. 1-3	1,103	--	--	113	30	536	--	151	0	112	920	--	4.6	--	1,900	2.58	5,660	406	282	74	12	3,300	7.8
Nov. 4-10	683	--	--	138	36	737	--	164	0	146	1,280	--	3.6	--	2,590	3.52	4,780	492	358	76	14	4,450	7.9
Nov. 11-20	540	--	--	179	49	1,060	--	184	0	173	1,850	--	2.4	--	3,650	4.96	5,320	648	497	78	18	6,150	7.6
Nov. 21-22	4,465	--	--	90	21	533	--	143	0	71	895	--	2.5	--	1,830	2.49	22,060	311	194	79	13	3,160	7.9
Nov. 23-24	5,185	--	--	54	12	257	--	135	0	43	410	--	6.5	--	898	1.22	12,570	184	74	75	8.2	1,630	7.8
Nov. 25-28	1,905	--	--	88	22	374	--	132	0	81	655	--	5.1	--	1,400	1.90	7,200	310	202	72	9.2	2,430	7.7
Nov. 29-30	1,265	--	--	116	30	632	--	169	0	123	1,080	--	5.0	--	2,240	3.05	7,650	413	274	77	13	3,810	7.9
Dec. 1-5	1,304	--	--	132	34	728	--	193	0	147	1,230	--	4.5	--	2,550	3.47	8,980	470	312	77	15	4,350	7.8
Dec. 6-7	2,930	--	--	114	31	1,140	--	164	0	146	1,850	--	3.1	--	3,480	4.73	27,530	412	278	86	24	6,000	7.6
Dec. 8-9	3,235	--	--	66	17	437	--	134	0	85	680	--	4.6	--	1,440	1.96	12,580	234	124	80	12	2,570	7.9

ARKANSAS RIVER AT SAND SPRINGS BRIDGE NEAR TULSA, OKLA.--Continued

Chemical analyses, in part per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Dec. 10, 1953	2,030	--	--	91	24	591	--	133	0	113	980	--	6.9	--	2,000	2.72	10,960	326	216	80	14	3,420	7.8
Dec. 11-14	1,382	--	--	100	26	537	--	158	0	120	870	--	4.8	--	1,790	2.43	6,680	356	227	77	12	3,250	7.8
Dec. 15-18	1,045	--	--	134	35	796	--	199	0	160	1,310	--	6.9	--	2,570	3.50	7,250	478	316	78	16	4,500	8.9
Dec. 19-20	896	--	--	156	40	1,010	--	214	0	188	1,700	--	7.6	--	3,280	4.46	7,930	554	378	80	19	5,740	8.0
Dec. 21-31	822	--	--	175	44	1,030	--	236	0	195	1,720	--	8.2	--	3,360	4.57	7,460	618	424	78	18	5,790	8.2
Jan. 1-10, 1954	946	--	--	178	45	1,050	--	241	0	208	1,750	--	9.0	--	3,520	4.79	8,990	629	432	78	18	5,920	8.2
Jan. 11-20	726	--	--	193	50	1,200	--	242	0	226	1,980	--	6.0	--	4,000	5.44	7,840	687	488	79	20	6,720	8.0
Jan. 21-23	643	--	--	286	88	2,010	--	244	0	368	3,390	--	7.5	--	6,580	8.95	11,420	1,080	876	80	27	10,800	8.0
Jan. 24-31	620	--	--	199	53	1,190	--	228	0	216	2,020	--	7.8	--	4,000	5.44	6,700	714	528	78	19	6,720	7.9
Feb. 1-10	793	--	--	174	49	1,080	--	205	0	218	1,800	--	4.5	--	3,640	4.95	7,790	636	468	79	19	6,110	7.8
Feb. 11-20	853	--	--	151	45	1,070	--	175	0	247	1,780	--	2.0	--	3,540	4.81	8,150	562	418	81	20	6,030	7.8
Feb. 21-25	954	--	--	178	52	1,300	--	186	0	257	2,220	--	1.9	--	4,290	5.83	11,050	658	506	81	22	7,290	8.1
Feb. 26-28	909	--	--	134	38	739	--	179	0	211	1,220	--	3.3	--	2,540	3.45	6,230	490	344	77	15	4,430	8.0
Mar. 1-10	786	--	--	156	45	887	--	197	0	231	1,480	--	2.5	--	3,090	4.20	6,560	574	412	77	16	5,210	8.1
Mar. 11-20	748	--	--	159	49	1,080	--	191	0	262	1,790	--	1.4	--	3,660	4.98	7,390	598	442	80	19	6,210	8.1
Mar. 21-29	820	--	--	177	48	1,130	--	182	0	253	1,920	--	.1	--	3,850	5.24	8,520	640	491	79	19	6,410	7.9
Mar. 30-31	1,730	--	--	114	32	689	--	170	10	196	1,100	--	.4	--	2,390	3.25	11,160	416	260	78	15	3,980	8.5
Apr. 1-3	1,250	--	--	116	31	575	--	174	0	161	960	--	.2	--	2,040	2.77	6,880	416	274	75	12	3,510	8.0
Apr. 4-10	851	--	--	145	42	855	--	148	0	228	1,480	--	1.1	--	3,040	4.13	6,990	535	414	78	16	5,060	7.6
Apr. 11-17	747	--	--	160	44	1,010	--	161	0	230	1,750	--	.5	--	3,530	4.80	7,120	580	448	79	18	5,820	7.9
Apr. 18-20	733	--	--	185	53	1,170	--	171	0	249	2,000	--	1.1	--	4,050	5.51	8,020	680	540	79	20	6,580	7.4
Apr. 21	706	--	--	167	51	1,160	--	160	8	254	1,980	--	2.3	--	3,960	5.39	7,550	625	480	80	20	6,460	8.4
Apr. 22-29	815	--	--	149	43	907	--	160	0	211	1,560	--	1.8	--	3,250	4.42	7,150	550	419	78	17	5,290	7.9
Apr. 30	2,810	--	--	92	22	450	--	104	0	59	810	--	4.8	--	1,620	2.20	12,290	320	235	75	11	2,840	7.9
May 1	6,220	--	--	110	21	604	--	141	0	77	1,040	--	5.0	--	2,020	2.75	33,920	360	244	74	14	3,530	8.2
May 2-3	18,250	--	--	52	7.5	163	--	114	0	34	285	--	1.8	--	682	.93	33,610	161	68	69	5.6	1,180	8.1
May 4	11,400	--	--	61	10	254	--	123	4	53	400	--	4.8	--	958	1.30	29,490	193	86	74	7.9	1,600	8.3
May 5-8	5,142	--	--	98	18	412	--	127	0	200	620	--	4.3	--	1,510	2.05	20,960	318	214	74	10	2,590	8.1
May 9-10	3,530	--	--	142	33	1,070	--	159	0	258	1,700	--	4.5	--	3,370	4.58	32,120	490	360	83	21	5,760	8.2
May 11-20	2,038	6.8	0.00	127	42	1,000	8.0	162	0	254	1,640	0.2	.7	0.36	3,260	4.43	17,940	490	357	81	20	5,700	8.2
May 21-29	3,987	--	--	144	34	1,130	--	154	0	240	1,800	--	1.3	--	3,520	4.79	37,890	500	374	83	22	6,160	7.9
May 30-31	10,280	--	--	84	21	681	--	118	0	123	1,060	--	2.8	--	2,050	2.79	56,900	295	198	83	17	3,760	8.0
June 1-2	8,375	--	--	150	17	1,010	--	136	0	178	1,650	--	--	--	3,220	4.38	72,810	445	334	83	21	5,620	7.8
June 3-7	4,516	--	--	84	56	1,270	--	151	0	243	1,980	--	--	--	3,870	5.26	47,190	440	316	86	26	6,790	7.9

June 8-10, 1954	2,550	--	--	132	40	994	--	179	0	247	1,580	--	--	--	3,340	4.54	23,000	495	348	81	19	5,830	7.8
June 11-12	2,045	--	--	140	32	1,050	--	182	4	252	1,650	--	--	--	3,310	4.50	18,280	480	324	83	21	5,710	8.6
June 13-15	2,813	--	--	110	23	767	--	133	0	152	1,240	--	--	--	2,440	3.32	18,530	370	261	82	17	4,280	8.0
June 16	2,310	--	--	154	40	1,250	--	176	8	245	2,050	--	--	--	3,990	5.43	24,890	550	392	83	23	6,770	8.4
June 17	2,120	--	--	124	33	903	--	168	4	197	1,450	--	--	--	2,820	3.84	16,140	445	301	82	19	4,950	8.4
June 18	2,040	--	--	90	22	580	--	134	0	117	925	--	3.5	--	1,870	2.54	10,300	314	204	80	14	3,300	8.2
June 19-20	1,505	--	--	118	40	769	--	146	2	180	1,260	--	--	--	2,480	3.37	10,080	460	337	78	16	4,360	8.3
June 21	1,820	--	--	120	52	1,050	--	127	4	210	1,750	--	--	--	3,600	4.90	17,690	513	402	82	20	5,970	8.3
June 22	2,000	--	--	140	41	1,290	--	130	4	275	2,080	--	--	--	4,170	5.67	22,520	520	407	84	25	6,990	8.3
June 23-30	1,441	--	--	136	39	826	--	166	6	217	1,350	--	--	--	2,810	3.82	10,930	500	354	78	16	4,930	8.3
July 1	888	--	--	128	55	833	--	186	8	217	1,370	--	--	--	2,720	3.70	6,520	545	379	77	16	4,750	8.4
July 2	1,050	--	--	120	37	765	--	140	0	215	1,250	--	--	--	2,470	3.36	7,000	450	336	79	16	4,380	8.2
July 3	820	--	--	118	38	760	--	144	0	220	1,240	--	--	--	2,510	3.41	5,560	450	332	79	16	4,300	8.2
July 4-5	686	--	--	116	39	759	--	134	0	214	1,250	--	--	--	2,520	3.43	4,670	450	340	79	16	4,350	8.2
July 6-8	589	--	--	138	46	893	--	109	0	216	1,560	--	--	--	3,150	4.28	5,010	535	446	78	17	5,160	8.0
July 9	511	--	--	140	50	943	--	98	0	226	1,620	--	--	--	3,100	4.22	4,280	555	474	79	17	5,410	8.1
July 10	475	--	--	140	44	987	--	92	0	226	1,710	--	--	--	3,380	4.60	4,330	530	454	80	19	5,700	8.0
July 11-20	354	10	0.00	178	37	976	14	84	0	122	1,800	0.4	5.7	0.00	3,340	4.54	3,190	595	526	78	17	6,020	8.0
July 21-25	254	--	--	164	51	972	--	112	0	188	1,730	--	--	--	3,300	4.49	2,260	620	528	77	17	5,830	8.2
July 26-29	205	--	--	152	50	926	--	120	0	148	1,620	--	--	--	3,150	4.28	1,740	585	486	77	17	5,440	8.2
July 30-31	186	--	--	194	60	1,130	--	127	0	188	2,050	--	--	--	4,060	5.52	2,040	730	626	77	18	6,850	7.8
Aug. 1-3	240	--	--	174	51	993	--	116	0	169	1,780	--	--	--	3,530	4.80	2,290	645	550	77	17	5,930	8.2
Aug. 4-5	208	--	--	196	65	1,150	--	110	0	178	2,100	--	--	--	3,880	5.28	2,180	755	665	77	18	6,920	8.2
Aug. 6-10	214	--	--	268	79	1,570	--	120	0	147	2,820	--	--	--	5,240	7.13	3,030	995	896	77	22	9,100	8.1
Aug. 11-12	216	--	--	182	56	1,080	--	116	0	179	1,900	--	--	--	3,620	4.92	2,110	685	590	77	18	6,380	8.1
Aug. 13-14	239	--	--	160	51	938	--	114	0	169	1,650	--	--	--	3,210	4.37	2,070	610	516	77	17	5,600	8.1
Aug. 15-20	203	--	--	124	37	716	--	123	0	162	1,200	--	--	--	2,450	3.33	2,340	460	359	77	15	4,370	7.9
Aug. 21-31	157	--	--	124	41	691	--	123	0	148	1,200	--	--	--	2,380	3.24	1,010	480	379	76	14	4,330	7.8
Sept. 1	176	--	--	128	40	705	--	82	0	153	1,250	--	--	--	2,620	3.56	1,250	485	418	76	14	4,300	8.0
Sept. 2-3	164	--	--	341	95	2,010	--	103	0	225	3,650	--	--	--	7,040	9.57	3,120	1,240	1,160	78	25	11,500	8.0
Sept. 4	245	--	--	588	132	3,070	--	106	0	187	5,960	--	--	--	10,900	14.82	7,210	1,010	1,920	77	30	16,900	8.0
Sept. 5	499	--	--	196	45	1,740	--	158	0	169	2,950	--	--	--	5,480	7.45	7,380	675	546	85	29	9,120	8.2
Sept. 6-7	314	--	--	160	29	844	--	142	0	95	1,500	--	--	--	3,030	4.12	2,570	520	404	78	16	5,190	8.2
Sept. 8-10	197	--	--	196	43	1,040	--	120	0	117	1,920	--	--	--	3,810	5.18	2,030	665	566	77	18	6,460	8.0
Sept. 11-13	160	--	--	224	56	1,230	--	112	0	131	2,300	--	--	--	4,290	5.83	1,850	790	698	77	19	7,560	8.1
Sept. 14-19	122	--	--	252	68	1,400	--	106	0	143	2,650	--	--	--	4,880	6.64	1,610	910	823	77	20	8,420	8.0

ARKANSAS RIVER BASIN--Continued

ARKANSAS RIVER AT SAND SPRINGS BRIDGE NEAR TULSA, OKLA.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Sept. 20, 1954	94.0	--	--	252	66	1,410	--	111	0	151	2,850	--	--	--	4,750	6.46	1,210	900	809	77	21	7,970	8.1
Sept. 21-23	87.7	--	--	240	54	1,290	--	146	0	152	2,320	--	--	--	4,700	6.39	1,110	820	725	77	20	7,640	8.0
Sept. 24-27	90.2	--	--	200	46	1,060	--	132	0	154	1,850	--	--	--	3,880	5.28	945	690	582	77	18	6,330	7.9
Sept. 28	85.0	--	--	202	54	1,070	--	128	0	152	1,900	--	--	--	3,970	5.40	911	725	620	76	17	6,250	8.0
Sept. 29-30	106	--	--	214	49	1,110	--	119	0	156	1,980	--	--	--	4,170	5.67	1,190	735	638	77	18	6,710	8.0
Weighted average	1,280	--	--	125	33	827		a156	--	174	1,370	--	--	--	2,750	3.74	9,500	448	320	80	17	4,730	--

a Includes equivalent of individual carbonate values shown above.

ARKANSAS RIVER BASIN--Continued

ARKANSAS RIVER AT SAND SPRINGS BRIDGE NEAR TULSA, OKLA.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	83	55	45	47	41	41	55	64	75	84	80	74
2	72	57	53	48	42	42	53	62	75	93	75	75
3	73	57	53	44	44	44	58	57	70	92	82	75
4	71	59	46	47	46	45	63	56	69	79	80	77
5	61	53	--	45	45	45	66	60	71	82	81	77
6	58	40	46	38	48	43	67	65	71	81	82	76
7	56	41	45	41	47	46	75	70	74	81	83	76
8	70	38	45	52	39	47	64	60	70	86	76	75
9	59	40	42	45	45	49	65	60	84	87	75	83
10	59	43	42	33	47	54	64	63	85	84	77	80
11	61	46	42	33	42	65	66	62	87	84	76	70
12	64	48	41	32	39	64	58	64	78	83	77	69
13	64	59	40	32	41	43	58	65	84	85	80	69
14	66	51	37	33	65	38	62	66	77	86	80	71
15	72	52	--	40	59	40	64	71	74	90	79	73
16	65	53	37	35	52	48	--	70	85	82	82	75
17	64	54	36	32	46	47	62	70	88	87	80	78
18	64	60	35	33	50	49	62	66	81	86	79	77
19	--	57	37	41	52	50	65	74	86	83	85	77
20	65	47	44	40	52	50	66	69	84	80	77	76
21	64	46	46	32	55	57	70	66	82	80	77	67
22	63	46	32	32	47	50	67	74	82	81	77	62
23	63	45	32	32	47	50	62	72	84	82	77	66
24	60	46	32	40	47	54	72	72	87	86	78	66
25	61	45	34	52	51	57	68	70	88	86	79	69
26	56	42	37	33	50	54	--	81	88	82	78	69
27	50	43	38	38	47	56	69	82	90	79	80	74
28	58	43	33	36	44	58	70	75	89	80	84	72
29	51	42	35	41	--	56	72	71	88	94	84	75
30	55	42	34	39	--	45	67	74	88	81	81	74
31	56	--	35	39	--	50	--	75	--	82	75	--
Average	63	48	40	39	48	50	65	68	81	84	79	73

ARKANSAS RIVER BASIN--Continued

VERDIGRIS RIVER NEAR LENAPAH, OKLA.

LOCATION.--At gaging station at county highway bridge, 2¾ miles east of Lenapah, Nowata County, 4¼ miles upstream from Cedar Creek, and at mile 144.6.
DRAINAGE AREA.--3,639 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1951 to September 1954.
Water temperatures: October 1951 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 659 ppm Mar. 11-20; minimum, 163 ppm May 1-5.
Hardness: Maximum, 275 ppm June 6-7; minimum, 84 ppm May 1-5.
Specific conductance: Maximum daily, 1,230 micromhos Mar. 11-12, Sept. 9; minimum daily, 179 micromhos May 3.
Water temperatures: Maximum observed daily, 90°F Aug. 29; minimum observed daily, 35°F Dec. 22, Jan. 22.
EXTREMES, 1951-54.--Dissolved solids: Maximum, 662 ppm Dec. 21-31,1952; minimum, 163 ppm May 1-5, 1954.
Hardness: Maximum, 304 ppm Oct. 4-5, 9-10, 1951, Jan. 1-10, 1952; minimum, 84 ppm May 1-5, 1954.
Specific conductance: Maximum daily, 1,270 micromhos Dec. 26, 27, 1952; minimum daily, 179 micromhos May 3, 1954.
Water temperatures: Maximum observed daily, 92°F July 28, 1952; minimum observed daily, freezing point Dec. 21-22, 1951, Jan. 3, 1952.
REMARKS.--Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluorids (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-10, 1953....	11.3	3.2	0.00	46	14	87	4.5	135	0	39	144	0.5	1.1	0.17	422	0.57	13	172	62	51	2.7	749	7.9
Oct. 11-20.....	13.7	3.0	.00	46	14	95	4.6	136	0	40	153	.5	.5	.17	438	.60	16	172	61	54	3.1	783	7.5
Oct. 21-31.....	26.5	2.6	.00	48	14	87	4.4	139	0	37	149	.5	.6	.16	429	.58	31	178	64	51	2.8	771	7.8
Nov. 1-10	18.2	--	--	49	10	92	--	143	0	37	153	--	.2	--	424	.58	21	165	48	55	3.1	794	7.6
Nov. 11-20	27.6	--	--	51	9.7	100	--	143	0	42	163	--	2.4	--	462	.63	34	167	50	57	3.4	842	7.8
Nov. 21-30.....	186	--	--	50	8.8	57	--	141	0	29	102	--	1.3	--	339	.46	170	161	46	44	2.0	607	7.7
Dec. 1-10.....	101	5.2	.00	56	15	85	4.8	153	0	42	145	.5	4.4	.15	459	.62	125	201	76	47	2.6	805	7.3
Dec. 11-20	38.2	4.8	.00	55	12	89	4.2	141	0	31	158	.3	3.1	.14	446	.61	46	186	71	50	2.8	796	8.0
Dec. 21-31.....	25.6	--	--	56	9.6	84	--	140	0	24	157	--	1.8	--	434	.59	30	179	64	50	2.7	781	8.1
Jan. 1-10, 1954 ...	22.4	--	--	57	9.5	82	--	147	0	29	149	--	2.9	--	434	.59	26	181	60	50	2.7	775	8.1
Jan. 11-20	14.8	--	--	57	11	82	--	154	0	32	136	--	3.8	--	420	.57	17	187	61	49	2.6	761	7.8
Jan. 21-31	15.5	--	--	56	12	83	--	155	0	36	137	--	4.2	--	428	.58	18	189	62	49	2.6	771	7.6
Feb. 1-10.....	12.1	--	--	59	13	86	--	164	0	47	143	--	3.8	--	456	.62	15	200	66	48	2.6	813	7.5
Feb. 11-20.....	7.95	--	--	60	13	102	--	177	0	62	144	--	2.0	--	487	.66	10	203	58	52	3.1	863	7.4
Feb. 21-28.....	64.6	--	--	58	14	112	--	165	0	62	167	--	5.9	--	552	.75	96	202	67	55	3.4	963	7.6
Mar. 1-10.....	31.4	--	--	61	15	138	--	146	0	62	225	--	10	--	602	.82	51	212	92	59	4.1	1,090	7.9
Mar. 11-20	16.9	--	--	68	15	146	--	156	0	51	262	--	5.4	--	659	.90	30	230	102	58	4.2	1,200	7.8
Mar. 21-31	21.5	--	--	65	15	122	--	162	0	39	215	--	2.3	--	580	.79	34	225	92	54	3.5	1,030	7.7
Apr. 1-10	32.7	--	--	66	12	92	--	178	0	42	165	--	3.3	--	512	.70	45	214	68	48	2.7	900	7.8
Apr. 11-20	40.5	--	--	66	15	118	--	186	0	53	205	--	3.3	--	596	.81	65	226	74	53	3.4	1,060	7.4
Apr. 21-22.....	25.0	--	--	69	16	130	--	191	0	54	225	--	3.8	--	640	.87	43	238	82	54	3.6	1,140	8.2
Apr. 23-27	929	--	--	61	10	56	--	168	0	31	105	--	2.9	--	395	.54	991	193	56	39	1.8	681	8.1
Apr. 28-30.....	5,343	--	--	43	4.3	21	--	121	0	18	36	--	3.8	--	201	.27	2,900	125	26	27	.8	359	8.1

May 1-5, 1954.....	18,850	--	--	28	3.4	13	--	78	0	14	22	--	0.2	--	163	.22	8,300	84	20	25	.6	244	7.8
May 6-10.....	966	--	--	50	6.1	27	--	126	0	29	54	--	.1	--	294	.40	767	150	47	28	1.0	452	8.0
May 11-20	295	14	0.01	65	9.2	49	3.6	154	0	44	86	0.3	6.6	0.07	362	.49	288	200	74	34	1.5	602	8.0
May 21-28	190	--	--	73	8.8	53	--	175	0	49	100	--	4.0	--	424	.58	218	218	74	35	1.6	707	8.0
May 29-31	778	--	--	64	7.4	47	--	156	0	41	90	--	4.2	--	373	.51	784	190	62	35	1.5	626	8.0
June 1-5	409	--	--	72	13	46	--	189	0	45	95	--	2.5	--	401	.55	443	233	78	30	1.3	687	8.2
June 6-7	562	--	--	83	17	74	--	173	8	47	152	--	6.2	--	544	.74	825	275	120	37	1.9	927	8.5
June 8	450	--	--	81	16	96	--	146	6	44	220	--	3.1	--	652	.89	792	269	140	44	2.5	1,020	8.5
June 9-10	209	--	--	70	13	72	--	146	4	35	165	--	2.2	--	512	.70	289	230	104	41	2.1	836	8.4
June 11-14	296	--	--	75	18	103	--	145	4	44	212	--	1.9	--	596	.81	476	260	134	46	2.8	1,050	8.4
June 15-20	363	--	--	56	13	66	--	126	2	39	138	--	2.2	--	432	.59	423	195	88	42	2.1	728	8.3
June 21-30	54.9	10	.01	56	15	73	4.6	122	0	36	152	.3	1.1	.25	448	.61	66	200	100	43	2.2	749	8.2
July 1-10	44.6	8.0	.01	62	16	94	4.7	128	0	47	206	.3	.2	.11	545	.74	66	220	115	48	2.8	911	8.1
July 11-20	5.40	--	--	64	19	112	--	132	0	34	243	--	1.4	--	599	.81	8.7	236	128	51	3.2	1,090	--
July 21-31	2.28	--	--	66	17	124	--	112	0	36	261	--	1.3	--	604	.82	3.7	234	142	54	3.5	1,130	8.1
Aug. 1-10.....	4.70	--	--	58	22	106	--	109	0	33	255	--	1.2	--	590	.80	7.5	235	146	50	3.0	1,090	8.2
Aug. 11-20.....	2.73	--	--	61	15	131	--	113	0	34	255	--	1.3	--	577	.78	4.3	215	122	57	3.9	1,110	8.2
Aug. 21-31.....	.92	--	--	56	17	136	--	106	0	36	270	--	1.3	--	595	.81	1.5	210	123	58	4.1	1,180	8.0
Sept. 1-10	.35	5.0	.02	58	18	151	5.6	100	0	38	298	.3	.6	.04	656	.89	.6	220	138	59	4.4	1,250	7.8
Sept. 11-20	2.83	--	--	50	11	138	--	93	0	41	260	--	1.2	--	604	.82	4.6	170	94	64	4.6	1,150	7.9
Sept. 21-30	.98	4.0	.01	50	18	138	5.0	94	0	37	281	.3	.5	.00	604	.82	1.6	200	123	59	4.2	1,180	7.9
Weighted average.	390	--	--	37	5.2	25	--	a 100	--	20	45	--	1.2	--	224	0.30	236	114	32	32	1.0	361	--

a Includes equivalent of individual carbonate values shown above.

ARKANSAS RIVER BASIN--Continued

VERDIGRIS RIVER NEAR LENAPAH, OKLA.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	75	62	49	44	45	52	56	64	76		--	83
2	75	63	51	45	--	47	65	64	74		--	82
3	75	58	51	45	46	45	65	61	74		--	85
4	72	56	52	45	47	46	66	59	71		--	84
5	68	57	52	47	49	47	68	60	72		--	86
6	65	50	51	47	48	49	70	60	75		--	83
7	63	48	50	50	47	51	72	62	75		--	80
8	63	50	50	53	47	52	70	63	78		--	83
9	65	50	47	40	53	56	68	65	80		--	82
10	66	50	48	38	51	55	65	66	83		--	80
11	65	51	45	37	46	58	64	67	80		--	80
12	68	55	--	36	--	60	65	66	82		--	77
13	67	55	--	37	53	54	70	67	73		--	75
14	68	55	42	38	55	52	71	68	72		--	80
15	70	57	41	40	57	50	70	70	73		--	81
16	70	54	41	37	58	52	67	71	--		--	80
17	70	58	40	37	54	54	72	70	--		--	81
18	69	60	40	44	53	56	74	70	--		85	84
19	68	--	42	45	53	56	70	70	--		87	83
20	68	153	43	42	54	51	70	72	--		86	85
21	68	52	44	36	54	50	68	75	--		86	84
22	66	--	35	35	54	49	64	72	--		84	77
23	65	51	36	38	55	55	70	72	--		82	75
24	--	49	37	39	50	60	70	76	--		84	74
25	62	50	37	47	50	60	72	72	--		84	74
26	58	50	39	38	50	60	73	73	--		83	76
27	55	48	40	38	51	60	73	75	--		87	77
28	60	47	41	40	51	66	69	75	--		88	78
29	63	47	40	42	--	55	68	75	--		90	79
30	58	47	42	42	--	50	64	76	--		87	75
31	59	--	42	45	--	55	--	77	--		85	--
Average	66	53	44	42	51	54	68	69	--		--	80

VERDIGRIS RIVER NEAR CLAREMORE, OKLA.

LOCATION.--At gaging station at bridge on State Highway 20, 2.3 miles downstream from Caney River, 4½ miles west of Claremore, Rogers County, 12.4 miles upstream from Bird Creek, and at mile 76.0.
DRAINAGE AREA.--6,534 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1954.
Water temperatures: October 1947 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 722 ppm Mar. 21-31; minimum, 204 ppm May 2-10.
Hardness: Maximum, 262 ppm Mar. 21-31; minimum, 98 ppm May 2-10.
Specific conductance: Maximum daily, 1,330 micromhos Mar. 28, 29, Apr. 1; minimum daily, 280 micromhos May 5.
Water temperatures: Maximum observed daily, 89°F July 14-15, 18-19; minimum observed daily, freezing point on several days during December and January.
EXTREMES, 1947-54.--Dissolved solids: Maximum, 747 ppm Feb. 1-10, 1951; minimum, 126 ppm June 22-30, 1948.
Hardness: Maximum, 406 ppm Feb. 1-10, 1951; minimum, 50 ppm June 22-30, 1948.
Specific conductance: Maximum daily, 1,330 micromhos Jan. 18, 1953, Mar. 28, 29, Apr. 1, 1954; minimum daily, 130 micromhos June 24, 1948.
Water temperatures: Maximum observed daily, 93°F July 22, 1949; minimum observed daily, freezing point many days during winter months.
REMARKS.--Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-8, 1953	16.6	--	--	47	8.9	83	--	112	0	26	163	--	0.8	--	434	0.59	19	154	62	54	2.9	758	7.9
Oct. 9-10	23.0	--	--	54	10	104	--	115	0	29	202	--	.2	--	520	.71	32	177	83	56	3.4	907	8.0
Oct. 11-16	14.5	--	--	51	10	96	--	116	0	27	191	--	1.0	--	492	.67	19	170	75	55	3.2	853	8.0
Oct. 17-20	13.0	--	--	47	9.1	77	--	117	0	24	153	--	.4	--	410	.56	14	155	59	52	2.7	726	8.0
Oct. 21-31	33.8	--	--	42	6.1	55	--	103	0	23	104	--	.2	--	306	.42	28	130	46	48	2.1	554	7.6
Nov. 1-3	58.3	--	--	43	6.9	57	--	106	0	27	109	--	.6	--	324	.44	51	136	49	48	2.1	579	7.5
Nov. 4-10	33.0	--	--	62	10	115	--	127	0	28	225	--	.2	--	562	.76	50	197	93	56	3.6	987	7.8
Nov. 11-20	24.8	--	--	60	11	104	--	127	0	33	200	--	.5	--	518	.70	35	193	89	54	3.3	920	8.0
Nov. 21-30	334	4.2	0.00	66	15	121	5.3	147	0	44	220	0.3	1.6	0.18	580	.79	523	226	106	53	3.5	1,040	7.8
Dec. 1-10	162	--	--	61	12	117	--	147	0	34	212	--	.6	--	554	.75	242	201	80	56	3.6	992	7.9
Dec. 11-20	69.7	3.6	.00	50	12	97	4.8	128	0	39	168	.5	1.2	.15	458	.62	86	174	70	54	3.2	829	7.5
Dec. 21-31	45.5	--	--	54	11	96	--	126	0	35	180	--	1.2	--	484	.66	59	180	77	54	3.1	850	8.0
Jan. 1-10, 1954	36.4	--	--	56	9.6	92	--	129	0	39	168	--	1.8	--	456	.62	45	179	74	53	3.0	830	7.5
Jan. 11-20	30.8	--	--	62	7.9	91	--	130	0	52	165	--	3.2	--	470	.64	39	187	80	51	2.9	846	7.7
Jan. 21-31	29.5	--	--	60	7.7	84	--	135	0	43	153	--	2.2	--	441	.60	35	181	70	50	2.7	793	7.5
Feb. 1-10	26.2	--	--	61	8.8	81	--	148	0	36	152	--	.7	--	438	.60	31	188	66	48	2.6	791	7.6
Feb. 11-20	21.5	--	--	71	11	106	--	163	0	35	205	--	.6	--	552	.75	32	224	90	51	3.1	986	7.7
Feb. 21-28	44.5	--	--	70	16	113	--	162	0	39	215	--	1.3	--	553	.75	66	240	108	51	3.2	1,020	7.8

ARKANSAS RIVER BASIN--Continued

VERDIGRIS RIVER NEAR CLAREMORE, OKLA.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluorids (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Mar. 1-10, 1954	66.8	--	--	76	13	118	--	169	0	46	228	--	1.0	--	588	0.80	106	244	106	51	3.3	1,080	8.1
Mar. 11-20	17.9	--	--	76	16	138	--	160	0	52	260	--	.8	--	656	.89	32	254	123	54	3.8	1,180	8.1
Mar. 21-31	57.8	--	--	79	16	156	--	162	0	49	292	--	.8	--	722	.98	113	262	130	56	4.3	1,270	7.9
Apr. 1-10	33.2	--	--	78	13	141	--	153	0	45	285	--	1.3	--	702	.95	63	250	124	55	3.9	1,270	7.5
Apr. 11-20	29.5	--	--	69	12	127	--	146	0	48	245	--	1.3	--	645	.88	51	222	102	55	3.7	1,160	7.6
Apr. 21-24	62.8	--	--	68	15	134	--	178	0	51	235	--	.2	--	684	.93	116	232	86	56	3.8	1,130	8.1
Apr. 25-30	2,491	--	--	39	4.3	51	--	86	0	22	100	--	.2	--	336	.46	2,260	115	44	49	2.1	514	7.9
May 1	16,400	--	--	37	6.1	49	--	85	0	23	101	--	4.2	--	376	.51	16,650	118	48	48	2.0	518	8.0
May 2-10	18,630	--	--	31	5.0	21	--	88	0	15	40	--	1.8	--	204	.28	10,260	98	26	32	.9	319	7.9
May 11-14	1,896	--	--	49	6.7	29	--	131	0	25	58	--	3.8	--	292	.40	1,490	150	42	30	1.0	458	8.1
May 15-20	453	--	--	61	8.3	41	--	154	0	33	87	--	3.9	--	354	.48	433	186	60	32	1.3	592	8.1
May 21-31	782	12	0.01	61	12	62	3.8	138	0	36	126	.3	2.5	0.12	398	.54	840	200	87	40	1.9	670	7.8
June 1-4	1,835	--	--	44	8.5	49	--	100	1	35	95	--	2.8	--	332	.45	1,640	145	62	42	1.8	547	8.3
June 5-10	1,266	--	--	58	13	61	--	136	4	37	125	--	2.4	--	409	.56	1,400	196	78	40	1.9	691	8.5
June 11-14	1,038	--	--	41	8.6	57	--	89	0	23	120	--	3.1	--	338	.46	947	138	65	47	2.1	587	8.2
June 15-17	1,146	--	--	51	12	68	--	110	0	24	148	--	2.9	--	422	.57	1,310	178	88	45	2.2	706	8.1
June 18-20	696	--	--	65	14	92	--	124	2	32	202	--	1.8	--	527	.72	990	220	115	48	2.7	918	8.3
June 21-30	164	12	.02	56	15	75	3.8	128	0	32	157	.3	.4	.31	452	.61	200	200	95	44	2.3	768	8.2
July 1-10	41.0	12	.01	58	11	78	4.2	128	0	27	157	.3	1.3	.00	418	.57	46	190	85	46	2.5	807	8.2
July 11-20	18.1	--	--	62	15	80	--	140	0	29	166	--	2.5	--	456	.62	22	216	102	45	2.4	839	7.9
July 21-31	3.41	--	--	62	15	80	--	144	00	25	174	--	.6	--	486	.66	4.5	218	100	44	2.3	866	--
Aug. 1-10	44.5	--	--	61	13	88	--	146	0	15	182	--	1.2	--	482	.66	58	205	86	48	2.7	861	8.2
Aug. 11-20	21.0	--	--	64	13	98	--	142	2	23	198	--	1.2	--	524	.71	30	214	94	50	2.9	941	8.3
Aug. 21	123	--	--	64	8.6	130	--	127	8	38	220	--	2.6	--	533	.72	177	195	78	59	4.0	980	8.5
Aug. 22-31	18.6	--	--	40	15	62	--	106	0	31	125	--	1.7	--	419	.57	21	160	73	46	2.1	599	8.2
Sept. 1-10	4.19	--	--	42	9.0	58	--	110	0	21	111	--	1.3	--	329	.45	3.7	142	52	47	2.1	598	8.1
Sept. 11-20	9.31	8.0	.00	46	10	69	4.8	120	0	45	117	.3	1.2	.00	360	.49	9.0	158	60	48	2.4	643	7.7
Sept. 21-30	1.26	--	--	45	9.6	59	--	123	0	22	112	--	1.0	--	256	.48	1.2	152	51	46	2.1	625	8.0
Weighted average...	706	--	--	37	6.4	35	--	a97	--	20	69	--	2.0	--	270	0.37	515	119	40	39	1.4	430	--

a Includes equivalent of individual carbonate values shown above.

ARKANSAS RIVER BASIN--Continued

VERDIGRIS RIVER NEAR CLAREMORE, OKLA.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	70	55	47	35	40	47	52	63	73	84	79	80
2	69	56	48	40	41	45	55	61	71	84	78	78
3	69	57	50	38	45	43	58	60	69	85	80	76
4	64	55	45	38	43	42	--	56	68	85	83	77
5	63	53	44	36	43	44	62	54	73	86	84	78
6	62	49	40	38	45	44	65	58	71	86	83	79
7	60	48	39	40	45	47	67	60	70	87	82	79
8	59	47	40	41	39	48	66	60	74	87	80	78
9	58	45	41	--	38	50	65	61	78	86	79	76
10	59	44	41	36	40	54	66	62	76	87	80	75
11	63	46	43	32	43	56	65	63	79	88	81	74
12	68	48	41	32	43	59	64	64	79	88	82	74
13	66	49	40	32	46	52	62	65	78	88	82	73
14	67	49	39	33	50	49	63	65	77	89	84	74
15	66	52	39	35	53	47	64	66	77	89	85	75
16	65	54	38	35	53	50	64	67	78	87	87	76
17	64	56	37	37	51	51	65	69	80	87	88	76
18	63	58	35	38	50	54	66	68	81	89	88	76
19	63	59	35	40	49	52	--	67	82	89	85	77
20	64	52	--	43	48	52	67	67	73	85	82	78
21	64	49	36	40	59	53	68	66	74	88	80	75
22	63	48	32	34	51	54	69	68	84	87	83	73
23	60	46	32	32	50	54	69	70	85	86	84	70
24	59	45	32	33	52	55	70	73	85	86	85	68
25	58	45	32	35	52	57	72	70	86	85	87	70
26	58	44	35	36	50	57	73	69	86	84	88	72
27	55	44	36	33	50	58	72	69	86	84	87	74
28	53	46	37	33	48	59	70	70	87	83	87	75
29	54	46	38	34	--	57	68	72	87	82	86	77
30	54	46	32	37	--	55	65	73	85	80	85	78
31	56	--	32	41	--	53	--	75	--	80	82	--
Average	62	50	39	36	47	52	65	66	78	86	83	75

ARKANSAS RIVER BASIN--Continued

VERDIGRIS RIVER NEAR INOLA, OKLA.

LOCATION.--At gaging station at bridge on State Highway 33, 6 miles downstream from Dog Creek, 6 miles west of Inola, Rogers County, and at mile 48.8.
DRAINAGE AREA.--7,911 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1954.
Water temperatures: October 1950 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 2,230 ppm Sept. 29; minimum, 166 ppm May 3-5.
Hardness: Maximum, 430 ppm Sept. 29; minimum, 48 ppm Oct. 4.
Specific conductance: Maximum daily, 3,800 micromhos Sept. 29; minimum daily, 199 micromhos May 4.
Water temperatures: Maximum observed daily, 95°F on several days during July; minimum observed daily, freezing point on several days during December and January.
EXTREMES, 1947-54.--Dissolved solids: Maximum, 2,230 ppm Sept. 29, 1954; minimum, 91 ppm June 22-30, July 1-2, 1948.
Hardness: Maximum, 500 ppm Feb. 20-22, 1948; minimum, 48 ppm Oct. 4, 1953.
Specific conductance: Maximum daily, 4,010 micromhos Nov. 1, 1947; minimum daily, 143 micromhos June 24, 1948.
Water temperatures(1950-54): Maximum observed daily, 95°F on several days during July 1954; minimum observed daily, freezing point on many days during winter months.
REMARKS.--Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-3, 1953	249			54	13	170		104	0	19	325		5.8		747	1.02	502	190	105	66	5.4	1,300	7.8
Oct. 4	1,100			11	5.0	52		36	0	19	76		5.0		234	.32	695	48	18	70	3.2	354	7.4
Oct. 5-7	97.7			22	6.1	73		50	0	13	135		3.5		368	.50	97	80	39	66	3.5	568	7.3
Oct. 8-9	47.5			30	8.5	101		72	0	19	176		3.9		436	.59	56	110	51	65	4.2	734	7.7
Oct. 10	44.0			42	12	145		91	0	24	258		6.5		606	.82	72	154	80	67	5.1	1,070	8.0
Oct. 11-14	51.5			46	11	136		99	0	30	252		5.5		594	.81	83	162	81	65	4.6	1,070	7.7
Oct. 15-20	47.0			53	12	158		126	0	21	290		9.1		678	.92	86	181	78	65	5.1	1,210	7.5
Oct. 21-23	81.7			58	12	177		127	0	19	320		9.4		704	.96	155	192	88	67	5.6	1,300	7.9
Oct. 24-26	194			50	9.0	117		126	0	19	210		9.2		508	.69	266	162	59	61	4.0	936	7.9
Oct. 27-31	158			45	6.4	73		108	0	28	125		14		371	.50	158	139	50	53	2.7	665	8.0
Nov. 1-10	78.1			54	10	123		110	0	27	228		8.4		561	.76	118	176	86	60	4.0	997	7.8
Nov. 11-12	43.5			63	13	166		118	0	27	318		5.4		727	.99	85	210	114	63	5.0	1,290	7.8
Nov. 13-18	39.3			70	15	222		120	0	26	425		5.1		926	1.26	98	238	140	67	6.2	1,620	7.7
Nov. 19-20	502			39	7.9	62		84	0	35	112		7.0		326	.44	442	130	61	51	2.4	590	7.8
Nov. 21-23	698			58	10	95		119	0	55	170		2.8		498	.68	939	187	90	52	3.0	868	7.8
Nov. 24-30	319			80	14	164		146	0	65	300		6.5		782	1.06	674	258	138	58	4.4	1,340	7.8
Dec. 1-2	108			79	13	178		143	0	65	320		8.5		812	1.10	237	252	135	61	4.9	1,400	8.0
Dec. 3-10	313			62	13	122		133	0	38	230		5.5		582	.79	492	209	100	56	3.7	1,050	8.0
Dec. 11-20	119			61	12	150		130	0	41	270		5.6		644	.88	207	202	96	62	4.6	1,170	7.9
Dec. 21-31	60.4			74	15	217		138	0	37	402		6.5		882	1.20	144	248	135	66	6.0	1,600	7.8

Jan. 1-10, 1954	50.2			77	16	228		141	0	38	418		9.4		924	1.26	125	258	142	66	6.1	1,660	7.5
Jan. 11-20	46.9			72	18	219		138	0	37	400		16		907	1.23	115	254	140	65	6.0	1,620	8.0
Jan. 21-31	58.5			70	17	212		137	0	35	370		12		849	1.15	134	244	132	65	5.9	1,530	7.4
Feb. 1-10	48.6			68	16	185		139	0	41	328		16		782	1.06	103	236	122	63	5.3	1,410	7.1
Feb. 11-20	49.3			78	18	238		145	0	52	410		13		956	1.30	127	268	150	66	6.3	1,700	7.2
Feb. 21-28	71.4			68	16	159		142	0	39	292		20		714	.97	138	235	118	60	4.5	1,290	7.2
Mar. 1-10	84.3			71	15	155		152	0	39	275		7.7		694	.94	158	238	114	59	4.4	1,210	8.0
Mar. 11-15	49.0			75	20	211		162	0	39	385		8.2		905	1.23	120	268	136	63	5.6	1,570	7.8
Mar. 16-20	40.6			90	17	250		162	0	41	485		4.5		1,150	1.56	126	294	162	65	6.3	1,910	7.9
Mar. 21-26	83.5			89	19	247		170	0	40	485		3.9		1,160	1.58	262	302	162	64	6.2	1,900	7.7
Mar. 27-31	187			74	16	154		152	0	41	288		8.2		788	1.07	398	252	128	57	4.2	1,310	7.1
Apr. 1-4	48.2			81	18	215		155	0	44	390		19		924	1.26	120	276	149	63	5.6	1,620	8.0
Apr. 5-8	54.8			90	20	267		157	0	45	505		12		1,140	1.55	169	308	180	65	6.6	1,980	7.9
Apr. 9-10	51.0			114	26	359		164	0	45	695		5.8		1,460	1.99	201	392	258	67	7.9	2,570	8.2
Apr. 11-20	49.6			106	25	335		170	0	43	645		4.2		1,380	1.88	185	368	228	66	7.6	2,440	7.9
Apr. 21-24	92.5			96	20	283		170	0	43	540		7.5		1,190	1.62	297	322	182	66	6.9	2,090	8.1
Apr. 25-29	1,050			76	10	173		173	0	50	290		3.5		742	1.01	2,100	232	90	62	5.0	1,320	8.0
Apr. 30	6,880			44	5.6	37		82	0	49	59		4.5		260	.35	4,830	133	65	38	1.4	452	8.2
May 1-2, 6-10	16,720			34	4.9	24		93	0	18	45		3.1		210	.29	9,480	105	29	33	1.0	342	8.0
May 3-5	35,870			23	2.3	13		65	0	9.7	22		4.0		166	.23	16,080	67	14	30	.7	208	7.9
May 11-12	3,170			42	4.6	24		117	0	21	44		3.7		232	.32	1,990	124	28	30	.9	381	8.2
May 13-16	942			48	7.1	39		128	0	27	70		4.0		296	.40	753	149	44	36	1.4	497	8.0
May 17-20	452			59	8.5	53		145	0	34	105		5.5		392	.53	478	182	63	39	1.7	645	8.2
May 21-26	418			66	8.6	69		153	2	35	129		4.4		442	.60	499	200	71	43	2.1	744	8.3
May 27-29	2,040			47	6.0	43		105	0	40	80		3.1		318	.43	1,750	142	56	40	1.6	523	8.1
May 30-31	1,520			60	8.9	77		113	0	48	153		5.6		497	.68	2,040	186	94	47	2.5	779	8.2
June 1-6	1,766			49	7.7	70		106	2	49	120		2.0		366	.50	1,750	154	64	54	2.4	628	8.3
June 7-9	1,291			59	11	100		116	2	29	192		2.3		505	.69	1,760	192	94	53	3.1	858	8.3
June 10	3,010			52	8.9	58		118	3	22	120		5.1		384	.52	3,120	166	64	43	2.0	643	8.5
June 11-14	1,215			49	13	71		106	0	30	145		2.9		461	.63	1,510	178	91	46	2.3	737	8.0
June 15-16	1,830			32	7.3	46		78	0	20	92		1.3		320	.44	1,580	110	46	48	1.9	475	6.9
June 17-20	1,164			47	9.1	80		99	0	23	150		2.5		472	.64	1,480	155	74	53	2.8	725	7.9
June 21-30	204	10	0.01	64	17	126	3.6	128	0	55	246	0.3	1.0	0.11	620	.84	341	230	125	54	3.6	1,050	8.2

ARKANSAS RIVER BASIN--Continued

VERDIGRIS RIVER NEAR INOLA, OKLA.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
July 1-2, 1954	61.0			70	13	122		136	0	31	251		2.0		650	0.88	107	230	118	54	3.5	1,120	--
July 3-6	44.5			75	18	156		140	0	31	312		1.8		724	.98	87	262	148	56	4.2	1,340	--
July 7-8	34.0			80	21	204		144	0	31	418		1.4		945	1.29	87	286	168	61	5.3	1,660	--
July 9	78.0			90	24	283		146	0	32	560		1.7		1,210	1.65	255	322	202	66	6.9	2,130	--
July 10	81.0			74	24	182		146	0	32	372		1.2		860	1.17	188	282	162	58	4.7	1,500	8.2
July 11-13	50.7			64	16	144		138	3	32	282		1.4		682	.93	93	227	109	58	4.2	1,200	8.4
July 14-15	34.0			71	23	200		140	4	33	380		2.4		874	1.19	80	270	149	62	5.3	1,500	8.4
July 16-20	23.2			84	22	286		148	2	30	540		1.4		1,150	1.56	72	300	175	67	6.8	2,080	8.3
July 21-24	17.8			98	26	391		153	1	30	755		1.3		1,520	2.07	73	350	223	71	9.1	2,750	8.3
July 25-29	15.2			118	32	524		156	0	28	1,000		2.8		2,020	2.75	83	425	297	73	11	3,520	8.2
July 30-31	21.5			108	27	440		155	4	28	850		1.6		1,650	2.24	96	380	246	72	9.8	2,900	8.4
Aug. 1	23.0			95	30	390		161	4	37	735		1.9		1,410	1.92	88	360	222	70	8.9	2,610	8.4
Aug. 2-5	37.5			80	17	295		159	3	31	525		3.6		1,040	1.41	105	270	134	70	7.8	2,010	8.3
Aug. 6-10	95.2			74	24	214		165	4	25	415		2.0		906	1.23	233	285	144	62	5.5	1,680	8.4
Aug. 11-15	49.4			64	18	153		180	2	25	265		3.5		630	.86	84	235	84	59	4.3	1,160	8.3
Aug. 16-17	23.0			75	36	192		164	4	23	420		5.4		942	1.28	58	335	177	55	4.6	1,710	8.5
Aug. 18-19	16.5			85	36	309		167	12	28	595		5.2		1,440	1.96	64	360	203	65	7.1	2,240	8.5
Aug. 20	234			101	34	460		148	10	35	860		5.9		1,680	2.28	1,060	390	252	72	10	3,010	8.5
Aug. 21-25	121			45	13	85		115	0	24	165		2.9		432	.59	141	165	71	53	2.9	791	8.0
Aug. 26-31	34.2			61	15	150		136	2	16	285		2.3		622	.85	57	215	100	60	4.4	1,180	8.3
Sept. 1-3	13.0			80	18	281		150	0	15	550		2.0		1,110	1.51	39	275	152	69	7.4	2,080	8.2
Sept. 4-10	13.1			108	24	489		154	0	16	950		5.2		1,810	2.46	64	370	244	74	11	3,310	7.8
Sept. 11-12	24.0			104	26	434		156	2	15	850		3.0		1,630	2.22	106	365	234	72	9.9	2,970	8.3
Sept. 13-20	20.6			94	18	357		164	0	14	670		2.2		1,360	1.85	76	310	176	71	8.8	2,500	8.0
Sept. 21-25	12.6			116	20	458		166	0	16	890		2.4		1,780	2.42	61	370	234	73	10	3,190	8.0
Sept. 26-28	22.0			98	21	385		169	0	17	700		1.8		1,520	2.07	90	330	192	72	9.2	2,710	8.1
Sept. 29	17.0			136	22	590		175	0	18	1,150		--		2,230	3.03	102	430	286	75	13	3,800	8.2
Sept. 30	19.0			90	23	350		170	2	18	675		1.3		1,410	1.92	72	320	177	70	8.5	2,400	8.3
Weighted average	875	--	--	37	5.5	41		a91	--	21	76	--	3.8	--	279	0.38	659	115	40	44	1.7	444	--

a Includes equivalent of individual carbonate values shown above.

ARKANSAS RIVER BASIN--Continued

VERDIGRIS RIVER NEAR INOLA, OKLA.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	86	60	51	34	44	50	54	68	75	92	81	80
2	84	60	53	37	48	49	54	67	76	93	81	80
3	84	60	53	35	48	48	56	67	74	94	81	80
4	71	59	53	36	48	48	58	67	88	94	81	80
5	76	59	52	36	48	47	57	64	76	94	80	80
6	75	56	50	36	48	49	59	62	76	94	80	80
7	69	--	50	37	48	51	60	61	76	94	80	71
8	68	55	50	37	49	52	62	62	76	94	80	80
9	76	52	49	--	49	54	65	60	76	94	80	71
10	76	52	44	34	59	55	64	60	77	89	80	80
11	76	51	49	33	48	55	64	63	71	94	80	71
12	76	51	48	32	48	54	64	60	71	95	80	71
13	76	52	46	32	49	54	66	64	80	95	80	71
14	--	54	45	33	50	51	66	64	80	94	80	71
15	74	54	46	33	51	51	66	66	80	95	80	71
16	75	55	46	33	51	51	69	67	80	94	80	71
17	74	55	44	32	49	53	70	68	80	95	80	71
18	74	56	42	34	51	54	71	68	80	95	80	71
19	72	52	46	34	49	54	72	68	80	95	80	80
20	70	56	41	34	49	54	72	68	80	95	80	80
21	72	52	41	32	51	55	73	70	84	91	71	80
22	69	52	36	32	52	55	71	61	87	91	71	71
23	67	52	32	32	51	54	73	70	88	90	71	79
24	66	52	32	33	52	57	73	70	88	91	71	71
25	66	52	34	35	52	55	74	71	88	90	71	71
26	62	52	35	32	52	55	74	70	89	--	80	71
27	64	52	35	36	50	57	73	70	90	90	80	71
28	64	52	34	38	49	58	74	70	91	90	80	71
29	61	50	35	39	--	54	73	70	92	90	81	74
30	60	50	34	--	--	51	73	70	92	81	80	71
31	60	--	34	45	--	51	--	70	--	81	80	--
Average	71	54	43	35	50	53	67	66	81	92	79	75

NEOSHO RIVER NEAR COMMERCE, OKLA.

LOCATION.--At gaging station at County highway bridge, 1¼ miles upstream from Mud Creek, 1¾ miles downstream from Four Mile Creek, 4½ miles west of Commerce, Ottawa County, and at mile 153.4.
DRAINAGE AREA.--5,876 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1954.
Water temperatures: November 1947 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 584 ppm Apr. 18-20; minimum, 136 ppm May 2-5.
Hardness: Maximum, 297 ppm June 9-10; minimum, 59 ppm May 2-5.
Specific conductance: Maximum daily, 943 micromhos Apr. 18; minimum daily, 128 micromhos May 4.
Water temperatures: Maximum observed daily, 90°F June 30; minimum observed daily, 33°F Jan. 21.
EXTREMES, 1947-54.--Dissolved solids: Maximum, 690 ppm Mar. 1-4, 1953; minimum, 83 ppm July 8-10, 1949.
Hardness: Maximum, 462 ppm Jan. 21-31, 1951; minimum, 51 ppm Aug. 11-12, 1948.
Specific conductance: Maximum daily, 1,140 micromhos Apr. 2, 1953; minimum daily, 126 micromhos July 27-28, 1948.
Water temperatures: Maximum observed daily, 95°F June 11, 13, 1953; minimum observed daily, freezing point on many days during winter months.
REMARKS.--Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year October 1953 to September 1954 given in WSP 1341. No flow, Oct. 1-3, July 25-31, Aug. 1-31, Sept. 1-29.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-10, 1953	1.91	--	--	51	14	37	--	156	0	48	59	--	4.4	--	313	0.43	1.6	183	55	31	1.2	535	8.0
Oct. 11-20	.56	10	0.00	47	14	39	3.7	149	0	48	60	0.7	2.5	0.21	312	.42	.5	175	53	32	1.3	531	7.6
Oct. 21-31	2.78	--	--	48	12	39	--	152	0	50	59	--	2.3	--	300	.41	2.3	171	46	33	1.3	527	7.4
Nov. 1-10	1.97	--	--	50	12	38	--	150	0	56	54	--	3.1	--	304	.41	1.6	175	52	32	1.2	523	7.7
Nov. 11-20	2.42	7.4	.00	50	15	36	3.5	155	0	65	50	.5	1.8	.15	313	.43	2.0	186	60	29	1.2	531	7.4
Nov. 21-30	6.53	--	--	54	13	32	--	157	0	66	45	--	1.9	--	308	.42	5.4	186	58	27	1.0	517	8.0
Dec. 1-10	12.6	4.2	.02	69	20	33	4.0	144	0	150	36	.5	1.3	.14	402	.55	14	254	136	22	.9	636	7.9
Dec. 11-20	9.50	--	--	80	19	36	--	153	0	173	38	--	1.2	--	428	.58	11	276	150	22	.9	683	7.9
Dec. 21-31	11.8	--	--	66	15	32	--	153	0	117	38	--	1.0	--	354	.48	11	226	100	24	.9	585	8.0
Jan. 1-10, 1954	18.1	--	--	62	15	48	--	165	0	103	54	--	1.3	--	390	.53	19	216	81	33	1.4	633	7.2
Jan. 11-20	16.1	--	--	64	15	66	--	183	0	100	72	--	1.2	--	431	.59	19	221	71	39	1.9	715	7.3
Jan. 21-31	19.4	--	--	56	14	47	--	173	0	79	53	--	.7	--	354	.48	19	197	55	34	1.5	588	7.4
Feb. 1-10	15.4	--	--	59	15	32	--	173	0	82	39	--	.0	--	341	.46	14	208	66	25	1.0	562	7.8
Feb. 11-20	12.6	--	--	68	19	36	--	169	0	128	39	--	1.0	--	400	.54	14	248	109	24	1.0	636	7.4
Feb. 21-28	52.0	--	--	67	18	35	--	170	0	126	38	--	1.2	--	403	.55	57	241	102	24	1.0	617	7.5
Mar. 1-10	33.7	--	--	59	15	32	--	176	0	71	43	--	1.3	--	334	.45	30	208	64	25	1.0	547	7.8
Mar. 11-20	16.3	--	--	64	16	35	--	182	0	79	52	--	1.8	--	362	.49	16	256	76	25	1.0	618	7.5
Mar. 21-31	22.5	--	--	66	17	38	--	193	0	102	55	--	1.3	--	394	.54	24	234	76	26	1.1	643	8.0

Apr. 1-10, 1954	43.9	--	--	71	18	54	--	158	0	109	81	--	1.2	--	452	.61	54	251	122	32	1.5	745	7.7
Apr. 11-17	134	--	--	71	16	86	--	205	0	76	127	--	.6	--	535	.73	194	242	74	44	2.4	868	8.2
Apr. 18-20	156	--	--	73	15	96	--	187	0	77	158	--	1.7	--	584	.79	246	242	89	46	2.7	942	8.2
Apr. 21-22	87.5	--	--	66	17	86	--	196	0	72	132	--	1.3	--	534	.73	126	234	74	44	2.4	863	8.1
Apr. 23-28	1,795	--	--	45	9.1	39	--	118	0	60	54	--	4.8	--	313	.43	1,520	150	54	36	1.4	502	7.7
Apr. 29-30	5,790	--	--	28	6.3	14	--	70	0	24	20	--	10	--	181	.25	2,830	96	38	24	.6	250	7.8
May 1, 6-10	4,353	--	--	32	5.8	15	--	72	0	48	18	--	1.3	--	186	.25	2,190	104	45	24	.6	297	7.6
May 2-5	24,550	--	--	18	3.4	6.3	--	53	0	12	7.8	--	.2	--	136	.18	9,010	59	16	19	.4	156	7.4
May 11-20	350	--	--	53	9.0	26	--	118	0	68	38	--	5.9	--	274	.37	259	169	72	25	.9	456	8.0
May 21-31	673	10	0.01	58	14	23	3.2	122	0	92	40	0.3	3.5	0.03	309	.42	561	204	104	19	.7	504	7.5
June 1-4	996	--	--	42	6.1	19	--	78	0	66	28	--	3.6	--	228	.31	613	130	66	24	.7	358	7.6
June 5-6	592	--	--	60	8.6	29	--	104	0	93	44	--	2.5	--	342	.47	547	185	100	25	.9	509	7.2
June 7	642	--	--	82	11	44	--	126	4	133	72	--	1.6	--	482	.66	835	250	140	28	1.2	709	8.4
June 8	572	--	--	63	7.8	29	--	98	2	98	48	--	2.5	--	357	.49	551	189	105	25	.9	531	8.3
June 9-10	558	---	--	95	15	46	--	132	6	167	78	--	1.3	--	554	.75	835	297	179	25	1.2	789	8.3
June 11-12	406	--	--	78	9.1	35	--	122	4	117	60	--	3.6	--	442	.60	485	232	126	25	1.0	635	8.4
June 13-14	909	--	--	53	4.9	23	--	86	0	80	36	--	2.3	--	304	.41	746	152	82	25	.8	422	8.0
June 15-18	1,739	--	--	90	15	38	--	152	0	156	63	--	1.4	--	516	.70	2,420	286	162	22	1.0	737	8.1
June 19-20	3,760	--	--	46	6.3	17	--	112	8	38	24	--	5.0	--	256	.35	2,600	141	36	21	.6	358	8.6
June 21-30	687	12	.03	43	10	13	4.0	116	0	48	19	.3	4.3	.02	217	.30	403	150	55	16	.5	344	7.8
July 1-10	57.6	14	.02	40	9.2	15	4.1	118	2	40	19	.3	3.5	.00	205	.28	32	138	38	19	.5	359	8.3
July 11-20	7.61	--	--	42	10	16	--	136	0	39	22	--	1.6	--	223	.30	4.6	148	36	19	.6	376	8.2
July 21-31	.05	--	--	45	11	20	--	140	2	41	27	--	2.0	--	246	.33	(c)	156	38	22	.7	406	8.3
Aug. 1-31	(a)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sept. 1-29	(a)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sept. 30	2,490	--	--	52	9.8	41	--	156	0	50	62	--	2.6	--	326	.44	2,190	170	42	34	1.4	571	8.0
Weighted average	539	--	--	32	6.1	15	--	b 79	--	38	21	--	2.0	--	205	0.28	296	105	40	24	0.6	289	--

a No flow.
b Includes equivalent of individual carbonate values shown above.
c Less than 0.1 ton per day.

ARKANSAS RIVER BASIN--Continued

NEOSHO RIVER NEAR COMMERCE, OKLA.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	--	61	48	47	46	48	53	67	75	86	--	--
2	--	62	54	47	48	47	50	64	73	87	--	--
3	--	--	53	45	48	43	65	62	71	86	--	--
4	70	--	51	41	49	45	65	60	71	85	--	--
5	70	57	51	43	48	47	69	63	75	86	--	--
6	67	50	49	44	48	51	74	63	75	86	--	--
7	67	49	49	46	46	54	72	63	78	86	--	--
8	67	51	48	51	47	56	69	63	77	85	--	--
9	63	--	46	44	49	54	64	63	79	84	--	--
10	70	49	45	38	53	60	69	65	82	83	--	--
11	68	48	43	39	48	62	66	64	81	83	--	--
12	71	--	45	39	47	62	65	66	81	86	--	--
13	71	55	43	37	48	50	66	71	78	87	--	--
14	72	55	41	38	58	48	72	73	82	88	--	--
15	73	56	38	37	59	45	72	74	79	87	--	--
16	73	56	42	39	57	52	63	71	80	87	--	--
17	73	57	40	39	56	52	69	73	82	88	--	--
18	72	58	42	38	57	55	69	75	85	88	--	--
19	72	59	44	44	55	56	70	74	82	87	--	--
20	72	54	43	39	47	51	73	76	82	85	--	--
21	70	52	47	33	51	54	71	71	81	85	--	--
22	68	51	35	35	57	52	67	77	82	84	--	--
23	66	51	37	34	53	52	73	77	81	85	--	--
24	65	51	40	38	53	60	70	79	88	85	--	--
25	63	48	40	43	54	62	73	76	85	--	--	--
26	58	48	44	36	55	60	72	75	83	--	--	--
27	58	47	42	38	48	62	75	78	85	--	--	--
28	60	47	44	38	48	67	71	79	86	--	--	--
29	58	46	42	43	--	56	70	73	86	--	--	--
30	58	46	43	43	--	48	66	69	90	--	--	77
31	60	--	43	39	--	49	--	75	--	--	--	--
Average	67	52	44	40	51	54	68	70	81	--	--	--

NEOSHO (GRAND) RIVER AT PENSACOLA RESERVOIR AT LANGLEY, OKLA.
(Lake o' the Cherokees)

LOCATION.--Immediately below dam on Neosho (Grand) River at Langley, Mayes County, 3.6 miles upstream from gaging station near Langley, and 9.9 miles upstream from Big Cabin Creek.
DRAINAGE AREA.--10,298 square miles above dam, 10,335 square miles above gaging station.
RECORDS AVAILABLE.--Chemical analyses: October 1951 to September 1954.
Water temperatures: October 1951 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 221 ppm Dec. 1-31; minimum, 198 ppm July 1-31.
Hardness: Maximum, 164 ppm Jan. 1-31, Apr. 1-30; minimum, 144 ppm July 1-31.
Specific conductance: Maximum daily, 409 micromhos Sept. 19; minimum daily, 301 micromhos Aug. 13.
Water temperatures: Maximum observed daily, 81°F Sept. 1-2; minimum observed daily, 40°F on several days during January and February.
EXTREMES, 1951-54.--Dissolved solids: Maximum, 240 ppm Mar. 1-31, 1953; minimum, 155 ppm Oct. 1-31, 1951.
Hardness: Maximum, 177 ppm Apr. 1-30, 1953; minimum, 104 ppm Oct. 1-31, 1951.
Specific conductance: Maximum daily, 409 micromhos Sept. 19, 1953; minimum daily, 234 micromhos Oct. 18, 1951.
Water temperatures: Maximum observed daily, 82°F July 18, 1953; minimum observed daily, 40°F on several days during January and February 1954.
REMARKS.--Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for gaging station near Langley for water year October 1953 to September 1954 given in WSP 1341. No appreciable inflow between sampling station and gaging station except during periods of heavy local runoff.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-31, 1953	81.2	2.2	0.02	51	7.9	11	2.3	133	0	55	13	0.3	1.9	0.53	216	0.29	47	160	50	13	0.4	360	7.8
Nov. 1-30	159	3.6	.00	52	8.1	13	2.2	135	0	56	13	.3	2.3	.10	220	.30	94	163	52	15	.4	365	7.8
Dec. 1-31	843	3.0	.00	51	8.2	12	2.2	136	0	57	13	.3	1.9	.11	221	.30	503	160	49	14	.4	367	8.2
Jan. 1-31, 1954	144	2.0	.00	52	8.3	12	2.2	136	0	57	12	.3	1.7	.12	217	.30	84	164	52	14	.4	365	8.0
Feb. 1-28	559	2.0	.00	54	6.9	11	2.4	137	0	55	14	.1	.1	.22	213	.29	321	163	51	13	.4	371	7.9
Mar. 1-31	594	2.1	.00	53	7.0	12	2.3	138	0	57	14	.1	.1	.22	216	.29	346	161	48	14	.4	367	8.1
Apr. 1-30	799	1.5	.00	53	7.7	11	2.3	140	0	57	14	.0	.2	.25	216	.29	466	164	49	13	.4	370	7.9
May 1-31	3,870	3.9	.00	49	7.2	11	2.5	126	0	54	14	.1	.7	.26	205	.28	2,140	152	49	13	.4	348	--
June 1-30	3,351	8.0	.02	45	8.6	12	2.3	113	0	48	19	.4	2.6	.00	202	.27	1,830	148	56	15	.4	328	8.1
July 1-31	1,756	5.5	.00	46	7.1	12	2.4	111	0	49	17	.3	3.2	.00	198	.27	939	144	53	15	.4	358	7.5
Aug. 1-31	568	8.0	.00	47	6.9	12	2.6	117	0	49	17	.3	2.5	.00	203	.28	311	146	50	15	.4	358	7.7
Sept. 1-30	118	1.5	.01	51	6.1	14	2.3	121	0	54	17	.3	2.0	.00	208	.28	66	152	53	16	.5	380	7.7
Weighted average	1,074	4.9	--	48	7.6	12	2.4	123	--	52	16	--	1.7	--	206	0.28	597	151	50	14	0.4	350	--

ARKANSAS RIVER BASIN--Continued

NEOSHO (GRAND) RIVER AT PENSACOLA RESERVOIR AT LANGLEY, OKLA.--Continued
(Lake o' the Cherokees)

Temperature (°F) of water, water year October 1953 to September 1954

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

NEOSHO (GRAND) RIVER AT FORT GIBSON RESERVOIR NEAR FORT GIBSON, OKLA.

LOCATION.--Immediately below dam on Neosho (Grand) River, 1.1 miles upstream from gaging station, and 4 miles north of Fort Gibson, Wagoner County.
DRAINAGE AREA.--12,492 square miles above dam, 12,495 square miles above gaging station.
RECORDS AVAILABLE.--Chemical analyses: October 1951 to September 1954.
Water temperatures: October 1951 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 221 ppm Apr. 1-30; minimum, 200 ppm July 1-31.
Hardness: Maximum, 158 ppm Jan. 1-31, Feb. 1-28, Mar. 1-31, Apr. 1-30; minimum, 146 ppm July 1-31, Aug. 1-31.
Specific conductance: Maximum daily, 387 micromhos May 5; minimum daily, 299 micromhos July 13.
Water temperatures: Maximum observed daily, 83°F July 18, 25, Aug. 7; minimum observed daily, 39°F Dec. 27, Jan. 22.
EXTREMES, 1951-54.--Dissolved solids: Maximum, 233 ppm Nov. 1-30, 1952; minimum, 158 ppm Oct. 1-31, 1951.
Hardness: Maximum, 171 ppm Dec. 1-31, 1952; minimum, 101 ppm Oct. 1-31, 1951.
Specific conductance: Maximum daily, 424 micromhos Feb. 16, 1953; minimum daily, 200 micromhos Oct. 30, 1951.
Water temperatures: Maximum observed daily, 86°F Aug. 4, 1952, July 1-3, 9-10, 1953; minimum observed daily, 34°F Dec. 21, 1951.
REMARKS.--Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for gaging station near Fort Gibson for water year October 1953 to September 1954 given in WSP 1341. No appreciable inflow between sampling station and gaging station except during periods of heavy local runoff.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-31, 1953	340	3.2	0.00	48	8.3	13	2.5	136	0	48	14	0.3	0.4	0.55	210	0.29	193	154	42	15	0.5	350	7.9
Nov. 1-30	298	3.2	.00	48	8.4	14	2.4	134	0	49	15	.3	.5	.11	211	.29	170	154	44	16	.5	361	7.8
Dec. 1-31	269	3.6	.00	48	8.3	14	2.3	136	0	50	15	.3	.5	.14	214	.29	155	154	42	16	.5	358	8.0
Jan. 1-31, 1954	612	3.0	.00	49	8.6	14	2.3	138	0	50	16	.3	.4	.17	217	.30	359	158	45	16	.5	366	7.8
Feb. 1-28	211	3.4	.00	49	8.7	14	2.2	139	0	51	18	.5	.0	.22	216	.29	123	158	44	16	.5	372	7.5
Mar. 1-31	557	2.9	.00	50	8.1	15	2.6	141	0	51	20	.5	.0	.21	219	.30	329	158	42	17	.5	342	7.7
Apr. 1-30	1,063	2.3	.00	50	8.1	15	2.6	141	0	52	21	.0	.0	.22	221	.30	634	158	42	17	.5	383	8.1
May 1-31	5,399	5.0	.01	48	8.8	14	2.3	128	0	48	20	.3	.2	.00	209	.28	3,050	156	51	16	.5	359	7.7
June 1-30	2,835	8.0	.01	47	8.4	13	2.3	122	0	48	18	.3	.4	.00	206	.28	1,580	152	52	16	.5	340	8.1
July 1-31	1,809	5.0	.00	43	9.4	14	2.3	116	0	49	18	.3	1.8	.00	200	.27	977	146	51	17	.5	359	7.5
Aug. 1-31	185	5.0	.00	46	7.5	13	2.6	120	0	50	17	.3	1.3	.00	203	.28	101	146	48	16	.5	373	7.7
Sept. 1-30	218	1.5	.00	48	7.5	16	2.6	120	0	54	20	.3	.8	.00	210	.29	124	151	52	18	.6	375	7.8
Weighted Average	1,158	5.0	--	47	8.6	14	2.3	128	--	49	19	--	0.5	--	209	0.28	653	153	48	16	0.5	357	--

ARKANSAS RIVER BASIN--Continued

NEOSHO (GRAND) RIVER AT FORT GIBSON RESERVOIR NEAR FORT GIBSON, OKLA.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

ARKANSAS RIVER BASIN--Continued

UTE CREEK NEAR BUEYEROS, N. MEX.

LOCATION.--At gaging station at ford on State Highway 57, 3½ miles northwest of Bueyeros, Harding County, and 19½ miles northeast of Mosquero.
DRAINAGE AREA.--620 square miles, of which 162 square miles is probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: February 1950 to September 1953 (discontinued).
Water temperatures: March 1949 to September 1954 (discontinued).
Sediment records: March 1949 to September 1954 (discontinued).
EXTREMES, 1953-54.--Water temperatures: Maximum observed, 91°F Aug. 5; minimum observed, freezing point Dec. 6, 22.
Sediment concentrations: Maximum daily, 8,440 ppm May 17; ppm minimum daily, no flow on many days.
Sediment loads: Maximum daily, 6,830 tons May 16; minimum daily, 0 tons on many days.
EXTREMES, 1949-54.--Water temperatures: Maximum observed, 94°F June 16, 1950; minimum observed, freezing point on many days.
Sediment concentrations: Maximum daily, 21,700 ppm Aug. 23, 1952; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 840,000 tons Aug. 16, 1953; minimum daily, 0 tons on many days.
REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1341. No flow on days where temperature not shown. Stage relation affected by ice Dec. 6-18, 23-31, Jan. 1-5, Jan. 9-17, 21-24, Feb. 17-18, 28, Mar. 1-6, 13-14.

Temperature (°F) of water, water year October 1953 to September 1954
(Once-daily measurement, generally between 11 a.m. and 6 p.m.)

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	65	65	49	39	49	46	60	51	72	--	76	80
2	65	63	39	35	56	38	72	58	71	65	b74	80
3	67	52	42	42	57	45	b52	65	71	--	a80	--
4	66	52	42	42	57	48	63	70	77	--	81	--
5	64	43	a34	46	56	47	66	70	b70	--	91	--
6	63	49	31	49	49	46	65	75	79	--	82	--
7	66	50	43	46	55	46	62	70	--	--	b69	--
8	67	55	38	46	60	55	61	65	--	--	83	65
9	65	50	36	42	55	58	66	58	--	75	76	73
10	68	60	43	40	52	60	63	55	--	78	b72	65
11	--	57	34	37	48	45	49	56	--	84	81	82
12	--	57	37	33	54	48	62	68	--	--	74	70
13	--	60	38	36	55	41	68	71	--	--	b75	72
14	--	62	38	38	55	51	65	74	--	--	--	70
15	--	60	46	41	45	46	57	a71	b70	--	--	--
16	--	58	39	48	50	46	--	59	75	--	--	--
17	--	53	47	46	58	52	72	a58	82	--	--	--
18	--	52	46	57	54	49	70	b72	--	--	b79	--
19	--	40	47	45	43	49	68	79	81	b70	b75	--
20	58	45	45	35	47	55	63	81	80	78	72	--
21	65	37	41	35	47	66	65	62	81	79	--	--
22	50	43	32	36	48	51	65	a66	87	73	b71	--
23	49	51	33	47	52	60	66	60	90	78	b71	--
24	60	51	36	48	57	54	74	62	85	87	70	62
25	52	49	36	50	58	56	75	72	--	83	74	62
26	55	45	36	47	54	53	69	76	--	85	b72	66
27	62	55	35	48	46	60	71	73	--	69	82	65
28	65	50	33	49	57	61	68	66	--	85	80	62
29	58	52	35	57	--	58	61	75	--	80	78	--
30	61	50	38	a40	--	55	41	69	85	82	71	--
31	b43	--	41	b46	--	55	--	75	--	86	82	--
Average	--	52	39	43	53	52	64	67	--	--	--	--

a Measurement before 11 a.m.
b Measurement after 6 p.m.

ARKANSAS RIVER BASIN--Continued

UTE CREEK NEAR BUEYEROS, N. MEX.--Continued

Suspended sediment, water year October 1953 to September 1954

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1				2.0			4.1	30	(t)
2				2.4			5.5	78	1
3				2.4			6.4	368	6
4				2.9			4.7	86	1
5		39	(t)	2.5	140	1	4.1	30	(t)
6				9.4			4	415	4
7				5			4	410	4
8				3			4.5	579	7
9				3			4.5	71	1
10	1			3			4	301	3
11				3.5			3.5	97	1
12				3			3	533	4
13				3			3	515	4
14				3			3	1,050	9
15		50	(t)	3.5	45	(t)	4	716	8
16				3.5			4	120	1
17				3			4	468	5
18				3.5			4	285	3
19	1.2			3			4.7	243	3
20	2.4	1,145	7	2.5			4.7	115	1
21	.9			2			3.5	104	1
22	1.2			2.5			2.9		
23	5.5			3.5			2.5		
24	6.4			3.5			3	133	1
25	5.5			3.5			3.5		
26	4.7	44	(t)	3.5	137	1	3.5		
27	4.1			3.5			3		
28	2.4			3.5			3		
29	2.4			3.5			3	227	2
30	2.0			3.5			3		
31	2.4			--			3		
Total	59.1	--	13	99.6	--	24	117.6	--	83

Day	January			February			March		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	3.5			4.1			3		
2	3.5			4.1			3		
3	3.5			2.9			3		
4	4	514	5	2.4			3		
5	4			2.9			2.5		
6	4.1			3.5	101	1	2.5	407	3
7	4.1			2.9			2.9		
8	4.1			2.4			2.4		
9	4			2.4			2.9		
10	4	252	3	2.0			2.9		
11	3.5			1.6			2.9		
12	3.5			2.0			3.5		
13	3			2.4			3.5		
14	4			2.4			3.5		
15	4.5			2.4	188	1	4.1	361	3
16	5			2.4			4.1		
17	5	436	6	2.5			4.1		
18	6.4			2			3.5		
19	5.5			.6			2.4		
20	6.4			2.4			2.9		
21	3			3.5			2.9		
22	3.5			2.9			3.5		
23	4			3.5			4.1		
24	5			2.9	208	2	3.5		
25	7.4	282	4	3.5			3.5	135	1
26	6.4			3.5			3.5		
27	5.5			3.5			2.9		
28	5.5			3.5	706	7	2.0		
29	4.7	119	2	--	--	--	2.0		
30	4.7	121	2	--	--	--	1.6		
31	4.7	219	3	--	--	--	1.2		
Total	140.0	--	134	77.1	--	41	93.3	--	--

t Less than 0.50 ton.

ARKANSAS RIVER BASIN--Continued

UTE CREEK NEAR BUEYEROS, N. MEX.--Continued

Suspended sediment, water year October 1953 to September 1954--Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	1.6			6.4	2,100	36	0.4		
2	.6	243	1	3.5	168	2	.6		
3	.6			3.5	122	1	.9	23	(t)
4	.4			2.9	137	1	1.2		
5	.6			2.0	75	(t)	.4		
6	.2			1.6	103	(t)	.1	13	(t)
7	.2			1.2	72	(t)	0	--	0
8	.4			1.2	64	(t)	0	--	0
9	.9	75	(t)	3.5	125	1	0	--	0
10	.6			2.4	126	1	0	--	0
11	1.6			4.1	635	7	0	--	0
12	3.5			2.9	500	4	0	--	0
13	3.5			4.1	300	3	0	--	0
14	2.9			6.4	500	9	0	--	0
15	2.9			34	4,840	444	1.4	35	(t)
16	1.6			138	7,310	s 6,830	2.9		
17	2.4			155	8,440	3,530	.1	443	1
18	2.4			29			0		
19	2.0	42	(t)	14			34	2,660	s 647
20	1.6			8.4	119	5	34	3,200	293
21	.9			7.4			8	1,700	a 37
22	1.2			7.4			3	800	a 6
23	1.6			5.5			.5	300	(a)(t)
24	1.2			6.4	164	3	.4	100	(a)(t)
25	.9			8.4			0	--	0
26	.9	65	(t)	6.4			0	--	0
27	.6			4.7			0	--	0
28	.9			3.5			0	--	0
29	.9			3.5	197	1	0	--	0
30	1.2			1.2			.7	32	(t)
31	--	--	--	.6			--	--	--
Total	40.8	--	10	479.1	--	10,910	88.6	--	987

Day	July			August			September		
1	0	--	0	0.1	250	(t)	0.3	100	(t)
2	1.0	1,290	s 16	.1			.2	150	(t)
3	0	--	0	1.2			0	--	0
4	0	--	0	1.2	102	(t)	0	--	0
5	0	--	0	.4			0	--	0
6	0	--	0	1.2			0	--	0
7	0	--	0	8.4	3,500	79	0	--	0
8	0	--	0	32	1,800	156	8.4	2,250	51
9	22	2,170	s 181	5.5	500	7	4.1	800	9
10	6.4	72	1	6.4	2,750	48	4.1	85	1
11	.1			.9	980	2	1.6	70	(t)
12	0	--	0	.4	240	(t)	.1	100	(t)
13	0	--	0	1.2	200	1	.2	90	(t)
14	0	--	0	0	--	0	.2	85	(t)
15	0	--	0	0	--	0	0	--	0
16	0	--	0	0	--	0	0	--	0
17	0	--	0	0	--	0	0	--	0
18	0	--	0	20	1,850	s 205	0	--	0
19	7.0	2,040	s 132	12	930	30	0	--	0
20	94	5,340	s 1,500	1.2	350	1	0	--	0
21	24	1,800	117	0	--	0	0	--	0
22	13	3,180	112	7.4	800	16	0	--	0
23	80	4,900	1,060	22	530	31	0	--	0
24	41	1,000	a 110	8.4	200	5	2.4	2,500	16
25	20	400	a 22	4.1	480	5	29	2,700	211
26	6.4	300	a 5	5.5	790	12	2.4	300	2
27	26	2,980	s 1,020	8.4	200	5	1.2	300	1
28	41	4,250	470	2.4	200	1	.2	320	(t)
29	27	2,900	211	.4	110	(t)	0	--	0
30	3.5	600	6	33	4,710	s 1,760	0	--	0
31	.6	300	(t)	.4	1,400	2	--	--	--
Total	413.0	--	4,964	184.2	--	2,367	54.4	--	292

Total discharge for year (cfs-days) 1,846.8
Total load for year (tons) 19,896

s Computed by subdividing day.
a Computed from estimated concentration graph.
t Less than 0.50 ton.

ARKANSAS RIVER BASIN--Continued

UTE CREEK NEAR BUEYEROS, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1953 to September 1954
(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 (cfs)	Water temperature (°F)	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 15, 1954	7:00 a.m.	63	58	12,700	4,820		50		68		88	97	99		100	--	SPWCM
May 15	7:00 a.m.	63	58	12,700	5,140		6		62		88	97	99		100	--	SPN
May 15	7:30 a.m.	57	60	12,100	4,730		47		62		82	92	98		100	--	SPWCM
May 16	5:57 p.m.	425	57	21,500	3,480		44		57		76	87	95		99	100	SPWCM
May 17	8:20 a.m.	192	57	9,400	3,620		37		45		59	78	94		99	100	SPWCM
July 23	5:00 p.m.	107	75	4,540	3,700		58		69		79	90	98		100	--	SPWCM
Aug. 7	6:15 p.m.	39	69	7,530	3,980		6		85		95	95	95		96	100	SPN
Aug. 7	6:15 p.m.	39	69	7,530	3,860		71		85		95	95	95		96	100	SPWCM
Aug. 8	5:00 a.m.	52	64	4,220	4,030		73		82		87	97	100		--	--	SPWCM
Aug. 8	3:00 p.m.	24	83	1,050	2,670		64		88		96	100	--		--	--	SPWCM
Aug. 10	6:20 p.m.	74	72	7,990	3,680		62		76		90	98	100		--	--	SPWCM
Aug. 10	7:20 p.m.	50	68	15,900	4,280		57		83		96	99	100		--	--	SPWCM
Aug. 18	2:30 p.m.	48	80	4,960	3,230		61		78		89	97	100		--	--	SPWCM
Aug. 18	2:30 p.m.	48	80	4,960	3,750		7		71		89	97	100		--	--	SPN
Aug. 30	6:00 p.m.	110	70	17,300	3,940		40		67		83	89	95		99	100	SPWCM
Aug. 30	6:00 p.m.	110	70	17,300	3,810		1		67		83	89	95		99	100	SPN
Sept. 25	1:55 p.m.	19	65	1,530	3,480		72		76		87	90	95		100	--	SPWCM

ILLINOIS RIVER AT TENKILLER RESERVOIR NEAR GORE, OKLA.

LOCATION.--Immediately below dam on Illinois River, half a mile upstream from gaging station, and 6 miles northeast of Gore, Sequoyah County.
DRAINAGE AREA.--1,610 square miles above dam, 1,626 square miles above gaging station.
RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1954.
Water temperatures: October 1953 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 123 ppm Oct. 1-31; minimum, 100 ppm Dec. 1-31.
Hardness: Maximum, 92 ppm June 1-30; minimum, 80 ppm Feb. 1-28.
Specific conductance: Maximum daily, 275 micromhos May 2; minimum daily, 156 micromhos Aug. 23.
Water temperatures: Maximum observed daily, 64°F Aug. 24; minimum observed daily, 44°F on many days during January, February, and March.
REMARKS.--Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for gaging station near Gore for water year October 1953 to September 1954 given in WSP 1341. No appreciable inflow between sampling station and gaging station except during periods of heavy local runoff.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-31, 1953 ...	93.3	8.0	0.06	33	2.0	5.5	2.1	106	0	4.0	8.5	0.1	3.5	0.48	123	0.17	31	91	4	11	0.3	205	7.2
Nov. 1-30	490	7.2	.02	32	2.7	5.5	2.0	100	0	4.9	8.5	.1	2.8	.11	117	.16	155	91	9	11	.3	201	7.6
Dec. 1-31	979	5.6	.01	29	2.0	3.7	1.8	92	0	5.8	3.8	.1	1.3	.15	100	.14	264	81	5	9	.2	170	7.6
Jan. 1-31, 1954 ...	1,288	5.6	.01	29	2.1	3.6	1.9	93	0	6.1	3.8	.1	1.2	.07	102	.14	355	81	5	9	.2	174	7.7
Feb. 1-28.....	1,679	4.5	.00	29	1.9	3.5	1.6	97	0	5.8	5.8	.0	.0	.24	101	.14	458	80	1	8	.2	179	7.4
Mar. 1-31	751	4.7	.00	30	2.2	3.4	1.9	98	0	5.5	7.3	.0	.2	.25	104	.14	211	84	4	8	.2	184	8.0
Apr. 1-30	564	5.3	.00	30	2.2	3.5	1.8	97	0	6.6	7.4	.0	.1	.20	102	.14	155	84	4	8	.2	183	7.9
May 1-31	301	--	--	31	2.3	4.8	--	97	0	7.2	7.5	--	1.3	--	112	.15	91	87	8	11	.2	199	7.8
June 1-30.....	630	8.0	.02	32	2.9	4.8	1.9	99	0	5.8	10	.1	.7	.00	115	.16	196	92	11	10	.2	192	8.0
July 1-31	916	6.5	.01	32	2.2	3.3	2.0	100	0	6.0	8.5	.1	1.7	.00	111	.15	275	89	7	7	.1	204	7.7
Aug. 1-31	1,717	8.0	.00	29	2.8	3.5	1.9	92	0	4.9	9.5	.1	1.9	.00	107	.15	496	84	8	8	.2	191	7.7
Sept. 1-30	308	9.0	.05	30	3.6	5.0	1.9	96	0	3.9	12	.1	3.1	.00	116	.16	96	90	12	11	.2	210	7.2
Weighted average	806	--	--	30	2.3	3.8	--	98	--	5.6	7.1	--	1.2	--	106	0.14	231	84	6	9	0.2	186	--

ARKANSAS RIVER BASIN--Continued

ILLINOIS RIVER AT TENKILLER RESERVOIR NEAR GORE, OKLA.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

CANADIAN RIVER NEAR AMARILLO, TEX.

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LOCATION.--At gaging station at bridge on U. S. Highways 87 and 287, 2,000 feet downstream from Pitcher Creek, 2.0 miles downstream from Panhandle and Santa Fe Railway bridge, and 19 miles north of Amarillo, Potter County, and at mile 537.7.
DRAINAGE AREA.--19,445 square miles (revised), of which 4,069 square miles is probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: July 1948 to October 1949, February 1950 to September 1954.
Water temperatures: August 1949 to September 1954.
Sediment Records: August 1949 to September 1952.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 2,310 ppm Apr. 12; minimum, 390 ppm May 10-11, 17-18.
Hardness: Maximum, 827 ppm Apr. 12; minimum, 112 ppm Apr. 26-27.
Specific conductance: Maximum daily, 3,390 micromhos Apr. 12; minimum daily, 406 micromhos May 18.
Water temperatures: Maximum observed, 75°F July 26-27; minimum observed, freezing point on many days during winter months.
EXTREMES, 1948-54.--Dissolved solids: Maximum, 2,320 ppm Dec. 25-29, 1952; minimum, 285 ppm Sept. 3, 1952.
Hardness (1950-54): Maximum, 860 ppm Dec. 25-29, 1952; minimum, 90 ppm Aug. 10-12, 1951.
Specific conductance: Maximum daily, 3,980 micromhos Dec. 26, 1952; minimum daily, 406 micromhos May 18, 1954.
Water temperatures (1949-54): Maximum observed, 95°F June 29, 1951; minimum observed, freezing point on many days during winter months.
REMARKS.--Values reported for dissolved solids concentrations less than 1,000 ppm are residues on evaporation and for concentrations more than 1,000 ppm are sums of determined constituents unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residues at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-10, 1953	11.7	74		60	44	148		315		108	138	5.2	91		856	1.16	27.0	330	72	49	3.5	1,290	7.9
Oct. 11-20	12.0	75		64	46	149		311		112	150	4.8	95		892	1.21	28.9	348	94	48	3.5	1,340	8.0
Oct. 21, 24-31	228	28		48	17	122		196		119	115	1.2	7.2		568	.77	350	190	30	58	3.9	914	8.2
Oct. 22-23	1,042	20		33	13	92		163		83	75	1.2	7.5		414	.56	1,160	136	2	59	3.4	680	8.0
Nov. 1-10	19.6	57		132	54	269		284		330	355	3.2	64		1,400	1.90	74.1	552	319	51	5.0	2,230	7.9
Nov. 11-20	18.0	66		93	49	197		296		219	225	2.8	83		1,080	1.47	52.5	434	191	50	4.1	1,690	8.2
Nov. 21-30	14.2	66		94	47	190		292		213	212	3.2	89		1,060	1.44	40.6	428	188	49	4.0	1,640	8.2
Dec. 1-2, 6, 9	17.5	65		98	47	206		293		234	228	4.0	88		1,110	1.51	52.4	438	198	51	4.3	1,710	8.0
Dec. 3-5, 7-8, 10	19.3	54		144	54	315		268		400	405	2.8	65		1,570	2.14	81.8	582	362	54	5.7	2,450	8.1
Dec. 11-20	19.0	60		121	55	277		289		326	345	2.4	75		1,400	1.90	71.8	528	291	53	5.2	2,190	8.2
Dec. 21-31	16.7	63		128	57	284		306		344	352	2.4	73		1,450	1.97	65.4	554	304	53	5.2	2,280	8.1
Jan. 1-10, 1954	14.4	71		120	54	265		315		309	320	4.4	68		1,370	1.86	53.3	522	264	52	5.1	2,160	7.5
Jan. 11-13, 16-22, 26-31	16.8	65		119	53	282		304		331	345	2.8	51		1,400	1.90	63.5	515	266	54	5.4	2,210	8.2
Jan. 14-15, 23-25	18.8	68		146	59	338		288		418	440	2.8	53		1,670	2.27	84.8	607	371	55	6.0	2,640	7.9
Feb. 1-10	13.4	78		100	51	217		352		249	258	4.8	9.0		1,140	1.55	41.2	459	170	51	4.4	1,870	7.1
Feb. 11-21	11.3	90		70	45	162		344		134	144	4.8	92		a911	1.24	27.8	360	78	49	3.7	1,400	7.3
Feb. 22-28	13.0	86		68	41	146		346		107	131	6.0	74		831	1.13	29.1	338	54	48	3.4	1,310	7.2

a Sum of determined constituents.

ARKANSAS RIVER BASIN--Continued

CANADIAN RIVER NEAR AMARILLO, TEX.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residues at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Mar. 1-2, 4-5, 9-10, 16, 18, 1954	12.9	84		68	43	172		409		111	125	6.4	94		a904	1.23	31.5	346	12	52	4.0	1,350	7.4
Mar. 3, 6-8, 11-15, 17, 19-20	12.5	86		72	45	213		469		112	160	6.4	103		1,030	1.40	34.8	364	0	56	4.8	1,490	7.4
Mar. 21-31	12.2	77		68	43	148		349		111	130	5.0	88		845	1.15	27.8	346	60	48	3.5	1,270	7.7
Apr. 1-10	11.7	65		69	40	152		358		122	153	5.2	22		841	1.14	26.6	336	43	50	3.6	1,360	7.3
Apr. 11, 13-20	15.8	79		67	43	149		414		103	138	5.2	18		846	1.15	36.1	344	5	49	3.5	1,350	7.3
Apr. 12	39	36		221	67	470		151		800	618	1.6	20		2,310	3.14	243	827	704	55	7.1	3,390	8.1
Apr. 21-25, 28-30	30.6	68		64	39	172		321		141	167	4.4	46		880	1.20	72.7	320	57	54	4.2	1,410	7.5
Apr. 26-27	454	40		27	11	120		213		77	81	.8	2.5		465	.63	570	112	0	70	4.9	745	8.2
May 1-9, 12-16	222	66		65	40	151		321		133	146	3.6	47		824	1.12	494	326	64	50	3.6	1,320	7.4
May 10-11, 17-18	2,237	25		36	14	79		166		79	68	.8	5.0		390	.53	2,360	148	12	54	2.8	650	8.0
May 19-24, 30-31	1,090	28		76	32	262		257		263	315	1.2	4.0		1,130	1.54	3,330	321	110	66	6.9	1,890	7.8
May 25-29	790	24		58	23	208		238		182	214	.8	4.6		848	1.15	1,810	239	44	65	5.8	1,420	7.9
June 1-4, 9	21.6	43		112	47	282		249		356	350	1.6	18		1,330	1.81	77.6	473	269	56	5.6	2,120	7.9
June 5-8, 10-20	48.2	53		59	31	122		278		114	122	2.4	19		670	.91	87.2	274	46	49	3.2	1,090	7.3
June 21-30	17.5	67		62	45	125		363		109	120	4.0	26		792	1.08	37.4	340	42	44	3.0	1,200	7.5
July 1-10	250	56		60	34	204		290		181	207	2.4	12		919	1.25	620	290	52	61	5.2	1,470	7.9
July 11-20	9.86	99		60	49	136		379		115	120	4.4	45		838	1.14	22.3	351	40	46	3.2	1,270	7.5
July 21-31	1,513	38		48	26	163		248		146	153	1.6	8.2		730	.99	2,980	227	24	61	4.7	1,180	7.5
Aug. 1-2, 8-10, 13-18, 20	60.2	42		76	33	194		228		229	252	1.4	15		1,000	1.36	163	325	138	53	4.7	1,630	7.5
Aug. 3-7, 11-12, 19	56.8	57		112	47	310		278		330	390	2.8	21		1,410	1.92	216	473	245	59	6.2	2,300	7.8
Aug. 21, 25-31	701	22		40	15	161		204		128	146	1.2	4.0		a617	.84	1,170	162	0	68	5.5	1,040	7.9
Aug. 22-24	506	19		36	13	89		165		82	78	1.2	3.5		a403	.55	551	144	8	57	3.2	677	7.9
Sept. 1-3, 12-20	38.5	67		68	41	174		321		140	180	4.4	52		921	1.25	95.7	338	75	53	4.1	1,460	7.0
Sept. 4-11	29.6	62		100	47	242		292		271	290	3.2	37		1,200	1.63	95.9	443	204	54	5.0	1,910	7.4
Sept. 21-29	11.8	79		66	45	145		353		103	142	4.4	70		850	1.16	27.1	350	60	47	3.4	1,320	7.6
Sept. 30	106	20		90	38	424		282		314	525	1.2	.5		1,550	2.11	444	380	150	71	9.5	2,560	8.0
Weighted average	171	36		54	25	170		237		156	171	1.6	12		754	1.03	348	238	44	61	4.8	1,230	--

a Sum of determined constituents.

ARKANSAS RIVER BASIN--Continued

CANADIAN RIVER NEAR AMARILLO, TEX.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

ARKANSAS RIVER BASIN--Continued

CANADIAN RIVER AT BRIDGEPORT, OKLA.

LOCATION.--At gaging station at Chicago, Rock Island and Pacific Railway bridge, 1 mile north of Bridgeport, Caddo County, 2¾ miles upstream from Lumpmouth Creek, and at mile 267.1.
DRAINAGE AREA.--25,229 square miles (revised), of which 4,801 square miles is probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: October 1948 to September 1954.
Water temperatures: October 1948 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 1,550 ppm Aug. 27-31; minimum, 227 ppm Sept. 29-30.
Hardness: Maximum, 488 ppm Jan. 21-28; minimum, 123 ppm Sept. 29-30.
Specific conductance: Maximum daily, 3,080 micromhos Aug. 27; minimum daily, 348 micromhos Sept. 30.
Water temperatures: Maximum observed daily, 79°F June 23; minimum observed daily, freezing point on several days during November, December, January, and March.
EXTREMES, 1948-53.--Dissolved solids: Maximum, 1,880 ppm June 20, 1950; minimum, 186 ppm July 17, 1953.
Hardness: Maximum, 778 ppm Jan. 30, 1951; minimum, 123 ppm Sept. 29-30, 1954.
Specific conductance: Maximum daily, 3,100 micromhos Sept. 2, 1952; minimum daily, 226 micromhos May 23, 1952.
Water temperatures: Maximum observed daily, 97°F July 11, 1952; minimum observed daily, freezing point on many days during winter months.
REMARKS.--Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year October 1953 to September 1954 given in WSP 1341. No flow Oct. 1-2, July 12-27, Aug. 7, 14-21, 26, Sept. 7-28.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-10, 1953	2.97	--	--	77	16	33	--	223	0	121	16	--	1.3	--	393	0.53	3.2	258	76	22	0.9	621	7.9
Oct. 11-14	2.55	--	--	73	16	31	--	198	0	131	15	--	.5	--	378	.51	2.6	248	86	21	.9	593	8.2
Oct. 15-16	295	--	--	74	15	41	--	201	0	135	27	--	.6	--	414	.56	3.3	248	84	26	1.1	647	8.2
Oct. 17	1,580	--	--	64	23	164	--	176	0	226	172	--	6.4	--	753	1.02	3,210	254	110	58	4.5	1,240	8.1
Oct. 18-20	299	--	--	53	18	137	--	159	0	173	140	--	4.2	--	611	.83	493	204	74	59	4.2	1,040	8.1
Oct. 21	156	--	--	45	13	95	--	138	0	122	97	--	4.3	--	459	.62	193	166	53	55	3.2	776	8.1
Oct. 22	226	--	--	43	11	52		137	0	78	48	--	4.9	--	331	.45	202	151	38	43	1.9	539	8.1
Oct. 23-24	244	--	--	54	13	71	--	137	0	64	70	--	3.5	--	437	.59	288	186	80	45	2.3	704	8.0
Oct. 25	2,310	--	--	58	20	110	--	163	0	164	120	--	5.9	--	598	.81	3,730	226	92	51	3.2	962	8.1
Oct. 26-31	1,396	--	--	73	24	180	--	183	0	210	215	--	3.3	--	849	1.15	3,200	280	130	58	4.7	1,390	8.0
Nov. 1-10	102	12	0.00	82	27	162	5.5	210	0	191	208	1.3	2.4	0.33	810	1.10	223	316	144	52	4.0	1,340	8.1
Nov. 11-19	42.2	--	--	105	23	124	--	240	0	226	151	--	1.6	--	779	1.06	89	358	162	43	2.8	1,230	8.1
Nov. 20	151	--	--	74	23	92	--	139	0	214	106	--	3.8	--	609	.83	248	278	164	42	2.4	947	7.9
Nov. 21-30	63.8	12	.00	106	28	103	4.8	186	0	267	120	.7	1.8	.19	754	1.03	130	380	227	37	2.3	1,150	7.9
Dec. 1-2	34.0	--	--	110	22	82	--	224	0	230	90	--	1.9	--	684	.93	63	366	182	33	1.9	1,040	8.2
Dec. 3-4	172	--	--	75	14	66	--	136	0	174	76	--	2.3	--	507	.69	235	246	134	37	1.8	792	8.0
Dec. 5-10	53.3	--	--	114	26	101	--	198	0	276	120	--	1.8	--	777	1.06	112	392	230	36	2.2	1,180	8.1
Dec. 11-20	50.5	17	.00	122	36	145	4.8	260	0	272	185	1.1	2.0	.30	936	1.27	128	452	240	41	3.0	1,430	8.2
Dec. 21-31	38.0	--	--	142	32	110	--	259	0	315	128	--	2.5	--	909	1.24	93	486	274	33	2.2	1,340	8.0

Jan. 1-10, 1954	43.7	--	--	126	31	125	--	223	0	312	148	--	2.0	--	902	1.23	106	440	258	38	2.6	1,360	8.0
Jan. 11-20	28.1	--	--	134	33	96	--	246	0	303	103	--	2.6	--	858	1.17	65	470	268	31	1.9	1,240	8.1
Jan. 21-28	25.4	--	--	143	32	77	--	261	0	302	80	--	3.2	--	828	1.13	57	488	274	26	1.5	1,170	8.2
Jan. 29-31	18.7			122	43	240	--	233	0	342	315	--	3.0	--	1,240	1.69	63	482	290	52	4.8	1,950	8.2
Feb. 1-10	80.4	--	--	110	35	187	--	243	0	261	242	--	2.2	--	1,020	1.39	221	418	220	49	4.0	1,610	8.2
Feb. 11-14	32.2	--	--	122	33	122	--	223	0	303	150	--	1.3	--	892	1.21	78	440	258	38	2.5	1,350	8.1
Feb. 15-20	20.8	--	--	128	26	67	--	230	0	287	60	--	1.0	--	727	.99	41	426	238	25	1.4	1,040	8.1
Feb. 21-28	15.8	--	--	124	24	33	--	215	0	274	18	--	1.3	--	622	.85	27	410	234	15	.7	862	8.2
Mar. 1-10	15.2	--	--	130	25	33	--	218	0	278	16	--	1.3	--	622	.85	26	426	248	14	.7	872	8.2
Mar. 11-20	14.7	--	--	140	24	34	--	229	6	289	16	--	1.7	--	655	.89	26	450	252	14	.7	913	8.3
Mar. 21-31	23.8	--	--	146	21	30	--	220	6	300	16	--	1.8	--	660	.90	42	450	260	13	.6	896	8.3
Apr. 1-10	13.5	--	--	144	23	31	--	266	0	280	14	--	2.6	--	700	.95	26	456	238	13	.6	908	7.9
Apr. 11-20	17.7	--	--	138	23	30	--	254	0	272	14	--	1.9	--	676	.92	32	440	232	13	.6	909	8.1
Apr. 21-30	71.2	--	0.00	124	23	33	3.5	232	0	250	18	0.1	1.3	0.27	600	.82	115	405	215	15	.7	844	8.2
May 1-10	1,100	6.8	.00	98	29	124	5.5	171	0	288	146	.7	.8	.32	800	1.09	2,380	362	222	42	2.8	1,240	8.2
May 11-15, 17-18	745	--	--	98	28	135	--	180	0	256	183	--	1.9	--	884	1.20	1,780	360	212	45	3.1	1,360	8.2
May 16, 19-20	885	--	--	109	32	230	--	190	0	289	315	--	2.3	--	1,160	1.58	2,770	402	246	55	5.0	1,840	8.2
May 21-23	1,954	--	--	113	35	307	--	239	0	292	410	--	1.6	--	1,380	1.88	7,280	424	228	61	6.5	2,210	8.0
May 24-25	7,540	--	--	78	14	77	--	130	0	177	97	--	2.2	--	567	.77	11,540	250	144	40	2.1	868	8.2
May 26-27	4,805	--	--	79	25	142	--	184	0	209	185	--	1.9	--	798	1.09	10,350	298	147	51	3.6	1,290	--
May 28-29	1,150	--	--	90	27	191	--	193	0	232	260	--	3.2	--	954	1.30	2,960	334	176	45	4.5	1,580	8.1
May 30	1,410	--	--	100	29	258	--	185	4	251	352	--	6.2	--	1,180	1.60	4,490	370	207	60	5.8	1,910	8.3
May 31	1,530	--	--	78	21	155	--	156	3	174	210	--	6.4	--	780	1.06	3,220	280	147	55	4.0	1,290	8.3
June 1-7	235	--	--	114	33	216	--	222	0	298	282	--	5.2	--	1,140	1.55	723	420	238	54	4.6	1,750	7.8
June 8-10	41.7	--	--	130	22	122	--	225	0	302	142	--	2.2	--	918	1.25	103	415	230	39	2.6	1,320	7.7
June 11	29.0	--	--	105	23	76	--	134	0	292	79	--	1.6	--	747	1.02	58	356	246	32	1.8	1,100	8.1
June 12	26.0	--	--	121	21	52	--	136	0	326	42	--	1.3	--	699	.95	49	390	278	22	1.1	1,060	8.1
June 13-14	84.5	--	--	117	20	36	--	100	0	326	18	--	2.5	--	636	.86	145	374	292	17	.8	825	8.1
June 15	196	--	--	65	8.3	51	--	122	0	113	64	--	3.2	--	364	.50	193	196	96	36	1.6	643	8.1
June 16-19	370	--	--	120	15	128	--	133	0	309	154	--	3.0	--	872	1.19	871	363	254	43	2.9	1,280	8.0
June 20	44.0	--	--	94	15	106	--	134	8	233	106	--	4.9	--	664	.90	79	297	174	44	2.7	949	8.5
June 21	26.0	--	--	100	16	82	--	156	12	221	80	--	1.4	--	644	.88	45	314	166	36	2.0	935	8.5
June 22	18.0	--	--	98	17	61	--	154	10	219	52	--	1.3	--	599	.81	29	313	170	30	1.5	849	8.5
June 23-30	9.80	--	--	118	15	36	--	185	10	238	20	--	1.8	--	572	.78	15	358	190	18	.8	785	8.4

CANADIAN RIVER AT BRIDGEPORT, OKLA.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluorids (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
July 1-10, 1954	3.45	28	0.01	80	33	35	4.4	176	0	221	20	0.3	0.3	0.09	532	0.72	5.0	334	190	18	0.8	789	8.2
July 11	.40	--	--	82	29	43	--	152	4	231	26	--	1.9	--	511	.69	.6	322	191	23	1.0	750	8.4
July 12-27	(a)																						
July 28-31	416	--	--	110	39	360	--	227	7	342	478	--	2.4	--	1,500	2.04	1,680	435	238	64	7.5	2,540	8.4
August 1-7	34.6	--	--	90	35	383	--	197	8	291	478	--	10	--	1,440	1.96	135	370	195	69	8.7	2,430	8.5
Aug. 8-10	71.0	--	--	48	7.3	68	--	128	2	90	67	--	2.8	--	349	.47	67	150	42	50	2.4	607	8.3
Aug. 11-20	1.46	--	--	55	18	37	--	124	2	135	33	--	3.2	--	361	.49	1.4	210	105	28	1.1	611	8.3
Aug. 21-22	.80	--	--	38	8.5	45	--	110	2	78	36	--	4.5	--	280	.38	.6	130	36	43	1.7	453	8.3
Aug. 23-26	3.22	--	--	82	16	37	--	136	0	210	18	--	3.8	--	452	.61	3.9	270	158	23	1.0	704	8.2
Aug. 27-31	54.0	--	--	94	35	376	--	228	4	312	510	--	3.1	--	1,550	2.11	226	380	186	68	8.4	2,620	8.3
Sept. 1, 3-6	38.7	--	--	94	31	367	--	204	4	309	468	--	4.6	--	1,430	1.94	149	360	186	69	8.4	2,460	8.3
Sept. 2	58.0	--	--	80	27	308	--	187	0	272	382	--	8.4	--	1,230	1.67	193	310	157	68	7.6	2,040	8.2
Sept. 7-28	(a)																						
Sept. 29-30	47.5	--	--	44	3.2	22	--	135	2	37	16	--	2.8	--	227	.31	29	123	9	28	.9	348	8.3
Weighted average	230	--	--	90	25	151		b 180	--	234	191	--	2.5	--	841	1.14	522	328	180	50	3.6	1,330	--

a No flow.
b Includes equivalent of individual carbonate values shown above.

ARKANSAS RIVER BASIN--Continued

CANADIAN RIVER AT BRIDGEPORT, OKLA.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

ARKANSAS RIVER BASIN--Continued

LITTLE RIVER BELOW HOG CREEK NEAR NORMAN, OKLA.

LOCATION.--At gaging station at bridge on county road just downstream from Hog Creek, three-quarters of a mile upstream from Prairie Creek, 13 miles east of Norman, Cleveland County, and at mile 96.0.
DRAINAGE AREA.--257 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1954.
Water temperatures: October 1953 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 1,150 ppm Sept. 1-10; minimum, 124 ppm Oct. 26.
Hardness: Maximum, 324 ppm Jan. 11-20; minimum, 73 ppm Oct. 26.
Specific conductance: Maximum daily, 2,180 micromhos Sept. 8; minimum daily, 189 micromhos Oct. 26.
Water temperatures: Maximum observed daily, 98°F July 11-12; minimum observed daily, 36°F Jan. 22-23.
REMARKS.--Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1, 1953	1.00	--	--	39	28	69		260	8	34	72	--	0.6	--	379	0.52	1.0	214	0	41	2.0	688	8.5
Oct. 2-3	7.90	--	--	30	15	33	--	176	0	14	36	--	.7	--	235	.32	5.0	137	0	34	1.2	420	8.1
Oct. 4-6	8.33	--	--	23	13	19	--	133	0	6.9	25	--	1.3	--	176	.24	4.0	109	0	28	.8	310	7.7
Oct. 7-10	1.58	--	--	30	15	33	--	178	0	17	36	--	.8	--	235	.32	1.0	136	0	34	1.2	418	8.0
Oct. 11-21	38.3	8.0	0.00	30	16	35	3.4	176	0	18	35	0.5	1.6	0.22	235	.32	24	141	0	34	1.3	417	7.9
Oct. 22-24	409	--	--	20	7.1	12	--	97	0	6.1	16	--	1.6	--	130	.18	144	79	0	25	.6	213	7.9
Oct. 25	538	--	--	26	12	20		147	0	11	17	--	1.3	--	175	.24	254	113	0	28	.8	295	7.8
Oct. 26	526	--	--	18	6.8	11		94	0	6.0	9.0	--	1.0	--	124	.17	176	73	0	24	.5	189	7.8
Oct. 27	40.0	--	--	25	11	17		136	0	8.8	17	--	.6	--	157	.21	17	107	0	26	.7	261	7.8
Oct. 28-31	11.2	--	--	48	24	20	--	274	0	13	20	--	.4	--	278	.38	8.4	219	0	17	.6	482	8.2
Nov. 1-10	6.36	15	.00	56	42	36	2.3	386	0	21	36	.3	.5	.24	399	.54	6.9	312	0	20	.9	684	8.2
Nov. 11-19	7.56	--	--	40	39	36	--	312	4	22	37	--	.6	--	334	.45	6.8	260	0	23	1.0	614	8.3
Nov. 20-21	38.0	--	--	37	16	16	--	196	0	11	16	--	1.8	--	201	.27	21	160	0	18	.6	368	8.0
Nov. 22-30	6.91	--	--	60	34	29	--	354	2	19	29	--	.7	--	348	.47	6.5	290	0	18	.7	631	8.3
Dec. 1-4	97.3	--	--	57	35	27	--	337	4	17	29	--	1.3	--	340	.46	89	284	2	17	.7	613	8.3
Dec. 5-6	17.0	--	--	48	19	24	--	236	0	13	30	--	2.4	--	258	.35	12	200	6	21	.7	472	8.2
Dec. 7-10	9.62	--	--	53	37	30	--	353	0	18	30	--	.6	--	343	.47	8.9	284	0	19	.8	631	8.2
Dec. 11-20	8.70	--	--	51	37	31	--	344	0	19	31	--	1.9	--	341	.46	8.0	280	0	19	.8	624	8.2
Dec. 21-31	8.52	--	--	50	38	30	--	343	0	18	31	--	.6	--	337	.46	7.8	280	0	19	.8	621	8.2
Jan. 1-10, 1954	7.00	--	--	48	42	35	--	375	0	20	34	--	.5	--	387	.53	7.3	292	0	21	.9	667	8.0
Jan. 11-20	7.00	--	--	64	40	29	--	389	0	18	30	--	1.1	--	394	.54	7.4	324	5	16	.7	671	8.1
Jan. 21-31	10.2	--	--	57	40	31	--	364	0	17	30	--	.8	--	373	.51	10	306	8	18	.8	639	8.1
Feb. 1-10	7.45	--	--	55	44	39	--	391	0	20	36	--	.6	--	399	.54	8.0	318	0	21	1.0	697	8.1
Feb. 11-20	8.65	--	--	56	44	37	--	389	0	20	34	--	.6	--	403	.55	9.4	320	2	20	.9	694	8.2
Feb. 21-28	8.94	--	--	54	41	34	--	375	0	19	34	--	.1	--	383	.52	9.2	303	0	20	.8	671	8.2

Mar. 1-10, 1954 ...	8.32	--	--	46	42	36	--	361	0	18	33	--	.4	--	365	.50	8.2	288	0	21	.9	647	8.2
Mar. 11-20	6.70	--	--	34	45	40	--	340	0	22	39	--	.4	--	365	.50	6.6	270	0	24	1.1	648	8.2
Mar. 21-24	7.30	--	--	45	46	40		379	0	21	40	--	.0	--	382	.52	7.5	302	0	22	1.0	695	8.2
Mar. 25-26	50.5	--	--	40	22	16		229	0	13	17	--	1.2	--	248	.34	34	190	3	16	.5	423	8.2
Mar. 27-31	13.4	--	--	44	42	31	--	354	0	18	32	--	.2	--	361	.49	13	282	0	19	.8	637	8.2
Apr. 1-10	8.52	--	--	43	46	39	--	367	0	20	38	--	.1	--	395	.54	9.1	296	0	22	1.0	679	8.2
Apr. 11-20	11.6	--	--	54	43	35	--	379	4	18	36	--	.2	--	418	.57	13	310	0	20	.9	689	8.3
Apr. 21-25	6.90	--	--	30	44	45	--	293	16	23	46	--	.8	--	355	.48	6.6	255	0	28	1.2	659	8.5
Apr. 26	4.80	--	--	45	20	17	--	241	0	11	18	--	.2	--	230	.31	3.0	195	0	16	.5	438	8.2
Apr. 27.	5.20	--	--	30	45	50	--	329	0	28	50	--	1.0	--	366	.50	5.1	259	0	30	1.3	698	8.2
Apr. 28-30	343	--	--	37	19	24	--	179	3	10	39	--	3.7	--	247	.34	229	170	2	23	.8	438	8.4
May 1	544	--	--	18	36	26	--	206	14	16	27	--	4.2	--	288	.39	423	195	2	22	.8	612	8.6
May 2-10	96.3	--	--	48	24	17	--	256	7	11	19	--	1.4	--	276	.38	72	220	0	14	.5	473	8.4
May 11-13	347	--	--	34	16	20	--	170	3	8.6	28	--	2.5	--	226	.31	212	150	6	22	.7	371	8.4
May 14-20	23.7	--	--	60	32	25	--	319	15	14	29	--	1.8	--	347	.47	22	282	0	16	.7	603	8.5
May 21-23	17.0	--	--	25	38	67	--	252	16	31	62	--	1.3	--	364	.50	17	220	0	40	2.0	663	8.5
May 24-25	95.5	--	--	35	17	20	--	168	8	7.8	28	--	.7	--	214	.29	55	156	5	22	.7	377	8.4
May 26	464	--	--	25	10	15	--	124	4	7.0	10	--	5.2	--	155	.21	194	104	0	24	.6	263	8.3
May 27-29	46.3	--	--	56	18	24	--	232	15	14	28	--	1.8	--	284	.39	36	212	0	20	.7	371	8.6
May 30-31	14.0	--	--	37	36	38	--	268	18	22	40	--	.8	--	335	.46	13	241	0	26	1.1	598	8.7
June 1-10	6.33	22	.02	26	41	49	2.1	297	0	28	48	0.5	.4	0.24	363	.49	6.2	234	0	31	1.4	605	7.6
June 11-12	5.60	--	--	21	43	51	--	254	16	26	50	--	1.3	--	342	.47	5.2	230	0	33	1.5	625	8.7
June 13-15	6.13	--	--	37	27	30	--	228	6	15	47	--	1.2	--	281	.38	4.7	205	8	24	.9	499	8.5
June 16-20	5.14	--	--	35	39	59	--	282	10	29	58	--	1.2	--	378	.51	5.2	246	0	34	1.6	673	8.5
June 21-25	2.50	--	--	26	39	59	--	242	16	30	64	--	1.2	--	354	.48	2.4	226	1	36	1.7	643	8.6
June 26	1.80	--	--	20	43	111	--	250	20	53	120	--	1.0	--	491	.67	2.4	226	0	52	3.2	973	8.7
June 27-29	1.40	--	--	26	45	81	--	264	20	43	91	--	2.2	--	437	.59	1.7	250	0	41	2.2	784	8.7
June 30	1.10	--	--	21	45	108	--	256	18	62	120	--	3.9	--	504	.69	1.5	236	0	50	3.1	952	8.7
July 1-10	.50	16	.00	31	45	118	3.0	279	23	61	124	.5	1.4	.41	560	.76	.8	261	0	49	3.2	1,010	8.6
July 11-20	.50	--	--	29	46	142	--	273	21	77	175	--	1.4	--	639	.87	.9	260	2	54	4.3	1,180	8.7
July 21-31	.41	--	--	27	47	222	--	268	18	109	266	--	1.4	--	821	1.12	.9	260	10	65	6.0	1,500	8.6
Aug. 1-2	3.25	--	--	23	16	57	--	166	4	26	56	--	3.1	--	312	.42	2.7	122	0	50	2.2	494	8.5
Aug. 3	3.20	--	--	24	20	73	--	190	8	30	76	--	2.4	--	370	.50	3.2	142	0	53	2.7	613	8.6
Aug. 4-10	.74	--	--	35	40	146	--	258	12	81	175	--	1.7	--	638	.87	1.3	250	18	56	4.0	1,190	8.5

ARKANSAS RIVER BASIN--Continued

LITTLE RIVER BELOW HOG CREEK NEAR NORMAN, OKLA.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Aug. 11-20, 1954.	0.43	--	--	44	32	228	--	301	4	103	279	--	1.2	--	860	1.17	1.0	240	0	67	6.4	1,620	8.4
Aug. 21-31	.10	14	0.00	37	50	275	4.8	285	5	145	363	0.5	1.3	0.52	1,040	1.41	.3	300	58	66	6.9	1,940	8.4
Sept. 1-10	.10	10	.00	36	47	336	3.6	276	8	161	406	.4	1.4	.78	1,150	1.56	.3	284	44	72	8.7	2,090	8.4
Sept. 11-20	.10	--	--	33	44	313	--	235	13	169	420	--	2.3	--	1,110	1.51	.3	265	51	72	8.4	2,100	8.5
Sept. 21-24, 26-27	.10	--	--	32	51	318	--	241	13	165	425	--	2.3	--	1,130	1.54	.3	290	71	70	8.1	2,130	8.5
Sept. 25	.10	--	--	14	40	32	--	215	15	16	35	--	2.3	--	268	.36	.1	198	0	26	1.0	517	8.7
Sept. 28-30	.70	--	--	19	14	26	--	131	0	11	31	--	5.4	--	218	.30	.4	106	0	35	1.1	344	7.8
Weighted average	26.1	--	--	35	21	23		a 213	--	12	26	--	2.0	--	246	0.33	17	174	0	22	0.8	429	--

a Includes equivalent of individual carbonate values shown above.

ARKANSAS RIVER BASIN--Continued

LITTLE RIVER BELOW HOG CREEK NEAR NORMAN, OKLA.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

ARKANSAS RIVER BASIN--Continued

NORTH CANADIAN RIVER AT CANTON RESERVOIR NEAR CANTON, OKLA.

LOCATION.--Immediately below dam on North Canadian River, 2 miles northwest of Canton, Blaine County, and 4½ miles upstream from Minnehaha Creek.
DRAINAGE AREA.--12,483 square miles (revised) of which 4,883 square miles is probably noncontributing (at gaging station).
RECORDS AVAILABLE.--Chemical analyses: October 1951 to September 1954.
Water temperatures: October 1951 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 766 ppm Apr. 1-30; minimum, 370 ppm May 25-31.
Hardness: Maximum, 364 ppm Mar. 18-31; minimum, 205 ppm May 25-31.
Specific conductance: Maximum daily, 1,290 micromhos Apr. 20; minimum daily, 399 micromhos May 26.
Water temperatures: Maximum observed daily, 84°F June 22-23, July 3, 6; minimum observed daily, 46°F Mar. 18, 31, Apr. 1.
EXTREMES, 1951-54.--Dissolved solids: Maximum, 1,150 ppm July 17-19, 1953; minimum, 370 ppm May 25-31, 1954.
Hardness: Maximum, 417 ppm Mar. 1-31, 1953; minimum, 205 ppm May 25-31, 1954.
Specific conductance: Maximum daily, 1,790 micromhos July 17, 1953; minimum daily, 399 micromhos May 26, 1954.
Water temperatures: Maximum observed daily, 85°F July 31, Aug. 5, 7, 9, 1952; minimum observed daily, freezing point Dec. 20-21, 1951.
REMARKS.--Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Samples collected only for days when releases made from reservoir. Records of contents for Canton Reservoir near Canton, Okla. for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180 C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Mar. 18-31, 1954 ...		18	0.01	90	34	118	9.1	238	0	184	167	0.8	1.2	0.04	739	1.01		364	169	41	2.7	1,210	7.9
Apr. 1-30.....		7.4	.00	81	34	135	8.1	221	0	207	172	.6	.8	.25	766	1.04		340	159	46	3.2	1,250	8.2
May 1-24.....		--	--	75	26	91	--	170	0	179	127	--	1.2	--	630	.86		293	154	40	2.3	1,010	8.2
May 25-31.....		--	--	52	18	48	--	125	0	103	67	--	1.6	--	370	.50		205	102	34	1.5	626	8.1
June 1-30.....		20	.01	69	30	109	8.8	181	0	162	152	.8	1.8	.00	692	.94		296	148	44	2.8	1,050	8.1
July 1-4, 6-7.....		--	--	66	35	127	--	166	0	178	175	--	3.7	--	704	.96		310	164	47	3.1	1,210	8.4

ARKANSAS RIVER BASIN--Continued

NORTH CANADIAN RIVER AT CANTON RESERVOIR NEAR CANTON, OKLA.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

ARKANSAS RIVER BASIN--Continued

NORTH CANADIAN RIVER NEAR YUKON, OKLA.

LOCATION.--At bridge on State Highway 4, 3 miles north of Yukon, Canadian County, and 16 miles downstream from gaging station near El Reno.
DRAINAGE AREA.--13,042 square miles (revised), of which 4,899 square miles is probably noncontributing (at gaging station).
RECORDS AVAILABLE.--Chemical analyses: October 1952 to September 1954.
Water temperatures: October 1952 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 954 ppm Apr. 25-30; minimum, 114 ppm Oct. 25-26.
Hardness: Maximum, 518 ppm Nov. 5-10; minimum, 53 ppm Oct. 25-26.
Specific conductance: Maximum daily, 1,640 micromhos Mar. 21; minimum daily, 145 micromhos Oct. 26.
Water temperatures: Maximum observed daily, 91°F July 13; minimum observed daily, freezing point Jan. 21-22, Mar. 13.
EXTREMES, 1952-54.--Dissolved solids: Maximum, 1,060 ppm July 21-24, 1953; minimum, 98 ppm Apr. 6-7, 1953.
Hardness: Maximum, 518 ppm Nov. 5-10, 1953; minimum, 53 ppm Oct. 25-26, 1953.
Specific conductance: Maximum daily, 1,780 micromhos July 23, 1953; minimum daily, 144 micromhos Apr. 6, 1953.
Water temperatures: Maximum observed daily, 92°F July 8, 1953; minimum observed daily, freezing point Jan. 21-22, Mar. 13, 1954.
REMARKS.--Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for gaging station near El Reno for water year October 1953 to September 1954 given in WSP 1341. No appreciable inflow between gaging station and sampling station except during periods of heavy local runoff. No flow, Oct. 2, 7-14, 18-21, July 14-31, Aug. 1-31, Sept. 1-30.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluorids (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-10, 1953 ...	1.01	--	--	81	35	126	--	307	0	137	157	--	6.3	--	733	1.00	2.0	346	94	44	3.0	1,210	7.5
Oct. 11-20.....	.28	17	0.02	72	42	132	9.6	331	0	123	162	0.7	7.3	0.64	746	1.01	.6	352	81	44	3.1	1,230	7.8
Oct. 21-22.....	3.60	--	--	94	36	127	--	388	3	101	162	--	6.9	--	751	1.02	7.3	384	61	42	2.8	1,260	8.3
Oct. 23-24.....	23.5	--	--	20	5.8	20	--	73	0	27	22	--	3.6	--	144	.20	9.1	74	14	37	1.0	248	7.5
Oct 25-26.....	19.0	--	--	14	4.4	8.8	--	54	0	18	8.5	--	2.2	--	114	.16	5.8	53	9	26	.5	148	7.2
Oct. 27-30	1.90	--	--	36	9.5	32	--	131	0	38	37	--	4.0	--	242	.33	1.2	129	22	35	1.2	410	7.8
Oct. 31.....	.40	--	--	68	19	56	--	254	0	61	69	--	7.2	--	426	.58	.5	248	40	33	1.5	725	8.2
Nov. 1.....	.30	--	--	67	21	55	--	256	0	64	69	--	6.4	--	432	.59	.3	252	42	32	1.5	730	8.2
Nov. 2-4	.47	--	--	114	39	99	--	457	0	93	123	--	10	--	740	1.01	.9	444	70	33	2.0	1,220	7.9
Nov. 5-10	.45	--	--	129	48	124	--	531	0	118	155	--	10	--	879	1.20	1.1	518	83	34	2.4	1,440	7.9
Nov. 11-17	.27	--	--	89	49	130	--	420	0	126	164	--	7.0	--	791	1.08	.6	422	78	40	2.8	1,340	7.9
Nov. 18-19	220	--	--	18	4.1	8.9	--	69	0	15	7.8	--	1.7	--	126	.17	75	62	6	24	.5	164	7.4
Nov. 20-22	21.2	--	--	33	8.6	30	--	118	0	35	36	--	4.6	--	222	.30	13	118	22	36	1.2	384	7.9
Nov. 23-24	1.40	--	--	46	11	42	--	158	0	57	48	--	3.8	--	308	.42	1.2	161	32	36	1.4	518	8.1
Nov. 25-30	.90	--	--	58	16	65	--	198	0	86	76	--	5.1	--	428	.58	1.0	212	50	40	2.0	718	7.6
Dec. 1-2, 5-10 ...	1.62	--	--	61	16	72	--	200	0	91	83	--	4.6	--	448	.61	2.0	216	52	42	2.1	753	7.9
Dec. 3-4.....	32.9	--	--	28	6.1	20	--	91	0	30	24	--	3.5	--	179	.24	16	95	20	31	.9	289	7.6
Dec. 11-20	.59	17	.00	84	31	109	6.9	301	0	130	127	.5	7.8	.20	674	.92	1.1	337	90	41	2.6	1,090	8.2
Dec. 21-31	.50	--	--	79	25	100	--	262	1	125	122	--	5.5	--	622	.85	.8	298	82	42	2.5	1,010	8.3
Jan. 1-10, 1954 ...	.72	--	--	81	28	120	--	273	0	146	143	--	7.2	--	687	.93	1.3	316	92	45	2.9	1,130	8.1
Jan. 11-20.....	.61	--	--	81	29	133	--	275	0	159	160	--	5.5	--	732	1.00	1.2	322	96	47	3.2	1,210	8.2
Jan. 21-31.....	.59	--	--	80	36	152	--	274	0	172	180	--	3.0	--	820	1.12	1.3	348	123	49	3.5	1,340	8.0

Feb. 1-10, 1954...	.63	--	--	76	35	146	--	266	0	167	175	--	3.0	--	780	1.06	1.3	334	116	49	3.5	1,290	8.2
Feb. 11-20.....	2.26	--	--	83	37	149	--	308	0	163	175	--	3.5	--	802	1.09	4.9	359	106	47	3.4	1,340	7.9
Feb. 21-28	.64	--	--	76	33	124	--	284	0	142	146	--	5.0	--	714	.97	1.2	325	92	45	3.0	1,190	7.8
Mar. 1-10	.51	--	--	77	35	123	--	300	0	142	145	--	2.6	--	708	.96	1.0	335	89	44	2.9	1,170	8.0
Mar. 11-19	.27	--	--	81	38	145	--	331	0	161	172	--	3.2	--	794	1.08	.6	360	89	47	3.3	1,310	8.0
Mar. 20-26	597	--	--	84	34	146	--	255	0	194	178	--	.1	---	872	1.19	1,410	350	141	48	3.4	1,310	8.2
Mar. 27-31	55.0	--	--	76	27	116	--	217	0	166	143	--	.1	--	710	.97	105	300	122	46	2.9	1,100	8.1
Apr. 1-10	30.5	--	--	88	35	140	--	277	0	190	173	--	2.5	--	806	1.10	66	364	137	46	3.2	1,330	8.0
Apr. 11-20	29.4	--	--	80	35	144	--	226	0	205	188	--	2.0	--	806	1.10	64	344	159	48	3.4	1,330	7.9
Apr. 21-24.....	21.8	--	--	82	38	151	--	235	0	216	200	--	2.8	--	904	1.23	53	360	168	48	3.5	1,390	8.2
Apr. 25-30	28.8	--	--	83	42	156	--	236	2	229	210	--	3.2	--	954	1.30	74	380	183	47	3.5	1,450	8.3
May 1, 3-5, 9	111	--	--	42	20	59	--	132	0	94	78	--	2.5	--	432	.59	129	188	64	41	1.9	647	8.0
May 2	100	--	--	22	7.2	29		74	0	34	28	--	16	--	236	.32	64	84	24	43	1.4	283	7.9
May 6-8, 10	560	--	--	70	25	95	--	173	0	162	130	--	2.5	--	688	.94	1,040	276	134	43	2.5	1,010	8.0
May 11-18	96.1	--	--	64	24	83	--	162	0	153	108	--	1.6	--	535	.73	139	260	127	41	2.2	899	8.0
May 19-20	94.0	--	--	53	16	69	--	131	0	121	85	--	1.7	--	451	.61	114	198	90	43	2.1	722	8.0
May 21-24	201	--	--	66	22	87	--	168	0	158	108	--	1.2	--	557	.76	302	254	116	43	2.4	911	8.2
May 25	1,500	--	--	34	9.7	22	--	119	0	39	26	--	3.0	--	238	.32	964	125	28	28	.9	349	8.2
May 26	557	--	--	64	22	91	--	148	16	137	119	--	1.4	--	589	.80	886	248	100	44	2.5	938	8.7
May 27	401	--	--	51	13	50	--	124	0	97	64	--	3.0	--	386	.52	418	180	78	38	1.6	561	8.2
May 28	188	--	--	70	13	75	--	156	4	116	100	--	2.4	--	500	.68	254	230	96	41	2.1	804	8.3
May 29-31	795	--	--	50	12	48	--	124	0	91	63	--	2.2	--	365	.50	783	175	74	37	1.6	593	8.0
June 1-4	904	--	--	64	13	60	--	142	5	114	68	--	1.8	--	460	.63	1,120	213	88	38	1.8	730	8.7
June 5-10.....	521	--	--	79	15	96	--	163	7	141	126	--	1.7	--	578	.79	813	260	115	45	2.6	953	8.4
June 11-15.....	142	--	--	81	16	104	--	178	0	149	149	--	1.9	--	638	.87	245	266	120	46	2.8	1,050	8.1
June 16-20.....	138	--	--	57	11	68	--	147	0	92	90	--	1.7	--	429	.58	160	187	66	44	2.2	707	8.2
June 21-22	59.5	--	--	66	22	80	--	161	12	99	124	--	3.0	--	556	.76	89	255	103	41	2.2	893	8.7
June 23-30	55.0	--	--	69	32	126	--	172	6	150	175	--	3.6	--	738	1.00	110	303	152	47	3.1	1,170	8.5
July 1-10	21.7	13	0.00	64	36	142	10	168	0	198	195	0.9	3.1	0.00	745	1.01	44	308	170	49	3.5	1,320	8.2
July 11-13	.30	--	--	78	37	138	--	186	2	197	202	--	2.3	--	800	1.09	.6	345	189	47	3.2	1,350	8.3
July 14-31	(a)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aug. 1-31	(a)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sept. 1-30	(a)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Weighted average	67.6	--	--	66	20	87		b174	--	134	111	--	1.8	--	570	0.78	104	246	104	43	2.4	892	--

a No flow.
b Includes equivalent of individual carbonate values shown above.

ARKANSAS RIVER BASIN--Continued

NORTH CANADIAN RIVER NEAR YUKON, OKLA.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	74	61	52	39	45	44	51	65	75	88		
2	--	75	53	41	46	46	55	57	72	83		
3	76	67	50	40	47	48	59	58	70	84		
4	61	63	50	43	45	40	64	62	74	85		
5	60	57	--	42	46	40	69	69	75	87		
6	75	56	--	42	41	44	69	69	77	88		
7	--	45	--	44	45	47	69	65	77	89		
8	--	45	--	44	44	45	66	65	81	88		
9	--	53	--	43	48	48	62	60	81	88		
10	--	54	--	39	50	53	65	57	82	89		
11	--	53	--	37	45	58	64	57	81	90		
12	--	53	--	38	41	40	60	62	80	89		
13	--	54	--	38	45	32	67	71	79	91		
14	--	--	50	39	51	35	63	72	81	--		
15	68	66	39	38	57	37	64	75	81	--		
16	70	--	41	37	51	34	61	72	83	--		
17	70	54	40	36	49	35	64	74	84	--		
18	--	60	40	39	50	39	69	72	86	--		
19	--	58	41	40	50	42	70	69	86	--		
20	--	53	42	40	48	45	67	67	85	--		
21	--	54	45	32	49	48	68	70	84	--		
22	69	52	37	32	51	52	68	72	89	--		
23	60	50	35	33	52	52	71	71	90	--		
24	61	49	38	37	51	53	72	73	89	--		
25	59	--	41	41	52	55	73	67	88	--		
26	57	--	42	38	52	52	75	70	86	--		
27	61	50	43	40	51	53	75	72	85	--		
28	59	50	39	40	48	60	76	75	87	--		
29	58	51	40	41	--	57	76	75	87	--		
30	59	53	39	41	--	47	68	74	87	--		
31	60	--	40	43	--	44	--	--	--	--		
Average	--	55	--	39	48	46	67	68	82	--		

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NORTH CANADIAN RIVER NEAR WETUMKA, OKLA.

LOCATION.--At gaging station at bridge on U. S. Highway 75, 2½ miles northeast of Wetumka, Hughes County, 2.3 miles upstream from Wewoka Creek, and at mile 84.4.
DRAINAGE AREA.--14,290 square miles (revised), of which 4,899 square miles is probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1954.
Water temperatures: October 1953 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 21,000 ppm June 19; minimum, 381 ppm May 2.
Hardness: Maximum, 4,230 ppm June 19; minimum, 115 ppm May 2.
Specific conductance: Maximum daily, 32,100 micromhos June 19; minimum daily, 621 micromhos May 2.
Water temperatures: Maximum observed daily, 92°F Aug. 24-25; minimum observed daily, freezing point on several days during December and January.
REMARKS.--Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year October 1953 to September 1954 given in WSP 1341. No flow Aug. 27-31, Sept. 1-30.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-2, 1953	22.5	--	--	720	156	3,500	--	93	0	49	7,160	--	--	--	12,600	17.14	765	2,440	2,360	76	31	19,600	7.8
Oct. 3	29.0	--	--	672	156	3,340	--	78	0	35	6,860	--	--	--	12,000	16.32	940	2,320	2,260	76	30	18,700	7.7
Oct. 4	64.0	--	--	435	96	2,090	--	82	0	19	4,240	--	--	--	7,600	10.34	1,310	1,480	1,410	75	24	12,300	7.8
Oct. 5	48.0	--	--	557	119	2,630	--	89	0	45	5,470	--	--	--	9,560	13.00	1,240	1,880	1,810	75	26	15,300	7.8
Oct. 6-7	39.0	--	--	589	131	2,830	--	76	0	46	5,870	--	--	--	10,300	14.01	1,080	2,010	1,950	75	27	16,300	7.7
Oct. 8-9	44.0	--	--	561	127	2,710	--	76	0	52	5,570	--	--	--	9,840	13.38	1,170	1,920	1,860	75	27	15,700	7.6
Oct. 10	46.0	--	--	778	175	4,020	--	77	0	67	8,040	--	--	--	14,000	19.04	1,740	2,660	2,600	77	34	21,600	7.6
Oct. 11-14	42.2	--	--	727	155	3,660	--	58	0	70	7,450	--	--	--	12,800	17.41	1,460	2,450	2,400	76	32	20,300	7.3
Oct. 15	36.0	--	--	675	147	3,500	--	52	0	70	7,100	--	--	--	12,100	16.46	1,180	2,290	2,250	77	32	20,100	7.5
Oct. 16	38.0	--	--	525	119	2,700	--	55	0	48	5,470	--	--	--	9,460	12.87	971	1,800	1,760	77	28	16,000	7.5
Oct. 17	35.0	--	--	636	139	3,160	--	54	0	52	6,510	--	--	--	11,200	15.23	1,060	2,160	2,120	76	30	18,600	7.5
Oct. 18-19	210	--	--	656	147	3,320	--	53	0	51	6,760	--	--	--	11,500	15.64	6,520	2,240	2,200	76	31	18,500	7.4
Oct. 20	505	--	--	486	97	2,290	--	117	0	71	4,660	--	--	--	8,680	11.80	11,840	1,610	1,510	76	25	14,000	7.9
Oct. 21	122	--	--	347	69	1,730	--	105	0	46	3,440	--	--	--	6,490	8.83	2,140	1,150	1,060	77	22	10,100	7.9
Oct. 22	119	--	--	224	43	1,150	--	94	0	30	2,250	--	--	--	4,340	5.90	1,390	735	658	77	18	6,960	7.9
Oct. 23	1,790	--	--	106	18	459	--	104	0	16	900	--	5.7	--	1,760	2.39	8,510	338	253	75	11	2,990	7.9
Oct. 24	860	--	--	482	102	2,460	--	85	0	31	4,930	--	--	--	9,190	12.50	21,340	1,620	1,550	77	27	13,900	7.7
Oct. 25	753	--	--	150	32	699	--	104	0	28	1,370	--	--	--	2,630	3.58	5,350	505	420	75	14	4,480	7.9
Oct. 26	3,770	--	--	110	21	428	--	102	0	19	860	--	8.3	--	1,680	2.28	17,100	360	276	72	9.8	2,820	7.9
Oct. 27-29	936	--	--	60	8.4	216	--	95	0	16	405	--	3.1	--	852	1.16	2,150	184	106	72	6.9	1,490	7.8
Oct. 30	321	--	--	105	19	396	--	92	0	24	800	--	8.3	--	1,580	2.15	1,370	342	266	72	9.3	2,660	7.9
Oct. 31	219	--	--	280	56	1,140	--	104	0	40	2,380	--	--	--	4,430	6.02	2,620	930	845	73	16	7,130	7.9

ARKANSAS RIVER BASIN--Continued

NORTH CANADIAN RIVER NEAR WETUMKA, OKLA.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Nov. 1-5, 1953	183	--	--	185	41	818	--	114	0	32	1,650	--	--	--	3,060	4.16	1,510	630	536	74	14	5,180	7.7
Nov. 6-7	148	--	--	296	66	1,300	--	143	0	43	2,600	--	--	--	4,820	6.56	1,930	1,010	893	74	18	7,940	7.7
Nov. 8-10	118	--	--	461	103	2,060	--	177	0	54	4,190	--	--	--	7,550	10.27	2,410	1,570	1,430	74	23	12,300	7.8
Nov. 11-18	95.6	--	--	581	110	2,510	--	204	0	63	5,120	--	--	--	9,430	12.82	2,430	1,900	1,730	74	25	14,800	7.9
Nov. 19	446	--	--	348	76	1,540	--	128	0	48	3,100	--	--	--	5,520	7.51	6,650	1,180	1,080	74	19	9,240	8.0
Nov. 20	1,150	--	--	84	16	335	--	66	0	15	670	--	5.5	--	1,280	1.74	3,970	274	220	73	8.8	2,280	7.7
Nov. 21-24	298	--	--	228	43	1,030	--	92	0	34	2,080	--	--	--	3,820	5.20	3,070	745	670	75	16	6,390	7.6
Nov. 25-30	110	--	--	510	104	2,270	--	169	0	45	4,610	--	--	--	8,440	11.48	2,510	1,700	1,560	74	24	13,400	7.9
Dec. 1-2	89.0	--	--	467	89	2,020	--	207	0	74	4,040	--	--	--	7,470	10.16	1,800	1,530	1,360	74	22	12,000	8.0
Dec. 3-4	912	--	--	332	64	1,450	--	120	0	38	2,920	--	--	--	5,400	7.34	13,300	1,090	992	74	19	8,820	7.9
Dec. 5-7	402	--	--	170	32	720	--	89	0	23	1,480	--	--	--	2,740	3.73	2,970	555	482	74	13	4,670	7.8
Dec. 8	245	--	--	573	107	2,500	--	120	0	73	5,070	--	--	--	9,310	12.66	6,160	1,870	1,770	74	25	14,500	7.9
Dec. 9-10	178	--	--	292	54	1,360	--	105	0	35	2,750	--	--	--	5,040	6.85	2,420	950	864	76	19	8,230	7.9
Dec. 11-12	130	--	--	212	40	918	--	135	0	53	1,820	--	--	--	3,370	4.58	1,180	695	584	74	15	5,760	8.0
Dec. 13-20	114	--	--	534	102	2,270	--	213	0	59	4,630	--	--	--	8,570	11.66	2,640	1,750	1,580	74	24	13,400	7.8
Dec. 21-31	104	--	--	704	127	3,030	--	233	0	68	6,160	--	--	--	11,300	15.37	3,170	2,280	2,090	74	28	17,300	7.7
Jan. 1-10, 1954	95.8	--	--	724	147	3,230	--	234	0	70	6,610	--	--	--	11,900	16.18	3,080	2,410	2,220	74	29	18,300	7.4
Jan. 11-20	92.7	--	--	700	144	3,160	--	227	0	74	6,360	--	--	--	11,800	16.05	2,950	2,340	2,150	75	28	17,800	7.0
Jan. 21-31	107	--	--	711	138	3,220	--	215	0	74	6,550	--	--	--	12,000	16.32	3,470	2,340	2,160	75	29	18,300	7.3
Feb. 1-10	85.2	--	--	658	149	3,180	--	119	0	76	6,260	--	--	--	11,400	15.50	2,620	2,250	2,160	75	29	17,800	7.6
Feb. 11-20	102	--	--	661	151	3,300	--	74	0	72	6,520	--	--	--	11,600	15.78	3,190	2,270	2,210	76	30	18,100	6.6
Feb. 21	233	--	--	427	94	2,080	--	93	0	49	4,140	--	--	--	7,280	9.90	4,580	1,450	1,380	76	24	12,000	7.7
Feb. 22	172	--	--	950	219	5,010	--	107	0	65	10,200	--	--	--	16,500	22.44	7,660	3,270	3,180	77	38	26,600	7.9
Feb. 23-26	146	--	--	648	143	3,240	--	87	0	71	6,460	--	--	--	11,600	15.78	4,570	2,200	2,130	76	30	18,200	7.2
Feb. 27-28	102	--	--	427	90	2,200	--	78	0	45	4,290	--	--	--	7,770	10.57	2,140	1,440	1,370	77	25	12,600	7.1
Mar. 1-5	81.0	--	--	402	96	1,950	--	95	0	62	3,940	--	--	--	7,420	10.09	1,620	1,400	1,320	75	23	11,600	7.5
Mar. 6-10	74.6	--	--	635	138	2,890	--	148	0	63	5,920	--	--	--	11,300	15.37	2,280	2,150	2,030	75	27	16,900	7.8
Mar. 11-20	65.0	--	--	762	158	3,660	--	176	0	71	7,290	--	--	--	13,500	18.36	2,370	2,550	2,410	76	32	20,400	7.5
Mar. 21-26	150	--	--	670	155	3,280	--	98	0	63	6,610	--	--	--	12,500	17.00	5,060	2,310	2,230	76	30	18,700	7.0
Mar. 27-31	175	--	--	250	60	1,140	--	130	0	19	2,300	--	--	--	4,650	6.32	2,200	870	764	74	17	7,070	7.8
Apr. 1,	89.0	--	--	470	92	2,170	--	118	0	50	4,280	--	--	--	8,250	11.22	1,980	1,550	1,410	75	24	12,500	8.1
Apr. 2-4	83.7	--	--	494	148	3,240	--	169	0	102	6,420	--	--	--	11,400	15.50	2,580	1,840	1,700	79	33	19,300	6.1
Apr. 5-9	77.8	--	--	581	127	3,010	--	58	0	62	5,820	--	--	--	11,200	15.23	2,350	1,970	1,920	77	29	16,700	7.0
Apr. 10	73.0	--	--	755	160	3,700	--	50	0	72	7,300	--	--	--	13,500	18.36	2,660	2,540	2,500	76	32	20,500	7.7
Apr. 11-12	130	--	--	660	137	3,280	--	58	0	64	6,360	--	--	--	12,100	16.46	4,250	2,210	2,160	76	30	18,200	7.7

Apr. 13-15, 1954	115	--	--	534	114	2,510	--	81	0	53	5,180	--	--	--	9,430	12.82	2,930	1,800	1,730	75	26	15,000	7.5
Apr. 16-20	90.0	--	--	775	162	4,030	--	26	0	88	7,850	--	--	--	14,900	20.26	3,620	2,600	2,580	77	34	22,000	7.2
Apr. 21-24	92.0	--	--	636	164	3,750	--	5	0	86	7,250	--	--	--	13,300	18.09	3,300	2,260	2,260	78	34	20,900	4.9
Apr. 25-29	79.0	--	--	398	167	2,720	--	3	0	67	5,230	--	--	--	9,630	13.10	2,050	1,680	1,680	78	29	15,500	4.8
Apr. 30	2,170	--	--	128	21	529	--	98	0	15	1,020	--	6.8	--	2,160	2.94	12,660	405	324	74	11	3,420	8.1
May 1, 4, 6-9	2,421	--	--	121	23	452	--	135	0	22	885	--	3.1	--	1,790	2.43	11,700	398	288	71	9.8	3,070	8.0
May 2	12,300	--	--	36	6.1	73	--	95	0	7.0	132	--	4.0	--	381	.52	12,650	115	37	58	3.0	621	8.1
May 3	4,140	--	--	64	13	180	--	100	0	9.9	375	--	4.0	--	874	1.19	9,770	215	133	65	5.3	1,400	8.2
May 5, 10	1,800	--	--	130	31	533	--	3	0	30	1,100	--	--	--	2,170	2.95	10,550	450	448	72	11	3,900	5.1
May 11-12	2,675	--	--	71	10	227	--	2	0	20	438	--	85	--	928	1.26	6,700	218	216	69	6.7	1,750	5.0
May 13	3,360	--	--	132	24	479	--	101	0	19	965	--	4.9	--	1,970	2.68	17,870	430	347	71	10	3,190	8.1
May 14-15	1,059	--	--	66	9.6	184	--	107	0	13	372	--	2.3	--	803	1.09	2,300	204	116	66	5.6	1,420	8.2
May 16	634	--	--	114	22	390	--	109	0	19	790	--	4.8	--	1,590	2.16	2,720	374	284	69	8.8	2,690	8.2
May 17-20	473	--	--	224	49	922	--	95	0	35	1,820	--	--	--	3,770	5.13	4,810	760	682	73	15	5,900	6.9
May 21-27	472	--	--	270	70	1,230	--	120	0	38	2,450	--	--	--	4,820	6.56	6,140	960	862	74	17	7,680	7.6
May 28-29	854	--	--	300	66	1,380	--	121	0	40	2,720	--	--	--	5,320	7.24	12,270	1,020	921	75	19	8,470	8.0
May 30	517	--	--	218	44	1,040	--	122	0	29	2,000	--	--	--	3,780	5.14	5,280	725	625	76	17	6,180	8.1
May 31	340	--	--	158	36	738	--	121	2	26	1,430	--	--	--	2,780	3.78	2,550	540	438	75	14	4,600	8.3
June 1	281	--	--	158	34	698	--	129	3	30	1,400	--	--	--	2,900	3.94	2,200	533	422	74	13	4,290	8.3
June 2-3	220	--	--	212	43	871	--	153	8	35	1,720	--	--	--	3,450	4.69	2,050	704	565	73	14	5,690	8.4
June 4-5	172	--	--	242	65	1,050	--	130	8	36	2,120	--	--	--	4,260	5.79	1,980	870	750	72	15	6,910	8.4
June 6-7	168	--	--	338	82	1,480	--	162	8	43	3,020	--	--	--	5,880	8.00	2,670	1,180	1,030	73	19	9,290	8.4
June 8-10	169	--	--	399	94	1,740	--	175	0	44	3,570	--	--	--	6,860	9.33	3,130	1,380	1,240	73	20	10,900	7.5
June 11-14	128	--	--	530	145	2,200	--	137	0	47	4,620	--	--	--	7,610	10.35	2,630	1,920	1,810	71	22	13,600	7.5
June 15	211	--	--	399	59	1,840	--	100	0	39	3,530	--	--	--	6,490	8.83	3,700	1,240	1,160	76	23	10,500	7.8
June 16	219	--	--	292	66	1,200	--	106	0	28	2,440	--	--	--	4,350	5.92	2,570	1,000	913	72	16	7,630	7.9
June 17-18	152	--	--	546	128	2,420	--	125	0	44	4,850	--	--	--	8,430	11.46	3,460	1,890	1,790	74	24	14,500	8.1
June 19	130	--	--	1,170	319	5,810	--	49	0	63	11,800	--	--	--	21,000	28.56	7,370	4,230	4,190	75	39	32,100	7.5
June 20	127	--	--	617	168	2,810	--	113	0	52	5,900	--	--	--	10,700	14.55	3,670	2,230	2,140	73	26	17,300	7.9
June 21-30	85.2	20	0.01	525	153	2,470	39	117	0	43	5,170	0.3	--	0.48	9,370	12.74	2,160	1,940	1,840	73	24	14,600	7.5
July 1-10	59.6	20	.00	537	153	2,500	41	115	0	47	5,390	.1	6.6	.87	9,460	12.87	1,520	1,970	1,880	73	24	15,500	7.9
July 11-20	43.9	--	--	509	131	2,520	--	99	0	37	4,880	--	--	--	8,880	12.08	1,050	1,810	1,730	75	26	14,500	7.9
July 21-22	30.5	--	--	414	82	1,910	--	133	2	48	3,830	--	--	--	6,720	9.14	553	1,370	1,260	75	22	11,500	8.3
July 23	25.0	--	--	356	76	1,600	--	142	4	42	3,250	--	--	--	5,690	7.74	384	1,200	1,080	74	20	9,750	8.3
July 24-25	25.0	--	--	224	42	809	--	182	14	58	1,600	--	--	--	2,950	4.01	199	730	558	71	13	5,300	8.5

ARKANSAS RIVER BASIN--Continued

NORTH CANADIAN RIVER NEAR WETUMKA, OKLA.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
July 26-27, 1954	20.5	--	--	148	37	478	--	216	0	44	950	--	--	--	1,870	2.54	104	520	343	67	9.1	3,310	7.7
July 28	43.0	--	--	525	190	2,550	--	66	0	56	5,270	--	--	--	9,130	12.42	1,060	2,090	2,040	73	24	15,100	7.9
July 29-31	20.3	--	--	367	84	1,810	--	116	0	32	3,590	--	--	--	6,230	8.47	341	1,260	1,160	76	22	11,000	7.9
Aug. 1-2	33.5	--	--	336	73	1,380	--	102	0	30	2,900	--	--	--	5,060	6.88	458	1,140	1,060	72	18	8,680	8.2
Aug. 3-8	35.8	--	--	494	87	2,420	--	101	0	36	4,830	--	--	--	8,270	11.25	799	1,590	1,510	77	26	14,300	8.0
Aug. 9	22.0	--	--	296	59	1,330	--	148	0	26	2,650	--	--	--	4,690	6.38	279	980	858	75	18	8,210	8.2
Aug. 10	21.0	--	--	442	89	2,090	--	125	0	24	4,230	--	--	--	7,340	9.98	416	1,470	1,370	76	24	12,200	8.2
Aug. 11	17.0	--	--	324	71	1,520	--	154	2	31	2,950	--	--	--	5,510	7.49	253	1,100	970	75	20	8,920	8.3
Aug. 12-14	13.3	--	--	483	96	2,480	--	66	0	33	4,890	--	--	--	8,800	11.97	316	1,600	1,550	77	27	14,000	7.7
Aug. 15-20	4.65	--	--	714	158	3,730	--	42	0	76	7,440	--	--	--	13,000	17.68	163	2,430	2,400	77	33	20,200	7.2
Aug. 21-23	1.50	--	--	931	109	4,810	--	36	0	67	9,410	--	--	--	15,800	21.49	64	2,770	2,740	79	40	23,800	7.4
Aug. 24-31	.35	--	--	434	118	2,040	--	80	0	27	4,230	--	--	--	7,680	10.44	7.3	1,570	1,500	74	22	12,500	7.8
Sept. 1-30	(a)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Weighted average	269	--	--	233	50	1,030	--	b106	--	30	2,070	--	--	--	3,910	5.32	2,840	787	700	74	16	6,250	--

a No flow.

b Includes equivalent of individual carbonate values shown above.

ARKANSAS RIVER BASIN--Continued

NORTH CANADIAN RIVER NEAR WETUMKA, OKLA.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	80	56	45	35	42	40	44	61	70	78	85	
2	--	54	56	41	41	42	50	60	72	80	73	
3	85	54	50	36	42	35	54	55	65	80	78	
4	67	52	46	46	43	34	65	56	65	90	81	
5	60	52	47	39	41	40	65	58	67	80	78	
6	57	47	51	38	43	36	65	60	67	79	77	
7	54	44	42	39	38	42	66	62	71	80	76	
8	55	45	45	47	41	46	54	60	71	80	77	
9	57	42	41	47	42	47	58	62	76	80	78	
10	65	52	38	37	48	52	60	58	75	81	75	
11	75	51	42	37	42	56	68	56	75	78	72	
12	67	50	40	32	38	56	58	57	76	85	78	
13	65	54	--	32	41	42	56	58	76	83	72	
14	67	51	--	35	52	35	62	58	75	81	77	
15	67	62	40	39	58	37	68	62	79	80	80	
16	64	49	45	36	50	42	55	65	75	79	76	
17	64	55	41	32	46	45	55	69	76	80	80	
18	64	65	37	34	48	52	58	65	79	79	80	
19	63	65	39	47	54	--	59	67	82	80	79	
20	64	50	41	55	42	50	61	64	81	78	79	
21	68	46	45	32	48	48	64	63	78	79	78	
22	70	48	33	32	49	52	65	66	80	79	78	
23	68	41	32	32	50	54	62	--	81	81	80	
24	60	45	32	36	45	52	65	70	82	88	92	
25	62	43	32	49	48	55	68	70	80	84	92	
26	56	45	35	44	47	54	68	69	80	79	78	
27	55	45	40	33	52	53	69	70	82	87	--	
28	55	42	40	38	40	58	66	72	77	82	--	
29	55	43	45	39	--	56	68	70	79	80	--	
30	54	41	33	42	--	44	65	73	80	80	--	
31	53	--	33	41	--	41	--	75	--	79	--	
Average	63	50	41	39	45	47	61	64	76	81	79	

ARKANSAS RIVER BASIN--Continued

DEEP FORK RIVER NEAR BEGGS, OKLA.

LOCATION.--At gaging station at county highway bridge, 3 miles upstream from Adams Creek, 4 miles south of Beggs, Okmulgee County, 8 miles downstream from Flat Rock (Checkerboard) Creek, and at mile 85.0.
DRAINAGE AREA.--2,018 square miles.
RECORDS AVAILABLE.--Chemical analyses: November 1951 to September 1954.
Water temperatures: November 1951 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 5,340 ppm Mar. 26; minimum, 190 ppm May 3-8.
Hardness: Maximum, 1,090 ppm Mar. 26; minimum, 63 ppm May 3-8.
Specific conductance: Maximum daily, 8,360 micromhos Mar. 26; minimum daily, 219 micromhos May 4.
Water temperatures: Maximum observed daily, 71°F Oct. 2, July 14; minimum observed daily, freezing point on many days during December, January, and March.
EXTREMES, 1951-54.--Dissolved solids: Maximum, 5,340 ppm Mar. 26, 1954; minimum 140 ppm July 26-31, 1953.
Hardness: Maximum, 1,190 ppm Jan. 24, 1953; minimum, 50 ppm July 14-16, 1953.
Specific conductance: Maximum daily, 8,700 micromhos Jan. 24, 1953; minimum daily, 190 micromhos July 27, 1953.
Water temperatures: Maximum observed daily, 96°F June 12, July 6, 1953; minimum observed daily, freezing point on many days during winter months.
REMARKS.--Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year October 1953 to September 1954 given in WSP 1341. No flow, Sept. 13-30.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-10, 1953	7.22	6.2	0.00	43	23	95	4.7	205	0	28	144	0.5	1.0	0.34	457	0.62	8.9	202	34	50	2.9	824	7.9
Oct. 11-21	6.56	6.4	.00	48	25	112	4.9	214	0	30	175	.5	1.0	.37	516	.70	9.1	223	48	51	3.2	929	8.0
Oct. 22-25	418	--	--	43	14	123	--	121	0	19	230	--	1.0	--	529	.72	597	167	68	62	4.1	976	7.9
Oct. 26-27	1,390	--	--	22	7.8	66	--	68	0	12	118	--	1.3	--	293	.40	1,100	87	32	62	3.1	524	7.6
Oct. 28-31	924	--	--	20	8.3	34	--	85	0	12	56	--	1.4	--	196	.27	489	84	14	47	1.6	350	7.7
Nov. 1-5	221	--	--	26	10	39	--	111	0	14	64	--	1.7	--	222	.30	132	106	15	45	1.7	415	7.9
Nov. 6-10	85.6	--	--	32	13	47	--	142	0	18	76	--	1.8	--	274	.37	63	134	18	43	1.8	505	7.9
Nov. 11-20	127	--	--	38	15	68	--	152	0	21	110	--	3.1	--	354	.48	121	155	30	49	2.4	638	7.8
Nov. 21-23	322	--	--	31	9.1	88	--	69	0	14	173	--	2.3	--	419	.57	364	115	58	62	3.6	709	7.4
Nov. 24-30	119	--	--	47	21	111	--	195	0	31	182	--	3.6	--	513	.70	165	204	44	54	3.4	939	8.0
Dec. 1-2	63.0	--	--	48	18	113	--	174	0	24	195	--	6.2	--	516	.70	88	196	54	56	3.5	952	7.9
Dec. 3	583	--	--	26	7.5	71		72	0	16	122	--	3.8	--	309	.42	486	96	37	62	3.2	558	7.7
Dec. 4	1,200	--	--	46	11	155		56	0	13	308	--	4.4	--	594	.81	1,920	161	115	68	5.3	1,110	7.5
Dec. 5-10	504	--	--	32	14	63		138	0	21	95	--	7.6	--	322	.44	438	137	24	50	2.4	574	8.0
Dec. 11-20	115	6.8	.06	38	19	77	4.2	158	0	20	127	.5	3.3	.22	388	.53	120	173	44	48	2.5	695	8.1
Dec. 21-26	51.8	--	--	56	21	115	--	191	0	27	208	--	5.9	--	574	.78	80	225	68	53	3.3	1,020	8.1
Dec. 27-31	42.4	--	--	69	27	173	--	216	0	39	310	--	9.1	--	774	1.05	89	284	107	57	4.5	1,390	8.1

Jan. 1-10, 1954	41.6	--	--	84	33	204	--	261	0	36	375	--	12	--	941	1.28	106	344	130	56	4.8	1,670	8.2
Jan. 11-20	37.8	--	--	94	36	243	--	275	3	44	465	--	10	--	1,100	1.50	112	382	152	58	5.4	1,960	8.3
Jan. 21-26	39.7	--	--	88	42	280	--	270	0	45	500	--	4.8	--	1,160	1.58	124	392	171	61	6.2	2,090	8.1
Jan. 27-31	54.4	--	--	100	46	371	--	259	0	45	695	--	5.5	--	1,520	2.07	223	438	226	65	7.7	2,690	7.9
Feb. 1-10	47.4	--	--	90	42	273	--	275	0	45	490	--	3.6	--	1,140	1.55	146	397	172	60	6.0	2,060	7.6
Feb. 11-19	39.9	--	--	112	44	357	--	270	0	43	670	--	3.2	--	1,470	2.00	158	460	240	63	7.2	2,630	7.7
Feb. 20-25	201	--	--	55	23	156	--	176	0	29	280	--	4.0	--	670	.91	364	232	88	59	4.5	1,260	7.8
Feb. 26-28	81.7	--	--	48	24	109	--	208	0	29	177	--	4.4	--	517	.70	114	218	48	52	3.2	940	8.1
Mar. 1-10	51.0	--	--	58	32	169	--	246	0	39	280	--	3.0	--	858	1.17	118	278	76	57	4.4	1,320	8.2
Mar. 11-20	42.6	--	--	55	35	226	--	200	0	44	385	--	1.4	--	879	1.20	101	282	118	64	5.9	1,630	7.9
Mar. 21-25	41.4	--	--	60	36	246	--	203	0	45	425	--	2.4	--	988	1.34	110	298	132	64	6.2	1,770	7.9
Mar. 26	180	--	--	318	72	1,360	--	121	0	37	2,780	--	7.8	--	5,340	7.26	2,600	1,090	991	73	18	8,360	8.2
Mar. 27-31	157	--	--	56	25	158	--	190	0	29	285	--	2.9	--	690	.94	292	242	86	59	4.4	1,260	7.7
Apr. 1-10	57.7	--	--	62	30	177	--	230	0	33	310	--	3.3	--	780	1.06	122	278	90	58	4.6	1,400	7.7
Apr. 11-16	61.3	--	--	70	30	203	--	229	0	31	368	--	2.4	--	862	1.17	143	298	110	60	5.1	1,560	8.1
Apr. 17-20	42.5	--	--	87	36	284	--	231	0	30	530	--	.8	--	1,200	1.63	138	365	176	63	6.5	2,080	8.2
Apr. 21-22	50.5	--	--	83	38	252	--	255	4	34	470	--	.8	--	1,050	1.43	143	365	150	60	5.7	1,940	8.3
Apr. 23-25	100	--	--	100	39	385	--	226	0	33	720	--	.2	--	1,490	2.03	402	410	225	67	8.3	2,660	8.1
Apr. 26-29	56.5	--	--	73	31	218	--	246	0	33	375	--	.2	--	920	1.25	140	308	106	61	5.4	1,610	8.1
Apr. 30	986	--	--	28	9.0	110	--	42	0	9.9	209	--	2.4	--	389	.53	1,040	107	72	69	4.6	787	7.6
May 1-2, 9-10	3,640	--	--	19	5.5	42	--	65	0	7.9	78	--	.2	--	247	.34	2,430	70	16	57	2.2	385	7.6
May 3-8	4,460	--	--	16	5.6	25	--	63	0	7.3	43	--	.4	--	190	.26	2,290	63	12	46	1.4	267	7.5
May 11-16	1,175	--	--	34	14	58	--	130	0	13	98	--	2.5	--	315	.43	999	142	36	47	2.1	555	8.2
May 17-20	566	--	--	40	17	71	--	143	3	17	138	--	2.9	--	400	.54	611	170	48	48	2.4	894	8.4
May 21-24	236	--	--	50	21	79	--	189	2	22	148	--	1.8	--	477	.65	304	210	52	45	2.4	826	8.3
May 25	237	--	--	62	20	123	--	193	0	25	238	--	2.0	--	645	.88	413	236	78	53	3.5	1,120	8.2
May 26	2,050	--	--	21	6.7	69	--	40	0	6.2	139	--	3.1	--	325	.44	1,800	80	47	65	3.4	556	7.5
May 27	2,490	--	--	19	6.9	41	--	58	0	11	79	--	2.3	--	271	.37	1,820	76	28	54	2.0	379	7.8
May 28-31	657	--	--	38	15	67	--	143	0	20	124	--	1.4	--	380	.52	674	155	38	48	2.3	673	8.0
June 1-4	206	--	--	43	26	78	--	173	0	22	152	--	2.5	--	469	.64	261	216	74	44	2.3	800	7.9
June 5-8	101	--	--	52	30	102	--	205	0	31	198	--	2.0	--	603	.82	164	252	84	47	2.8	1,020	7.7
June 9-10	61.5	--	--	62	30	124	--	221	0	27	248	--	1.9	--	686	.93	114	277	96	49	3.3	1,190	8.2
June 11-13	56.3	--	--	71	31	148	--	224	4	26	305	--	1.1	--	727	.99	111	312	122	51	3.7	1,340	8.4
June 14	124	--	--	122	48	436	--	140	0	20	940	--	1.9	--	1,970	2.68	660	502	388	65	8.5	3,190	8.2

ARKANSAS RIVER BASIN--Continued

DEEP FORK RIVER NEAR BEGGS, OKLA.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
June 15-16, 1954	157	--	--	61	27	126	--	182	10	24	255	--	2.5	--	608	0.83	258	264	98	51	3.4	1,130	8.4
June 17	67.0	--	--	44	16	115	--	110	0	12	227	--	2.6	--	520	.71	94	174	84	59	3.8	927	8.2
June 18-19	61.5	--	--	42	14	98	--	104	0	11	196	--	2.6	--	459	.62	76	162	77	57	3.3	814	8.2
June 20	53.0	--	--	52	23	118	--	156	4	19	235	--	2.0	--	557	.76	80	224	90	54	3.4	1,040	8.4
June 21-30	29.4	13	0.02	64	32	164	7.2	209	9	30	294	0.5	.2	0.21	720	.98	57	290	118	54	4.2	1,290	8.5
July 1-10	10.2	13	.00	69	36	175	4.6	238	6	34	312	.5	1.8	.20	772	1.05	21	322	117	54	4.3	1,560	8.4
July 11-20	5.24	--	--	72	38	192	--	243	7	33	340	--	1.6	--	850	1.16	12	335	124	55	4.6	1,570	8.4
July 21-31	1.93	--	--	74	38	171	--	242	6	32	348	--	1.2	--	858	1.17	4.5	340	132	52	4.0	1,620	8.4
Aug. 1, 3-6	5.44	--	--	69	31	213	--	198	4	35	390	--	1.6	--	879	1.20	13	300	132	61	5.3	1,720	8.4
Aug. 2	12.0	--	--	25	13	95	--	50	0	30	176	--	4.6	--	380	.52	12	115	74	64	3.9	691	7.6
Aug. 7-8	5.30	--	--	94	40	292	--	258	6	36	555	--	.6	--	1,180	1.60	17	400	178	61	6.4	2,290	8.4
Aug. 9-10	7.35	--	--	37	41	197	--	156	8	40	362	--	1.2	--	788	1.07	16	260	118	62	5.3	1,630	8.6
Aug. 11-20	3.16	--	--	66	43	188	--	263	0	31	335	--	2.0	--	800	1.09	6.8	340	124	55	4.4	1,530	8.2
Aug. 21-31	.58	--	--	64	43	176	--	253	4	27	320	--	1.4	--	771	1.05	1.2	335	121	53	4.2	1,440	8.4
Sept. 1-10	1.01	3.0	.00	62	40	179	7.8	237	8	29	332	.5	1.1	.09	784	1.07	2.1	320	112	54	4.3	1,540	8.4
Sept. 11-12	.15	--	--	68	38	187	--	240	2	25	368	--	1.4	--	840	1.14	.3	324	124	56	4.5	1,630	8.3
Sept. 13-30	(a)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Weighted average	246	--	--	30	12	68		b102	--	14	124	--	1.7	--	352	0.48	234	124	41	54	2.7	598	--

a No flow.

b Includes equivalent of individual carbonate values shown above.

ARKANSAS RIVER BASIN--Continued

DEEP FORK RIVER NEAR BEGGS, OKLA.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

ARKANSAS RIVER BASIN--Continued

CANADIAN RIVER NEAR WHITEFIELD, OKLA.

LOCATION.--At gaging station at bridge on State Highway 2, three-quarters of a mile north of Whitefield, Haskell County, 5½ miles upstream from Snake Creek, and at mile 18.8.
DRAINAGE AREA.--47,576 square miles, of which 9,700 square miles is probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: September 1944 to February 1945, September 1946 to September 1954.
Water temperatures: September 1944 to February 1945, September 1946 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 11,100 ppm Mar. 28-29; minimum, 361 ppm May 3-6.
Hardness: Maximum, 2,090 ppm Mar. 28-29; minimum, 125 ppm May 3-6.
Specific conductance: Maximum daily, 17,700 micromhos Mar. 28; minimum daily, 531 micromhos May 3.
Water temperatures: Maximum observed daily, 86°F July 13-14; minimum observed daily, freezing point Feb. 26.
EXTREMES, 1944-45, 1946-54.--Dissolved solids: Maximum, 11,800 ppm Dec. 2-3, 1952; minimum, 89 ppm Jan. 2, 5-7, 1948.
Hardness: Maximum, 2,260 ppm Dec. 2-3, 1952; minimum, 18 ppm Feb. 17, 1948.
Specific conductance: Maximum daily, 18,900 micromhos Dec. 2, 1952; minimum daily, 71.7 micromhos Jan. 2, 1948.
Water temperatures: Maximum observed daily, 88°F Sept. 4, 1944; minimum observed daily, freezing point on many days during winter months.
REMARKS.--Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-3, 1953	95.7			264	62	1,120	170	0	34	2,280		--		4,290	5.83	1,110	915	776	73	16	7,030	8.1
Oct. 4-5	1,000			115	27	455	94	0	18	930		0.6		1,810	2.46	4,890	398	321	71	9.9	3,070	7.8
Oct. 6-7	1,696			72	17	283	75	0	19	558		1.1		1,150	1.56	5,270	250	188	71	7.8	1,970	7.7
Oct. 8	592			131	35	551	85	0	22	1,130		--		2,060	2.80	3,290	470	400	72	11	3,630	7.8
Oct. 9-10	400			214	55	945	108	0	34	1,950		--		3,520	4.79	3,800	760	672	73	15	6,080	7.8
Oct. 11-12	258			220	55	980	113	0	33	2,000		--		3,640	4.95	2,540	775	682	73	15	6,260	7.9
Oct. 13-14	185			276	67	1,230	122	0	30	2,520		--		4,550	6.19	2,270	965	865	73	17	7,730	7.9
Oct. 15-16	151			312	73	1,390	126	0	27	2,850		--		5,130	6.98	2,090	1,080	977	74	18	8,600	7.9
Oct. 17-18	123			407	96	1,850	133	0	31	3,810		--		6,410	8.72	2,130	1,410	1,300	74	21	11,200	7.8
Oct. 19-20	108			356	83	1,580	146	0	30	3,250		--		5,860	7.97	1,710	1,230	1,110	74	20	9,700	7.9
Oct. 21-22	123			312	76	1,390	151	0	30	2,850		--		5,200	7.07	1,730	1,090	966	73	18	8,600	7.9
Oct. 23	548			385	90	1,750	141	0	32	3,590		--		6,080	8.27	9,000	1,330	1,210	74	21	10,600	8.0
Oct. 24	15,500			230	56	977	144	0	89	1,950		--		3,660	4.98	153,200	805	687	73	15	6,240	7.9
Oct. 25	15,600			94	22	374	112	0	22	740		4.6		1,440	1.96	60,650	326	234	71	9.0	2,560	7.9
Oct. 26-27	16,600			80	18	300	104	0	23	580		2.0		1,180	1.60	52,890	274	189	70	7.9	2,090	7.8
Oct. 28	13,100			76	16	259	113	0	15	505		3.2		1,040	1.41	36,780	256	164	69	7.1	1,870	7.9
Oct. 29-31	7,310			62	15	177	115	0	57	322		2.3		766	1.04	15,120	216	122	64	5.3	1,350	7.9
Nov. 1-3	2,990			78	23	243	134	0	81	430		3.5		984	1.34	7,940	289	179	65	6.2	1,750	7.9
Nov. 4-6	3,913			111	33	416	132	0	72	775		3.5		1,580	2.15	16,690	412	304	69	8.9	2,780	7.7
Nov. 7	4,940			153	44	634	118	0	48	1,250		--		2,360	3.21	31,480	562	466	71	12	4,050	7.7
Nov. 8-10	1,540			191	53	829	112	0	39	1,680		--		3,080	4.19	12,810	694	602	72	14	5,240	7.6

Nov. 11-13, 1953 ..	767		176	47	738	150	0	49	1,450	--	2,780	3.78	5,760	632	510	72	13	4,700	7.9
Nov. 14-16.....	597		230	65	992	167	0	59	2,000	--	3,710	5.05	5,980	842	704	72	15	6,240	7.9
Nov. 17-20.....	1,166		278	78	1,280	151	0	56	2,520	--	4,720	6.42	14,860	1,010	890	73	18	7,750	7.9
Nov. 21.....	13,900		213	52	934	105	0	24	1,850	--	3,460	4.71	129,900	746	660	73	15	5,770	7.7
Nov. 22-27.....	4,147		95	28	364	116	0	33	700	2.5	1,410	1.92	15,790	352	257	69	8.5	2,480	7.6
Nov. 28-30.....	969		128	35	517	121	0	34	1,040	--	1,900	2.58	4,970	464	364	71	10	3,450	7.5
Dec. 1-3.....	1,191		194	52	797	147	0	47	1,600	--	2,930	3.98	9,420	698	578	71	13	5,160	7.3
Dec. 4	11,400		90	23	327	107	0	29	630	2.6	1,260	1.71	38,780	319	232	69	7.9	2,280	7.7
Dec. 5	12,300		141	36	600	99	0	22	1,200	--	2,230	3.03	74,060	500	419	72	12	3,840	7.5
Dec. 6-10	3,450		84	23	328	99	0	26	645	2.3	1,260	1.71	11,740	304	223	70	8.2	2,250	7.5
Dec. 11	1,820		98	26	380	100	0	25	750	4.5	1,450	1.97	7,130	352	270	70	8.8	2,560	7.6
Dec. 12-16	1,331		125	34	504	124	0	31	1,020	4.5	1,930	2.62	6,940	452	350	71	10	3,350	7.8
Dec. 17-18.....	772		170	47	702	150	0	39	1,410	--	2,580	3.51	5,380	618	494	71	12	4,510	7.9
Dec. 19-20.....	674		215	59	890	175	0	43	1,800	--	3,300	4.49	6,010	779	636	71	14	5,650	8.0
Dec. 21-25.....	568		299	80	1,220	195	0	49	2,600	--	4,840	6.58	7,420	1,080	915	71	16	7,950	7.9
Dec. 26-31	476		405	108	1,740	221	0	58	3,590	--	6,700	9.11	8,610	1,450	1,270	72	20	10,700	7.8
Jan. 1-10, 1954	400		435	116	1,950	188	0	57	3,990	--	6,930	9.42	7,480	1,560	1,410	73	21	11,700	8.1
Jan. 11-16.....	517		421	111	1,940	188	0	51	3,840	--	6,790	9.23	9,480	1,510	1,350	74	22	11,500	8.2
Jan. 17-20.....	1,590		182	50	819	108	0	35	1,650	--	2,940	4.00	12,620	660	571	73	14	5,230	7.8
Jan. 21.....	3,790		255	69	1,190	118	0	35	2,350	--	4,260	5.79	43,590	920	823	74	17	7,240	7.9
Jan. 22-23.....	4,645		50	13	186	56	0	15	365	2.5	744	1.01	9,330	178	132	69	6.1	1,330	7.5
Jan. 24.....	2,170		74	19	305	57	0	14	605	3.6	1,130	1.54	6,620	262	216	72	8.2	2,080	7.7
Jan. 25.....	2,680		186	48	849	82	0	25	1,700	--	3,110	4.23	22,500	662	594	74	14	5,270	7.8
Jan. 26-29.....	3,775		94	25	410	62	0	18	805	2.6	1,550	2.11	15,800	338	286	73	9.7	2,740	7.4
Jan. 30.....	1,650		158	42	714	90	0	29	1,410	--	2,590	3.52	11,540	566	493	73	13	4,640	7.7
Jan. 31.....	1,270		238	63	1,140	96	0	34	2,280	--	4,060	5.52	13,920	853	774	74	17	6,830	7.7
Feb. 1-10	696		281	76	1,360	120	0	46	2,680	--	4,840	6.58	9,100	1,010	915	74	19	8,200	7.8
Feb. 11-20.....	564		324	76	1,550	130	0	82	3,120	2.5	6,000	8.16	9,140	1,120	1,010	75	20	9,390	7.8
Feb. 21-23.....	2,170		174	42	800	68	0	33	1,620	--	3,050	4.15	17,870	606	551	74	14	5,120	7.6
Feb. 24-28.....	955		393	96	1,920	116	0	54	3,840	--	7,110	9.67	18,330	1,380	1,280	75	22	11,500	7.0
Mar. 1-10	419		282	77	1,310	135	0	49	2,600	3.5	5,070	6.90	5,740	1,020	910	74	18	8,030	8.0
Mar. 11-13	285		342	84	1,620	74	0	47	3,350	--	6,280	8.54	4,830	1,200	1,140	75	20	9,920	7.6
Mar. 14-20	207		454	109	2,230	101	0	49	4,480	--	8,370	11.38	4,680	1,580	1,500	75	24	13,000	7.7
Mar. 21-23	364		464	115	2,320	94	0	48	4,730	--	8,850	12.04	8,700	1,630	1,550	76	25	13,700	7.3

ARKANSAS RIVER BASIN--Continued

CANADIAN RIVER NEAR WHITEFIELD, OKLA.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Mar. 24, 1954	522			292	71	1,390	105	0	33	2,780		--		5,380	7.32	7,580	1,020	934	75	19	8,380	8.0
Mar. 25-26	1,385			150	32	638	95	0	20	1,300		--		2,680	3.64	10,020	505	427	73	12	4,160	7.7
Mar. 27	1,590			191	46	892	81	0	26	1,820		--		3,810	5.18	16,360	665	598	74	15	5,600	8.0
Mar. 28-29	2,140			603	142	2,940	60	0	51	5,970		--		11,100	15.10	64,140	2,090	1,990	75	28	16,700	7.8
Mar. 30	1,470			344	73	1,620	126	0	42	3,280		--		6,180	8.40	24,530	1,160	1,060	75	21	9,720	8.1
Mar. 31	1,140			202	49	933	146	0	38	1,850		--		3,600	4.90	11,080	705	586	74	15	5,880	8.2
Apr. 1-3	671			194	54	890	148	0	40	1,750		--		3,410	4.64	6,180	705	584	73	15	5,630	8.1
Apr. 4-10	310			256	72	1,260	110	0	49	2,420		--		4,760	6.47	3,980	935	845	75	18	7,560	7.6
Apr. 11-15	322			318	84	1,570	112	0	44	3,150		--		5,830	7.93	5,070	1,140	1,050	75	20	9,460	7.8
Apr. 16-20	494			423	94	2,130	86	0	48	4,190		--		7,910	10.76	10,550	1,440	1,370	76	24	12,400	7.6
Apr. 21-24	398			455	96	2,320	85	0	52	4,540		--		8,480	11.53	9,110	1,530	1,460	77	26	13,400	7.7
Apr. 25-28	410			355	89	1,740	111	0	56	3,440		--		6,380	8.68	7,060	1,250	1,160	75	21	10,500	7.6
Apr. 29	1,130			264	68	1,250	120	4	42	2,480		--		4,720	6.42	14,400	940	835	74	18	7,650	8.3
Apr. 30	12,500			160	44	735	88	2	32	1,460		--		2,940	4.00	99,230	580	504	73	13	4,630	8.3
May 1	51,800			101	18	354	110	0	6.6	700		4.8		1,580	2.15	221,000	328	238	70	8.5	2,420	8.2
May 2, 7	69,900			50	13	110	96	0	19	228		2.8		519	.71	97,950	180	102	49	3.6	924	8.1
May 3-6	55,300			39	6.7	74	93	0	21	134		1.6		361	.49	53,900	125	49	56	2.9	633	8.0
May 8-10	9,450			56	12	135	103	0	31	268		3.2		640	.87	16,330	190	106	61	4.3	1,120	8.1
May 11, 18-19	9,967			85	20	255	135	0	39	490		2.2		1,080	1.47	29,060	296	186	65	6.5	1,900	8.2
May 12, 15-17	12,980			62	14	171	114	0	21	332		2.2		750	1.02	26,280	212	118	64	5.1	1,320	8.0
May 13-14	27,800			58	13	130	121	0	21	260		2.2		620	.84	46,540	196	97	59	4.0	1,080	7.8
May 20	4,060			121	31	376	152	9	79	720		3.1		1,610	2.19	17,650	430	290	66	7.9	2,650	8.4
May 21-26	3,115			145	41	502	172	0	102	970		1.7		2,020	2.75	16,990	530	389	67	9.5	3,470	8.1
May 27	15,600			99	27	285	150	0	114	515		4.3		1,230	1.67	51,810	358	235	63	6.5	2,130	8.2
May 28	13,600			176	43	663	125	3	94	1,290		--		2,540	3.45	93,270	615	508	70	12	4,390	8.3
May 29-31	8,467			94	26	278	144	0	111	495		2.8		1,230	1.67	28,120	342	224	64	6.6	2,040	8.1
June 1, 1954	3,480			138	34	497	150	0	110	905		11		1,920	2.61	18,040	486	363	69	9.8	3,180	8.2
June 2-7	2,213			114	31	393	163	0	118	695		4.2		1,540	2.09	9,200	412	278	67	8.4	2,610	8.2
June 8	3,760			44	8.3	91	102	0	21	170		5.9		448	.61	4,550	144	60	58	3.3	737	8.0
June 9	4,360			73	19	224	110	0	55	440		5.0		978	1.33	11,510	262	172	65	6.0	1,650	8.1
June 10	3,330			126	35	498	126	2	44	970		2.8		1,910	2.60	17,170	460	354	70	10	3,230	8.3
June 11	2,240			89	20	362	104	0	38	675		2.4		1,360	1.85	8,230	304	219	72	9.0	2,300	8.2
June 12	1,700			130	33	550	112	2	57	1,020		--		2,040	2.77	9,360	460	364	72	11	3,380	8.3
June 13-17	1,540			190	50	797	148	0	56	1,580		--		3,130	4.26	13,010	680	558	72	13	4,950	8.2

June 18, 1954	4,090			270	66	1,200	108	0	40	2,480		--		4,730	6.43	52,230	945	856	73	17	7,350	8.1
June 19-20	1,795			212	55	960	111	0	43	1,950		--		3,830	5.21	18,560	755	664	73	15	6,040	8.1
June 21	800			222	60	1,050	116	4	44	2,100		--		4,120	5.60	8,900	800	698	74	16	6,500	8.3
June 22	704			262	67	1,230	116	4	59	2,450		--		4,530	6.16	8,610	930	828	74	18	7,520	8.3
June 23-24	728			310	82	1,550	110	4	58	3,050		--		5,630	7.66	11,070	1,110	1,010	75	20	9,030	8.3
June 25	564			284	73	1,370	124	6	110	2,680		--		5,060	6.88	7,710	1,010	898	75	19	8,180	8.3
June 26	451			254	72	1,250	126	0	110	2,420		--		4,620	6.28	5,630	930	827	75	18	7,480	8.2
June 27-30	336			244	68	1,090	151	0	102	2,180		--		4,240	5.77	3,850	890	766	73	16	6,830	8.2
July 1	342			234	70	1,050	100	0	83	2,190		--		4,050	5.51	3,740	870	788	72	15	6,560	8.1
July 2	285			200	59	788	152	0	67	1,600		--		3,210	4.37	2,470	740	616	70	13	4,940	8.2
July 3	256			240	78	1,050	138	0	76	2,110		--		4,390	5.97	3,030	920	807	71	15	6,600	8.1
July 4-8	242			270	84	1,160	148	0	60	2,400		--		4,740	6.45	3,100	1,020	898	71	16	7,370	8.1
July 9	252			228	79	1,000	144	0	134	1,960		--		3,790	5.15	2,580	895	777	71	15	6,240	8.2
July 10	204			206	67	936	100	0	107	1,810		--		3,490	4.75	1,920	790	708	72	14	5,790	8.0
July 11	180			202	65	961	106	0	87	1,880		--		3,720	5.06	1,810	770	683	73	15	5,950	8.1
July 12-14	150			240	79	1,050	150	0	88	2,120		--		3,970	5.40	1,610	925	802	71	15	6,520	8.1
July 15-19	113			282	92	1,260	146	0	48	2,500		--		5,020	6.83	1,530	1,080	960	72	17	7,520	8.0
July 20	118			176	55	691	142	0	30	1,430		--		2,800	3.81	892	665	548	69	12	4,540	8.2
July 21-25	89.2			286	89	1,240	148	0	36	2,550		--		5,120	6.96	1,230	1,080	958	71	16	7,720	8.1
July 26-28	66.3			298	92	1,310	142	0	35	2,690		--		5,260	7.15	942	1,120	1,000	72	17	8,080	8.0
July 29-31	60.7			280	83	1,180	152	0	31	2,410		--		4,420	6.01	724	1,040	916	71	16	7,310	8.0
Aug. 1-3	75.7			272	73	1,140	116	0	28	2,350		--		4,260	5.79	871	980	885	72	16	7,490	8.0
Aug. 4-6	88.3			375	103	1,690	140	0	33	3,440		--		6,180	8.40	1,470	1,360	1,250	73	20	10,400	8.1
Aug. 7-8	140			426	133	1,980	125	0	39	4,080		--		7,000	9.52	2,650	1,610	1,510	73	21	12,300	8.0
Aug. 9	131			466	177	2,180	119	0	42	4,530		--		7,730	10.51	2,730	1,890	1,790	71	22	13,100	8.1
Aug. 10	112			426	104	2,030	108	0	78	4,180		--		7,680	10.44	2,320	1,490	1,400	75	23	12,500	8.1
Aug. 11-15	66.4			414	177	1,980	127	0	68	4,180		--		7,440	10.12	1,330	1,760	1,660	71	21	12,500	7.9
Aug. 16-18	36.3			379	118	1,770	156	0	54	3,640		--		6,590	8.96	646	1,430	1,300	73	20	10,800	8.1
Aug. 19-20	29.0			336	88	1,520	164	0	42	3,150		--		5,480	7.45	429	1,200	1,070	73	19	9,490	8.2
Aug. 21-31	24.5			280	83	1,220	172	0	29	2,450		--		4,180	5.68	277	1,040	899	72	16	7,040	8.0

ARKANSAS RIVER BASIN--Continued

CANADIAN RIVER NEAR WHITEFIELD, OKLA.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Sept. 1-4, 1954.....	23.0			226	91	866	154	0	21	1,900		--		3,500	4.76	217	940	814	67	12	6,030	8.1
Sept. 5-10.....	17.0			184	61	701	153	0	17	1,480		--		2,780	3.78	128	710	584	68	11	4,920	8.1
Sept. 11-17.....	13.0			164	43	586	174	0	16	1,180		--		2,250	3.06	79	585	442	69	11	4,040	8.2
Sept. 18-20.....	12.0			150	48	499	163	3	16	1,080		--		2,040	2.77	66	570	432	66	9.1	3,690	8.3
Sept. 21-29.....	11.2			150	43	465	184	3	17	1,000		--		1,940	2.64	59	550	394	65	8.6	3,460	8.3
Sept. 30.....	24.0			114	37	332	143	3	16	725		1.7		1,440	1.96	93	435	313	62	6.9	2,570	8.3
Weighted average..	2,972			102	25	377	a 111	--	35	742		--		1,500	2.04	12,040	358	266	70	8.6	2,510	--

a Includes equivalent of individual carbonate values shown above.

ARKANSAS RIVER BASIN--Continued

CANADIAN RIVER NEAR WHITEFIELD, OKLA.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	70	55	45	40	44	43	46	65	71	77	78	72
2	72	55	55	48	45	46	50	66	72	82	77	71
3	75	55	54	39	46	36	57	56	67	83	78	71
4	70	60	47	45	46	37	65	57	65	82	80	76
5	64	50	50	42	45	41	67	59	70	82	78	77
6	60	46	46	40	47	40	67	61	70	80	78	74
7	56	45	45	41	40	46	68	63	74	80	80	72
8	58	45	48	50	40	48	60	60	70	81	80	75
9	59	42	44	52	46	47	58	60	76	82	77	74
10	61	43	40	39	47	54	64	58	75	81	76	72
11	62	45	45	33	47	58	68	58	76	81	78	63
12	64	47	43	33	41	64	61	58	76	83	77	60
13	64	48	39	33	44	46	54	58	75	86	75	60
14	66	49	39	35	55	38	64	60	76	86	78	67
15	65	50	39	40	60	38	69	62	77	84	78	71
16	66	50	40	39	55	43	58	65	76	82	79	70
17	65	54	40	35	49	48	57	67	80	83	79	73
18	63	60	35	38	48	52	62	66	80	85	78	76
19	65	63	41	47	55	50	63	67	80	82	78	76
20	63	50	45	59	48	50	66	64	82	79	76	76
21	65	46	50	35	48	48	67	65	81	80	76	67
22	67	46	37	33	38	50	67	66	82	80	77	57
23	65	46	34	37	50	55	64	67	85	--	76	59
24	59	48	33	42	47	55	67	70	84	80	76	61
25	59	45	33	50	53	56	70	70	84	80	76	--
26	60	41	33	48	32	56	70	71	83	80	77	67
27	53	45	40	37	55	53	71	72	83	79	78	68
28	54	44	37	40	44	60	69	72	83	79	80	72
29	53	43	35	43	--	63	68	73	84	80	77	78
30	54	44	33	45	--	50	70	74	80	78	78	75
31	54	--	35	44	--	46	--	75	--	78	76	--
Average	62	49	41	41	47	49	64	65	77	81	78	70

ARKANSAS RIVER BASIN--Continued

LEE CREEK NEAR VAN BUREN, ARK.

LOCATION.--At gaging station, 300 feet west of Arkansas-Oklahoma State line, 3.2 miles downstream from Webbers Creek, 6¾ miles northwest of Van Buren, Crawford County, and 7.9 miles upstream from mouth.
DRAINAGE AREA.--427 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1953 to July 1954.
REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, October 1953 to July 1954

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, magnesium	Noncarbonate			
Oct. 13, 1953	0.47	3.1	0.01	13	2.1	3.6	1.8	51	2.4	4.5	0.1	0.6	67	41	0	107	7.6	6
Nov. 27	a2.3	3.4	.04	12	2.4	3.8	1.7	47	5.0	4.8	.1	.6	62	40	1	107	6.9	4
Dec. 16	21.2	4.7	.10	11	2.2	2.9	1.3	39	6.6	4.8	.1	.2	60	36	5	90.6	6.9	4
Jan. 15, 1954	24.4	3.2	.11	12	1.9	3.6	1.0	37	4.4	7.2	.0	.6	60	38	7	97.9	7.1	5
Mar. 2	101	.8	.00	9.5	2.2	3.6	.9	32	6.0	6.0	.1	1.3	60	33	7	89.4	6.8	10
Mar. 18	36.3	1.8	.00	9.8	2.1	3.9	.8	35	7.2	6.5	.1	.7	57	33	4	89.6	7.3	5
Apr. 14	81.8	2.4	.00	10	2.1	3.9	1.0	36	7.4	6.2	.1	.7	59	34	4	91.6	6.8	10
May 11	236	5.3	.09	11	2.7	2.8	1.0	38	10	3.5	.3	1.0	60	39	7	89.3	7.0	6
June 10	26.8	2.6	.06	11	2.2	3.8	1.1	43	5.8	5.0	.3	.1	58	36	1	98.3	7.3	8
July 23	.02	.5	.00	14	2.0	4.8	1.8	b48	4.4	6.0	.1	2.9	76	43	4	119	8.3	5

a Mean daily discharge (cfs).
b Includes equivalent of 2 parts per million of carbonate (CO_3).

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ARKANSAS RIVER AT VAN BUREN, ARK.

LOCATION.--At gaging station at bridge on U. S. Highways 64 and 71, at Van Buren, Crawford County, 1.3 miles downstream from Lee Creek, 8.6 miles downstream from Poteau River, and at mile 353.4.
DRAINAGE AREA.--150,483 square miles (revised), of which 22,241 square miles is probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1954.
Water temperatures: October 1945 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 5,830 ppm Apr. 1; minimum, 183 ppm Jan. 21, 26.
Hardness: Maximum, 1,100 ppm Apr. 1; minimum, 47 ppm Jan. 21, 26.
Specific conductance: Maximum daily, 8,980 micromhos Apr. 1; minimum daily, 206 micromhos Jan. 26.
Water temperatures: Maximum, 88°F July 14, 18; minimum, freezing point Dec. 22.
EXTREMES, 1945-54.--Dissolved solids: Maximum, 5,830 ppm Apr. 1, 1954; minimum, 183 ppm Jan. 21, 26, 1954.
Hardness: Maximum, 1,100 ppm Apr. 1, 1954; minimum, 47 ppm Jan. 21, 26, 1954.
Specific conductance: Maximum daily, 8,980 micromhos Apr. 1, 1954; minimum daily, 132 micromhos May 11, 1948.
Water temperatures: Maximum, 88°F Aug. 23, 1951, June 13, 1953, July 14, 18, 1954; minimum, freezing point Jan. 30, 1947, Dec. 22, 1953.
REMARKS.--Values reported for dissolved solids are residue on evaporation. Records of specific conductance of daily samples available in district office at Fayetteville, Ark. Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate					
Oct. 1-6, 9, 1953.....	1,914	7.4	0.00	109	27	445	9.4	173	0	81	792	0.1	2.0	0.10	1,700	2.31	8,790	383	241	71	9.9	2,900	8.1	10
Oct. 7, 10-12, 16.....	2,236	8.0	.03	82	20	312	7.2	134	0	51	568	.1	2.0	--	1,230	1.67	7,430	286	176	70	8.0	2,160	7.8	12
Oct. 8, 13-15.....	2,062	7.5	.01	72	18	246	6.4	136	0	45	460	.2	2.1	--	992	1.35	5,520	254	142	67	6.7	1,780	7.9	7
Oct. 17-27.....	4,424	8.5	.00	116	31	425	9.0	177	0	56	830	.2	2.0	.05	1,690	2.30	20,190	417	272	68	9.1	2,940	8.1	7
Oct. 28-30.....	15,370	7.2	.07	78	19	292	6.8	108	0	28	555	.2	3.7	--	1,160	1.58	48,140	272	184	69	7.7	2,040	7.3	7
Oct. 31, Nov. 1-3....	7,275	6.5	--	63	14	192	5.9	112	0	46	359	.2	2.6	--	837	1.14	16,440	214	122	65	5.7	1,420	8.2	18
Nov. 4-8.....	4,282	7.1	.03	86	22	319	8.0	135	0	78	566	.1	3.5	.10	1,310	1.78	15,150	305	194	69	7.9	2,130	7.8	17
Nov. 9-10.....	4,345	8.6	--	111	28	406	8.8	126	4	71	771	.1	2.4	--	1,680	2.28	19,710	392	282	69	8.9	2,720	8.4	17
Nov. 11-20, 23-24....	3,964	6.4	.01	127	30	479	9.6	151	0	66	944	.1	3.4	.05	2,010	2.73	21,510	440	317	70	9.9	3,230	8.2	17
Nov. 21-22, 25-27....	7,578	7.0	.06	103	25	431	8.3	137	0	68	797	.1	4.4	.20	1,760	2.39	36,010	360	248	72	9.9	2,880	7.7	20
Nov. 28-29.....	6,285	6.6	--	70	14	302	7.0	127	0	52	523	.1	3.8	--	1,150	1.56	19,510	232	128	73	8.7	1,950	8.0	20
Nov. 30, Dec. 1-5....	5,227	7.4	.00	71	18	221	6.7	120	0	43	418	.0	3.5	.00	955	1.30	13,480	251	153	65	6.1	1,620	7.8	15
Dec. 6-9.....	10,030	8.3	.01	94	27	355	5.6	114	0	40	672	.0	4.4	--	1,340	1.82	36,290	346	252	69	8.3	2,400	7.9	20
Dec. 10-11.....	6,390	--	--	74	17	283	--	116	0	85	509	--	2.9	--	1,080	1.47	18,630	254	160	71	7.7	1,900	8.2	20
Dec. 12-13.....	7,220	--	--	89	23	435	--	123	2	75	784	--	3.0	--	1,600	2.18	31,190	316	212	75	11	2,700	8.3	15
Dec. 14-20.....	4,671	8.0	.00	79	24	332	6.6	129	0	62	599	.0	3.4	.00	1,260	1.71	15,890	296	190	70	8.4	2,220	8.1	20
Dec. 21-23, 25-27....	3,360	6.8	.00	94	24	326	7.1	151	0	57	611	.1	2.2	.00	1,290	1.75	11,700	333	209	67	7.7	2,270	8.2	10
Dec. 24, 28-29.....	3,080	7.7	.00	118	28	433	8.5	166	2	69	835	.0	4.8	--	1,700	2.31	14,140	410	270	69	9.3	2,960	8.3	10

ARKANSAS RIVER AT VAN BUREN, ARK.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate					
Dec. 30-31, 1953	3,270	--	--	148	40	640	--	180	9	91	1,180	--	3.9	--	2,360	3.21	20,840	534	371	72	12	3,990	8.5	10
Jan. 1-4, 1954	3,350	7.7	0.01	118	27	461	8.9	163	0	60	890	0.1	4.4	0.00	1,790	2.43	16,190	406	272	71	10	3,190	8.1	7
Jan. 5, 8-9	3,557	7.7	.00	135	32	575	9.6	178	0	90	1,030	.0	4.0	--	2,260	3.07	21,700	468	322	72	12	3,720	8.0	10
Jan. 6-7	3,370	9.6	.06	167	38	690	13	191	0	96	1,310	--	4.7	--	2,740	3.73	24,930	572	416	72	13	4,270	7.7	6
Jan. 10-16	3,420	4.8	.01	116	27	438	8.4	162	0	66	850	.2	3.1	.00	1,720	2.34	15,880	400	268	69	9.5	3,030	8.1	9
Jan. 17-19, 23	7,960	--	--	65	18	272	--	89	0	50	495	--	4.3	--	1,020	1.39	21,920	236	163	71	7.7	1,830	8.2	15
Jan. 20, 24	11,400	--	--	35	9.0	121	--	56	0	24	228	--	3.5	--	505	.69	15,540	124	78	68	4.7	908	7.4	40
Jan. 21, 26	14,000	--	--	9.8	5.4	27	--	29	0	18	45	--	2.6	--	183	.25	6,920	47	25	56	1.7	249	7.6	33
Jan. 22, 25, 27	14,670	--	--	15	5.8	45	--	29	0	18	82	--	2.7	--	249	.34	9,860	61	37	61	2.5	363	7.2	35
Jan. 28-29	14,150	--	--	27	6.4	89	--	38	0	17	175	--	2.6	--	412	.56	15,740	94	63	67	4.0	683	7.7	38
Jan. 30-31	11,700	--	--	18	6.1	61	--	34	0	15	114	--	2.3	--	302	.41	9,540	70	42	65	3.2	476	7.7	40
Feb. 1	7,640	--	--	43	9.3	143	--	72	0	15	260	--	.7	--	662	.90	13,660	146	86	68	5.2	1,030	8.0	40
Feb. 2-3, 9	4,927	5.6	.01	73	18	300	5.7	99	0	35	550	.3	1.2	--	1,170	1.59	15,560	256	175	71	8.2	2,030	7.9	6
Feb. 4, 7-8	5,177	5.6	.00	94	28	429	7.6	109	0	50	810	.1	1.0	--	1,680	2.28	23,480	350	260	72	10	2,840	7.7	6
Feb. 5-6, 10	5,113	4.2	.00	88	24	365	7.1	110	0	46	710	.1	1.2	--	1,520	2.07	20,980	318	228	71	8.9	2,580	7.0	6
Feb. 11, 18	4,535	5.7	.00	116	42	620	11	134	0	79	1,110	--	1.4	--	2,300	3.13	28,160	462	352	74	13	3,930	7.8	8
Feb. 12-15	4,318	5.9	.04	92	26	420	7.4	113	0	59	780	.1	1.0	.15	1,580	2.15	18,420	336	244	73	10	2,740	7.8	6
Feb. 16, 19	4,395	5.3	.00	72	19	326	6.1	103	0	57	575	--	.9	--	1,230	1.67	14,600	258	173	73	8.8	2,120	7.9	6
Feb. 17	3,540	--	--	106	30	475	--	142	0	64	870	--	.1	--	1,930	2.62	18,450	388	272	73	10	3,100	8.2	8
Feb. 20-21, 24	7,293	2.8	.01	53	16	267	4.7	74	0	47	475	.1	1.0	--	1,040	1.41	20,480	198	138	74	8.3	1,770	7.7	10
Feb. 22	7,430	--	--	49	14	226	--	72	0	26	398	--	1.2	--	984	1.34	19,740	180	121	73	7.3	1,480	8.0	40
Feb. 23, 25-26	6,177	3.0	.01	71	19	349	6.2	84	0	87	630	.1	1.9	--	1,330	1.81	22,180	255	186	74	9.5	2,270	7.8	8
Feb. 27-28	5,170	4.3	.01	119	39	612	10	110	0	90	1,140	--	1.5	--	2,280	3.10	31,830	458	368	74	12	3,770	8.0	8
Mar. 1, 3-4	4,200	--	--	118	35	593	--	123	0	69	1,100	--	1.4	--	2,180	2.96	24,720	438	338	75	12	3,820	7.8	9
Mar. 2, 5-7	3,605	4.7	.02	106	29	521	8.2	124	0	73	920	.1	3.1	.00	1,870	2.54	18,200	384	282	74	12	3,270	7.7	8
Mar. 8-10	2,560	6.0	.01	94	29	405	7.8	143	0	77	710	.1	2.5	.00	1,550	2.11	10,710	354	236	71	9.3	2,710	8.0	10
Mar. 11, 18	2,780	--	--	102	42	514	--	161	0	85	920	--	1.4	--	1,890	2.57	14,190	427	295	72	11	3,350	8.0	14
Mar. 12-14	3,477	4.4	.00	91	28	384	7.6	139	0	81	700	.1	2.8	.05	1,460	1.99	13,710	342	228	70	9.1	2,610	8.1	8
Mar. 15-17	2,257	5.0	.01	83	21	317	6.6	134	0	65	570	.1	2.3	.00	1,230	1.67	7,500	294	184	70	8.0	2,190	8.0	9
Mar. 19-23	2,658	3.6	.01	106	35	528	9.3	138	0	78	950	.1	2.4	.10	1,940	2.64	13,920	408	296	73	11	3,400	7.9	9
Mar. 24-26, 30	4,330	4.0	.00	97	17	373	7.2	117	0	66	700	.1	2.3	.00	1,420	1.93	16,600	312	216	72	9.2	2,530	7.8	10
Mar. 27-28	5,970	--	--	67	23	336	--	96	0	65	610	--	2.0	--	1,260	1.71	20,310	262	183	74	9.1	2,260	7.7	15
Mar. 29, 31	4,785	--	--	102	35	502	--	104	0	68	920	--	1.9	--	1,860	2.53	24,030	398	314	73	11	3,270	7.7	15
Apr. 1	4,680	--	--	284	94	1,510	--	108	3	79	3,000	--	6.6	--	5,830	7.93	73,670	1,100	1,000	75	20	8,980	8.3	10

Apr. 2-3, 1954	4,675	6.5	.02	168	38	875	16	126	0	98	1,640	0.3	5.8	--	3,280	4.46	41,400	575	472	76	16	5,150	8.1	12
Apr. 4-6, 9	4,063	3.9	.04	88	26	453	9.8	123	2	94	785	.3	4.3	05	1,620	2.20	17,770	326	222	74	11	2,880	8.3	15
Apr. 7-8	3,355	3.3	.02	102	33	575	10	129	3	115	995	.3	3.8	--	2,220	3.02	20,110	390	280	76	13	3,510	8.4	12
Apr. 10	3,540	--	--	76	27	386	--	121	5	90	640	--	3.5	--	1,660	2.26	15,870	300	193	74	9.7	2,420	8.5	6
Apr. 11-12	3,915	1.8	.04	72	19	319	7.6	119	0	77	540	--	4.3	--	1,230	1.67	13,000	258	160	72	8.6	2,040	7.9	10
Apr. 13-15	4,590	--	--	55	16	202	--	86	0	45	375	--	1.4	--	845	1.15	10,470	203	132	68	6.2	1,450	7.7	25
Apr. 16-17, 19	8,147	--	--	17	10	64	--	48	0	20	112	--	1.3	--	313	.43	6,890	84	44	62	3.0	513	7.8	40
Apr. 18, 20	6,700	--	--	17	11	93	--	36	0	26	158	--	.4	--	389	.53	7,040	88	58	70	4.3	648	7.1	40
Apr. 21	3,260	--	--	68	24	348	--	78	2	63	620	--	3.0	--	1,480	2.01	13,030	268	200	74	9.2	2,190	8.3	8
Apr. 22-24	4,230	4.7	.02	119	21	559	10	102	0	86	980	--	4.5	--	2,100	2.86	23,980	384	300	75	12	3,350	7.6	10
Apr. 25-26	4,390	4.1	.05	78	32	407	9.4	112	0	79	755	--	3.8	--	1,560	2.12	18,490	326	234	72	9.8	2,700	8.2	12
Apr. 27-28	3,270	3.3	.09	103	31	505	9.7	119	1	85	910	--	3.9	--	1,990	2.71	17,570	384	286	73	11	3,150	8.3	8
Apr. 29-30	7,070	--	--	74	26	360	--	101	2	71	640	--	4.1	--	1,460	1.99	27,870	292	206	73	9.2	2,280	8.4	8
May 1-5	126,000	6.6	.38	32	7.5	71	3.4	83	0	17	123	.3	3.2	--	349	.47	118,700	111	43	57	2.9	588	7.7	40
May 6-10	71,120	6.6	.14	34	7.2	56	3.4	95	0	24	90	.4	1.8	.05	304	.41	58,380	114	38	51	2.3	506	7.7	40
May 11, 16	34,100	--	--	34	10	92	--	86	0	32	160	--	2.6	--	449	.61	41,340	126	56	61	3.6	762	8.0	12
May 12, 14-15	46,770	5.0	.02	50	8.3	121	4.0	97	0	30	215	.5	1.7	--	534	.73	67,430	158	79	62	4.2	921	8.1	13
May 13, 19	31,500	--	--	56	16	189	--	104	0	38	355	--	4.6	--	850	1.16	72,290	356	270	67	5.7	1,410	8.2	10
May 17-18	17,600	--	--	44	13	154	--	100	0	44	260	--	3.8	--	646	.88	30,700	164	82	67	5.2	1,130	8.1	10
May 20-25	11,660	4.4	.01	74	16	222	5.2	135	0	63	385	.1	2.0	.15	945	1.29	29,750	250	140	65	6.1	1,620	8.1	11
May 26, 28-29, 31	18,030	4.3	.13	85	19	256	6.0	140	0	76	450	.1	3.6	.10	1,080	1.47	52,580	290	176	65	6.5	1,840	8.0	11
May 27, 30	18,100	--	--	81	31	360	--	131	0	64	660	--	5.5	--	1,480	2.01	72,330	330	222	70	8.6	2,510	8.2	8
June 1-3, 6-9	15,160	7.4	.07	80	21	478	12	132	0	96	780	.2	5.3	--	1,640	2.23	67,130	286	178	78	12	2,930	7.8	10
June 4-5	17,000	--	--	69	16	291	--	126	0	85	465	--	2.7	--	1,080	1.47	49,570	238	135	73	8.2	1,910	7.7	20
June 10-13, 17	11,260	9.0	.09	70	21	389	7.1	129	0	89	655	.1	1.4	.00	1,400	1.90	42,560	261	156	76	10	2,500	7.9	7
June 14-16, 18-19, 26	8,020	8.0	.07	67	19	296	6.0	136	0	74	510	.1	1.6	--	1,090	1.48	23,600	245	134	72	8.2	1,960	7.8	6
June 20-25, 27-30	6,643	7.2	.01	77	21	343	7.8	130	0	82	585	.3	1.7	.20	1,270	1.73	22,780	278	172	72	8.9	2,200	7.8	10
July 1-2, 9-10	6,025	4.6	.06	68	22	350	8.0	113	0	80	588	.1	2.5	--	1,250	1.70	20,330	260	168	74	9.4	2,250	7.9	5
July 3-5, 7	4,805	5.0	.06	58	17	263	8.6	107	0	81	425	.1	1.7	--	949	1.29	12,310	214	127	72	7.8	1,730	7.9	5
July 6, 8	3,495	--	--	60	13	185	--	124	0	68	300	--	1.5	--	752	1.02	7,100	203	102	66	5.6	1,310	8.2	5
July 11, 16	5,770	--	--	65	16	267	--	104	0	82	435	--	.8	--	995	1.35	15,500	228	143	72	7.7	1,720	8.2	5
July 12-15, 17	4,342	5.0	.06	55	15	164	5.8	117	0	62	288	.1	1.2	.05	690	.94	8,090	198	102	63	5.1	1,250	8.1	5
July 18, 20-22, 25	3,412	4.5	.05	53	13	134	4.6	122	0	54	238	.1	1.6	--	592	.81	5,450	186	86	60	4.3	1,070	8.0	5
July 19, 26-29, 31	2,623	4.8	.03	52	11	114	3.8	132	0	46	192	.2	1.2	--	504	.69	3,570	175	67	58	3.7	914	8.2	5

ARKANSAS RIVER BASIN--Continued

ARKANSAS RIVER AT VAN BUREN, ARK.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate					
July 23-24, 30	3,400	5.0	0.02	61	16	202	5.7	117	4	50	342	0.1	1.6	--	827	1.12	7,590	218	116	66	5.9	1,420	8.4	5
Aug. 1, 5, 7	2,607	--	--	53	11	114	--	130	0	32	205	--	.2	0.05	540	.73	3,800	177	70	58	3.7	936	7.9	10
Aug. 2-4, 6	1,988	2.4	.03	59	14	162	5.7	131	2	47	285	.1	1.9	--	709	.96	3,810	204	94	62	4.9	1,220	8.3	8
Aug. 8-11	2,205	5.9	.00	49	9.4	98	4.3	123	0	26	173	.1	1.1	--	473	.64	2,820	161	60	56	3.4	814	8.2	9
Aug. 12, 18	2,205	--	--	54	11	144	--	119	4	25	250	--	.5	--	590	.80	3,510	180	76	63	4.7	1,060	8.3	10
Aug. 13	2,600	--	--	82	19	283	--	115	5	37	540	--	.3	--	1,160	1.58	8,140	282	180	69	7.4	2,060	8.3	10
Aug. 14-17	2,380	2.9	.02	59	12	199	5.8	114	0	32	358	.1	.9	--	819	1.11	5,260	196	103	68	6.2	1,390	8.1	9
Aug. 19-26	2,358	6.6	.00	48	8.9	117	4.1	118	0	21	208	.1	.4	.05	535	.73	3,410	156	60	61	4.1	914	8.1	7
Aug. 27-28	2,140	--	--	66	19	262	--	114	3	38	480	--	.8	--	990	1.35	5,720	242	144	70	7.4	1,740	8.3	10
Aug. 29-31	1,423	4.7	.01	52	12	158	5.3	122	2	30	275	.1	1.5	--	647	.88	2,490	179	76	65	5.1	1,140	8.3	9
Sept. 1-4	1,095	5.2	.00	61	11	141	5.1	146	0	31	248	.3	1.4	--	648	.88	1,920	197	78	60	4.4	1,080	8.2	10
Sept. 5-10	900	1.9	.00	72	16	203	6.7	167	0	44	350	.3	.4	.00	875	1.19	2,130	246	108	63	5.6	1,470	7.8	10
Sept. 11-19	1,005	3.1	.00	71	17	203	6.0	159	0	53	345	.2	1.2	.00	888	1.21	2,410	247	116	63	5.6	1,480	7.7	10
Sept. 20-30	658	5.2	.00	75	18	240	6.6	160	0	42	430	.3	1.0	.05	1,030	1.40	1,830	261	130	66	6.5	1,710	8.2	10
Weighted average	8,474	--	--	60	15	221	--	106	0	45	394	--	2.7	--	891	1.21	20,390	211	124	69	6.6	1,520	--	14

ARKANSAS RIVER BASIN--Continued

ARKANSAS RIVER AT VAN BUREN, ARK.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	73	55	46	39	43	44	50	68	74	82	81	76
2	73	56	51	42	44	47	52	67	72	83	76	76
3	76	56	52	41	46	39	56	57	67	83	81	78
4	74	60	47	41	45	46	60	60	67	85	83	79
5	72	55	49	43	45	44	65	61	69	85	84	79
6	65	48	46	42	47	47	68	63	71	83	83	80
7	62	47	46	42	43	45	70	63	75	82	81	78
8	61	48	47	45	47	48	65	63	73	84	83	79
9	64	43	45	41	45	49	61	63	78	--	81	79
10	63	45	41	41	48	54	65	61	78	82	81	76
11	65	46	44	35	48	57	66	62	79	81	82	73
12	65	48	44	35	43	61	62	61	79	82	82	74
13	65	48	42	34	44	50	61	60	79	87	81	71
14	66	50	42	34	52	44	64	62	79	88	80	73
15	67	50	39	38	56	46	69	64	80	86	82	75
16	67	51	40	37	53	48	61	66	78	85	83	76
17	66	53	39	39	49	48	61	68	80	86	83	77
18	67	57	37	35	51	52	64	70	81	88	84	78
19	68	59	41	41	53	51	65	70	82	84	83	81
20	66	54	43	49	48	52	66	68	82	81	81	82
21	67	50	47	43	46	51	68	66	82	85	80	75
22	68	48	32	36	46	50	70	69	83	84	80	65
23	68	45	33	41	51	52	68	71	86	84	80	69
24	66	48	33	38	48	52	69	72	83	84	80	73
25	62	45	34	44	51	53	71	72	85	81	82	69
26	62	44	36	47	48	55	73	71	85	82	83	71
27	57	46	38	40	53	55	75	74	85	80	82	72
28	56	45	39	41	46	59	74	74	85	81	84	74
29	54	45	37	42	--	61	70	73	86	--	83	76
30	54	45	38	44	--	54	70	74	80	80	83	75
31	55	--	37	45	--	52	--	77	--	81	81	--
Average	65	50	41	40	48	51	65	67	79	83	82	75

ARKANSAS RIVER BASIN--Continued

MULBERRY RIVER NEAR MULBERRY, ARK.

LOCATION.--At gaging station, a quarter of a mile upstream from Mill Creek, 5 miles northeast of Mulberry, Crawford County, and 11.3 miles upstream from mouth.
DRAINAGE AREA.--372 square miles
RECORDS AVAILABLE.--Chemical analyses: October 1953 to August 1954.
REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, October 1953 to August 1954

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, magnesium	Noncarbonate			
Oct. 21, 1953	0	1.2	0.01	3.0	3.0	2.6	1.2	29	0.8	2.5	0.1	0.6	38	20	0	65.2	7.0	8
Nov. 11	0	1.2	.01	5.6	1.6	3.2	1.4	28	1.6	3.0	.1	.9	44	21	0	62.7	6.6	4
Dec. 23	14.0	4.7	.03	4.0	1.2	2.0	1.0	17	4.2	2.5	.0	.3	34	15	1	41.1	6.6	4
Jan. 15, 1954	32.1	4.2	.01	2.5	1.3	2.0	.6	12	3.0	2.8	.1	.2	34	12	2	36.6	6.6	8
Feb. 26	291	5.6	.02	1.4	1.2	2.5	.6	6	6.0	2.5	.2	.8	47	8	4	32.0	6.6	20
Mar. 18	64.0	3.3	.06	1.8	1.3	1.4	.6	11	2.0	2.0	.3	.5	35	10	1	28.9	6.7	15
Apr. 6	204	1.1	.01	2.1	1.0	1.4	.7	11	2.8	1.2	.1	.5	36	9	0	26.3	6.6	15
May 19	138	5.6	.15	2.9	1.0	1.4	.8	12	2.8	1.8	.3	.5	28	11	2	33.4	6.6	10
June 10	71.6	4.5	.19	2.9	1.0	1.9	.7	15	2.6	1.5	.2	.0	27	11	0	33.4	6.7	10
July 21	.50	2.5	.02	4.6	1.2	2.9	1.0	23	1.0	2.8	.1	1.6	39	16	0	52.8	7.4	5
Aug. 10	0	.7	.02	5.7	2.5	4.3	1.4	28	1.0	7.8	.1	.4	54	24	2	80.7	6.8	5

PINEY CREEK NEAR DOVER, ARK.

LOCATION.--At gaging station, 7¼ miles downstream from Indian Creek and 10 miles north of Dover, Pope County.
DRAINAGE AREA.--274 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1953 to August 1954.
REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, October 1953 to August 1954

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, magnesium	Noncarbonate			
Oct. 20, 1953	0	1.1	0.01	13	1.8	2.5	1.3	54	1.4	2.0	0.0	0.8	60	40	0	102	7.0	8
Nov. 10	0	.8	.01	14	1.8	2.1	1.5	56	1.2	2.0	.0	1.5	58	42	0	106	6.9	5
Dec. 22	10.7	3.8	.01	9.0	1.8	1.8	1.5	28	6.8	2.8	.0	.7	52	30	7	72.2	6.8	10
Jan. 19, 1954	121	4.3	.10	6.1	1.4	1.1	.8	20	5.4	2.0	.3	.6	56	21	5	48.8	6.7	40
Feb. 25	465	3.3	.00	4.0	1.0	.9	.6	16	2.0	1.8	.0	.7	44	14	1	40.7	7.4	14
Mar. 17	68.8	3.3	.00	6.0	1.4	1.3	.7	24	4.4	1.8	.0	.0	47	21	1	47.9	6.9	12
Apr. 6	193	1.9	.01	4.4	1.5	1.0	.6	18	3.4	1.8	.1	.6	42	17	2	40.0	6.8	15
May 18	155	4.6	.05	5.9	1.2	1.1	.8	23	1.8	1.8	.3	.4	38	20	1	49.7	7.4	7
June 9	56.6	4.2	.18	7.5	1.1	1.2	.8	27	3.2	1.5	.2	.1	37	23	1	54.9	7.0	6
July 19	.37	1.5	.00	11	1.9	2.1	1.0	45	2.2	1.8	.1	.9	56	35	0	83.2	7.4	5
Aug. 10	.02	1.2	.00	12	2.4	2.2	1.1	51	1.0	2.8	.1	.7	63	40	0	97.7	7.3	5

ARKANSAS RIVER BASIN--Continued

ILLINOIS BAYOU NEAR SCOTTSVILLE, ARK.

LOCATION.--At gaging station at bridge on county road, 1¼ miles north of Scottsville, Pope County, and 3 miles downstream from North Fork Illinois Bayou.
DRAINAGE AREA.--242 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1953 to August 1954.
REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, October 1953 to August 1954

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, magnesium	Noncarbonate			
Oct. 20, 1953	0.01	4.2	0.02	4.8	1.6	2.9	1.3	23	2.2	3.8	0.1	1.4	42	19	0	59.9	6.6	6
Nov. 10	.02	4.0	.09	5.1	1.8	2.6	1.3	20	4.6	3.8	.0	1.1	42	20	4	60.3	6.4	4
Dec. 22	.12	4.1	.01	4.4	1.6	2.0	.8	19	3.0	3.0	.0	.4	35	18	2	47.5	6.7	4
Jan. 14, 1954	14.8	3.7	.04	2.4	1.3	2.0	.6	12	3.0	3.0	.1	.4	34	11	2	34.0	6.3	12
Feb. 24	353	2.5	.01	2.1	1.0	1.3	.7	10	2.0	1.8	.0	1.2	40	9	1	27.9	6.5	16
Mar. 17	53.0	3.3	.01	2.1	1.0	1.3	.6	9	2.8	2.5	.0	.0	38	9	2	29.5	6.5	15
Apr. 6	127	2.2	.01	1.7	1.5	1.3	.7	11	3.0	1.2	.1	1.7	33	10	1	26.3	6.5	15
May 18	122	4.2	.05	2.7	1.0	1.1	.9	13	2.4	1.0	.3	.7	30	10	0	32.6	6.5	8
June 9	69.3	5.0	.11	3.0	1.2	1.5	.7	12	4.0	1.8	.3	.3	28	12	3	33.2	6.9	10
July 19	.55	2.4	.02	4.8	1.7	2.2	1.1	25	.4	2.8	.1	.8	41	19	0	54.7	7.0	7
Aug. 11	2.6	1.9	.04	3.9	1.9	1.7	1.3	24	1.0	2.2	.1	.7	39	18	0	50.5	6.9	5

ARKANSAS RIVER AT DARDANELLE, ARK.

LOCATION.--At gaging station at bridge on State Highway 7 at Dardanelle, Yell County, 1 mile upstream from Whig Creek, 4.7 miles downstream from Illinois Bayou, and at mile 255.8.
DRAINAGE AREA.--153,707 square miles (revised), of which 22,241 square miles is probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: October 1948 to September 1954.
Water temperatures: October 1948 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 3,140 ppm Apr. 4-6; minimum, 254 ppm Apr. 16-17.
Hardness: Maximum, 583 ppm Apr. 4-6; minimum, 65 ppm Apr. 16-17.
Specific conductance: Maximum daily, 5,310 micromhos Apr. 4; minimum daily, 206 micromhos May 2.
Water temperatures: Maximum, 93°F June 28; minimum, 35°F Jan. 13.
EXTREMES, 1948-54.--Dissolved solids: Maximum, 3,140 ppm Apr. 4-6, 1954; minimum, 160 ppm Feb. 12-13, 1950.
Hardness: Maximum, 583 ppm Apr. 4-6, 1954; minimum, 54 ppm Feb. 12-13, 1950.
Specific conductance: Maximum daily, 5,310 micromhos Apr. 4, 1954; minimum daily, 171 micromhos Jan. 25, 1949.
Water temperatures: Maximum, 94°F Aug. 17, 1952; minimum, freezing point Jan. 30, 1949, Feb. 1-3, 1951.
REMARKS.--Values reported for dissolved solids are residues on evaporation. Records of specific conductance of daily samples available in district office at Fayetteville, Ark. Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue at 180°C): Parts per million	Dissolved solids (residue at 180°C): Tons per acre-foot	Dissolved solids (residue at 180°C): Tons per day	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
Oct. 1-7, 1953	1,549	--	--	91	20	267	--	190	6	66	465	--	1.6	1,070	1.46	4,480	309	144	65	6.6	1,900	8.4	10
Oct. 8-10	3,893	--	--	102	27	414	--	174	3	83	710	--	1.9	1,530	2.08	16,080	366	218	71	9.4	2,680	8.3	10
Oct. 11-14	2,640	--	--	76	19	291	--	135	0	58	502	--	1.3	1,100	1.50	7,840	268	157	70	7.7	1,980	7.9	8
Oct. 15-17	1,590	--	--	102	25	390	--	154	0	58	700	--	1.1	1,470	2.00	6,310	358	232	70	8.9	2,580	7.9	10
Oct. 18-24, 30-31	4,866	8.0	0.04	86	19	267	6.5	165	0	42	495	0.1	2.0	1,130	1.54	14,850	292	158	66	6.8	1,980	7.6	7
Oct. 25-29	8,492	--	--	111	24	340	--	206	0	53	615	--	1.3	1,320	1.80	30,270	376	206	66	7.6	• 2,400	8.0	10
Nov. 1-2	10,950	--	--	77	19	292	--	103	0	25	565	--	2.2	1,120	1.52	33,110	270	186	70	7.7	1,970	7.8	18
Nov. 3-6	6,495	--	--	64	17	204	--	112	0	42	385	--	2.2	827	1.12	14,500	230	138	66	5.8	1,520	7.8	15
Nov. 7-8	4,280	--	--	85	20	277	--	139	0	74	490	--	2.7	1,100	1.50	12,710	294	180	67	7.0	1,920	7.5	15
Nov. 9-11	4,950	--	--	88	21	308	--	143	0	76	560	--	2.1	1,240	1.69	16,570	306	189	69	7.7	2,150	7.8	15
Nov. 12-14	3,647	--	--	104	28	364	--	147	0	66	705	--	2.7	1,490	2.03	14,670	374	254	68	8.2	2,530	7.7	10
Nov. 15-20	2,432	7.9	.02	125	31	441	9.0	160	1	59	857	.1	2.3	1,850	2.52	12,150	440	307	68	9.1	3,040	8.3	18
Nov. 21-24, 27, 30	5,895	--	--	110	27	426	--	147	2	64	830	--	2.1	1,680	2.28	26,740	386	262	71	9.4	2,910	8.3	8
Nov. 25-26	10,700	--	--	159	41	628	--	122	0	40	1,260	--	2.3	2,420	3.29	69,910	565	465	71	11	4,240	8.0	15
Nov. 28-29	9,625	--	--	82	21	316	--	116	0	49	581	--	3.9	1,190	1.62	30,930	291	196	70	8.1	2,210	7.8	15
Dec. 1-2	6,090	--	--	70	16	320	--	123	0	58	550	--	3.0	1,120	1.52	18,420	240	140	74	9.0	2,060	7.8	15
Dec. 3-7	6,044	--	--	67	15	232	--	124	0	44	418	--	2.3	901	1.23	14,700	228	127	69	6.7	1,630	7.6	10
Dec. 8, 11-12	9,133	6.6	.11	90	23	340	7.6	110	0	39	650	.2	2.7	1,350	1.84	33,290	319	229	69	8.3	2,350	7.9	10
Dec. 9-10	9,850	--	--	119	32	460	--	108	0	38	930	--	3.4	1,810	2.46	48,140	428	340	70	9.6	1,810	7.7	15
Dec. 13-14	7,400	--	--	75	18	285	--	114	0	44	522	--	2.6	1,110	1.51	22,180	261	168	71	7.7	2,010	8.1	18
Dec. 15-17	6,333	--	--	89	24	427	--	128	0	68	780	--	2.7	1,550	2.11	26,500	320	216	74	10	2,760	7.9	15

ARKANSAS RIVER BASIN--Continued

ARKANSAS RIVER AT DARDANELLE, ARK.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate					
Dec. 18-20, 1953	4,793	--	--	80	19	332	--	132	0	58	595	--	2.8	1,220	1.66	15,790	278	170	72	8.6	2,210	7.7	15
Dec. 21-27, 29	3,830	--	--	84	22	304	--	154	0	58	560	--	4.2	1,220	1.66	12,620	300	174	69	7.6	2,030	8.1	10
Dec. 28, 30-31	3,140	--	--	102	27	351	--	173	0	58	660	--	5.2	1,410	1.92	11,950	336	224	68	8.0	2,480	8.2	7
Jan. 1-2, 1954	3,290	--	--	102	23	353	--	161	7	53	665	--	4.9	1,390	1.89	12,350	349	206	69	8.2	2,460	8.4	8
Jan. 3-6	3,698	--	--	127	30	508	--	180	0	66	925	--	5.2	1,880	2.56	18,770	440	293	71	11	3,300	8.2	6
Jan. 7-9	3,277	--	--	114	30	444	--	170	4	62	850	--	4.9	1,720	2.34	15,220	408	262	70	9.5	3,040	8.3	8
Jan. 10-11	4,720	--	--	142	32	571	--	180	0	73	1,060	--	5.2	2,110	2.87	26,890	486	338	72	11	3,640	8.2	8
Jan. 12-14	4,033	--	--	114	29	450	--	167	0	73	865	--	4.4	1,750	2.38	19,060	404	266	71	9.7	3,100	8.0	6
Jan. 15, 18-19	6,577	--	--	84	21	322	--	128	0	54	605	--	3.6	1,260	1.71	22,370	296	191	70	8.2	2,230	8.0	9
Jan. 16-17	7,160	--	--	56	15	204	--	98	0	38	382	--	3.3	847	1.15	16,370	201	120	69	6.3	1,500	7.8	11
Jan. 20-24	25,200	5.4	0.10	30	6.8	94	2.8	56	0	32	170	0.1	2.5	430	.58	29,260	103	57	66	4.0	702	7.2	45
Jan. 25-26, 30-31	19,020	--	--	35	9.1	129	--	52	0	20	242	--	2.6	536	.73	27,530	125	82	69	5.0	939	7.4	40
Jan. 27-29	19,330	--	--	21	5.0	58	--	41	0	19	105	--	3.6	308	.42	16,070	73	39	63	3.0	471	7.4	33
Feb. 1-4	11,220	--	--	34	8.6	122	--	58	0	37	218	--	1.7	501	.68	15,180	120	73	69	4.8	832	7.6	35
Feb. 5-6	7,160	--	--	58	14	223	--	86	0	53	400	--	1.9	997	1.36	19,270	202	132	71	6.8	1,420	8.0	8
Feb. 7-10	6,212	3.9	.00	74	19	294	5.4	102	0	34	565	.1	1.1	1,210	1.65	20,290	262	179	70	7.9	2,060	7.7	8
Feb. 11-15	4,968	--	--	76	20	311	--	108	0	59	590	--	1.0	1,200	1.63	16,100	272	183	71	8.2	1,970	7.6	8
Feb. 16-19	8,370	--	--	47	10	171	--	67	0	46	315	--	1.3	696	.95	15,730	158	104	70	5.9	1,150	7.5	20
Feb. 17-18, 20	10,980	--	--	27	9.0	114	--	45	0	38	205	--	1.0	462	.63	13,700	104	68	70	4.9	768	7.4	50
Feb. 21, 26-28	9,580	--	--	48	14	231	--	63	0	55	408	--	1.0	864	1.18	22,350	178	126	74	7.5	1,440	7.5	18
Feb. 22-25	11,050	--	--	35	9.7	154	--	56	0	49	270	--	.8	625	.85	18,650	128	82	72	5.9	1,000	7.6	22
Mar. 1	6,800	--	--	55	18	266	--	81	0	41	480	--	1.7	1,050	1.43	19,280	211	144	73	8.0	1,810	8.0	8
Mar. 2-6, 9-11	4,815	5.2	.00	92	20	398	6.9	105	0	59	720	.3	1.0	1,530	2.08	19,890	312	226	73	9.8	2,600	7.5	8
Mar. 7-8	4,610	--	--	108	29	532	--	111	0	63	970	--	1.9	1,960	2.67	24,400	388	298	75	12	3,410	7.4	8
Mar. 12, 15-18	3,200	--	--	91	22	367	--	138	0	71	650	--	1.1	1,430	1.94	12,360	318	204	72	8.9	2,430	8.0	10
Mar. 13-14, 19-20	3,092	--	--	79	20	301	--	136	0	62	540	--	1.3	1,190	1.62	9,930	279	168	70	7.8	2,070	7.3	10
Mar. 21-22, 25	3,967	--	--	74	19	308	--	124	0	52	545	--	.4	1,220	1.66	13,070	262	161	72	8.3	2,020	7.9	8
Mar. 23-24	3,435	--	--	91	33	453	--	132	0	70	810	--	1.4	1,810	2.46	16,790	362	254	74	10	2,940	8.1	15
Mar. 26-27	9,500	--	--	27	13	132	--	55	0	28	238	--	.8	563	.77	14,440	121	76	70	5.2	958	7.3	15
Mar. 28-31	8,940	--	--	42	14	198	--	64	0	38	365	--	.5	831	1.13	20,060	162	110	73	6.8	1,380	7.8	10
Apr. 1-3	6,403	--	--	56	17	260	--	79	0	42	460	--	.7	1,040	1.41	17,980	210	144	73	7.8	1,720	7.5	10
Apr. 4-6	6,090	--	--	148	52	852	--	76	0	54	1,680	--	.8	3,140	4.27	51,630	583	520	76	15	5,240	7.3	10
Apr. 7-10	4,925	3.0	.00	71	19	316	6.4	98	0	57	560	.3	1.1	1,200	1.63	15,960	255	174	72	8.6	2,090	7.6	8
Apr. 11-12	5,175	--	--	68	16	416	--	105	0	60	670	--	3.3	1,420	1.93	19,840	236	150	79	12	2,460	7.4	10
Apr. 13-15	6,480	--	--	44	15	214	--	87	0	49	360	--	.7	798	1.09	13,960	172	100	73	7.1	1,350	7.4	10

Apr. 16-17, 1954	20,850	--	--	16	6.2	49	--	42	0	13	88	--	0.9	254	.35	14,300	65	31	62	2.6	400	7.2	45
Apr. 18-19	18,800	--	--	16	8.4	63	--	40	0	12	115	--	.6	307	.42	15,580	74	42	65	3.2	499	7.4	40
Apr. 20-24	9,090	--	--	28	8.4	112	--	49	0	21	210	--	2.5	476	.65	11,680	104	64	70	4.8	807	7.5	20
Apr. 25, 27-28	6,403	--	--	64	21	300	--	86	0	58	555	--	4.0	1,240	1.69	21,440	246	176	73	8.3	2,030	7.8	8
Apr. 26	6,090	--	--	85	23	405	--	83	0	57	755	--	3.6	1,710	2.33	28,120	306	238	74	10	2,660	7.8	6
Apr. 29-30	7,160	--	--	57	14	232	--	81	0	36	430	--	3.7	988	1.34	19,100	200	133	72	7.1	1,590	7.8	8
May 1	9,250	--	--	52	15	237	--	74	0	46	410	--	3.6	910	1.24	22,730	192	131	73	7.4	1,540	8.1	12
May 3	146,000	--	--	53	10	147	--	96	0	25	280	--	3.4	704	.96	277,500	173	94	65	4.9	1,130	7.9	15
May 2, 4-6, 10	119,500	6.5	0.18	37	6.4	60	3.0	98	0	16	107	0.5	3.4	366	.50	118,100	119	38	51	2.4	553	7.8	22
May 7-9	91,130	--	--	34	5.5	44	--	95	0	19	77	--	4.1	278	.38	68,400	107	30	47	1.8	456	7.7	35
May 11-13	42,530	--	--	40	6.3	69	--	92	0	48	112	--	2.3	335	.46	38,470	126	50	54	2.7	592	7.2	9
May 14-16, 19-20	35,480	--	--	51	10	138	--	98	0	44	242	--	2.2	584	.79	55,940	168	88	64	4.6	1,030	7.5	7
May 17-18	31,450	--	--	43	8.7	111	--	96	0	42	192	--	2.3	490	.67	41,610	144	65	63	4.0	858	7.5	8
May 21-26	13,680	--	--	64	13	193	--	126	0	69	332	--	3.1	810	1.10	29,920	213	110	66	5.7	1,400	7.2	7
May 27-28	12,300	--	--	52	11	144	--	105	0	58	250	--	1.5	605	.82	20,090	175	89	64	4.7	1,080	7.5	7
May 29-31	24,900	--	--	79	19	254	--	130	0	79	440	--	2.2	1,020	1.39	68,570	275	168	67	6.7	1,790	7.7	7
June 1-2, 6-8, 13	19,570	--	--	70	16	289	--	121	0	49	495	--	2.8	1,080	1.47	57,070	240	142	72	8.1	1,920	8.2	9
June 3, 5, 9-10, 12	17,020	4.9	.02	78	18	405	6.7	127	0	85	660	.3	4.6	1,460	1.99	67,090	268	164	76	11	2,530	8.2	16
June 4, 11	18,750	--	--	84	26	468	--	127	0	100	795	--	2.8	1,670	2.27	84,540	316	212	76	11	2,950	7.7	6
June 14-16,19-20, 23-24	9,296	--	--	84	17	356	--	132	0	84	620	--	2.0	1,320	1.80	33,130	280	172	73	9.2	2,310	8.2	7
June 17-18, 21-22, 25-26	7,742	--	--	78	16	286	--	134	0	80	508	--	1.6	1,130	1.54	23,620	260	150	70	7.7	1,970	7.4	7
June 27-28	7,040	--	--	93	14	428	--	140	0	84	730	--	1.2	1,570	2.14	29,840	290	175	76	11	2,740	7.6	7
July 1-5	5,838	--	--	69	18	348	--	90	0	88	580	--	2.8	1,330	1.81	20,960	246	172	75	9.7	2,130	7.3	3
July 6-12	4,636	5.3	.07	59	16	224	5.8	123	0	68	368	.2	1.6	834	1.13	10,440	213	112	69	6.6	1,550	8.0	5
July 13-14	5,510	--	--	76	19	301	--	127	0	84	495	--	1.4	1,120	1.52	16,660	268	164	71	8.0	1,910	7.3	3
July 15-20	4,743	--	--	63	14	196	--	131	0	67	320	--	1.0	802	1.09	10,270	214	107	67	5.8	1,370	7.7	5
July 21, 23, 26, 28, 31	3,296	--	--	64	13	148	--	137	5	56	242	--	1.6	649	.88	5,780	213	92	60	4.4	1,130	8.4	5
July 22, 24-25, 27	3,670	--	--	58	12	124	--	145	0	45	205	--	1.4	579	.79	5,740	194	75	58	3.9	955	8.1	5
July 29-30	2,185	--	--	72	15	197	--	156	0	59	330	--	1.2	854	1.16	5,040	241	113	64	5.5	1,430	8.0	5
Aug. 1, 4-5, 9-10	2,710	5.0	.05	61	13	144	4.4	152	0	43	255	.2	.8	657	.89	4,810	206	81	60	4.4	1,170	7.7	10
Aug. 2-3, 6-8	2,646	--	--	59	12	122	--	157	0	40	200	--	1.2	567	.77	4,050	196	68	57	3.8	979	7.9	5
Aug. 11-13, 17	2,440	--	--	59	12	130	--	152	0	33	225	--	1.5	592	.81	3,900	196	72	59	4.0	1,020	7.6	5
Aug. 14-16	2,617	--	--	52	10	96	--	147	0	24	170	--	1.4	469	.64	3,310	171	50	55	3.2	813	7.8	5
Aug. 18-20	2,357	--	--	70	14	201	--	135	2	31	365	--	1.6	851	1.16	5,420	232	118	65	5.8	1,460	8.3	5
Aug. 21-26	2,678	--	--	59	14	166	--	140	0	30	285	--	1.2	664	.90	4,800	204	90	64	5.0	1,210	8.2	8

ARKANSAS RIVER AT DARDANELLE, ARK.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate					
Aug. 27-31, Sept. 1, 1954	2,220	--	--	54	11	120	--	144	0	26	205	--	1.8	520	0.71	3,120	180	62	59	3.9	944	8.2	8
Sept. 2-6	1,330	--	--	69	16	193	--	165	0	36	345	--	1.4	805	1.09	2,890	238	103	64	5.4	1,450	8.2	7
Sept. 7-14	1,116	5.6	0.02	64	14	145	4.8	169	9	29	242	0.3	3.4	609	.83	1,840	217	64	59	4.3	1,110	8.5	7
Sept. 15-20	1,102	--	--	69	17	185	--	170	4	43	325	--	1.7	772	1.05	2,300	242	96	62	5.2	1,400	8.4	7
Sept. 21-30	929	--	--	71	17	187	--	177	2	51	320	--	1.2	772	1.05	1,940	247	98	62	5.2	1,400	8.3	7
Weighted averages	10,070	--	--	57	13	191	--	104	0	42	342	--	2.6	790	1.07	21,480	196	110	68	5.9	1,350	--	12

ARKANSAS RIVER BASIN--Continued

ARKANSAS RIVER AT DARDANELLE, ARK.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

ARKANSAS RIVER BASIN--Continued

ARKANSAS RIVER AT LITTLE ROCK, ARK.

LOCATION.--At gaging station, 130 feet downstream from Main Street Bridge in Little Rock, Pulaski County, and at mile 165.5.
DRAINAGE AREA.--158,201 square miles (revised), of which 22,241 square miles is probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1954.
Water temperatures: October 1945 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 2,400 ppm Nov. 28-29; minimum, 212 ppm May 9-14.
Hardness: Maximum, 556 ppm Nov. 28-29; minimum, 64 ppm Jan. 30-31.
Specific conductance: Maximum daily, 5,050 micromhos Apr. 8; minimum daily, 351 micromhos Jan. 30.
Water temperatures: Maximum, 98°F Aug. 16; minimum, 36°F Jan. 13.
EXTREMES, 1945-54.--Dissolved solids: Maximum, 2,400 ppm Nov. 28-29, 1953; minimum, 166 ppm Dec. 7-8, 1952.
Hardness: Maximum, 556 ppm Nov. 28-29, 1953; minimum, 48 ppm Jan. 11-14, 1948, Dec. 7-8, 1952.
Specific conductance: Maximum daily, 5,050 micromhos Apr. 8, 1954; minimum daily, 197 micromhos Dec. 6, 1952.
Water temperatures: Maximum, 98°F Aug. 16, 1954; minimum, freezing point Dec. 19, 1945, Feb. 10-11, 1947, Jan. 28-29, 1948.
REMARKS.--Values reported for dissolved solids are residues on evaporation. Records of specific conductance of daily samples available in district office at Fayetteville, Ark. Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate					
Oct. 1-6, 1953	2,178	9.2	0.01	93	21	291	6.6	216	0	68	505	0.3	2.0	1,170	1.59	6,880	318	142	66	7.1	2,100	8.1	10
Oct. 7-11	2,838	--	--	87	21	240	--	214	3	57	410	--	1.5	996	1.35	7,630	304	123	63	6.0	1,740	8.3	8
Oct. 12-17	3,298	--	--	89	29	368	--	184	0	72	640	--	1.5	1,370	1.86	12,200	341	190	70	8.7	2,400	8.1	7
Oct. 18-22	2,076	--	--	71	24	250	--	170	0	51	438	--	1.4	967	1.32	5,420	276	136	66	6.6	1,770	8.1	10
Oct. 23-27	1,946	--	--	97	24	310	--	182	6	48	555	--	1.5	1,200	1.63	6,310	340	182	66	7.3	2,140	8.4	15
Oct. 28-29	4,835	--	--	88	21	238	--	207	0	33	430	--	1.1	992	1.35	12,950	306	136	63	5.9	1,770	8.2	12
Oct. 30-31	14,250	--	--	144	36	602	--	136	0	65	1,140	--	3.1	2,210	3.01	85,030	508	396	72	12	3,720	7.8	17
Nov. 1-4	12,330	--	--	83	19	326	--	99	0	28	622	--	3.0	1,190	1.62	39,620	285	204	71	8.4	2,180	8.0	20
Nov. 5-11	5,567	6.5	.01	70	15	226	6.1	117	0	40	409	.1	3.1	933	1.27	14,020	236	140	67	6.4	1,600	7.5	20
Nov. 12-16	4,514	--	--	89	22	303	--	157	2	70	538	--	.2	1,180	1.60	14,380	312	180	68	7.5	2,070	8.3	22
Nov. 17-21	3,294	--	--	106	26	354	--	166	0	64	660	--	2.8	1,400	1.90	12,450	372	236	67	8.0	2,420	8.1	18
Nov. 22-26	4,548	--	--	116	28	413	--	177	0	52	768	--	2.5	1,540	2.09	18,910	404	260	69	8.9	2,750	8.2	15
Nov. 27,30	9,960	--	--	111	29	463	--	132	0	60	852	--	1.7	1,660	2.26	44,640	396	288	72	10	2,990	7.4	18
Nov. 28-29	8,600	--	--	154	42	617	--	121	0	48	1,240	--	2.4	2,400	3.26	55,730	556	458	71	11	4,150	7.5	25
Dec. 1-2, 5	6,987	--	--	77	19	304	--	125	0	64	555	--	2.8	1,220	1.66	23,020	270	168	71	8.0	1,950	7.9	14
Dec. 3-4	6,560	--	--	84	21	382	--	128	0	72	680	--	3.9	1,440	1.96	25,510	296	191	74	9.7	2,340	8.1	24
Dec. 6-10, 17	7,947	--	--	69	17	249	--	132	0	65	440	--	3.1	988	1.34	21,200	242	134	69	7.0	1,640	7.9	10
Dec. 11, 14, 19-21	6,954	--	--	96	21	401	--	128	0	67	745	--	2.3	1,530	2.08	28,730	326	221	73	9.7	2,500	7.8	12
Dec. 12-13	7,790	--	--	118	29	469	--	110	0	52	930	--	2.1	1,810	2.46	38,070	414	324	71	10	2,970	7.8	20
Dec. 15-16, 18	7,287	--	--	84	21	332	--	123	0	63	610	--	2.8	1,270	1.73	24,990	296	195	71	8.4	2,120	8.0	15
Dec. 22-31	4,256	8.3	.00	82	21	302	6.2	158	0	48	538	.2	2.4	1,210	1.65	13,900	291	162	69	7.7	2,090	7.9	8

Jan. 1-6, 1954	3,793	--	--	102	23	334	--	186	0	71	615	--	2.1	1,330	1.81	13,620	349	196	68	7.8	2,180	8.2	8
Jan. 7, 10	4,070	--	--	120	28	432	--	190	0	75	820	--	2.9	1,730	2.35	19,010	414	259	69	9.2	2,800	8.2	6
Jan. 8-9, 14	4,157	--	--	131	33	523	--	195	0	95	960	--	2.3	2,010	2.73	22,560	462	302	71	11	3,220	8.2	8
Jan. 11-13, 15	5,502	7.7	.01	104	26	403	7.3	170	0	53	755	0.2	2.9	1,580	2.15	23,470	366	227	70	9.2	2,710	8.2	9
Jan. 16-17	8,470	--	--	71	19	286	--	116	0	64	525	--	2.9	1,110	1.51	25,380	255	160	71	7.8	1,860	8.2	12
Jan. 18, 21	14,150	--	--	60	15	221	--	98	0	62	400	--	2.1	894	1.22	34,160	211	130	69	6.6	1,450	8.0	18
Jan. 19-20	10,750	--	--	45	13	160	--	82	0	47	295	--	2.7	665	.90	19,300	166	99	68	5.4	1,100	8.0	20
Jan. 22-26	34,140	--	--	27	4.9	70	--	53	0	23	126	--	2.4	330	.45	30,420	88	44	63	3.2	522	7.7	60
Jan. 27-29	28,100	--	--	31	5.8	98	--	47	0	24	182	--	2.8	426	.58	32,320	102	63	68	4.2	681	7.0	60
Jan. 30-31	24,800	--	--	19	4.1	56	--	40	0	23	89	--	1.8	269	.37	18,010	64	31	65	3.0	381	6.9	--
Feb. 1-7	15,050	5.3	.06	31	8.3	104	3.5	52	0	20	200	.2	2.0	448	.61	18,200	112	69	66	4.3	786	7.2	25
Feb. 8-9	8,910	--	--	52	12	182	--	81	0	47	340	--	2.5	777	1.06	18,690	180	113	69	5.9	1,230	7.8	10
Feb. 10-11, 13-15	6,816	--	--	67	18	254	--	98	0	54	472	--	1.5	1,030	1.40	18,960	241	160	70	7.1	1,660	7.9	8
Feb. 12, 16-18	9,420	--	--	58	15	220	--	93	0	51	402	--	2.2	902	1.23	22,940	206	130	70	6.7	1,450	7.9	12
Feb. 19, 23-25	21,050	--	--	26	7.5	107	--	44	0	36	188	--	1.7	416	.57	23,640	96	60	71	4.7	708	7.4	36
Feb. 20-22	22,200	--	--	20	4.7	66	--	37	0	22	116	--	1.9	289	.39	17,320	69	39	67	3.5	463	6.7	45
Feb. 26-28	14,930	--	--	27	11	124	--	48	0	40	220	--	1.6	484	.66	19,510	112	73	71	5.1	817	7.3	27
Mar. 1-4	10,160	--	--	42	9.8	176	--	62	0	32	322	--	4.7	676	.92	18,540	146	94	72	6.3	1,250	7.4	8
Mar. 5-6	7,740	--	--	62	16	270	--	77	0	40	485	--	5.6	1,080	1.47	22,570	220	158	73	7.9	1,870	7.6	6
Mar. 7-10	6,655	2.8	.14	73	19	315	6.0	94	0	35	570	.1	3.0	1,240	1.69	22,280	260	183	72	8.5	2,070	8.0	11
Mar. 11-12	5,615	--	--	83	26	407	--	105	0	52	750	--	3.7	1,520	2.07	23,040	314	228	74	10	2,690	8.2	5
Mar. 13-16	4,858	--	--	67	21	322	--	112	1	44	565	--	5.0	1,210	1.65	15,870	254	160	73	8.8	2,140	8.3	6
Mar. 17-18, 23-24	4,600	--	--	70	20	281	--	137	0	46	505	--	4.5	1,130	1.54	14,030	256	144	70	7.7	1,960	8.2	5
Mar. 19-22, 27	4,848	--	--	71	26	313	--	139	3	44	560	--	3.6	1,260	1.71	16,490	284	165	71	8.1	2,180	8.4	6
Mar. 25-26	4,995	--	--	63	19	233	--	133	0	48	425	--	4.0	990	1.35	13,350	235	126	68	6.6	1,700	8.1	8
Mar. 28, 31	11,100	--	--	46	15	224	--	73	0	40	405	--	4.4	860	1.17	25,770	176	116	73	7.3	1,550	8.0	10
Mar. 29-30	11,750	--	--	33	12	148	--	64	0	31	270	--	4.2	613	.83	19,450	132	80	71	5.6	1,080	8.1	8
Apr. 1-6	8,043	3.6	.00	51	13	219	4.8	75	0	36	395	.1	2.2	889	1.21	19,310	180	119	72	7.1	1,510	7.6	12
Apr. 7-10	6,970	--	--	96	35	510	--	77	0	40	970	--	8.6	2,010	2.73	37,830	384	320	74	11	3,360	8.0	8
Apr. 11-13, 16	6,730	--	--	49	18	242	--	89	0	39	422	--	4.5	928	1.26	16,860	196	123	73	7.5	1,660	8.2	8
Apr. 14-15	7,320	--	--	60	21	309	--	102	0	48	545	--	3.6	1,180	1.60	23,320	236	152	74	8.8	2,020	8.0	6
Apr. 17, 23-27	9,757	--	--	24	11	104	--	51	0	25	185	--	3.5	457	.62	12,040	105	63	68	4.4	770	7.6	10
Apr. 18-22	22,980	--	--	17	7.7	61	--	44	0	18	108	--	2.7	284	.39	17,620	74	38	64	3.1	495	7.4	45
Apr. 28-30	9,947	--	--	45	16	206	--	69	0	33	392	--	4.6	854	1.16	22,940	178	122	72	6.7	1,490	7.9	12

ARKANSAS RIVER BASIN--Continued

ARKANSAS RIVER AT LITTLE ROCK, ARK.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate					
May 1, 4, 1954	97,750	--	--	39	12	144	--	77	0	14	276	--	4.7	641	0.87	169,200	147	84	68	5.2	1,120	8.1	15
May 2-3, 5-8	137,000	4.5	0.25	32	5.5	59	2.8	81	0	15	110	0.3	3.7	306	.42	113,200	102	36	55	2.5	525	7.6	22
May 9-14	77,280	--	--	28	5.4	43	--	80	0	19	74	--	3.8	212	.29	44,240	92	26	50	2.0	432	7.8	15
May 15, 17-22	38,730	--	--	36	11	98	--	91	0	28	172	--	3.5	474	.64	49,570	135	60	61	3.7	793	8.1	20
May 16, 23-26	25,220	--	--	51	14	172	--	119	0	39	304	--	4.1	735	1.00	50,050	184	87	67	5.5	1,270	7.9	10
May 27-30	16,620	--	--	45	14	138	--	106	0	43	246	--	3.2	620	.84	27,820	170	83	64	4.6	1,090	8.0	10
May 31, June 1-2, 4, 9-10	22,280	4.0	.00	73	16	254	6.3	129	0	82	420	.3	1.5	1,000	1.36	60,160	248	142	68	7.0	1,720	7.9	10
June 3, 5, 8	22,430	--	--	79	17	316	--	117	0	95	530	--	8.7	1,170	1.59	70,860	267	171	72	8.4	2,060	7.7	15
June 6-7	22,350	--	--	87	17	448	--	129	0	132	730	--	4.6	1,570	2.14	94,740	287	182	77	12	2,750	7.8	15
June 11, 16-20	10,790	--	--	73	15	344	--	134	0	93	560	--	2.3	1,210	1.65	35,250	244	134	75	9.6	2,160	7.9	15
June 12-15	14,320	--	--	79	17	420	--	124	4	116	680	--	2.9	1,430	1.94	55,290	267	159	77	11	2,560	8.4	10
June 21, 24-26	9,645	--	--	77	14	287	--	131	6	77	470	--	1.4	1,050	1.43	27,340	250	132	71	7.9	1,880	8.4	10
June 22-23, 27-29	9,120	--	--	91	17	334	--	145	0	80	570	--	1.9	1,240	1.69	30,530	297	178	71	8.5	2,180	7.9	10
June 30-July 1	7,600	--	--	95	21	395	--	147	0	82	690	--	1.2	1,460	1.99	29,960	324	203	73	9.5	2,550	8.0	10
July 2, 5-9	6,327	--	--	70	17	328	--	109	0	84	560	--	1.6	1,170	1.59	19,990	244	155	74	9.1	2,090	7.8	10
July 3-4, 10	5,523	--	--	71	13	269	--	125	0	71	450	--	1.5	982	1.34	14,640	230	128	72	7.7	1,760	8.1	10
July 11-16, 19	5,130	3.0	.00	65	17	231	6.9	139	0	73	375	.3	.5	900	1.22	12,470	232	118	68	6.6	1,570	7.8	8
July 17-18	4,120	--	--	76	21	299	--	146	0	89	510	--	1.2	1,120	1.52	12,460	276	156	70	7.8	1,980	7.9	10
July 20-25	4,922	--	--	64	13	181	--	138	0	67	305	--	1.3	737	1.00	9,790	213	100	65	5.4	1,340	7.8	15
July 26-31	3,738	--	--	62	12	134	--	150	0	59	228	--	1.8	591	.80	5,960	204	81	59	4.1	1,070	8.0	10
Aug. 1-6	3,212	--	--	68	12	148	--	159	0	54	258	--	2.6	652	.89	5,650	219	88	60	4.3	1,170	8.1	10
Aug. 7-9	2,587	--	--	59	12	113	--	158	2	42	190	--	2.3	525	.71	3,670	196	64	56	3.5	940	8.3	10
Aug. 10-18	2,854	3.0	.00	61	13	143	5.2	154	0	37	252	.3	1.1	664	.90	5,120	206	80	59	4.3	1,110	8.2	12
Aug. 19-22	2,888	--	--	53	11	101	--	142	2	27	180	--	1.2	467	.64	3,640	177	57	55	3.3	839	8.3	15
Aug. 23, 27-31	2,773	--	--	60	13	154	--	146	0	30	275	--	1.2	650	.88	4,870	203	84	62	4.7	1,160	8.0	10
Aug. 24-26	3,170	--	--	68	14	188	--	142	0	32	355	--	1.0	789	1.07	6,750	227	110	64	5.4	1,420	8.2	10
Sept. 1-10	2,009	--	--	58	14	117	--	154	0	54	198	--	2.8	547	.74	2,970	202	76	56	3.6	966	8.2	10
Sept. 11-15	1,426	--	--	72	17	188	--	170	0	38	335	--	2.3	797	1.08	3,070	250	110	62	5.2	1,430	8.2	10
Sept. 16-24	1,523	6.6	.02	64	15	138	5.4	177	2	31	250	.4	1.6	654	.89	2,690	221	72	57	4.0	1,240	8.3	10
Sept. 25-30	1,290	--	--	69	19	166	--	182	2	45	295	--	1.7	748	1.02	2,610	250	98	59	4.6	1,330	8.3	10
Weighted average	12,470	--	--	49	12	167	--	95	0	38	297	--	3.2	680	0.92	22,890	172	94	68	5.5	1,180	--	15

ARKANSAS RIVER BASIN--Continued

ARKANSAS RIVER AT LITTLE ROCK, ARK.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

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ARKANSAS RIVER NEAR ALTHEIMER, ARK.

LOCATION.--About 11 miles southeast of Altheimer, Jefferson County, 4 miles southwest of Cornerstone, and about 2 miles upstream from ferry crossing.
RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1954.
Water temperatures: October 1953 to August 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 2,810 ppm Apr. 9-11; minimum, 266 ppm Jan. 30-31, Feb. 1.
Hardness: Maximum, 514 ppm Apr. 9-11; minimum, 64 ppm Jan. 30-31, Feb. 1
Specific conductance: Maximum daily, 4,550 micromhos Apr. 10; minimum daily, 354 micromhos Jan. 31.
Water temperatures: Maximum, 93°F July 2; minimum, 40°F Dec. 26-29.
REMARKS.--Values reported for dissolved solids are residues on evaporation. Records of specific conductance of daily samples available in district office at Fayetteville, Ark. No discharge records available for this station.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate					
Oct. 1-10, 1953		8.3	0.01	72	22	216	5.8	189	0	53	390	0.3	1.9	0.05	923			270	115	63	5.7	1,610	8.1	9
Oct. 11-15		8.4	.04	88	20	233	5.8	230	0	61	405	.1	2.3	.00	986			302	113	62	5.9	1,780	8.2	7
Oct. 16-23		9.0	.01	98	24	306	6.8	210	10	70	550	.2	3.4	.00	1,260			343	154	65	7.2	2,230	8.5	7
Oct. 24-25, 28-30		9.2	.01	90	19	225	6.6	223	0	49	402	.1	2.3	.00	984			302	120	61	5.7	1,750	8.1	5
Oct. 26-27		10	.10	91	19	162	5.0	272	0	41	272	.1	2.5	--	795			305	82	53	4.0	1,400	8.2	5
Oct. 31, Nov. 1, 3-7		7.3	.01	87	19	332	7.6	101	1	30	620	.1	2.2	--	1,370			295	210	70	8.4	2,260	8.3	15
Nov. 8-12		9.8	.01	73	28	276	6.5	156	0	25	510	.1	2.6	.10	1,160			297	169	66	7.0	1,780	7.7	12
Nov. 13-15, 17		10	.03	89	20	190	5.6	213	0	40	350	.1	2.6	--	932			304	69	57	4.7	1,520	8.2	13
Nov. 16, 18-22		9.5	.02	94	22	285	6.8	164	8	60	508	.1	3.9	.10	1,240			325	177	65	6.9	1,980	8.5	15
Nov. 23-26		7.4	.01	109	26	326	7.3	188	0	54	628	.2	3.8	.10	1,470			379	225	65	7.3	2,320	8.0	16
Nov. 27-30		8.9	.00	117	27	401	8.1	181	0	52	738	.1	1.7	--	1,660			403	254	68	8.7	2,740	7.8	17
Dec. 1-8		6.2	.00	89	26	350	7.5	128	0	55	658	.0	4.4	.05	1,350			329	224	69	8.4	2,380	7.8	10
Dec. 9-13		5.7	.04	79	23	262	6.8	133	0	46	492	.0	5.2	.00	1,050			292	183	65	6.7	1,870	8.0	10
Dec. 14-16		--	--	116	28	424	--	116	1	44	840	--	2.6	--	1,650			404	308	70	9.2	2,930	8.3	20
Dec. 17-25		7.4	.00	91	25	357	7.2	141	2	60	666	.0	3.8	.00	1,380			330	211	70	8.5	2,390	8.3	15
Dec. 26-31		6.5	.01	83	24	276	5.8	160	3	51	490	.0	4.4	.05	1,090			306	170	66	6.9	1,920	8.3	15
Jan. 1-9, 1954		7.0	.01	95	21	284	6.2	192	0	50	510	.1	3.7	.00	1,160			324	166	70	6.9	2,030	8.2	7
Jan. 10-13		9.9	.02	119	27	406	7.7	199	0	82	770	.1	4.2	.10	1,660			408	245	68	8.7	2,720	8.0	10
Jan. 14-18		7.6	.00	82	19	294	6.2	135	0	56	535	.0	7.8	.00	1,200			282	172	69	7.6	1,930	7.8	12
Jan. 19-23		5.0	.00	57	13	198	4.7	87	0	48	365	.1	2.9	.00	847			196	124	68	6.2	1,360	7.5	12
Jan. 24-25		--	--	25	5.6	65	--	49	0	17	121	--	4.4	--	342			85	45	62	3.1	538	7.5	30
Jan. 26-29		5.9	.07	30	7.5	102	3.0	50	0	29	189	.1	4.0	.15	476			106	65	67	4.3	730	7.1	35
Jan. 30-31, Feb. 1		6.0	.27	18	4.6	48	3.0	41	0	19	85	--	3.8	--	266			64	30	61	2.6	378	7.5	50

Feb. 2-8, 1954	5.5	--	33	6.6	96	3.8	57	0	30	178	.1	4.9	--	405		110	63	65	4.0	701	7.3	40
Feb. 9-10	7.1	--	40	10	121	4.5	76	0	39	220	--	6.9	--	569		141	78	64	4.4	874	7.6	18
Feb. 11-12, 16-18	6.7	0.04	58	13	190	5.2	96	0	42	362	.1	6.3	0.00	839		198	120	67	5.9	1,320	7.2	15
Feb. 13-15	6.4	--	66	15	212	5.4	112	0	43	405	--	2.1	--	918		226	134	66	6.1	1,490	7.6	12
Feb. 19-23	6.8	.14	23	6.1	73	4.4	46	0	22	133	.1	6.8	.05	362		82	45	64	3.5	552	7.0	25
Feb. 24-28	5.9	.16	32	7.7	122	3.5	52	0	36	220	.1	5.0	.00	542		112	69	70	5.0	815	7.3	40
Mar. 1-4, 6	6.4	.02	37	8.9	147	3.8	64	0	31	265	.1	2.4	.05	572		129	76	70	5.6	1,050	7.2	17
Mar. 5, 7	--	--	50	13	189	--	89	0	30	335	--	2.1	--	756		178	106	70	6.2	1,360	7.7	7
Mar. 8-12, 15	6.7	.00	72	16	267	5.3	115	0	38	490	.1	2.4	.15	1,040		246	152	70	7.4	1,830	7.5	8
Mar. 13-14, 16	--	--	84	21	336	--	126	0	45	610	--	2.1	--	1,280		296	193	71	8.5	2,270	8.1	10
Mar. 17-18	--	--	74	19	294	--	135	2	50	520	--	2.1	--	1,140		262	148	71	7.9	2,020	8.3	7
Mar. 19-30	6.8	.01	75	18	252	5.3	150	0	54	448	.1	3.5	.05	1,020		261	138	67	6.8	1,770	7.6	9
Mar. 31, Apr. 1-5	5.3	.00	44	13	187	4.5	75	0	60	332	.2	1.9	.00	800		164	102	71	6.4	1,270	7.6	15
Apr. 6-8	5.0	.00	55	15	229	4.8	94	0	69	400	.2	1.2	--	976		198	122	71	7.1	1,490	8.1	12
Apr. 9-11	2.7	.09	137	42	706	12	77	0	57	1,380	.2	4.4	--	2,810		514	452	74	14	4,450	7.9	8
Apr. 12-17	4.6	.00	57	15	232	5.1	100	0	70	412	.1	1.9	--	964		204	122	71	7.1	1,570	8.0	12
Apr. 18-23	4.1	.20	24	5.5	63	2.9	55	0	20	110	.4	1.8	--	325		82	37	61	3.0	500	7.5	14
Apr. 24-28	2.6	.00	31	8.0	98	2.8	66	0	28	180	.2	.9	--	454		110	56	65	4.1	729	7.8	15
Apr. 29-30	--	--	38	9.7	147	--	64	0	30	260	--	1.0	--	604		135	82	69	5.5	1,010	7.9	30
May 1-3	4.2	.08	39	5.5	148	4.0	65	0	28	260	.1	3.7	--	595		120	67	72	5.9	1,030	8.1	23
May 4, 7-9, 12-16	4.8	.03	34	4.6	53	3.2	82	0	21	96	.5	3.7	.10	288		104	37	52	2.3	493	7.9	21
May 5-6	--	--	42	8.1	100	--	93	0	21	190	--	4.3	--	491		138	62	61	3.7	819	8.2	12
May 10-11	--	--	28	5.5	37	--	82	0	16	64	--	3.1	--	279		92	25	47	1.7	393	8.2	40
May 17-23	5.4	.01	42	8.2	101	3.2	92	0	21	182	.1	3.0	.05	455		138	63	61	3.7	782	8.1	14
May 24-31	4.0	.04	58	12	170	4.5	124	0	47	285	.1	2.6	.10	713		194	92	65	5.3	1,240	8.0	11
June 1-5	6.0	.00	80	18	278	7.3	122	0	61	498	.1	3.4	.00	1,130		274	174	68	7.3	1,900	8.1	12
June 6-9	6.4	.03	80	20	438	7.2	128	0	90	720	.1	6.4	.05	1,570		282	176	77	11	2,730	7.9	22
June 10-15	6.3	.01	79	15	388	6.7	140	0	84	620	.1	4.4	.05	1,370		258	144	76	10	2,420	7.9	18
June 16-17	--	--	81	28	431	--	138	0	99	740	--	1.4	--	1,570		317	204	75	11	2,770	8.0	9
June 18-21	5.4	.03	77	14	335	6.2	142	3	69	540	.1	2.0	.00	1,230		250	128	74	9.2	2,150	8.3	19
June 22-30	6.3	.00	73	18	264	6.8	155	0	68	455	.4	1.2	.10	1,060		256	129	68	7.2	1,840	8.0	8

ARKANSAS RIVER BASIN--Continued

ARKANSAS RIVER NEAR ALTHEIMER, ARK.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate					
July 1-11, 1954		5.2	0.00	71	21	315	7.1	133	0	79	540	0.4	0.8	0.00	1,190			264	154	72	8.4	2,050	7.5	6
July 12-19		5.7	.02	67	18	182	4.8	178	0	63	310	.2	.8	--	811			241	95	62	5.1	1,410	7.9	10
July 20-22		5.3	.03	75	18	277	7.9	150	0	76	468	.2	1.9	--	1,110			261	138	69	7.5	1,920	8.2	10
July 23-31		6.5	.04	62	15	126	4.5	182	0	52	208	.2	1.2	--	622			216	67	55	3.7	1,070	8.2	10
Aug. 1-6		1.8	.01	64	15	128	5.1	186	0	51	208	.1	1.0	.05	621			221	68	55	3.8	1,050	8.0	8
Aug. 7-13		4.7	.02	56	14	105	5.0	172	0	38	170	.1	2.9	.10	532			197	56	53	3.3	911	7.6	9
Aug. 14-18		3.8	.03	62	14	120	5.0	190	0	36	200	.2	2.4	.05	599			212	56	54	3.6	1,020	8.1	6
Aug. 19-23		4.7	.02	61	11	106	4.8	178	0	27	180	.2	1.3	.05	526			197	51	53	3.3	914	7.9	8
Aug. 24-31		3.0	.02	67	14	162	5.3	178	0	30	280	.2	.9	.05	725			224	78	60	4.7	1,230	7.8	6
Sept. 1-8		15	.00	84	24	34	2.4	388	0	3.6	43	.3	2.2	.10	441			308	0	19	.8	707	7.8	8
Sept. 9-12, 15, 17-20		4.6	.00	71	16	124	5.0	219	0	24	208	.3	1.8	.20	652			243	64	52	3.4	1,050	7.8	10
Sept. 13-14, 16		9.7	--	88	25	33	2.3	407	0	2.0	36	.3	1.7	.00	448			322	0	18	.8	712	7.9	10
Sept. 21-30		6.7	.02	77	17	111	5.7	259	0	26	180	.3	2.5	--	649			262	50	47	3.0	1,030	7.6	25
Average		6.4	0.03	68	17	217	5.5	140	0	45	389	0.2	3.0	--	915			240	124	66	6.1	1,540	--	15

ARKANSAS RIVER BASIN--Continued

ARKANSAS RIVER NEAR ALTHEIMER, ARK.--Continued

Temperature (°F) of water, October 1953 to August 1954,

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

ARKANSAS RIVER BASIN--Continued

CROOKED CREEK NEAR HUMPHREY, ARK.

LOCATION.--At gaging station at bridge on U. S. Highway 79, 100 feet upstream from St. Louis-Southwestern Railway bridge, 2 miles east of Humphrey, Arkansas County, and 5.8 miles upstream from mouth.
DRAINAGE AREA.--87 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1953 to June 1954.
REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, October 1953 to June 1954

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, magnesium	Noncarbonate			
Oct. 13, 1953	0	3.6	0.19	18	7.0	11	3.3	91	1.0	17	0.4	1.9	126	74	0	214	6.8	22
Nov. 10	0	3.9	.09	17	7.8	10	4.0	88	2.4	18	.1	1.8	123	74	2	199	6.6	10
Dec. 7	0	8.6	.20	15	5.5	13	11	50	17	30	.1	2.6	151	60	19	224	6.5	35
Jan. 4, 1954	0	6.2	.21	15	5.6	14	6.7	51	13	29	.1	1.0	141	60	19	212	6.7	35
Feb. 2	1,190	3.8	.24	3.2	1.8	2.8	3.1	16	5.0	3.0	.3	1.2	118	15	2	51.9	6.2	32
Mar. 2	772	2.4	.21	2.9	1.9	2.3	2.7	18	5.4	2.0	.3	1.4	87	15	0	49.0	6.2	35
Apr. 6	19.8	2.5	.84	7.2	2.8	3.2	4.0	36	3.6	3.0	.5	.8	92	29	0	75.8	6.5	20
May 4	108	3.6	2.0	7.8	2.9	4.5	4.2	40	2.2	4.0	.9	1.8	60	31	0	91.2	6.8	25
June 1	43.4	4.5	1.3	6.4	3.5	4.4	3.6	36	3.6	4.2	--	3.1	97	30	1	86.8	6.5	45
June 29	0	2.0	.11	12	4.7	3.9	3.7	66	.6	3.5	.3	1.4	88	49	0	127	6.7	15

MISCELLANEOUS ANALYSES OF STREAMS IN ARKANSAS RIVER BASIN IN OKLAHOMA AND MISSOURI

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Discharge (cfs)	Temperature (°F)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chlorids (Cl)	Fluorids (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	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
BEAVER CREEK NEAR KAW CITY, KAY COUNTY, OKLA.																							
Mar. 1, 1954	0.01	55		59	8.8	118		175	0		198							184	40	58	3.8	925	8.0
Apr. 26	2.09	75		68	22	164		118	0		339							260	164	58	4.4	1,290	7.5
May 11	6.96	60		62	9.1	20		213	0		33							192	18	18	.6	448	7.8
June 2	13.8	--		80	5.0	50		173	13		105							220	56	33	1.5	704	8.6
SALT FORK ARKANSAS RIVER NEAR ALVA, WOODS COUNTY, OKLA.																							
Oct. 1, 1953	0.55	84		117	19	70		418	0		69							370	28	29	1.6	1,300	8.0
Nov. 2	1.08	72		99	25	112		657	0		30							350	0	41	2.6	1,250	7.5
Jan. 5, 1954	10.4	--		230	38	154		198	0		222							730	568	31	2.5	2,150	6.9
Feb. 1	38.0	47		184	26	98		195	0		138							565	405	27	1.8	2,080	7.4
Mar. 1	20.2	52		212	29	152		174	0		212							650	508	34	2.6	1,850	7.9
Apr. 27	15.3	64		250	50	158		125	0		250							830	728	29	2.4	2,190	8.0
June 2	42.7	78		268	47	153		131	4		315							860	746	28	2.3	2,210	8.4
SALT FORK ARKANSAS RIVER NEAR JET, ALFALFA COUNTY, OKLA.																							
Oct. 1, 1953	6.79	79		269	77			140	0		5,720							984	869			17,300	7.5
Oct. 14	5.22	80		267	72			160	0		5,670							959	828			17,200	8.0
Nov. 2	4.75	81		252	77			135	0		5,470							940	830			16,600	7.3
Nov. 16	3.22	63		263	83			141	0		5,620							994	879			17,000	7.8
Dec. 2	1.24	49		263	78			158	0		5,510							978	848			16,500	8.0
Dec. 15	.51	46		274	72			166	0		5,020							975	839			15,400	7.2
Jan. 18, 1954	1.40	42		260	75			184	0		5,020							955	804			15,500	7.1
Feb. 2	1.45	44		271	74			188	0		5,170							979	825			16,100	7.2
Feb. 16	2.63	53		247	72			147	0		5,170							910	790			15,800	7.2
Mar. 1	7.76	50		255	69			163	0		5,370							919	785			16,400	7.9
Mar. 15	2.19	48		243	81			179	0		5,070							934	787			15,600	8.2
Apr. 5	40.1	62		254	78			168	0		5,750							954	817			17,200	8.2
Apr. 19	9.78	65		247	94			147	0		6,140							1,000	883			18,200	8.1
Apr. 27	16.1	70		246	82			155	0		6,010							953	826			18,000	8.1
May 11	162	58		230	77			155	0		5,510							894	767			16,700	8.2

ARKANSAS RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN ARKANSAS RIVER BASIN IN OKLAHOMA AND MISSOURI--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Discharge (cfs)	Temperature (°F)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_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	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
SALT FORK ARKANSAS RIVER NEAR JET, ALFALFA COUNTY, OKLA.--Continued																							
May 24, 1954	892	65		235	66			148	0		5,150							856	734			15,700	8.2
May 26	1,460	68		215	76			138	0		4,990							845	682			15,200	8.0
June 3	396	74		203	61			131	0		3,800							756	649			12,400	8.1
June 15	129	73		213	60			136	4		3,960							776	658			12,800	8.3
June 29	6.31	95		231	78			98	0		5,270							896	816			16,200	8.0
July 12	4.56	92		258	92			129	0		5,860							1,020	914			17,700	8.2
July 30	19.1	92		250	94			111	0		5,770							1,010	919			17,100	8.2
Aug. 24	13.8	89		274	104			115	0		7,240							1,110	1,020			20,900	7.5
Aug. 30	20.3	80		305	112			101	0		7,730							1,220	1,140			23,000	7.8
Sept. 13	16.0	68		309	119			119	0		7,930							1,260	1,160			23,500	7.5
POND CREEK NEAR LAMONT, GRANT COUNTY, OKLA.																							
Oct. 22, 1953	0.10	66		43	17	47		248	7		32							176	0	37	1.5	530	8.4
Nov. 25	2.21	45		18	5.6	17		106	0		10							68	0	35	.9	222	7.8
Dec. 28	.60	39		46	15	48		254	0		32							176	0	37	1.6	541	8.0
Jan. 12, 1954	.24	39		66	24	69		374	8		38							262	0	36	1.9	720	8.4
Feb. 16	.18	58		66	27	84		432	0		44							276	0	40	2.2	834	8.0
Mar. 16	.19	50		19	30	168		261	0		45							172	0	68	5.6	695	8.0
Apr. 6	.59	71		46	17	77		308	11		52							185	0	48	2.5	641	8.5
June 7	2.13	69		27	8.9	26		131	5		25							104	0	35	1.1	342	8.5
July 7	.05	90		34	34	69		332	20		72							224	0	40	2.0	847	8.6
Aug. 3	.05	86		220	40	96		326	22		61							215	0	49	2.8	770	8.8
Sept. 29	.02	73		19	54	105		400	14		47							270	0	46	2.8	832	8.5
SALT FORK ARKANSAS RIVER AT TONKAWA, KAY COUNTY, OKLA.																							
Oct. 22, 1953	23.2	75		142	47			190	0		2,200							550	394			7,240	8.0
Nov. 10	24.8	59		164	52			247	0		2,250							625	422			7,430	8.2
Nov. 25	34.9	52		107	30			187	3		1,450							390	232			4,940	8.3
Dec. 15	27.6	41		133	36			238	4		1,400							480	278			4,950	8.3

Dec. 28, 1953	25.5	44		174	52			275	0		2,250						650	424			7,460	8.2
Jan. 12, 1954	19.2	33		198	54			300	0		2,420						715	469			7,950	8.2
Jan. 25	29.2	37		138	41			294	0		1,720						515	274			6,000	7.8
Feb. 16	13.7	63		148	50			315	0		2,020						575	317			6,890	8.2
Mar. 2	19.5	35		187	56			276	0		3,140						698	472			10,200	8.2
Mar. 16	53.9	54		270	87			207	2		5,470						1,030	861			16,700	8.3
Apr. 6	27.4	79		136	44			229	10		2,200						520	316			7,310	8.5
Apr. 19	36.1	83		219	71			216	5		4,560						836	651			14,000	8.4
Apr. 27	36.0	66		132	46			194	10		2,550						520	344			8,350	8.5
June 1	989	--		190	31			123	2		3,760						698	593			12,200	8.3
June 7	256	69		203	56			147	5		3,730						737	607			12,100	8.3
June 17	101	80		195	76			156	3		3,740						797	664			11,400	8.3
June 28	39.3	90		195	78			131	0		4,080						807	700			12,700	8.2
July 7	10.5	84		173	70			123	0		3,760						716	615			12,100	7.9
Aug. 3	7.06	100		140	78			99	0		2,850						670	589			9,230	8.1
Aug. 16	9.29	95		148	56			161	3		2,450						600	463			8,090	8.3
Aug. 23	3.43	86		136	73	1,880		130	2		2,650						640	530	86	32	9,120	8.3
Sept. 8	1.17	82		175	102			134	0		4,080						857	747			13,000	8.2
Sept. 28	.67	82		112	93			128	0		2,900						660	550			9,340	7.5

CHIKASKIA RIVER AT BLACKWELL, KAY COUNTY, OKLA.

Oct. 5, 1953	6.96	70		862	203	--		178	0		5,420						2,990	2,840	--	--	15,900	7.2
Oct. 22	22.3	66		277	68	--		120	0		1,590						970	872	--	--	5,320	7.4
Nov. 10	21.6	50		154	34	348		125	0		805						525	422	59	6.6	2,830	7.4
Nov. 25	49.9	45		87	133	148		191	0		295						765	608	30	2.3	1,590	8.2
Dec. 16	45.1	39		94	20	166		155	0		358						315	188	53	4.1	1,520	8.0
Dec. 29	65.3	34		114	22	139		239	2		288						375	176	45	3.1	1,440	8.3
Jan. 12, 1954	23.7	34		196	41	332		239	0		770						660	464	52	5.6	2,840	8.1
Jan. 25	38.5	35		171	37	252		250	0		580						580	375	49	4.6	2,350	7.9
Feb. 16	59.7	52		112	26	166		236	0		318						385	192	48	3.7	1,510	8.1
Mar. 1	52.2	48		115	26	186		221	0		360						395	214	51	4.1	1,620	8.0

ARKANSAS RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN ARKANSAS RIVER BASIN IN OKLAHOMA AND MISSOURI--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Discharge (cfs)	Temperature (°F)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_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	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
CHIKASKIA RIVER AT BLACKWELL, KAY COUNTY, OKLA.--Continued																							
Mar. 16, 1954	42.1	46		116	37	235		205	0		445							440	272	54	4.9	1,890	8.1
Apr. 6	52.5	71		106	35	210		183	0		415							410	260	53	4.5	1,740	8.2
Apr. 19	35.7	72		132	39	265		234	0		498							490	298	54	5.2	2,090	7.9
May 27	698	67		26	6.6	20		90	0		28							92	19	32	.9	280	7.2
June 2	144	--		64	11	58		158	7		115							206	65	38	1.8	751	8.4
June 17	442	77		54	17	39		198	8		40							206	31	29	1.2	522	8.5
June 28	2.75	92		292	18	624		108	0		1,520							1,090	1,000	55	8.2	4,540	8.1
July 7	.64	81		344	81	450		141	0		1,160							1,140	1,020	46	5.8	4,310	7.9
Aug. 3	2.51	80		993	278	--		115	0		6,700							3,620	3,530	--	--	18,800	8.1
Aug. 16	.02	90		1,270	290	--		73	0		7,990							4,360	4,300	--	--	21,500	7.7
Aug. 25	306	75		30	9.5	36		78	0		68							114	50	41	1.5	422	8.1
Sept. 8	.02	88		202	65	560		94	0		1,200							770	693	61	8.8	4,120	8.0
Sept. 14	1.98	78		879	240	--		98	0		6,210							3,180	3,100	--	--	17,900	7.2
Sept. 28	.47	77		1,030	340	--		95	0		7,300							3,970	3,890	--	--	19,700	7.3
RED ROCK CREEK NEAR RED ROCK, NOBLE COUNTY, OKLA.																							
Nov. 25, 1953	2.30	45		19	5.1	16		86	0		18							68	0	34	0.8	223	7.8
Dec. 15	.16	39		24	5.1	18		111	0		12							81	0	32	.9	253	7.8
Jan. 12, 1954	--	35		29	6.6	20		134	0		14							99	0	31	.9	288	8.0
Mar. 2	.03	42		61	20	48		285	0		56							232	0	31	1.4	662	7.9
Apr. 6	.08	79		37	12	83		198	4		39							142	0	56	3.0	479	8.3
June 7	.65	70		30	8.5	27		128	6		26							110	0	35	1.1	335	8.6
SALT CREEK NEAR SHIDLER, OSAGE COUNTY, OKLA.																							
May 11, 1954	5.93	60		44	4.9	8.9		132	4		15							130	12	13	0.3	396	8.4
June 2	.76	--		60	6.4	12		166	12		24							176	20	13	.4	390	8.7

SKEDEE CREEK AT LAKE PAWNEE NEAR PAWNEE, PAWNEE COUNTY, OKLA.

Nov. 9, 1953		--		42	11	16		189	2		7.8							150	0	19	0.6	346	8.3
Dec. 16		42		42	11	16		188	3		7.5							151	0	19	.6	352	8.3
Jan. 11, 1954		35		40	12	16		192	0		7.2							149	0	19	.6	349	8.2
Mar. 15		50		43	13	20		199	0		13							160	0	21	.7	373	8.2
Apr. 5		62		42	12	17		182	9		10							156	0	19	.6	365	8.5
May 11		62		34	9.0	114		154	0		10							122	0	20	.6	296	8.2
June 16		84		37	11	17		150	5		7.5							138	6	21	.6	309	8.4
Aug. 2		89		41	13	19		174	6		9.5							156	4	21	.7	352	8.5
Sept. 9		87		41	16	15		179	6		12							168	12	16	.5	388	8.4

CIMARRON RIVER NEAR KENTON, CIMARRON COUNTY, OKLA.

Nov. 9, 1953	1.66	48		91	53	200		286	11		40							445	192	49	4.1	1 590	8.5
Dec. 1	2.07	38		95	86	269		407	0		60							590	256	50	4.8	2,080	8.2
Dec. 30	.43	33		107	91	282		433	0		65							640	285	49	4.8	2,200	7.9
Jan. 13, 1954	1.76	34		107	97	284		452	0		62							665	294	48	4.8	2,270	7.9
Jan. 25	.26	50		108	94	327		377	0		72							655	346	52	5.6	2,280	8.2
Feb. 10	6.24	55		85	76	296		379	0		68							525	214	55	5.6	2,040	7.8
Mar. 3	11.1	33		87	85	304		382	0		66							565	252	54	5.6	2,070	8.0
Mar. 29	.21	64		124	100	398		437	0		86							720	362	55	6.5	2,660	8 0
Apr. 19	.45	73		106	106	428		415	0		91							700	360	57	7.0	2,720	8.0
May 5	.83	67		102	101	379		411	0		81							670	333	55	6.4	2,480	8.1
May 17	7.29	69		84	85	330		399	0		69							560	233	56	6.1	2,120	7.9
July 29	11.7	--		72	26	44		239	0		10							285	89	25	1.1	678	7.6
Sept. 14	1.92	85		82	72	237		260	0		46							500	287	51	4.6	1,710	7.8
Sept. 21	.73	69		110	91	305		346	0		65							650	366	50	5.2	2,260	7.9
Sept. 27	1.27	66		104	99	348		336	0		69							665	390	53	5.9	2,320	7.9

CIMARRON RIVER NEAR MOCANE, BEAVER COUNTY, OKLA.

Nov. 5, 1953	74.4	45		88	32	309		255	0		480							350	141	66	7.2	2,170	8.2
Nov. 12	73.7	48		87	34	312		253	0		490							355	148	66	7.2	2,140	8.2
Nov. 17	73.5	59		86	32	315		242	3		480							344	140	67	7.4	2,160	8.3
Nov. 30	77.0	45		87	36	312		252	0		480							365	158	65	7.1	2,170	8.0

MISCELLANEOUS ANALYSES OF STREAMS IN ARKANSAS RIVER BASIN IN OKLAHOMA AND MISSOURI--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Discharge (cfs)	Temperature (°F)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_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	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
CIMARRON RIVER NEAR MOCANE, BEAVER COUNTY, OKLA.--Continued																							
Dec. 4, 1953	96.8	34		88	32	298		242	6		465							350	142	65	6.9	2,090	8.3
Dec. 18	82.6	40		96	31	310		268	0		475							366	146	65	7.1	2,220	7.6
Dec. 24	31.9	33		124	44	445		336	0		700							490	214	66	8.7	3,050	7.7
Dec. 31	63.2	33		100	35	336		284	0		515							392	160	65	7.4	2,360	7.5
Jan. 12, 1954	40.2	33		112	40	392		307	0		595							444	192	66	8.1	2,710	7.8
Jan. 15	125	33		85	30	334		228	0		500							336	149	68	7.9	2,200	7.9
Jan. 29	85.7	36		91	29	309		245	0		460							344	143	66	7.2	2,090	7.9
Feb. 5	75.2	49		91	31	313		249	0		462							352	148	66	7.3	2,130	7.8
Feb. 25	67.9	55		93	30	346		252	0		490							354	148	68	8.0	2,240	7.8
Mar. 5	75.4	45		92	31	336		253	0		478							358	150	67	7.7	2,190	7.8
Mar. 17	68.9	46		80	51	328		268	0		485							410	190	54	7.0	2,250	7.6
Mar. 31	72.2	59		66	41	338		236	0		490							335	142	69	8.0	2,180	8.0
Apr. 23	68.9	68		78	34	356		233	0		530							335	144	71	8.5	2,230	7.9
Apr. 28	80.7	74		108	33	420		266	0		615							405	187	69	9.1	2,570	7.3
May 7	49.4	57		78	32	366		212	0		520							325	152	71	8.8	2,250	7.5
May 21	94.0	82		97	12	222		233	0		315							290	99	62	5.7	1,560	7.2
June 4	42.4	75		80	38	360		214	0		600							355	179	69	8.3	2,470	7.5
June 9	39.9	79		84	40	356		220	0		700							375	195	67	8.0	2,920	7.6
June 16	41.0	87		78	37	270		224	0		575							345	162	63	6.3	2,470	7.7
June 23	27.5	88		80	40	308		206	0		775							365	196	65	7.0	3,110	7.8
June 30	23.4	87		82	41	510		205	0		850							375	207	75	11	3,300	7.9
July 8	29.9	90		74	38	364		194	0		750							340	181	70	8.6	2,990	7.7
July 12	8.93	88		82	45	434		197	0		900							390	228	71	9.6	3,500	7.7
July 16	15.3	90		82	56	650		183	0		975							435	285	76	14	3,620	8.2
July 22	26.0	82		76	49	654		178	0		900							390	244	78	14	3,440	8.2
July 26	329	79		100	41	130		334	0		158							420	146	40	2.8	1,310	7.7
Sept. 1	52.2	70		106	44	319		300	0		468							445	199	61	6.6	2,280	7.3
Sept. 10	39.8	74		78	48	384		220	0		515							390	210	68	8.5	2,380	7.6
Sept. 15	39.2	77		74	43	398		208	0		555							360	190	71	9.1	2,490	7.6
Sept. 22	30.5	66		78	49	373		216	0		595							395	218	67	8.2	2,580	7.7
Sept. 24	28.2	66		78	52	396		223	0		600							410	228	68	8.5	2,670	7.7
Sept. 29	37.0	73		74	43	344		211	0		510							365	192	67	7.8	2,440	7.7

CIMARRON RIVER NEAR WAYNOKA, WOODS COUNTY, OKLA.

Oct. 1, 1953	0.08	81		191	60	--		293	0		5,120							721	482	--	--	15,200	8.1
Oct. 14	.02	82		189	58	--		277	0		5,330							713	486	--	--	15,800	8.2
Oct. 25	105	78		459	170	--		173	0		26,000							1,840	1,700	--	--	61,700	7.6
Oct. 26	118	82		226	89	--		173	0		9,710							932	789	--	--	26,700	7.9
Nov. 2	27.6	75		295	132	--		208	0		17,900							1,280	1,110	--	--	46,100	8.2
Nov. 16	47.1	71		233	96	--		245	4		12,600							976	769	--	--	32,400	8.3
Dec. 1	52.8	48		206	88	--		236	7		10,100							875	671	--	--	27,200	8.4
Dec. 15	51.6	46		208	83	--		266	0		9,760							862	644	--	--	27,100	8.1
Jan. 5, 1954.....	77.4	--		194	72	--		266	0		7,840							784	565	--	--	22,400	7.5
Jan. 18	36.1	40		284	107	--		240	0		14,900							1,150	954	--	--	39,200	7.6
Feb. 1.....	201	46		116	43	--		223	0		3,410							464	281	--	--	10,900	7.7
Feb. 16	61.6	57		219	89	--		243	3		10,600							914	709	--	--	28,700	8.3
Mar. 1.....	70.9	46		208	82	--		228	4		10,400							855	661	--	--	28,300	8.3
Mar. 15	35.3	49		221	104	--		240	0		11,600							978	782	--	--	31,500	8.2
Apr. 5	36.3	63		231	105	--		240	3		13,000							1,010	814	--	--	34,000	8.3
Apr. 19.....	3.52	63		296	135	--		199	0		17,600							1,290	1,130	--	--	45,900	7.9
Apr. 26	17.1	70		343	137	--		195	0		17,600							1,420	1,260	--	--	45,400	8.1
May 11	16.3	61		306	137	--		209	0		15,900							1,330	1,160	--	--	41,000	8.1
May 24	2,370	62		164	37	--		116	0		3,790							558	463	--	--	11,500	7.6
May 25	2,920	62		134	45	--		130	0		4,590							518	412	--	--	13,600	7.5
May 26	1,530	63		159	49	--		130	0		5,470							596	489	--	--	16,000	7.6
May 29	304	59		153	65	--		200	12		4,030							647	463	--	--	12,800	8.4
June 2.....	97.8	66		203	66	--		217	0		5,710							775	596	--	--	17,600	8.1
June 11.....	19.7	72		328	109	--		179	0		11,500							1,260	1,120	--	--	31,600	8.2
June 15	124	70		316	39	142		86	0		210							950	880	25	2.0	2,060	7.9
June 18.....	21.6	71		451	151	--		189	0		16,100							1 740	1,590	--	--	43,500	8.2
June 29.....	.16	89		234	123	--		125	0		7,840							1,090	988	--	--	22,900	7.9
July 12	.10	85		183	73	--		192	0		4,730							757	600	--	--	14,500	7.9
July 30	22.1	96		387	232	--		364	0		12,200							1,920	1,620	--	--	33,300	8.0
Aug. 24.....	368	87		88	39	1,870		160	0		2,700							380	249	91	42	8,860	8.2
Aug. 31	84.0	88		223	77	--		156	0		6,260							875	747	--	--	18,200	8.2

MISCELLANEOUS ANALYSES OF STREAMS IN ARKANSAS RIVER BASIN IN OKLAHOMA AND MISSOURI--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Discharge (cfs)	Temperature (°F)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_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	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
EAGLE CHIEF CREEK NEAR CARMEN, ALFALFA COUNTY, OKLA.																							
Oct. 14, 1953	0.17	81		95	37	63		236	0		42							390	196	26	1.4	954	8.1
Nov. 3	1.34	75		104	36	47		246	0		36							410	208	20	1.0	924	8.2
Jan. 5, 1954	1.72	39		136	57	66		301	0		48							575	328	20	1.2	1,260	7.8
Feb. 2	1.95	44		114	62	73		244	0		50							540	340	23	1.4	1,250	8.0
Mar. 2	2.48	45		130	65	77		323	0		54							590	326	22	1.4	1,290	8.0
Apr. 5	1.26	62		76	66	80		156	0		55							460	332	27	1.6	1,150	8.1
Apr. 27	5.80	79		220	71	66		212	0		38							840	666	15	1.0	1,570	8.0
Sept. 20	.08	62		39	57	50		182	12		42							330	161	25	1.2	844	8.6
EAGLE CHIEF CREEK NEAR ALINE, ALFALFA COUNTY, OKLA.																							
Oct. 14, 1953	1.06	78		93	41	60		275	0		41							400	174	25	1.3	954	8.2
EAGLE CHIEF CREEK NEAR CLEO SPRINGS, MAJOR COUNTY, OKLA.																							
Oct. 14, 1953	2.38	81		97	36	56		258	0		36							390	178	24	1.2	917	8.2
Nov. 3	4.68	73		111	30	45		273	0		30							400	176	20	1.0	908	8.1
Jan. 5, 1954	4.99	42		121	43	57		322	0		38							480	216	21	1.1	1,080	7.8
Feb. 2	5.10	45		121	45	63		314	0		41							485	228	22	1.2	1,100	7.8
Mar. 1	3.98	47		102	46	65		293	0		42							445	205	24	1.3	1,060	8.0
Apr. 5	4.38	59		78	50	67		207	0		44							400	230	27	1.5	992	8.1
Apr. 27	5.61	76		160	49	61		215	0		36							600	424	18	1.1	1,310	8.0
Sept. 20	.57	59		54	48	55		142	6		44							330	204	27	1.3	872	8.4
HOYLE CREEK NEAR AMES, MAJOR COUNTY, OKLA.																							
Jan. 4, 1954	0.01	44		99	26	58		379	0		97							356	46	26	1.3	924	8.1
Feb. 1	.05	43		99	25	58		369	0		93							352	50	26	1.3	898	8.0
Mar. 2	.10	44		96	24	59		361	0		93							338	42	28	1.4	884	7.9
Apr. 5	.02	62		75	20	52		354	3		80							270	0	30	1.4	773	8.3

TURKEY CREEK NEAR DRUMMOND, GARFIELD COUNTY, OKLA.

Jan. 4, 1954	0.42	44		234	147			455	0		2,320							1,190	817	--	--	8,180	7.4
Feb. 1	.21	45		108	62	--		306	0		890							525	274	--	--	3,490	7.7
Feb. 16	.22	58		103	71	--		309	0		930							550	297	--	--	3,670	8.2
Mar. 1	.38	43		98	59	499		342	7		780							485	194	69	9.9	3,150	8.4
Apr. 19	.05	60		72	41	310		265	0		495							350	133	66	7.2	2,170	8.2
May 11	8.00	59		22	10	49		117	0		72							96	0	53	2.2	451	8.2
May 30	11.3	60		32	9.7	56		130	3		34							120	8	50	2.2	578	8.3

PREACHER CREEK NEAR DOVER, KINGFISHER COUNTY, OKLA.

Oct. 29, 1953	0.28	79		154	34	162		530	6		225							525	80	40	3.1	1,630	8.3

TURKEY CREEK NEAR DOVER, KINGFISHER COUNTY, OKLA.

Oct. 14, 1953	0.15	82		45	13	62		187	0		84							167	14	45	2.1	628	8.1

COTTONWOOD CREEK NEAR GUTHRIE, LOGAN COUNTY, OKLA.

Oct. 9, 1953	1.99	60		63	23	41		306	0		34							252	2	26	1.1	629	8.2
Nov. 6	6.15	49		67	22	44		227	0		44							260	74	27	1.2	687	7.9
Dec. 21	12.2	43		127	34	99		338	0		100							455	178	32	2.0	1,350	8.1
Jan. 4, 1954	10.5	40		154	47	123		408	0		104							580	246	32	2.2	1,520	8.2
Feb. 5	10.6	46		148	36	129		374	0		95							520	214	35	2.5	1,440	8.0
Mar. 2	10.0	45		131	40	116		388	0		93							490	172	34	2.3	1,340	8.2
Apr. 12	8.46	60		131	42	128		389	0		93							500	181	36	2.5	1,390	8.1
May 13	26.0	58		91	30	65		269	0		41							350	130	29	1.5	884	7.9
June 3	17.2	72		62	19	34		172	7		42							232	80	24	1.0	636	8.4
July 8	.20	81		66	221	50		258	12		35							252	20	30	1.4	690	8.5

ARKANSAS RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN ARKANSAS RIVER BASIN IN OKLAHOMA AND MISSOURI--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Discharge (cfs)	Temperature (°F)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_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	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
CIMARRON RIVER NEAR GUTHRIE, LOGAN COUNTY, OKLA.																							
Nov. 6, 1953	74.0	46		193	62	--		196	0		5,630							737	576	--	--	16,700	7.8
Nov. 20	6,220	50		28	3.9	96		110	0		136							86	0	71	4.5	701	7.8
Nov. 23	316	45		118	34	--		158	0		2,450							434	304	--	--	7,840	7.7
Dec. 4	2,270	45		89	23	--		170	0		1,620							316	176	--	--	5,320	8.1
Dec. 7	353	49		83	19	--		137	0		1,380							288	176	--	--	4,500	7.9
Dec. 21	117	46		221	69	--		274	0		5,220							836	611	--	--	16,000	8.0
Dec. 29	144	41		237	68	--		272	0		5,670							871	649	--	--	17,300	8.1
Jan. 7, 1954	131	46		211	67	--		276	0		6,420							801	575	--	--	18,800	8.0
Jan. 26	86.9	35		223	72	--		275	0		5,120							851	626	--	--	15,400	8.1
Feb. 5	215	47		234	79	--		242	0		8,910							911	713	--	--	25,300	8.0
Feb. 17	94.0	55		228	77	--		236	0		6,410							889	695	--	--	19,000	8.0
Feb. 26	90.4	50		238	76	--		230	0		6,160							909	720	--	--	18,300	8.0
Mar. 12	83.7	53		255	77	--		244	0		6,850							952	752	--	--	19,200	8.2
Mar. 25	233	66		215	83	--		206	0		5,470							875	706	--	--	16,200	8.1
Mar. 31	99.1	48		191	61	--		220	5		4,180							727	538	--	--	13,000	8.3
Apr. 12	59.0	58		239	87	--		262	0		6,110							954	740	--	--	19,100	8.2
Apr. 20	49.0	68		239	78	--		229	0		5,870							915	728	--	--	17,300	8.2
Apr. 27	136	75		254	48	--		151	0		2,400							830	706	--	--	8,530	7.7
May 13	244	71		207	63	--		189	0		2,390							776	621	--	--	--	7.8
May 27	4,960	75		82	26	--		117	0		1,350							310	214	--	--	4,490	7.6
May 28	2,310	--		128	22	--		121	0		--							410	311	--	--	77,620	7.6
May 29	1,740	--		132	32	--		113	0		2,950							460	368	--	--	9,300	7.7
June 1	930	--		118	33	--		154	2		2,800							450	320	--	--	8,950	8.3
June 3	468	69		142	35	--		165	8		2,800							500	351	--	--	9,130	8.4
June 8	190	78		181	70	--		211	6		3,830							737	554	--	--	12,000	8.3
June 17	744	85		78	38	680		145	4		1,050							350	224	81	16	3,800	8.4
June 29	39.5	--		235	87	--		117	0		4,330							945	849	--	--	13,100	8.2
July 8	17.0	85		254	76	--		173	0		4,620							944	802	--	--	14,300	8.0
Aug. 17	.72	81		146	66	--		368	14		2,050							635	310	--	--	6,970	8.4
Aug. 23	31.7	87		235	87	--		135	0		3,880							946	836	--	--	12,500	8.2
Aug. 26	194	81		460	193	--		342	0		14,200							1,940	1,660	--	--	38,700	7.3
Sept. 7	13.6	82		187	90	--		165	3		5,420							836	696	--	--	16,500	8.3
Sept. 16	1.38	87		156	51	1,620		239	0		2,500							600	404	85	29	8,520	8.2
Sept. 29	.75	81		76	54	467		547	0		685							410	0	71	10	3,200	7.8

HOUSE CREEK NEAR TERLTON, PAWNEE COUNTY, OKLA.

Nov. 24, 1953	0.01	55		42	10	35		143	0		78							147	30	34	1.3	480	7.8
Dec. 28	--	41		52	13	41		163	0		94							183	50	33	1.3	580	8.1
Jan. 11, 1954	--	41		63	16	52		186	0		119							222	70	34	1.5	705	7.5
Feb. 15	--	57		72	21	68		209	0		157							266	94	36	1.8	853	8.0
Mar. 1	.02	55		78	22	76		213	0		177							284	110	37	2.0	930	8.0
Apr. 19	.01	75		74	33	99		499	0		238							320	0	40	2.4	1,100	7.5
May 18	.05	73		30	7.6	46		82	0		40							106	39	49	1.9	434	7.6
June 3	.47	--		20	6.3	23		61	0		54							76	26	40	1.1	295	8.0

SAND CREEK NEAR OKESA, OSAGE COUNTY, OKLA.

Oct. 21, 1953	0.01	70		22	4.4	11		86	0		20							74	4	24	0.6	230	7.7
Nov. 10	.01	44		21	4.4	10		83	0		18							71	3	23	.5	201	7.5
Dec. 16	.69	42		25	4.4	9.1		100	0		14							80	0	20	.4	214	7.8
Jan. 11, 1954	.16	38		29	4.1	13		106	0		21							89	2	24	.6	258	7.2
Feb. 15	.34	55		29	5.1	15		111	0		24							93	2	26	.7	267	7.7
Mar. 15	.09	50		32	5.8	17		113	3		29							104	6	26	.7	292	8.4
Apr. 5	--	71		34	6.6	18		126	4		32							112	2	26	.7	315	8.4
Apr. 26	.05	75		38	9.0	20		135	3		43							132	17	25	.8	358	8.3
May 10	13.6	62		27	4.5	10		68	0		29							86	30	20	.5	233	7.9
June 2	23.1	--		16	3.9	6.4		60	0		10							56	48	20	.4	149	8.0
July 6	.05	91		29	7.2	15		114	0		37							102	9	24	.6	319	7.0

DOUBLE CREEK NEAR RAMONA, WASHINGTON COUNTY, OKLA.

June 2, 1954	25.9	--		47	6.0	31		115	2		65							142	44	32	1.1	440	8.3

SPRING RIVER NEAR QUAPAW, OTTAWA COUNTY, OKLA.

Oct. 21, 1953	37.3	68		67	6.3	16		141	0		18							192	76	15	0.5	453	7.7
Jan. 5, 1954	1,120	42		96	11	23		132	0		26							286	178	15	.6	654	7.0
Mar. 8	66.4	51		77	7.3	18		128	0		23							222	117	15	.5	518	7.6
May 17	197	70		59	7.5	11		108	0		10							178	90	12	.4	395	7.5
Aug. 11	48.7	85		64	16	25		100	0		30							225	143	19	.7	499	7.7

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ARKANSAS RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN ARKANSAS RIVER BASIN IN OKLAHOMA AND MISSOURI--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Discharge (cfs)	Temperature (°F)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_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	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
LOST CREEK NEAR SENECA, McDONALD COUNTY, MO.																							
Oct. 21, 1953	3.31	68		49	1.2	3.6		152	0		5.8							128	4	6	0.1	295	8.2
Dec. 7	4.30	48		51	1.5	3.1		157	0		4.5							133	4	5	.1	270	7.4
Jan. 6, 1954	3.50	41		50	1.0	2.8		150	0		4.5							128	5	4	.1	259	7.8
Feb. 3	4.25	43		49	1.0	2.9		144	0		4.8							127	9	5	.1	283	8.0
Mar. 9	3.43	48		47	2.2	3.0		143	0		5.0							126	9	5	.1	279	7.8
May 10	9.51	64		44	1.5	3.0		124	0		5.0							116	14	5	.1	232	7.5
Aug. 10	1.42	83		50	2.7	4.5		151	0		8.5							136	12	7	.2	288	7.8
SYCAMORE CREEK NEAR WYANDOTTE, OTTAWA COUNTY, OKLA.																							
Mar. 9, 1954	5.18	50		42	1.7	3.5		118	0		7.5							112	16	6	0.1	234	7.3
ELK RIVER NEAR TIFF CITY, McDONALD COUNTY, MO.																							
Oct. 7, 1953	51.1	64		44	2.2	3.3		144	0		5.0							119	1	6	0.1	248	8.1
Oct. 21	38.3	70		41	3.4	3.7		142	0		5.5							117	0	6	.1	239	8.1
Dec. 7	86.4	48		46	2.2	3.9		147	0		6.5							125	4	6	.2	264	7.7
Jan. 6, 1954	51.4	42		46	1.5	2.8		143	0		6.2							122	5	5	.1	246	8.0
Feb. 3	77.4	43		46	1.7	2.9		139	0		6.8							122	8	5	.1	249	7.8
Mar. 9	59.9	48		42	2.2	3.2		132	0		7.5							114	6	6	.1	241	8.0
May 10	565	60		47	2.7	3.0		142	0		4.0							128	12	5	.1	260	7.4
Aug. 10	15.5	82		33	9.6	3.0		138	0		7.0							122	9	5	.1	242	8.1
BUFFALO CREEK NEAR TIFF CITY, McDONALD COUNTY, MO.																							
Feb. 24, 1954	6.92	49		46	1.0	3.2		133	0		8.0							119	10	6	0.1	250	7.8
ROUND SPRINGS CREEK NEAR DISNEY, MAYES COUNTY, OKLA.																							
Mar. 5, 1954	2.23	49		38	1.2	5.9		115	0		10							101	7	11	0.3	229	8.0

BIG CABIN CREEK NEAR BIG CABIN, CRAIG COUNTY, OKLA.

Oct. 5, 1953	35.3	69		38	10	86		128	0		126							136	31	58	3.2	703	7.9
Dec. 23	1.53	42		48	5.8	36		151	0		54							143	20	35	1.3	471	7.5
Jan. 5, 1954	1.43	43		51	5.8	42		157	0		64							151	22	38	1.5	518	7.4
Feb. 4	2.17	44		52	8.3	67		165	0		98							164	29	47	2.3	650	7.7
Mar. 8	1.48	52		56	8.9	76		171	0		105							176	36	48	2.5	679	7.9
Apr. 21	1.11	70		42	8.5	43		125	0		55							140	38	40	1.6	463	7.1
May 11	29.5	61		36	7.8	11		80	0		10							122	56	16	.4	283	6.9
Aug. 9	.60	--		52	5.5	11		152	0		18							152	20	14	.4	329	7.7
Sept. 28	.21	72		66	9.1	12		196	0		18							202	42	11	.4	401	8.0

NEOSHO (GRAND) RIVER NEAR CHOUTEAU, MAYES COUNTY, OKLA.

Oct. 20, 1953	--	74		42	6.6	16		110	0		26							131	41	21	0.6	343	8.0
Nov. 23	--	44		43	6.3	14		110	0		20							133	43	19	.5	333	8.0
Dec. 29	1,550	46		52	6.8	11		131	0		13							158	50	13	.4	365	7.8
Jan. 12, 1954	1,000	36		48	6.1	14		123	0		20							145	44	17	.5	355	7.5
Feb. 4	110	49		47	5.6	15		122	0		22							141	41	19	.5	352	7.9
Mar. 11	75.0	68		46	6.6	16		120	0		26							142	44	20	.6	346	7.9
Apr. 6	249	68		48	5.4	16		122	0		24							142	42	20	.6	363	7.4
May 18	7,200	62		49	6.8	12		122	0		14							150	50	15	.4	342	7.2
June 16	4,300	72		46	6.6	9.4		115	0		12							142	48	13	.3	338	7.5
July 21	1,740	84		46	8.5	13		103	0		16							150	66	16	.5	335	7.9
Sept. 23	70.9	80		41	11	14		99	0		21							148	67	17	.5	334	7.6

PRYOR CREEK NEAR PRYOR, MAYES COUNTY, OKLA.

Oct. 5, 1953	96.3	67		6.8	2.7	15		25	0		20							28	8	54	1.6	147	6.3
Oct. 28	.80	55		13	5.8	31		47	0		44							57	18	54	1.8	285	7.5
Nov. 23	11.2	46		12	6.1	22		37	0		31							56	26	46	1.3	238	7.3
Dec. 17	8.98	56		89	12	96		112	0		180							270	178	44	2.5	1,020	7.1
Feb. 10, 1954	.67	51		24	10	56		51	0		89							102	60	54	2.4	510	7.3
Mar. 11	.18	55		116	48	--		44	0		1,340							485	449	--	--	4,260	6.8
Apr. 12	.36	60		102	44	--		94	0		1,400							435	358	--	--	4,430	7.1
May 18	3.24	73		53	7.3	51		97	0		42							162	82	41	1.7	544	6.7
June 16	8.50	77		52	7.8	54		80	0		80							162	96	42	1.8	656	6.9

ARKANSAS RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN ARKANSAS RIVER BASIN IN OKLAHOMA AND MISSOURI--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Discharge (cfs)	Temperature (°F)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_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	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
GREENLEAF CREEK NEAR BRAGGS, MUSKOGEE COUNTY, OKLA.																							
Jan. 25, 1954	0.55	50		42	3.4	11		140	0		16							120	6	17	0.4	285	7.6
June 7	.52	75		446	5.1	10		141	0		14							136	20	14	.4	301	7.7
GRAND SPRING NEAR ARNETT, ELLIS COUNTY, OKLA.																							
Sept. 22, 1954				85	24	38		242	0		22							310	112	21	0.9	718	7.5
DEER CREEK NEAR THOMAS, CUSTER COUNTY, OKLA.																							
Sept. 15, 1954	0.29	57		88	20	22		190	6		10							300	134	14	0.6	612	8.4
DEER CREEK NEAR HYDRO, CADDO COUNTY, OKLA.																							
Oct. 1, 1953	3.48	82		94	16	27		253	0		11							298	90	16	0.7	645	8.2
Nov. 2	10.3	65		119	16	22		250	0		9.8							362	157	12	.5	743	8.2
Dec. 1	14.2	54		139	20	23		268	0		11							430	210	10	.5	853	8.0
Jan. 18, 1954	14.7	41		168	21	25		257	0		11							505	294	10	.5	987	7.6
Feb. 15	14.8	65		166	26	27		233	0		10							520	329	10	.5	989	7.5
Mar. 15	14.0	52		166	26	28		238	0		12							520	325	10	.5	994	7.6
May 4	13.7	70		256	44	48		222	6		17							820	628	11	.7	1,410	8.3
June 2	24.9	76		112	24	18		171	7		11							380	228	9	.4	777	8.3
June 29	8.23	84		104	36	26		252	12		14							408	180	14	.7	834	8.5
July 27	3.09	90		104	22	31		234	12		14							350	138	16	.7	658	8.5
Sept. 15	2.57	70		92	22	25		232	11		16							320	112	15	.6	648	8.5
WALNUT CREEK AT PURCELL, McCLAIN COUNTY, OKLA.																							
Nov. 18, 1953	7.95	63		38	54	38		380	10		19							316	0	21	0.9	697	8.5
Jan. 29, 1954	12.1	37		39	53	31		382	5		16							314	0	18	.8	701	8.3
Feb. 25	6.79	57		39	54	34		363	15		17							318	0	19	.8	667	8.5
Apr. 19	5.13	64		60	60	37		308	9		110							395	128	17	.8	882	8.5
May 28	13.5	80		28	42	27		284	12		15							242	0	19	.8	564	8.5

LITTLE RIVER NEAR NORMAN, CLEVELAND COUNTY, OKLA.

Oct. 6, 1953	0.98	60		37	18	12		221	0		16						165	0	14	0.4	370	8.1
Nov. 9	2.18	--		63	37	12		376	0		12						308	0	8	.3	585	8.2
Dec. 30	2.10	39		69	42	14		426	0		13						346	0	8	.3	830	8.2
Feb. 9, 1954.....	3.00	--		62	45	14		425	0		12						340	0	8	.3	649	8.0
Mar. 10.....	2.91	--		54	45	14		412	0		12						322	0	9	.3	626	8.2
Apr. 6	2.86	82		20	47	16		313	0		17						244	0	15	.4	487	8.2
June 2	2.68	79		36	36	16		284	11		18						236	0	13	.5	506	8.5
July 13	.24	90		84	5.5	20		273	17		12						232	0	16	.6	483	8.7
Aug. 19	.09	86		24	46	20		288	12		10						250	0	15	.6	470	8.5

LITTLE RIVER BELOW HOG CREEK NEAR NORMAN, CLEVELAND COUNTY, OKLA.

Nov. 9, 1953.....	5.26	--		64	37	33		395	0		33						312	0	19	0.8	687	8.2
Dec. 30.....	7.87	34		58	41	31		385	0		30						314	0	18	.8	688	8.0
Jan. 25, 1954	14.4	40		62	35	24		356	0		26						298	6	15	.6	617	8.2
Mar. 10	8.37	58		57	40	34		388	0		36						306	0	19	.8	693	8.1
Apr. 6.....	7.63	80		28	43	38		306	0		42						248	0	25	1.0	595	8.2
Aug. 19.....	.18	80		30	41	245		295	15		270						245	0	68	6.8	1,550	8.6

LITTLE RIVER NEAR TECUMSEH, POTTOWATOMIE COUNTY, OKLA.

Oct. 6, 1953	6.33	65		38	18	85		163	0		143						168	34	52	2.9	754	8.0
Nov. 9	15.2	36		76	38	121		329	7		215						345	64	43	2.8	1,240	8.4
Dec. 30	18.3	--		63	42	105		340	0		180						330	52	41	2.5	1,110	8.0
Feb. 9, 1954.....	15.5	49		61	43	126		341	0		205						330	50	45	3.0	1,460	8.1
Mar. 10	14.6	51		57	42	114		343	0		180						314	33	44	2.8	1,140	8.2
Apr. 20	12.0	76		36	43	119		254	11		205						266	40	49	3.2	1,100	8.4
June 2	20.4	79		28	42	72		225	10		155						242	41	39	2.0	953	8.4

ARKANSAS RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN ARKANSAS RIVER BASIN IN OKLAHOMA AND MISSOURI--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Discharge (cfs)	Temperature (°F)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_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	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
SALT CREEK NEAR DEWRIGHT, SEMINOLE COUNTY, OKLA.																							
Oct. 6, 1953	5.50	69		2,410	567			61	0		26,500							8,350	8,300			59,600	7.3
Nov. 18	23.8	58		2,490	672			202	0		27,600							8,970	8,810			62,200	7.6
Dec. 16	10.7	40		2,070	534			203	0		22,700							7,370	7,210			53,200	7.2
Feb. 2, 1954	16.6	46		2,870	693			199	0		30,400							10,000	9,840			69,500	7.2
Mar. 2	13.5	64		3,680	905			161	0		40,100							12,900	12,800			84,600	7.2
Apr. 20	7.35	74		4,910	675			51	0		46,000							15,000	15,000			98,600	7.3
June 2	20.3	77		4,390	1,360			40	0		24,800							17,500	17,400			59,600	7.1
July 13	2.24	89		6,600	1,800			74	0		71,300							23,900	23,800			132,000	6.9
Sept. 14	.92	72		9,890	3,020			44	0		113,000							37,100	37,100			159,000	6.9
LITTLE RIVER NEAR SASAKWA, SEMINOLE COUNTY, OKLA.																							
Oct. 6, 1953	71.5	--		3,470	804			73	0		37,800							12,000	11,900			79,900	6.6
Nov. 9	93.1	--		860	241			216	0		8,590							3,140	2,960			23,200	7.7
Dec. 16	68.5	40		1,130	311			265	0		11,800							4,090	3,880			30,100	7.5
Feb. 2, 1954	46.4	44		1,340	359			228	0		14,400							4,820	4,640			36,100	7.5
Mar. 2	33.7	61		1,770	429			215	0		18,300							6,170	5,990			45,000	7.6
Apr. 20	28.3	74		1,080	303			135	0		11,800							3,900	3,800			31,200	7.5
June 2	77.3	78		855	256			60	0		9,500							3,190	3,140			25,900	7.8
Aug. 31	--	82		2,340	589			87	0		24,500							8,760	8,190			58,200	7.7
NORTH CANADIAN RIVER NEAR GUYMON, TEXAS COUNTY, OKLA.																							
Nov. 6, 1953	12.8	40		47	19	22		224	3		12							198	10	20	0.7	454	8.3
Mar. 1, 1954	9.31	55		55	23	27		271	0		14							232	10	20	.8	540	8.2
Apr. 27	4.32	64		47	26	30		267	0		16							222	3	23	.9	540	7.6
Aug. 30	1.14	93		39	33	30		228	0		13							235	48	22	.8	520	7.9
COLDWATER CREEK NEAR HARDESTY, TEXAS COUNTY, OKLA.																							
Dec. 29, 1953	3.30	33		84	41	47		304	0		30							378	129	21	1.0	881	7.8
Mar. 1, 1954	3.60	49		76	38	46		284	0		27							346	114	22	1.1	806	8.2
Apr. 28	1.08	70		57	46	66		254	0		40							330	122	30	1.6	959	7.7

PALO DURO CREEK NEAR RANGE, TEXAS COUNTY, OKLA.

Nov. 10, 1953.....	6.14	55		82	34	146		250	5		200							342	128	48	3.4	1,320	8.3
Dec. 29.....	5.13	33		95	39	157		296	0		215							398	156	46	3.4	1,500	7.9
Feb. 26, 1954.....	4.52	55		80	36	166		249	0		225							350	146	51	3.9	1,420	8.2
Apr. 27	1.96	76		84	49	248		243	0		330							410	211	57	5.3	1,840	7.7

KIOWA CREEK NEAR SLAPOUT, BEAVER COUNTY, OKLA.

Nov. 24, 1953.....	9.02	44		79	18	73		279	0		102							272	24	39	2.0	852	7.7
Feb. 18, 1954	9.16	58		67	19	74		246	0		102							246	44	40	2.1	804	7.8
June 11.....	3.97	90		47	22	78		216	0		110							210	33	45	2.3	818	7.8
Sept. 8	.05	85		50	23	118		195	0		158							220	60	54	3.5	953	7.6

CLEAR CREEK NEAR MAY, HARPER COUNTY, OKLA.

Dec. 31, 1953	5.59	41		62	9.0	39		221	0		48							192	11	31	1.2	554	7.9
Feb. 18, 1954.....	9.23	57		58	9.2	40		210	0		50							182	10	32	1.3	535	7.9
Sept. 8	2.12	88		41	15	42		167	0		63							165	28	36	1.4	521	7.6

WOLF CREEK NEAR FORT SUPPLY, WOODWARD COUNTY, OKLA.

Oct. 25, 1953	965	80		50	16	85		159	0		109							190	60	49	2.7	770	8.2
Nov. 16.....	11.3	57		96	19	84		194	6		99							320	151	36	2.0	984	8.4
Dec. 21.....	32.2	--		79	18	81		205	0		117							270	102	39	2.1	918	7.4
Apr. 29, 1954.....	26.8	69		86	23	112		233	0		142							310	119	44	2.8	1,080	7.7
July 7	2.34	86		132	49	114		234	0		145							530	338	32	2.2	1,480	7.8
Sept. 1	1.30	80		170	60	140		252	0		170							640	464	31	2.4	1,730	7.5

INDIAN CREEK NEAR WOODWARD, WOODWARD COUNTY, OKLA.

Dec. 31, 1953	3.53	47		150	22	121		237	0		188							465	271	36	2.4	1,410	7.9
Apr. 6, 1954	3.13	54		134	26	104		230	0		160							440	252	34	2.2	1,250	7.7

ARKANSAS RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN ARKANSAS RIVER BASIN IN OKLAHOMA AND MISSOURI--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Discharge (cfs)	Temperature (°F)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_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	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
NORTH CANADIAN RIVER NEAR SEILING, MAJOR COUNTY, OKLA.																							
Nov. 16, 1953	14.7	72		110	31	143		243	0		198							402	203	44	3.1	1,390	8.1
Dec. 1	15.7	51		115	33	137		234	7		192							420	217	42	2.9	1,400	8.4
Dec. 15	35.1	47		115	29	131		245	0		200							408	207	41	2.8	1,370	8.2
Jan. 4 1954	46.1	--		99	26	109		229	0		155							354	166	40	2.5	1,180	7.4
Jan. 18	35.4	39		105	26	125		238	0		175							370	175	42	2.8	1,250	7.6
Feb. 1	50.0	45		92	24	104		217	0		143							328	150	41	2.5	1,100	7.8
Feb. 16	43.7	51		95	31	143		226	0		199							365	180	46	3.3	1,330	8.1
Mar. 2	33.6	43		104	29	128		228	5		179							378	182	42	2.9	1,290	8.3
Mar. 10	27.7	57		106	33	134		227	3		180							400	209	42	2 9	1,360	8.3
Mar. 15	17.3	51		108	40	154		211	0		220							435	262	44	3.2	1,510	8.2
Mar. 21	21.0	52		122	37	154		243	3		208							455	251	42	3.1	1,520	8.3
Mar. 23	23.0	52		106	49	154		208	0		200							415	294	42	3.1	1,460	8.2
Apr. 6	35.7	63		102	34	133		213	10		170							395	204	42	2.9	1,270	8.4
Apr. 12	32.6	59		100	32	133		216	8		182							380	190	43	3.0	1,310	8.4
Apr. 19	30.4	62		106	31	138		218	10		190							390	195	43	3.0	1,350	8.5
Apr. 26	41.5	78		100	35	68		196	6		172							395	224	27	1.5	1,270	8.4
Apr. 30	3,110	78		62	9.6	15		127	0		20							194	90	14	.5	465	7.9
May 11	94.6	58		96	26	142		239	0		160							345	149	47	3.3	1,200	8.1
May 17	115	59		82	25	115		216	0		145							305	128	45	2.9	1,090	8.2
May 24	1,090	59		62	11	21		114	0		23							200	106	19	.6	491	7.7
May 25	793	65		62	24	67		131	0		78							254	146	36	1.8	727	7.7
May 26	343	62		80	22	115		180	0		132							290	142	46	2.9	1,080	8.0
June 2	224	62		85	27	118		216	0		202							325	148	44	3.1	1.290	8.1
June 9	93.9	69		72	25	102		179	7		152							282	124	44	2.6	1,090	8.4
June 15	318	74		126	28	31		173	3		40							430	283	14	.7	848	8.3
June 18	33.2	72		91	34	114		194	11		178							365	187	40	2.6	1,300	8.5
June 19 (10:30 a.m.)	369	71		79	31	184		187	7		260							325	160	55	4.4	1,590	8.5
June 19 (2 p.m.)	402	76		95	34	134		197	8		230							375	200	44	3.0	1,530	8.4
June 22	124	75		56	27	108		163	5		125							250	108	48	3.0	914	8.4
June 29	11.7	89		94	40	151		226	9		195							400	200	45	3.3	1,380	8.5
July 7	.04	91		92	44	154		168	7		200							410	261	45	3.3	1,460	8.4

WEWOKA CREEK NEAR WETUMKA, HUGHES COUNTY, OKLA.

Oct. 7, 1953	16.6	61		2,430	520			33	0		25,000							8,220	8,190			56,400	7.0
Nov. 18	23.7	55		1,410	317			107	0		14,100							4,830	4,740			35,200	7.0
Dec. 29	27.8	48		1,850	393			153	0		18,300							6,230	6,100			43,800	7.4
Feb. 1, 1954	28.2	48		1,750	334			85	0		17,500							5,740	5,670			43,200	7.3
Mar. 9	16.5	60		1,940	392			105	0		19,100							6,460	6,370			46,700	7.5
Apr. 20	12.7	72		2,320	524			31	0		48,100							7,940	7,910			56,400	7.2
June 1	52.9	78		568	143			59	0		5,610							2,000	1,960			16,100	7.8
Aug. 10	1.53	88		1,590	456			35	0		16,900							5,840	5,810			40,600	7.5

BEAR CREEK NEAR FALLIS, LINCOLN COUNTY, OKLA.

Nov. 17, 1953....	0.80	55		60	50	38		492	6		14							356	0	19	0.9	755	8.3
Dec. 29	1.60	34		63	62	41		584	0		14							414	0	18	.9	896	8.1
Feb. 1, 1954.....	.99	40		58	59	40		531	0		14							386	0	18	.9	799	8.2
Mar. 9	1.88	44		61	48	41		503	0		13							352	0	20	1.0	759	8.2
Apr. 19	1.00	67		34	47	40		385	12		15							276	0	24	1.0	617	8.4
June 1.....	5.50	71		28	36	22		243	12		24							218	0	18	.6	483	8.5

CAPTAIN CREEK NEAR WELLSTON, LINCOLN COUNTY, OKLA.

Nov. 17, 1953	2.82	58		51	41	27		368	6		22							296	0	17	0.7	626	8.3
Dec. 29	2.24	32		51	42	28		389	0		23							300	0	17	.7	659	7.9
Feb. 1, 1954.....	2.85	37		50	41	28		371	0		21							294	0	17	.7	620	8.2
Mar. 9	2.86	40		47	39	30		273	0		24							280	0	19	.8	625	8.2
Apr. 19	1.27	66		26	47	36		336	0		29							258	0	23	1.0	592	8.5
June 1.....	2.39	72		29	36	39		248	13		52							216	0	28	1.2	591	8.6

BELLCOW CREEK AT CHANDLER, LINCOLN COUNTY, OKLA.

Nov. 17, 1953....	0.39	56		71	42	26		406	0		50							350	18	14	0.6	746	7.8
Dec. 29	1.69	36		56	42	21		371	0		35							310	6	13	.5	677	8.1
Feb. 1, 1954	1.15	42		65	41	26		378	0		44							330	20	15	.6	694	8.1
Mar. 9	.78	48		62	39	26		380	0		42							314	2	15	.6	692	8.1
Apr. 19	.39	72		33	43	25		327	0		35							260	0	17	.7	584	8.1

ARKANSAS RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN ARKANSAS RIVER BASIN IN OKLAHOMA AND MISSOURI--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Discharge (cfs)	Temperature (°F)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_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	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
QUAPAW CREEK NEAR MEEKER, LINCOLN COUNTY, OKLA.																							
Dec. 16, 1953	1.16	45		68	39	99		335	0		172							332	58	39	2.4	1,100	8.0
Feb. 2, 1954	.90			63	40	114		307	0		204							320	68	44	2.8	1,140	8.2
Mar. 23	.99			58	47	172		278	0		292							338	110	53	4.1	1,370	7.9
May 4	26.6			45	21	40		223	3		58							200	12	30	1.2	539	8.4
DEEP FORK RIVER NEAR STROUD, LINCOLN COUNTY, OKLA.																							
Nov. 18, 1953	27.0	59		65	38	148		360	0		184							318	23	50	3.6	1,270	8.2
DEEP FORK RIVER NEAR WELTY, CREEK COUNTY, OKLA.																							
Dec. 28, 1953	39.0	--		74	38	144		324	0		238							340	74	48	3.4	1,350	7.4
Dec. 29	37.1	44		76	37	148		325	0		242							340	74	49	3.5	1,360	7.5
Feb. 1, 1954	40.3	--		67	39	147		326	0		220							326	59	49	3.5	1,300	7.8
Mar. 9	34.9	56		67	36	152		315	0		235							318	60	51	3.7	1,310	8.1
Apr. 19	36.8	76		65	45	171		366	0		238							345	45	52	4.0	1,360	8.2
June 1	146	78		48	24	32		183	13		140							218	56	24	.9	812	8.7
July 12	2.45	91		56	57	68		283	8		380							375	144	35	1.5	1,740	8.5
Aug. 20	2.40	80		64	54	264		226	6		505							380	185	60	5.9	2,020	8.4
LITTLE DEEP FORK CREEK NEAR EDNA, CREEK COUNTY, OKLA.																							
Oct. 7, 1953	3.25	64		101	25	350		158	0		695							355	226	68	8.1	2,450	8.0
Nov. 17	.67	58		240	44	--		101	0		1,870							780	697	--	--	5,770	7.7
Dec. 28	2.74	--		414	77	--		116	0		3,570							1,350	1,250	--	--	10,100	7.4
Dec. 29	2.17	40		433	78	--		112	0		3,600							1,400	1,310	--	--	10,400	7.3
Feb. 1, 1954	3.87	46		496	92	--		97	0		4,040							1,620	1,540	--	--	11,500	7.3
Mar. 9	3.65	54		139	54	--		82	0		2,850							570	503	--	--	8,580	7.4
Apr. 19	2.02	74		449	97	--		100	0		4,080							1,520	1,440	--	--	11,900	7.7
June 1	11.6	75		118	31	399		100	2		870							420	334	68	8.5	2,990	8.3

SALLISAW CREEK NEAR SALLISAW, SEQUOYAH COUNTY, OKLA.

Nov. 16, 1953.....	0.50	55		26	2.4	3.4		86	0		4.5							76	6	9	0.2	176	7.9
Jan. 7, 1954.....	3.96	42		24	1.2	2.1		70	0		4.0							65	88	6	.1	143	7.7
Mar. 10.....	14.6	53		22	2.7	3.1		64	0		5.0							66	14	9	.2	139	7.7
Apr. 13.....	16.9	64		23	1.6	2.5		68	0		5.0							64	8	8	.1	140	7.4
May 13.....	88.5	63		24	1.9	2.5		73	0		4.5							68	8	7	.1	148	7.2
July 13.....	1.24	85		32	3.9	14		96	0		26							96	17	24	.6	192	7.4
Aug. 12.....	.42	83		32	4.9	3.3		103	0		6.0							100	16	7	.1	195	8.1

ARKANSAS RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN ARKANSAS RIVER BASIN IN ARKANSAS

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Specific conductance (micromhos at 25°C)	pH	Color
OSAGE CREEK NEAR ELM SPRINGS																		
Jan. 26, 1954	32.5							a140	4.0	8.2		5.7		118	3	284	8.4	
July 7	14.0							b139	2.0	6.2		1.7		108	0	245	8.6	
POTEAU RIVER AT CAUTHRON																		
Jan. 25, 1954	626							12	14	3.5		4.0		12	2	129	7.4	
July 27	.01							35	4.0	4.0		1.0		24	0	82.8	7.1	
COVE CREEK NEAR LEE CREEK																		
Jan. 15, 1954	35.9							86	4.0	3.5		0.5		81	10	185	8.0	
July 23	0							125	5.0	3.0		.1		104	2	224	8.2	
FROG BAYOU NEAR RUDY																		
Jan. 15, 1954	16.8							16	4.0	53		0.7		28	15	237	7.0	
July 23	0							30	7.0	3.5		.6		24	0	76.8	7.9	
SPADRA CREEK NEAR CLARKSVILLE																		
Jan. 15, 1954	38.2							22	72	19		2.7		66	48	222	7.2	
July 19	.65							15	6.0	4.0		.8		13	1	52.9	7.5	
PETIT JEAN CREEK NEAR BOONEVILLE																		
Jan. 13, 1954	20.3							48	9.0	5.5		1.1		34	0	122	7.8	
July 21	0							54	2.0	7.2		1.3		38	0	142	8.0	
PETIT JEAN CREEK NEAR WAVELAND																		
Jan. 13, 1954	2.06							26	4.0	4.5		1.1		24	3	98.1	7.2	
July 21	6.46							24	2.0	4.2		2.0		19	0	73.6	6.8	

a Includes equivalent of 4 parts per million of carbonate (CO_3).
b Includes equivalent of 7 parts per million of carbonate (CO_3).

DUTCH CREEK NEAR WALTREAK

Jan. 13, 1954	0							34	4.0	10		1.9		31	3	109	7.5
July 20	0							28	1.0	3.5		1.0		21	0	65.7	7.4

FOURCHE LA FAVE NEAR GRAVELLY

Feb. 2, 1954	256							10	3.0	2.8		0.9		8	0	30.4	7 0
July 20.....	.37							16	1.0	4.5		9.1		16	3	70.1	7.0

FOURCHE LA FAVE NEAR NIMROD

Jan. 14, 1954	1.19							19	1.0	2.8		1.1		18	2	43.9	7.3
July 20.....	30.5							21	2.0	4.0		2.6		16	0	48.5	7.4

SOUTH FOURCHE LA FAVE NEAR HOLLIS

Feb. 2, 1954	105							8	5.0	2.2		0.6		7	1	31.1	7.0
July 20	0							28	1.0	2.8		.0		19	0	55.8	7.5

RED RIVER BASIN

SALT FORK RED RIVER NEAR WELLINGTON, TEX.

LOCATION.--At gaging station at bridge on U. S. Highway 83, 4 miles downstream from Fort Worth and Denver (Burlington) Railway bridge, 4½ miles south of Lutie, and 6½ miles north of Wellington, Collingsworth County.
DRAINAGE AREA,--1,222 square miles, of which 209 square miles is probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: June 1952 to September 1954 (discontinued).
Water temperatures: June 1952 to September 1954 (discontinued).
EXTREMES, 1953-54.--Dissolved solids: Maximum, 3,980 ppm Aug. 12-20; minimum, 677 ppm Oct. 21-24.
Hardness: Maximum, 1,890 ppm Jan. 16; minimum, 362 ppm Aug. 23-24.
Specific conductance: Maximum daily, 5,770 micromhos Aug. 14; minimum daily, 736 micromhos Oct. 22.
Water temperatures: Maximum observed, 74°F Aug. 24; minimum observed, freezing point Nov. 9, Jan. 12-13, 21.
EXTREMES, 1952-54.--Dissolved solids: Maximum, 3,980 ppm Aug. 12-20,1954; minimum, 677 ppm Oct. 21-24, 1954.
Hardness: Maximum, 1,940 ppm Dec. 18-30, 1952; minimum, 362 ppm Aug. 23-24, 1954.
Specific conductance: Maximum daily, 5,770 micromhos Aug. 14, 1954; minimum daily, 736 micromhos Oct. 22, 1953.
Water temperatures: Maximum observed, 77°F Sept. 30, 1953; minimum observed, freezing point Nov. 9,1953, Jan. 12-13, 21, 1954.
REMARKS.--Values reported for dissolved solids concentrations less than 1,000 ppm are residues on evaporation and for concentrations more than 1,000 ppm are sums of determined constituents unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex.
Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-14, 18-20, 1953.	7.46	34		554	93	162		129		1,630	220	0.8	4.0		2,760	3.75	55.6	1,760	1,660	17	1.7	3,170	7.7
Oct. 15-17	57.3	24		330	57	98		137		917	140	.5	3.5		1,640	2.23	254	1,060	944	17	1.3	2,100	7.7
Oct. 21-24	414	14		127	21	53		131		295	71	.4	3.0		a677	.92	757	404	296	22	1.1	960	7.7
Oct. 25-31	41.9	25		341	65	148		176		950	215	.7	2.8		1,830	2.49	207	1,120	974	22	1.9	2,470	7.7
Nov. 1-10	23.5	28		434	87	179		160		1,260	272	.7	2.5		2,340	3.18	148	1,440	1,310	21	2.1	2,960	7.7
Nov. 11-20	15.4	24		482	84	209		169		1,400	285	.7	2.5		2,570	3.50	107	1,550	1,410	23	2.3	3,140	7.7
Nov. 21-30	13.7	28		492	99	190		129		1,490	275	--	3.0		2,640	3.59	97.7	1,630	1,530	20	2.0	3,180	7.4
Dec. 1-10	21.5	26		424	96	182		133		1,290	280	--	2.5		2,370	3.22	138	1,450	1,340	21	2.1	2,960	7.8
Dec. 11-20	15.6	25		502	102	183		151		1,490	278	--	4.0		2,660	3.62	112	1,670	1,550	19	1.9	2,190	7.7
Dec. 21-31	25.1	46		398	90	156		155		1,170	252	--	3.0		2,190	2.98	148	1,360	1,240	20	1.8	2,740	7.8
Jan. 1-9, 1954	22.0	30		410	86	190		104		1,250	282	.7	4.0		2,300	3.13	137	1,380	1,290	23	2.2	2,900	7.8
Jan. 10-15, 17-20	23.4	30		450	91	187		116		1,360	275	.7	4.0		2,450	3.33	155	1,500	1,400	21	2.1	3,060	7.8
Jan. 16	35	28		578	108	152		75		1,780	212	--	5.1		2,900	3.94	274	1,890	1,820	15	1.5	3,390	7.9
Jan. 21-31	26.7	53		402	78	200		91		1,240	275	.8	4.2		2,300	3.13	166	1,320	1,250	25	2.4	2,870	7.7
Feb. 1-10	18.4	44		410	80	195		95		1,250	278	.8	3.0		2,310	3.14	115	1,350	1,270	24	2.3	2,910	7.7
Feb. 11-19	13.4	45		494	89	196		98		1,490	275	.8	4.0		2,640	3.59	95.5	1,600	1,520	21	2.1	3,190	7.7
Feb. 20-28	8.54	39		538	94	179		95		1,620	248	.7	4.0		2,770	3.77	63.9	1,730	1,650	18	1.9	3,220	7.7
Mar. 1-10	11.7	26		536	99	202		122		1,610	285	.8	3.8		2,820	3.84	89.1	1,740	1,640	20	2.1	3,330	7.6
Mar. 11-20	5.42	24		556	98	186		136		1,650	255	.8	4.8		2,840	3.86	41.6	1,790	1,680	18	1.9	3,270	7.6
Mar. 21-31	7.10	24		560	95	170		146		1,640	232	.8	3.2		2,800	3.81	53.7	1,790	1,670	17	1.8	3,230	7.7

a Residue at 180°C.

Apr. 1-10, 1954	6.04	29	534	99	168	112	1,620	228	0.8	3.0	2,740	3.73	44.7	1,740	1,650	17	1.7	3,240	7.7	
Apr. 11-20	26.5	24	450	94	206	138	1,400	272	.8	3.0	2,520	3.43	180	1,510	1,400	23	2.3	3,090	7.8	
Apr. 21-26, 29	20.3	25	542	101	148	131	1,590	230	.8	3.0	2,700	3.67	148	1,770	1,660	15	1.5	3,210	7.4	
Apr. 27-28, 30, May 1, 7-9	192	28	162	44	112	180	454	145	.7	2.5	1,040	1.41	539	585	438	29	2.0	1,570	7.7	
May 2-6, 15-16	258	28	288	68	164	161	858	230	.7	2.8	1,720	2.34	1,200	998	866	26	2.3	2,340	7.8	
May 10-12, 17-19	1,135	22	112	26	77	152	277	97	.5	2.8	a708	.96	2,170	386	262	30	1.7	1,080	7.9	
May 13-14, 20, 24-28	691	27	161	41	111	160	443	152	.7	3.2	1,020	1.39	1,900	570	439	30	2.0	1,510	8.1	
May 21-23, 29-31	338	31	286	63	164	142	835	210	.7	2.8	1,690	2.30	1,540	972	856	27	2.3	2,320	7.9	
June 1, 14-17	172	28	191	43	129	145	520	190	.7	3.2	1,180	1.60	548	654	534	30	2.2	1,740	8.1	
June 2-8, 18-20	77.9	30	384	81	164	106	1,150	255	.7	3.0	2,120	2.88	446	1,290	1,200	22	2.0	2,730	7.8	
June 9-13	3,455	22	135	28	74	132	347	99	.7	3.0	a803	1.09	7,490	452	344	26	1.5	1,180	8.0	
June 21-30	33.7	40	358	74	233	112	1,110	320	.9	2.0	2,190	2.98	199	1,200	1,110	30	2.9	2,850	7.7	
July 1-10	10.4	44	474	107	215	93	1,470	340	.7	2.5	2,670	3.63	75.0	1,620	1,550	22	2.3	3,350	7.7	
July 11-20	3.91	37	538	113	181	98	1,640	290	.7	3.0	2,850	3.88	30.1	1,810	1,730	18	1.9	3,410	7.7	
July 21-31	5.62	34	548	105	213	97	1,630	340	.7	4.2	2,920	3.97	44.3	1,800	1,720	20	2.2	3,520	7.7	
Aug. 1-7	12.9	34	528	96	218	81	1,610	310	.8	4.2	2,840	3.86	989	1,710	1,650	22	2.3	3,370	7.6	
Aug. 8-11	54.2	30	300	55	156	131	864	215	.6	2.0	1,690	2.30	247	974	867	26	2.2	2,280	7.5	
Aug. 12-20	6.29	29	518	141	613	114	1,590	1,030	.8	3.5	3,980	5.41	67.6	1,870	1,780	42	6.2	5,470	7.7	
Aug. 23-24	212	30	107	23	62	134	265	75	.8	3.5	a680	.92	389	362	252	27	1.4	942	8.1	
Aug. 22, 25-26	191	25	218	38	98	122	594	135	.7	3.2	1,170	1.59	603	700	600	23	1.6	1,620	7.7	
Aug. 21, 27-31	9.35	30	468	86	157	97	1,390	235	.8	3.2	2,420	3.29	61.1	1,520	1,440	18	1.8	2,900	7.6	
Sept. 1-10	5.23	33	544	94	174	89	1,650	232	.9	2.5	2,770	3.77	39.1	1,740	1,670	18	1.8	3,230	7.5	
Sept. 11-20	4.00	29	572	94	160	100	1,680	230	.9	2.8	2,820	3.84	30.5	1,810	1,730	16	1.6	3,300	7.8	
Sept. 21-30	4.36	30	586	97	163	129	1,710	230	.9	3.0	2,880	3.92	33.9	1,860	1,760	16	1.6	3,330	7.4	
Weighted average	120	25	188	40	102	141	518	141	0.7	3.0	1,100	1.50	357	634	518	26	1.8	1,550	--	

a Residue at 180° C.

RED RIVER BASIN--Continued

SALT FORK RED RIVER NEAR WELLINGTON, TEX.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

RED RIVER BASIN--Continued

NORTH FORK RED RIVER NEAR CARTER, OKLA.

LOCATION.--At gaging station at bridge on State Highway 34, 3 miles south of Carter, Beckham County, 10.8 miles downstream from Timber Creek, and at mile 110.5.
DRAINAGE AREA.--2,337 square miles (revised), of which 399 square miles is probably noncontributing.
RECORDS AVAILABLE.--Sediment records: March 1948 to September 1954.
EXTREMES, 1953-54.--Sediment concentrations: Maximum, 12,000 ppm Oct. 27; minimum, no flow Oct. 1-2, 6-20, Dec. 16-17, June 26-30, July 1-31, Aug. 1-6, 8-9, 11-31, Sept. 1-30.
Sediment loads: Maximum daily, 287,000 tons May 24; minimum, no flow Oct. 1-2, 6-20, Dec. 16-17, June 26-30, July 1-31, Aug. 1-6, 8-9, 11-31, Sept. 1-30.
EXTREMES, 1948-54.--Sediment concentrations: Maximum, 19,600 ppm Sept. 26, 1950; minimum, no flow at times each year.
Sediment loads: Maximum daily, 633,000 tons May 18, 1951; minimum, no flow at times each year.
REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Suspended sediment, water year October 1953 to September 1954

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	0	0	0	11	1,080	32	2.2	619	3.7
2.....	0	0	0	10	899	24	1.4	476	1.8
3.....	301	3,990	s10,700	9.1	294	7.2	1.7	442	2.0
4.....	99	4,050	s1,870	8.4	807	18	1.2	478	1.5
5.....	1.0	737	2.0	8.1	323	7.1	1.0	652	1.8
6.....				7.8	510	11	1.0	451	1.2
7.....				6.6	200	3.6	2.0	386	2.1
8.....				5.7	290	4.5	2.6	364	2.6
9.....				5.4	376	5.5	2.2	526	3.1
10.....				5.7	306	4.7	2.0	422	2.5
11.....				4.9	114	1.5	2.2	131	.8
12.....				4.2	68	.8	3.9	188	2.0
13.....	0	0	0	2.4	58	.4	1.5	218	.9
14.....				1.7	110	.5	1.0	146	.4
15.....				1.0	205	.6	.2	126	.1
16.....				1.2	202	.7	0	0	0
17.....				1.2	220	.7	0	0	0
18.....				1.5	212	.9	.2	122	.1
19.....				108	6,320	s3,860	.9	124	.3
20.....				37	4,370	s481	2.2	166	1.0
21.....	6.1	994	s51	16	700	30	2.4	349	2.3
22.....	934	11,300	s49,200	6.3	586	10	2.2	346	2.1
23.....	2,490	10,500	s81,700	3.7	610	6.1	1.4	382	1.4
24.....	333	5,000	s5,040	28	522	3.9	.6	303	.5
25.....	118	5,740	s2,220	20	532	2.9	.9	480	1.2
26.....	182	7,000	s3,620	1.2	1,010	3.3	1.4	194	.7
27.....	279	12,000	s10,100	1.5	871	3.5	2.0	286	1.5
28.....	80	6,400	s1,430	1.4	971	3.7	3.7	224	2.2
29.....	38	3,400	348	1.5	856	3.5	3.0	260	2.1
30.....	22	2,400	142	1.0	984	2.7	5.2	248	3.5
31.....	15	1,350	55	--	--	--	4.7	258	3.3
Total	4,898.1	--	166,478	278.3	--	4,534.3	56.9	--	48.7

s Computed by subdividing day.

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RED RIVER BASIN--Continued

NORTH FORK RED RIVER NEAR CARTER, OKLA.--Continued

Suspended sediment, water year October 1953 to September 1954--Continued

Day	January			February			March		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	4.4	128	1.5	14	723	27	4.7	78	1.0
2.....	5.7	112	1.7	14	740	a28	4.2	92	1.0
3.....	6.3	138	2.3	13	740	a26	4.4	90	a1.1
4.....	6.0	111	1.8	11	752	22	4.4	86	1.0
5.....	5.7	120	a1.8	10	700	19	5.7	83	1.3
6.....	6.0	437	7.1	9.4	846	21	7.5	189	3.8
7.....	5.7	424	6.5	8.4	226	5.1	9.1	199	4.9
8.....	5.7	516	7.9	8.1	276	6.0	8.4	186	4.2
9.....	5.7	362	5.6	8.1	263	5.8	8.1	193	4.2
10.....	5.4	467	6.8	7.8	219	4.6	7.5	174	3.5
11.....	5.4	390	5.7	6.9	271	5.0	7.2	91	1.8
12.....	5.4	346	5.0	5.7	290	4.5	5.2	89	1.2
13.....	5.7	492	7.6	5.2	258	3.6	3.7	94	.9
14.....	6.0	386	6.2	4.9	291	3.8	3.0	81	.7
15.....	6.9	442	8.2	5.4	244	3.6	3.2	84	.7
16.....	7.2	251	4.9	4.9	245	3.2	1.5	103	.4
17.....	7.2	280	5.4	4.7	231	2.9	2.4	112	.7
18.....	10	292	7.9	4.9	214	2.8	3.4	99	.9
19.....	16	294	13	5.7	295	4.5	3.2	114	1.0
20.....	11	233	9.9	5.2	245	3.4	3.4	97	.9
21.....	8	140	3.0	4.7	135	1.7	3.4	55	.5
22.....	7	144	2.7	3.7	126	1.3	3.4	60	.6
23.....	9	132	3.2	1.4	132	.5	4.4	58	.7
24.....	10	136	3.7	1.5	148	.6	4.9	56	.7
25.....	11	132	3.9	3.7	120	1.2	3.9	65	.7
26.....	12	460	15	2.8	106	.8	3.7	34	.3
27.....	17	404	19	4.7	106	1.3	3.7	36	.4
28.....	22	387	23	4.4	117	1.4	3.7	36	.4
29.....	19	458	23	--	--	--	4.2	38	.4
30.....	16	448	19	--	--	--	4.4	34	.4
31.....	13	419	15	--	--	--	3.9	40	.4
Total.	281.4	--	247.3	184.2	--	210.6	143.8	--	40.7

	April			May			June		
1.....	4.2	28	0.3	1,860	8,790	s47,100	376	2,800	2,840
2.....	2.8	36	.3	836	7,220	s17,800	342	2,500	2,310
3.....	2.6	29	.2	382	3,600	3,710	313	1,400	1,180
4.....	3.0	30	.2	285	2,200	1,690	260	622	436
5.....	3.0	28	.2	268	2,100	1,520	239	764	493
6.....	2.8	52	.4	247	1,500	1,000	212	634	363
7.....	2.6	60	.4	272	1,000	734	194	529	277
8.....	1.4	55	.2	224	700	423	180	310	151
9.....	1.0	57	.2	849	6,970	s20,400	420	3,480	s5,560
10.....	.4	58	.1	348	2,600	2,440	438	2,990	s4,030
11.....	2.8	70	.5	2,100	8,900	s66,500	1,110	7,860	s34,300
12.....	6.0	101	1.6	2,220	9,370	s60,800	654	8,720	15,400
13.....	8.1	78	1.7	833	4,600	10,300	485	7,400	9,690
14.....	9.1	64	1.6	653	4,000	7,060	277	5,200	3,890
15.....	9.4	70	1.8	451	2,900	3,530	139	2,800	1,050
16.....	8.7	167	3.9	276	1,900	1,410	165	1,800	802
17.....	8.1	195	4.3	383	3,230	s4,880	71	1,300	249
18.....	4.7	176	2.2	563	4,000	6,080	20	1,150	62
19.....	5.7	76	1.2	634	3,100	5,310	8.1	476	10
20.....	3.9	82	.9	588	2,600	4,130	4.7	344	4.4
21.....	2.0	144	.8	387	2,300	2,400	2.4	100	.6
22.....	1.0	73	.2	316	2,000	1,700	1.7	40	.2
23.....	1.5	94	.4	1,050	8,160	s32,100	1.7	70	.3
24.....	1.5	173	.7	9,290	11,900	s287,000	1.7	146	.7
25.....	1.1	212	.6	2,800	8,050	60,800	.6	80	.1
26.....	.2	136	.1	1,640	7,700	34,100			
27.....	82	1,550	s396	938	5,600	14,200			
28.....	567	11,300	s21,900	403	3,500	3,810	0	0	0
29.....	190	4,400	s2,420	353	2,200	2,100			
30.....	4,890	11,000	s192,000	363	1,800	1,760			
31.....	--	--	--	830	7,980	s22,800	--	--	--
Total.	5,826.6	--	216,741	32,642	--	729,587	5,915.9	--	83,099.3

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

RED RIVER BASIN--Continued

NORTH FORK RED RIVER NEAR CARTER, OKLA.--Continued

Suspended sediment, water year October 1953 to September 1954--Continued

Day	July			August			September		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1									
2									
3									
4				0	0	0			
5									
6									
7				1.0	1,000	a2.7			
8				0	0	0			
9				0	0	0			
10				4.7	1,000	a13			
11									
12									
13									
14									
15	0	0	0				0	0	0
16									
17									
18									
19									
20									
21				0	0	0			
22									
23									
24									
25									
26									
27									
28									
29									
30									
31							--	--	--
Total	0	--	0	5.7	--	15.7	0	--	0

Total discharge for year (cfs-days) 50,232.9

Total load for year (tons) 1,201,002.6

a Computed from estimated concentration graph.

LITTLE WICHITA RIVER NEAR ARCHER CITY, TEX.

LOCATION.--At gaging station at bridge on State Highway 79, 1.5 miles downstream from confluence of North and Middle Forks, and 4.8 miles north of Archer City, Archer County.
DRAINAGE AREA.--481 square miles.
RECORDS AVAILABLE.--Chemical analyses: December 1952 to September 1954.
Water temperatures: December 1952 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 2,340 ppm Sept. 19; minimum, 137 ppm Oct. 22-27.
Hardness: Maximum, 590 ppm Sept. 19, minimum, 48 ppm Oct. 22-27.
Specific conductance: Maximum daily, 3,730 micromhos Sept. 19; minimum daily, 103 micromhos Oct. 26.
EXTREMES, 1952-54.--Dissolved solids: Maximum, 2,340 ppm Sept. 19, 1954; minimum, 137 ppm Oct. 22-27, 1953.
Hardness: Maximum, 590 ppm Sept. 19, 1954; minimum, 48 ppm Oct. 22-27, 1953.
Specific conductance: Maximum daily, 3,730 micromhos Sept. 19, 1954; minimum daily, 103 micromhos Oct. 26, 1953.
REMARKS.--Values reported for dissolved solids concentrations are residues on evaporation. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate					
Oct. 4-5, 1953	a100	13		30	9.0	108		118	7.6	168	0.6	4.2		399	0.54	107	112	16	68	4.4	742	8.0	
Oct. 6-12	3.37	14		19	4.8	48		107	5.9	53	.5	2.8		208	.28	1.89	67	0	61	2.6	359	7.9	
Oct. 18	0	--		--	--	--		154	--	59	--	--		--	--	--	90	0	--	--	429	8.2	
Oct. 22-27	1,542	10		14	3.1	20		59	3.3	25	.5	4.8		137	.19	570	48	0	48	1.3	192	7.8	
Oct. 28-31	61.7	11		37	10	89		75	5.2	181	.6	3.0		403	.55	67.1	134	72	59	3.3	728	7.8	
Nov. 1-5, 8-19, 22-23	2.50	13		30	8.0	59		104	6.4	100	.4	3.0		289	.39	1.95	108	23	54	2.5	513	7.9	
Nov. 6-7, 20	40.8	9.6		16	6.8	29		88	4.1	37	.4	2.8		168	.23	18.5	68	0	49	1.6	272	7.8	
Nov. 21, 24-30	3.85	11		63	16	114		105	17	258	.5	2.5		580	.79	6.03	223	137	53	3.3	1,030	7.9	
Dec. 1-17	.66	11		39	9.4	58		135	7.2	100	.4	1.2		316	.43	.56	136	26	48	2.1	559	7.7	
Jan. 3, 10, 17, 24, 30, 1954	0	17		50	12	65		187	5.9	109	.5	1.2		357	.49	--	174	22	45	2.1	637	8.0	
Feb. 7	0	--		--	--	--		209	--	107	--	--		--	--	--	180	8	--	--	678	--	
Feb. 14	0	--		--	--	--		218	--	110	--	--		--	--	--	187	8	--	--	697	--	
Feb. 21	0	--		--	--	--		233	--	117	--	--		--	--	--	201	10	--	--	753	8.2	
Feb. 28	0	--		--	--	--		245	--	122	--	--		--	--	--	210	10	--	--	772	--	

a No flow Oct. 1-3, 13-21, Dec. 18 to Mar. 30, Apr. 6-11, June 26-30, July 1-3, 10-30, Aug. 7 to Sept. 30.

Mar. 7, 1954.....	0	--		--	--	--	230	--	128	--	--		--	--	--	200	12	--	--	768	--
Mar. 14	0	--		--	--	--	280	--	133	--	--		--	--	--	232	2	--	--	837	--
Mar. 21	0	--		--	--	--	291	--	139	--	--		--	--	--	242	2	--	--	875	--
Mar. 28	0	--		--	--	--	300	--	145	--	--		--	--	--	252	6	--	--	921	--
Mar. 31, Apr. 1-5.	1.02	12		78	29	243	240	22	438	0.5	3.0		1,000	1.36	2.75	314	117	63	5.9	1,760	8.1
Apr. 12 (12 p. m. - 6 a. m.) 19-22, 25-29	22.1	14		40	12	113	106	8.2	211	.4	2.0		498	.68	29.7	150	62	62	4.0	869	7.4
Apr. 12 (6 a. m. - 12 p. m.) 13 (12 p. m. 6 a. m.), 14, 23, 30	344	10		19	5.1	32	77	4.7	46	.5	3.5		178	.24	344	68	5	50	1.7	292	7.5
Apr. 13 (6 a. m. - 12 p. m.) 15-18, 24.	114	13		28	8.0	73	95	5.8	124	.5	2.5		323	.44	99.4	103	25	61	3.1	570	8.0
May 1, 12-15, 19-20.....	595	15		16	4.9	26	69	4.1	36	.7	3.0		165	.22	265	60	4	48	1.4	244	7.7
May 2-10, 11 (12 p. m. -6 p. m.), 16-18.....	45.2	15		26	7.3	45	104	5.7	69	.6	2.5		234	.32	28.6	95	10	51	2.0	397	8.0
May 11 (6 p. m. - 12 p. m.), 24 (12 p. m. -12 m.), 27 (12 m. -12 p. m.) 30-31.....	180	20		32	9.5	80	91	5.8	147	.5	3.5		376	.51	183	119	44	59	3.2	629	7.5
May 21-23, 24 (12 m. -12 p. m.), 25-26, 27 (12 p. m. -12 m.), 28-29.....	299	13		21	7.1	37	81	4.7	62	.6	2.5		219	.30	177	82	15	50	1.8	336	7.8

RED RIVER BASIN--Continued

LITTLE WICHITA RIVER NEAR ARCHER CITY, TEX.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate					
June 1-2, 8 (12 p. m. 8 a. m.), 15 (12 m. 12 p. m.), 16-17, 1954	139	16		32	9.0	77		106	6.4	133	0.4	3.0		338	0.46	127	117	30	59	3.1	618	8.0	
June 3-7, 18-25	6.63	17		55	18	163		103	8.6	332	.5	3.0		731	.99	13.1	211	126	63	4.9	1,340	7.5	
June 8 (8 a. m. - 12 p. m.), 9-14, 15 (12 p. m. -12 m.)	168	13		24	6.0	48		104	4.7	68	.5	3.2		222	.30	101	85	0	55	2.3	401	8.2	
July 4-9	0.88	16		42	12	100		102	5.2	198	.4	3.5		491	.67	1.17	154	71	58	3.5	838	7.8	
July 11	0	--		--	--	--		116	--	175	--	--		--	--	--	136	41	--	--	710	8.1	
July 18	0	--		--	--	--		148	--	161	--	--		--	--	--	153	32	--	--	760	8.2	
July 25	0	--		--	--	--		168	--	198	--	--		--	--	--	174	36	--	--	908	8.2	
July 31, Aug. 1	12.1	14		--	--	--		99	--	20	.6	5.0		151	.21	4.93	64	0	--	--	242	7.9	
Aug. 2-6	2.64	16		--	--	225		115	6.8	458	.4	4.0		970	1.32	6.92	262	168	65	6.1	1,670	7.9	
Aug. 3	1.3	--		--	--	--		135	--	460	--	--		--	--	--	256	146	--	--	1,710	8.1	
Aug. 8	0	--		--	--	--		133	--	605	--	--		--	--	--	318	209	--	--	2,150	8.0	
Aug. 15	0	--		--	--	--		148	--	665	--	--		--	--	--	356	234	--	--	2,340	--	
Aug. 22	0	--		--	--	--		138	--	730	--	--		--	--	--	378	265	--	--	2,550	8.2	
Aug. 29	0	--		--	--	--		187	--	782	--	--		--	--	--	440	287	--	--	2,750	8.2	
Sept. 5	0	--		--	--	--		169	--	880	--	--		1,920	--	--	455	316	--	--	2,990	8.0	
Sept. 12	0	--		--	--	--		143	--	950	--	--		--	--	--	515	398	--	--	3,170	8.0	
Sept. 19	0	--		--	--	--		165	--	1,130	--	--		2,340	--	--	590	455	--	--	3,730	8.0	
Sept. 26	0	--		--	--	--		151	--	1,050	--	--		2,100	--	--	545	422	--	--	3,470	8.0	
Weighted average	60.0	12		19	5.1	34		73	4.2	53	0.5	3.7		192	0.26	31.1	68	9	53	1.8	303	--	

RED RIVER BASIN--Continued

LITTLE WICHITA RIVER NEAR ARCHER CITY, TEX.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	--	56	--	--	--	--	57	62	65	--	76	
2	--	56	--	--	--	--	51	64	69	--	79	
3	--	58	54	42	--	--	55	55	70	--	--	
4	68	60	51	--	--	--	65	51	66	84	--	
5	65	56	49	--	--	--	65	61	70	86	--	
6	60	52	46	--	--	--	--	64	75	82	--	
7	58	50	45	--	40	57	--	64	75	80	--	
8	59	48	42	--	--	--	--	64	67	--	--	
9	60	44	42	--	--	--	--	65	74	--	--	
10	61	46	--	33	--	--	--	60	73	--	--	
11	62	48	--	--	--	--	70	55	76	--	--	
12	62	49	--	--	--	--	60	56	81	--	--	
13	--	50	40	--	--	--	57	55	79	--	--	
14	--	50	--	--	51	38	60	60	79	--	--	
15	--	50	--	--	--	--	68	65	72	--	--	
16	--	--	--	--	--	--	58	70	74	--	--	
17	--	--	--	40	--	--	58	70	77	--	--	
18	--	--	--	--	--	--	63	70	78	--	--	
19	--	61	--	--	--	--	66	65	81	--	--	
20	--	54	46	--	--	--	68	68	82	--	--	
21	--	48	--	--	56	59	68	67	81	--	--	
22	--	--	--	--	--	--	70	73	81	--	--	
23	65	45	--	--	--	--	63	75	--	--	--	
24	59	47	--	39	--	--	66	65	--	--	--	
25	64	48	--	--	--	--	67	64	--	--	--	
26	61	46	--	--	--	--	71	66	--	--	--	
27	54	47	35	--	--	--	71	65	85	--	--	
28	55	48	--	--	52	60	70	70	--	--	--	
29	55	--	--	--	--	--	70	68	--	--	--	
30	58	--	--	40	--	--	63	73	--	--	--	
31	59	--	--	--	--	--	--	73	--	--	--	
Average	--	--	--	--	--	--	--	62	--	--	--	

RED RIVER BASIN--Continued

LITTLE WICHITA RIVER NEAR HENRIETTA, TEX.

LOCATION.--At gaging station at bridge on State Highway 148, 1.5 miles northwest of Henrietta, Clay County, 4 miles upstream from Turkey Creek, and 5 miles upstream from Dry Fork Little Wichita River.
DRAINAGE AREA.--1,037 square miles.
RECORDS AVAILABLE.--Chemical analyses: December 1952 to September 1954.
Water temperatures: December 1952 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 1,310 ppm Oct. 6; minimum, 66 ppm Oct. 22-24, 26-29.
Hardness: Maximum, 305 ppm Nov. 23; minimum, 32 ppm Oct. 22-24, 26-29.
Specific conductance: Maximum daily, 2,460 micromhos Oct. 6; minimum daily, 81.1 micromhos Oct. 24.
EXTREMES, 1952-54.--Dissolved solids: Maximum, 1,700 ppm Mar. 15 (12 m. - 12 p.m.), 16, 1953; minimum, 66 ppm Oct. 22-24, 26-29, 1953.
Hardness: Maximum, 700 ppm May 1, 1953; minimum, 32 ppm Oct. 22-24, 26-29, 1953.
Specific conductance: Maximum daily, 5,910 micromhos May 1, 1953; minimum daily, 81.1 micromhos Oct. 24, 1953.
REMARKS.--Values reported for dissolved solids concentrations less than 1,000 ppm are residues on evaporation and for concentrations more than 1,000 ppm are sums of determined constituents unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex.
Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C) Parts per million	Tons per acre-foot	Tons per day	Hardness as $CaCO_3$ Calcium, magnesium	Hardness as $CaCO_3$ Noncarbonate	Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
Oct. 2, 1953	0	--		--	--	--		188	--	96	--	--		--	--	--	143	0	--	--	620	--
Oct. 4-5, 7-12	a13.9	13		26	7.4	89		103	6.2	137	0.6	3.0		b333	0.45	12.5	96	11	67	3.9	645	7.7
Oct. 6	185	16		60	18	415		93	14	728	.8	7.5		b1,310	1.78	654	224	148	80	12	2,460	7.4
Oct. 19	0	--		--	--	--		114	--	163	--	--		--	--	--	104	10	--	--	720	8.1
Oct. 22-24, 26-29	3,326	7.2		8.2	2.7	11		38	2.6	12	.7	3.0		b66	.09	593	32	0	43	.8	116	7.4
Oct. 25, 30-31	2,993	11		12	4.1	21		51	3.0	30	.8	3.2		149	.20	1,200	47	5	49	1.3	204	7.3
Nov. 1-9	161.6	16		18	5.6	21		83	3.6	27	.7	2.5		151	.21	65.9	68	0	40	1.1	237	7.6
Nov. 10-12, 25-30	6.77	11		30	8.6	62		104	6.3	106	.5	2.2		296	.40	5.41	110	25	55	2.6	537	7.7
Nov. 13-22, 24	15.4	13		42	13	108		94	6.3	217	.4	2.2		484	.66	20.1	158	82	60	3.7	875	7.8
Nov. 23	43	--		--	--	--		84	--	695	--	--		--	--	--	305	236	--	--	2,350	7.9
Dec. 1-2, 5-6, 8-9	18.8	15		31	9.2	59		109	7.0	103	.3	1.8		305	.41	15.5	115	26	53	2.4	531	8.0
Dec. 3-4, 7, 10-17	a4.95	18		18	5.4	22		82	5.4	26	.7	3.2		176	.24	2.35	67	0	41	1.1	238	7.8
Dec. 28-31	0	16		17	5.3	18		86	5.3	17	.7	2.8		171	.23	--	64	0	38	1.0	206	7.6
Jan. 1-2, 4, 6, 1954	0	12		19	4.7	19		88	4.6	18	1.0	3.5		b125	.17	--	67	0	23	1.0	220	7.9
Jan. 8	0	--		--	--	--		94	--	19	--	--		--	--	--	62	0	--	--	219	8.1
Jan. 14	0	--		--	--	--		94	--	20	--	--		--	--	--	62	0	--	--	222	8.1
Jan. 20	0	--		--	--	--		94	--	19	--	--		--	--	--	65	0	--	--	228	8.1
Jan. 25	0	--		--	--	--		95	--	20	--	--		--	--	--	65	0	--	--	224	8.1
Jan. 30	0	--		--	--	--		95	--	21	--	--		--	--	--	65	0	--	--	234	8.0
Feb. 2	0	--		--	--	--		98	--	22	--	--		--	--	--	68	0	--	--	237	7.9
Feb. 10	0	--		--	--	--		106	--	22	--	--		--	--	--	72	0	--	--	255	7.9
Feb. 17	0	--		--	--	--		112	--	26	--	--		--	--	--	78	0	--	--	278	8.1
Feb. 25	0	--		--	--	--		110	--	34	--	--		--	--	--	82	0	--	--	311	7.9

a No flow Oct. 1-3, 13-21, Dec. 18 to Apr. 12, June 25 to July 4, July 10 to Sept. 30.

b Sum of determined constituents.

Mar. 5, 1954	0	--	--	--	--	124	--	28	--	--	--	--	--	86	0	--	--	303	8.0
Mar. 13	0	--	--	--	--	132	--	29	--	--	--	--	--	92	0	--	--	317	8.0
Mar. 19	0	--	--	--	--	126	--	41	--	--	--	--	--	103	0	--	--	363	7.9
Mar. 24	0	--	--	--	--	140	--	39	--	--	--	--	--	102	0	--	--	360	8.0
Mar. 31	0	--	--	--	--	151	--	35	--	--	--	--	--	104	0	--	--	361	8.1
Apr. 3	0	--	--	--	--	161	--	37	0.1	--	--	--	--	112	0	--	--	378	--
Apr. 8	0	--	--	--	--	160	--	45	.1	--	--	--	--	119	0	--	--	410	8.2
Apr. 13-22	a165	12	25	7.8	62	93	5.9	101	.4	3.0	276	0.38	123	94	18	59	2.8	497	7.7
Apr. 23-30	238	12	20	6.1	32	79	4.4	50	.6	3.5	189	.26	121	75	10	48	1.6	312	7.8
May 1-2, 5, 11-13 16-18	1,510	14	12	5.7	15	56	3.3	22	1.0	3.0	b104	.14	452	53	8	37	1.3	169	7.7
May 3-4, 6-10, 14-15	946	18	18	5.1	25	68	4.2	39	.7	3.2	177	.24	424	66	10	45	.9	250	7.8
May 19, 21, 25 (12 p.m. - 12 m.), 27, 29-31	528	M	20	5.9	32	81	4.3	49	.7	2.0	193	.26	275	74	8	48	2.9	297	7.8
May 20, 22-24, 26, 28	382	16	26	8.3	66	85	6.0	115	.6	2.5	309	.42	319	99	29	59	2.9	507	7.5
May 25 (12 m - 12 p.m.)	452	22	--	--	167	103	9.5	320	--	5.0	754	1.03	920	186	102	66	5.3	1,240	8.0
June 1, 3, 9 (12 m. - 12 p.m.), 10-11, 12, (12 p.m. -12 m.)	908	17	20	5.3	37	75	4.5	58	.6	3.0	202	.27	495	72	10	53	1.9	337	7.9
June 2, 8, 9 (12 p.m. - 12 m), 15, 16 (12 p.m. - 12 m.)	544	16	14	4.5	19	66	3.7	23	.7	2.5	142	.19	209	53	0	43	1.1	205	7.9
June 4, 16 (12 m.-12 p.m.) 1954	214	21	78	21	241	97	12	502	.6	3.0	b927	1.26	536	281	202	65	6.3	1,890	7.9
June 5-7, 17	142	20	46	12	132	97	8.1	255	.6	3.5	575	.78	220	164	85	64	4.5	1,030	7.9
June 12 (12m. - 12 p.m.), 13-14, 18-24	a59.6	19	29	8.0	61	102	5.9	103	.6	1.8	345	.47	55.5	105	22	56	2.6	523	7.9
July 5, 8-9	a30.0	14	13	4.2	22	76	3.5	18	.8	4.0	202	.27	16.4	50	0	49	1.3	200	7.6
July 6-7	30.5	18	--	--	73	124	3.5	128	1.2	2.5	368	.50	30.3	131	30	55	2.8	627	8.0
July 22	0	--	--	--	--	95	--	18	--	--	--	--	--	64	0	--	--	216	8.1
July 29	0	--	--	--	--	104	--	20	--	--	--	--	--	71	0	--	--	240	8.1

a No flow Oct. 1-3, 13-21, Dec. 18 to Apr. 12, June 25 to July 4, July 10 to Sept. 30.
b Sum of determined constituents.

RED RIVER BASIN--Continued

LITTLE WICHITA RIVER NEAR HENRIETTA, TEX.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Aug. 6, 1954	0	--		--	--	--		114	--	20	--	--		--	--	--	74	0	--	--	257	8.2
Aug. 12	0	--		--	--	--		120	--	23	--	--		--	--	--	80	0	--	--	275	8.1
Aug. 19	0	--		--	--	--		132	--	24	--	--		--	--	--	88	0	--	--	291	--
Aug. 26	0	--		--	--	--		139	--	27	--	--		--	--	--	93	0	--	--	312	8.1
Sept. 2	0	--		--	--	--		144	--	27	--	--		--	--	--	97	0	--	--	324	8.2
Sept. 9	0	--		--	--	--		150	--	29	--	--		--	--	--	102	0	--	--	338	8.2
Sept. 18	0	--		--	--	--		160	--	32	--	--		--	--	--	106	0	--	--	362	8.2
Sept. 22	0	--		--	--	--		164	--	34	--	--		--	--	--	111	0	--	--	382	8.2
Weighted average	204	12		14	4.8	25		58	3.6	39	0.7	3.0		147	0.20	81.0	55	7	50	1.5	236	--

RED RIVER BASIN--Continued

LITTLE WICHITA RIVER NEAR HENRIETTA, TEX.--Continued

Temperature (°F) of water, water year October 1953 to September 1954
/No flow Oct. 1-3, 13-21, Dec. 18 to Apr. 12, June 25 to July 4, July 10 to Sept. 30./

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

RED RIVER BASIN--Continued

RED RIVER NEAR GAINESVILLE, TEX.

LOCATION.--At gaging station at bridge on U. S. Highway 77, a quarter of a mile downstream from Gulf, Colorado, and Santa Fe Railway bridge, 5 miles downstream from Fish Creek, 7 miles north of Gainesville, Cooke County, and at mile 791.5.
DRAINAGE AREA.--30,782 square miles, of which 5,936 square miles is probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: May 1944 to April 1946, October 1952 to September 1954.
Water temperatures: October 1952 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 5,210 ppm Aug. 30-31; minimum, 412 ppm May 12-13.
Hardness: Maximum, 1,500 ppm Aug. 30-31, minimum, 155 ppm May 12-13.
Specific conductance: Maximum daily, 8,950 micromhos Aug. 31; minimum daily, 657 micromhos May 12.
Water temperatures: Maximum observed daily, 95°F July 13; minimum observed daily, freezing point Dec. 23, Jan. 21.
EXTREMES, 1944-46, 1952-54.--Dissolved solids: Maximum, 6,480 ppm Apr. 11, 1953; minimum, 250 ppm Sept. 30, Oct. 1-3, 1945.
Hardness: Maximum, 1,510 ppm Apr. 11, 1953; minimum, 120 ppm Sept. 30, Oct. 1-3, 1945.
Specific conductance: Maximum daily, 9,890 micromhos Apr. 11, 1953; minimum daily, 325 micromhos Oct. 1, 1945.
Water temperatures, 1952-54: Maximum observed daily, 95°F July 13, 1954; minimum observed daily, freezing point Dec. 23, 1953, Jan. 21, 1954.
REMARKS.--Records of specific conductance of daily samples for period May 1944 to April 1946 available in district office at Austin, Tex. Records of specific conductance of daily samples for period October 1952 to September 1954 available in district office at Oklahoma City, Okla. Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-6, 1953	93.8	--	--	294	83	903	--	126	0	754	1,450	--	4.0	--	3,670	4.99	929	1,080	972	65	12	5,740	7.5
Oct. 7-9	3,237	--	--	208	35	447	--	122	0	514	685	--	5.1	--	2,020	2.75	17,650	663	563	59	7.5	3,250	7.4
Oct. 10	2,000	--	--	140	26	332	--	106	0	337	500	--	5.7	--	1,450	1.97	7,830	456	370	61	6.8	2,380	7.7
Oct. 11-12	1,200	--	--	145	25	316	--	91	0	362	485	--	2.0	--	1,450	1.97	4,700	465	390	60	6.4	2,390	7.5
Oct. 13-14	667	--	--	177	29	354	--	107	0	426	545	--	2.2	--	1,660	2.26	2,990	560	473	58	6.5	2,650	7.6
Oct. 15	446	--	--	202	37	453	--	111	0	469	735	--	2.9	--	2,010	2.73	2,420	656	565	60	7.7	3,220	7.9
Oct. 16-18	415	--	--	243	43	639	--	121	0	572	1,020	--	2.0	--	2,660	3.62	2,980	784	684	64	9.9	4,290	7.8
Oct. 19	6,380	--	--	312	46	765	--	112	0	803	1,170	--	7.0	--	3,240	4.41	55,810	968	876	63	11	4,990	7.5
Oct. 20	4,820	--	--	237	36	627	--	96	0	615	960	--	5.7	--	2,610	3.55	33,970	740	661	65	10	4,130	7.5
Oct. 21-24	2,635	--	--	198	31	503	--	101	0	507	770	--	3.6	--	2,140	2.91	15,230	622	538	64	8.8	3,460	7.7
Oct. 25-26	39,700	--	--	98	16	196	--	114	0	212	302	--	3.5	--	933	1.27	100,000	310	217	58	4.8	1,560	7.9
Oct. 27-28	40,950	--	--	66	12	117	--	98	0	140	175	--	3.8	--	596	.81	65,900	214	134	54	3.5	1,010	7.8
Oct. 29-31	16,130	--	--	57	10	101	--	110	0	109	150	--	1.9	--	501	.68	21,820	183	93	55	3.2	866	7.7
Nov. 1-5	5,862	--	--	83	16	180	--	82	0	170	280	--	2.0	--	818	1.11	12,950	273	206	59	4.7	1,390	7.6
Nov. 6-9	1,982	--	--	129	26	269	--	147	0	263	435	--	2.0	--	1,240	1.69	6,640	429	308	58	5.6	2,090	7.7
Nov. 10	1,370	--	--	160	34	406	--	145	0	353	655	--	2.3	--	1,740	2.37	6,440	539	420	62	7.6	2,900	7.9
Nov. 11	1,540	--	--	198	41	511	--	168	0	438	825	--	3.0	--	2,170	2.95	9,020	662	525	63	8.6	3,510	8.0
Nov. 12	1,300	--	--	255	53	718	--	174	0	589	1,170	--	3.5	--	2,990	4.07	10,490	854	712	65	11	4,700	8.1
Nov. 13	1,130	--	--	300	59	861	--	170	0	705	1,420	--	3.0	--	3,560	4.84	10,860	991	852	65	12	6,550	8.0

Nov. 14-20, 1953.....	918	--	--	236	52	700	--	177	0	532	1,140	--	3.7	--	2,860	3.89	7,090	803	658	65	11	4,600	7.8
Nov. 21	1,030	--	--	260	59	755	--	200	0	563	1,270	--	4.3	--	3,130	4.26	8,700	891	727	65	11	4,930	8.1
Nov. 22-23	5,360	--	--	82	19	185	--	129	0	133	308	--	3.1	--	840	1.14	12,080	282	177	59	4.8	1,460	7.3
Nov. 24	4,760	--	--	68	15	149	--	111	0	106	238	--	2.6	--	666	.91	8,560	231	140	58	4.3	1,170	7.8
Nov. 25-26	1,995	--	--	88	21	213	--	110	0	181	348	--	2.0	--	928	1.26	5,000	306	216	60	5.3	1,610	7.9
Nov. 27-30	1,085	--	--	142	33	360	--	136	0	317	585	--	2.3	--	1,560	2.12	4,570	490	378	61	7.1	2,620	7.7
Dec. 1-5.....	742	--	--	182	42	461	--	169	0	375	770	--	2.6	--	1,990	2.71	3,990	626	488	62	8.0	3,290	8.1
Dec. 6	4,010	--	--	144	36	340	--	168	0	290	570	--	3.2	--	1,530	2.08	16,570	508	370	59	6.5	2,590	8.0
Dec. 7	5,720	--	--	64	16	137	--	118	0	105	222	--	4.3	--	638	.87	9,850	226	129	57	4.0	1,120	7.7
Dec. 8-9	2,895	--	--	78	19	215	--	132	0	115	355	--	2.5	--	894	1.22	6,990	272	164	63	5.7	1,580	7.7
Dec. 10	1,640	--	--	97	25	216	--	122	0	166	370	--	2.0	--	986	1.34	4,370	345	245	58	5.1	1,710	7.9
Dec. 11	1,380	--	--	190	42	496	--	142	0	422	850	--	2.6	--	2,070	2.82	7,710	645	528	63	8.5	3,510	8.1
Dec. 12-20	778	--	--	146	32	357	--	168	0	290	600	--	2.5	--	1,510	2.05	3,170	495	358	61	7.0	2,620	8.0
Dec. 21-31	454	--	--	256	58	616	--	259	2	525	1,030	--	3.8	--	2,630	3.58	3,220	875	660	60	9.1	4,300	8.3
Jan. 1-10, 1954.....	348	--	--	264	70	687	--	237	0	578	1,200	--	3.8	--	3,040	4.13	2,860	945	751	61	9.7	4,820	7.9
Jan. 11-20.....	370	--	--	266	65	695	--	211	0	573	1,200	--	2.2	--	3,040	4.13	3,040	930	757	62	9.9	4,810	7.7
Jan. 21-31.....	376	--	--	234	62	621	--	180	0	537	1,090	--	1.2	--	2,770	3.77	2,810	840	692	62	9.3	4,460	7.9
Feb. 1-10	299	--	--	252	72	729	--	173	0	617	1,260	--	1.2	--	3,160	4.30	2,550	925	783	63	10	5,000	7.6
Feb. 11-20	241	--	--	252	76	742	--	164	0	626	1,290	--	.7	--	3,100	4.22	2,020	940	806	63	11	5,040	7.3
Feb. 21-28	244	--	--	243	89	742	--	175	0	610	1,270	--	.4	--	3,300	4.49	2,170	972	829	62	10	5,160	7.8
Mar. 1-10.....	202	--	--	234	78	674	--	210	0	526	1,180	--	1.0	--	2,850	3.88	1,550	905	733	62	9.7	4,630	8.0
Mar. 11-20.....	194	--	--	238	79	699	--	197	0	547	1,200	--	1.0	--	2,870	3.90	1,500	920	758	62	10	4,800	7.9
Mar. 21-31.....	214	--	--	232	79	687	--	187	0	541	1,190	--	.5	--	2,820	3.84	1,630	905	752	62	9.9	4,730	7.8
Apr. 1-10	190	--	--	194	70	591	--	161	0	476	1,020	--	2.3	--	2,660	3.62	1,360	770	638	62	9.3	4,200	7.8
Apr. 11-12	422	--	--	182	54	500	--	162	0	388	895	--	2.3	--	2,170	2.95	2,470	675	542	62	8.4	3,530	8.1
Apr. 13-14	2,430	--	--	122	36	331	--	141	0	210	575	--	2.5	--	1,400	1.90	9,190	452	336	61	6.8	2,450	8.2
Apr. 15-16	3,385	--	--	80	23	202	--	129	0	142	330	--	4.5	--	886	1.20	8,100	295	190	60	5.1	1,550	8.1
Apr. 17-20	2,655	--	--	182	36	460	--	124	0	430	730	--	3.8	--	2,030	2.76	14,550	600	498	62	8.2	3,220	8.2
Apr. 21-22	1,017	--	--	210	43	564	--	128	0	500	900	--	3.3	--	2,440	3.32	6,700	700	595	64	9.3	3,870	8.2
Apr. 23-27	548	--	--	250	53	890	--	140	0	586	1,420	--	1.8	--	3,440	4.68	5,090	840	726	70	13	5,510	8.0
Apr. 28-29	889	--	--	174	36	511	--	150	0	351	835	--	2.6	--	2,050	2.79	4,920	580	457	66	9.2	3,470	8.0
Apr. 30	835	--	--	129	28	371	--	121	4	209	635	--	2.3	--	1,540	2.09	3,470	436	330	65	7.7	2,580	8.3

RED RIVER BASIN--Continued

RED RIVER NEAR GAINESVILLE, TEX.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
May 1-3, 6-8, 1954	6,433	--	--	53	10	90	--	109	0	67	149	--	3.5	--	468	0.64	8,130	174	84	53	3.0	802	7.9
May 4-5, 9-10	6,748	--	--	76	16	144	--	120	0	132	245	--	4.6	--	750	1.02	13,660	254	156	55	3.9	1,270	7.9
May 11, 16-17	19,120	--	--	72	8.4	107	--	119	0	110	175	--	1.8	--	590	.80	30,460	214	116	52	3.2	997	8.1
May 12-13	41,950	--	--	52	6.2	74	--	102	0	70	114	--	1.4	--	412	.56	46,670	155	72	51	2.6	698	8.0
May 14-15, 18-20	34,640	--	--	94	17	173	--	118	0	195	288	--	1.8	--	886	1.20	82,870	306	210	55	4.3	1,500	7.9
May 21	7,870	--	--	87	19	166	--	135	0	153	282	--	2.0	--	876	1.19	18,610	294	184	55	4.2	1,430	8.2
May 22-27	14,240	--	--	162	31	362	--	148	0	385	565	--	2.5	--	1,650	2.24	63,440	530	408	60	6.8	2,710	8.2
May 28-31	19,200	--	--	109	16	172	--	120	0	232	278	--	2.2	--	938	1.28	48,630	336	238	53	4.1	1,550	7.8
June 1-2	9,035	--	--	93	22	117	--	136	0	174	210	--	5.2	--	736	1.00	17,950	322	210	44	2.8	1,250	--
June 3	5,720	--	--	120	23	182	--	138	0	232	330	--	5.0	--	1,020	1.39	15,750	396	283	50	4.0	1,670	8.2
June 4-5	7,495	--	--	133	31	234	--	134	2	264	428	--	3.8	--	1,220	1.66	24,690	460	346	53	4.7	2,100	8.4
June 6-7	4,420	--	--	168	38	302	--	136	0	370	545	--	4.9	--	1,550	2.11	18,500	576	464	53	5.5	2,600	--
June 8-9	7,495	--	--	120	26	212	--	126	0	226	375	--	5.2	--	1,060	1.44	21,450	408	305	53	4.6	1,830	7.8
June 10	7,670	--	--	96	20	170	--	110	0	177	302	--	4.6	--	869	1.18	18,000	320	230	54	4.1	1,480	8.0
June 11-13	5,777	--	--	93	23	178	--	118	0	152	330	--	5.2	--	887	1.21	13,840	328	231	54	4.3	1,570	8.0
June 14-18	5,534	--	--	272	61	585	--	138	0	680	940	--	5.0	--	2,650	3.60	39,600	930	817	58	8.3	4,260	8.2
June 19-20	4,465	--	--	162	45	372	--	186	0	333	620	--	7.7	--	1,720	2.34	20,740	590	438	58	6.7	2,830	8.2
June 21-23	2,203	--	--	206	53	442	--	164	0	475	715	--	3.2	--	2,070	2.82	12,310	730	596	57	7.1	3,280	8.1
June 24-30	1,056	--	--	254	55	599	--	164	2	591	985	--	2.4	--	2,640	3.59	7,530	860	722	60	8.9	4,310	8.4
July 1-10	548	20	0.02	262	79	703	12	122	0	664	1,280	0.3	3.1	0.57	3,080	4.19	4,560	980	880	61	9.8	5,090	8.0
July 11-20	339	--	--	242	80	688	--	136	0	607	1,150	--	--	--	3,020	4.11	2,760	935	824	62	9.8	4,990	8.2
July 21-31	262	--	--	224	85	686	--	136	0	557	1,200	--	--	--	2,910	3.96	2,060	910	798	62	9.9	4,770	7.9
Aug. 1-10	252	--	--	184	74	542	--	131	0	436	1,000	--	2.9	--	2,390	3.25	1,630	765	658	61	8.5	4,160	8.0
Aug. 11-20	163	--	--	196	85	613	--	137	0	494	1,100	--	2.8	--	2,660	3.62	1,170	840	728	61	9.2	4,680	8.0
Aug. 21-29	176	--	--	212	73	676	--	134	0	503	1,220	--	--	--	2,830	3.85	1,340	830	720	64	10	4,760	7.9
Aug. 30-31	804	--	--	460	86	1,140	--	123	0	1,190	2,000	--	--	--	5,210	7.09	11,310	1,500	1,400	62	13	8,010	8.1
Sept. 1-4	432	--	--	430	70	1,040	--	110	0	1,140	1,700	--	--	--	4,720	6.42	5,510	1,360	1,270	62	12	7,330	8.0
Sept. 5-10	225	--	--	340	81	858	--	96	0	909	1,500	--	--	--	3,880	5.28	2,360	1,180	1,100	61	11	6,150	7.9
Sept. 11-20	159	17	.01	276	78	790	12	121	0	704	1,350	.5	1.8	.45	3,290	4.47	1,410	1,010	911	63	11	5,470	7.7
Sept. 21-30	120	--	--	240	67	687	--	140	0	575	1,280	--	--	--	3,090	4.20	1,000	875	760	63	10	5,070	8.0
Weighted average	3,090	--	--	115	23	242	--	a123	--	246	394	--	--	--	1,140	1.55	9,510	382	280	58	5.4	1,890	--

a Includes equivalent of individual carbonate values shown above.

RED RIVER BASIN--Continued

RED RIVER NEAR GAINESVILLE, TEX.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	--	62	56	52	57	53	57	77	80	92	82	92
2	--	64	58	52	58	49	64	56	77	87	87	87
3	--	64	58	52	62	44	66	60	71	88	89	86
4	--	60	56	55	58	45	68	59	72	80	86	84
5	--	58	59	50	57	44	66	67	77	88	88	86
6	--	54	54	59	51	54	76	69	75	86	90	89
7	--	56	50	56	50	56	75	66	79	89	94	82
8	66	48	55	58	54	57	64	71	81	87	88	85
9	72	56	48	48	57	61	68	68	81	89	92	88
10	67	56	54	38	60	64	66	60	83	90	91	82
11	70	60	48	44	49	66	65	56	86	88	94	79
12	76	56	48	34	51	63	64	58	84	94	89	79
13	78	60	50	36	54	47	65	58	83	95	89	84
14	76	62	44	42	64	49	68	67	82	91	92	87
15	78	64	54	48	67	50	69	70	78	90	87	87
16	75	64	46	44	58	51	64	71	91	92	90	86
17	74	64	45	40	63	53	68	74	94	93	94	84
18	73	66	44	51	60	52	--	73	88	91	91	88
19	71	64	45	59	51	62	79	76	93	92	89	89
20	72	54	47	48	54	58	74	70	88	89	82	88
21	70	56	48	32	58	61	73	76	89	90	91	77
22	74	48	38	36	64	67	72	75	89	91	84	76
23	68	52	32	42	58	69	76	74	91	93	87	73
24	66	52	34	48	57	74	80	76	89	94	89	77
25	64	52	38	60	59	64	78	72	88	93	87	78
26	64	54	40	46	63	64	76	72	87	90	88	83
27	60	58	44	44	49	73	79	76	86	93	91	84
28	60	54	42	50	52	70	74	79	87	91	90	81
29	58	55	48	55	--	57	77	77	89	88	91	79
30	59	58	44	54	--	52	78	80	96	81	91	77
31	60	--	46	58	--	53	--	82	--	86	86	--
Average	--	58	48	48	57	57	71	70	84	90	89	83

RED RIVER BASIN--Continued

WASHITA RIVER AT CARNEGIE, OKLA.

LOCATION.--At gaging station at bridge on State Highway 9, 1,300 feet upstream from Running Creek, 2.7 miles east of Carnegie, Caddo County, and at mile 353.9
DRAINAGE AREA.--3,129 square miles including that of Running Creek.
RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1954.
Water temperatures: October 1953 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 2,390 ppm Aug. 12; minimum, 232 ppm Oct. 24.
Hardness: Maximum, 1,260 ppm Aug. 24-27; minimum, 162 ppm Oct. 24.
Specific conductance: Maximum daily, 3,530 micromhos Aug. 26; minimum daily, 355 micromhos Oct. 24.
Water temperatures: Maximum observed daily, 89°F July 4, 12, 25; minimum observed daily, freezing point on several days during January, February, and March.
REMARKS.--Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-10, 1953	60.9			80	17	21		150	2	150	23		4.0		402	0.55	66	270	144	14	0.6	624	8.3
Oct. 11-18	75.6			91	17	21		138	0	195	23		3.7	0.67	448	.61	91	296	183	13	.5	662	8.0
Oct. 19-21	25.7			186	21	41		131	0	443	53		2.2		854	1.16	59	550	442	14	.8	1,160	8.1
Oct. 22-23	1,496			84	12	6.9		102	0	173	7.0		2.9		368	.50	1,490	258	174	5	.2	536	7.9
Oct. 24	3,450			50	9.0	9.2		104	0	77	8.0		6.8		232	.32	2,160	162	77	11	.3	355	8.0
Oct. 25-27	1,125			58	12	12		121	0	102	14		3.6		285	.39	866	194	95	12	.4	450	7.9
Oct. 28-31	292			79	17	11		109	0	181	13		2.3		388	.53	306	266	176	8	.3	575	7.9
Nov. 1-4	70.8			104	19	25		136	0	228	30		2.6		530	.72	101	338	226	14	.6	752	7.9
Nov. 5-10	42.2			164	28	60		211	0	389	72		3.0		866	1.18	99	525	352	20	1.1	1,180	8.2
Nov. 11-14	34.0			196	37	85		248	2	448	106		3.1		1,070	1.46	98	640	434	22	1.5	1,450	8.3
Nov. 15-20	36.5			238	43	131		292	0	565	168		2.4		1,370	1.86	135	770	530	27	2.1	1,850	8.2
Nov. 21-30	84.9			100	22	37		175	0	221	40		2.2		539	.73	124	338	194	19	.9	796	8.1
Dec. 1-2, 8-10	48.4			186	38	74		239	5	436	92		2.2		1,020	1.39	133	620	416	21	1.3	1,380	8.3
Dec. 3-7	428			71	12	18		113	0	149	17		3.9		340	.46	393	226	134	15	.5	528	7.9
Dec. 11-13	37.0			152	28	52		211	0	343	60		3.2		782	1.06	78	495	322	19	1.0	1,090	8.2
Dec. 14-17	31.8			208	38	91		253	0	504	114		2.9		1,130	1.54	97	675	468	23	1.5	1,530	8.2
Dec. 18-20	30.7			240	46	128		279	0	596	166		3.3		1,380	1.88	114	790	562	26	2.0	1,860	8.2
Dec. 21-31	27.2			268	58	157		304	0	696	198		3.7		1,610	2.19	118	905	656	27	2.3	2,130	8.1
Jan. 1-10, 1954	26.5			262	64	169		247	0	756	215		3.8		1,630	2.22	117	915	712	29	2.4	2,220	8.1
Jan. 11-20	26.4			278	64	166		292	0	770	210		2.2		1,740	2.37	124	955	716	27	2.3	2,260	8.2
Jan. 21-31	27.7			277	72	168		280	0	782	208		1.0		1,760	2.39	132	987	750	27	2.3	2,260	8.0
Feb. 1-10	26.8			275	73	163		283	0	774	192		.8		1,730	2.35	125	986	754	26	2.3	2,220	8.0
Feb. 11-20	25.6			265	70	158		296	0	752	188		1.0		1,690	2.30	117	949	706	27	2.2	2,180	7.8
Feb. 21-28	22.2			271	72	158		302	0	752	199		.2		1,750	2.38	105	972	724	26	2.2	2,270	8.0

Mar. 1-10, 1954...	21.7			264	66	172		266	0	762	208		1.3		1,700	2.31	100	930	712	29	2.5	2.210	8.0
Mar. 11-20	20.0			280	76	179		298	0	798	224		1.2		1,800	2.45	97	1,010	766	28	2.4	2,350	8.1
Mar. 21-25.....	37.4			290	84	169		302	0	838	218		.5		1,900	2.58	192	1,070	822	26	2.2	2,390	8.0
Mar. 26-29	38.0			190	51	174		253	0	546	200		.1		1,440	1.96	148	685	478	36	2.9	1,910	7.9
Mar. 30-31	22.5			316	78	227		305	0	900	308		.0		2,190	2.98	133	1,110	860	31	3.0	2,730	8.2
Apr. 1-10.....	17.7			306	67	167		299	0	864	212		3.1		1,970	2.68	94	1,040	795	26	2.3	2,440	8.2
Apr. 11-20	26.4			196	80	146		268	0	663	180		2.3		1,560	2.12	111	820	600	28	2.2	2,030	7.9
Apr. 21-26	20.3			277	67	177		294	0	779	212		.4		1,880	2.56	103	965	724	29	2.5	2,310	8.0
Apr. 27-30	563			80	19	16		122	0	188	15		.1		458	.62	696	278	178	11	4	615	7.8
May 1, 5-10.....	303			111	27	27		142	0	298	14		3.8		616	.84	504	386	270	13	.6	826	8.1
May 2-4	2,590			79	18	17		133	0	172	7.0		5.2		406	.55	2,840	270	161	12	.5	568	8.0
May 11-12	1,040			73	17	21		129	2	165	13		4.3		448	.61	1,260	250	131	15	.6	556	8.3
May 13-14	1,945			54	16	14		125	0	107	9.0		3.2		298	.41	1,560	200	98	13	.4	433	7.8
May 15-20	707			92	20	21		139	0	221	13		3.0		498	.68	951	310	196	13	.5	676	8.2
May 21-23	328			99	21	28		150	0	247	18		2.8		561	.76	497	335	212	15	.7	750	8.2
May 24-28	4,520			62	11	9.0		109	0	114	7.2		2.4		286	.39	3,490	200	110	9	.3	430	8.0
May 29-31.....	1,271			102	21	20		158	0	234	14		3.7		510	.69	1,750	340	210	11	.5	722	8.2
June 1-6	1,104			115	30	29		155	0	290	20		4.2		654	.89	1,950	410	283	13	.6	866	8.2
June 7-10	368			152	37	53		198	5	402	50		3.3		909	1.24	903	532	362	18	1.0	1,170	8.3
June 11-17	382			204	55	79		249	0	548	78		3.2		1,220	1.66	1,260	736	532	19	1.3	1,570	7.9
June 18-20	489			140	18	22		133	0	318	20		2.9		660	.90	871	425	316	10	.5	865	8.1
June 21.....	215			128	37	40		155	6	342	45		9.4		758	1.03	440	470	333	16	.8	983	8.5
June 22-24	174			155	43	68		174	5	427	85		2.5		944	1.28	443	565	414	21	1.2	1,270	8.4
June 25-30	122			179	71	114		116	0	640	135		2.5		1,440	1.96	474	740	645	25	1.8	1,710	8.2
July 1-10	83.8	36	0.04	230	79	140	8.8	180	0	791	170	0.5	.7	0.42	1,600	2.18	362	900	752	25	2.0	2,150	8.0
July 11-20	56.1			266	92	153		210	0	844	222		2.3		1,730	2.35	262	1,040	868	24	2.1	2,390	8.1
July 21-31.....	37.3			260	98	162		220	0	855	240		1.9		1,810	2.46	182	1,050	870	25	2.2	2.480	8.1

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RED RIVER BASIN--Continued

WASHITA RIVER AT CARNEGIE, OKLA.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Aug. 1-10, 1954	37.3			268	88	208		220	2	817	278		1.8		1,880	2.56	189	1,030	846	30	2.8	2,600	8.3
Aug. 11	40.0			260	85	176		169	16	784	302		3.7		1,850	2.52	200	1,000	835	28	2.4	2,480	8.5
Aug. 12	32.0			288	112	261		86	0	1,080	432		2.5		2,390	3.25	206	1,180	1,110	32	3.3	3,160	8.0
Aug. 13-17	25.4			184	63	122		200	2	534	195		2.0		1,300	1.77	89	720	552	27	2.0	1,880	8.3
Aug. 18-20	18.0			240	80	150		198	6	783	220		2.5		1,690	2.30	82	930	758	26	2.1	2,320	8.3
Aug. 21-23	21.7			236	88	166		208	8	784	190		3.0		1,680	2.28	98	950	766	28	2.3	2,280	8.4
Aug. 24-27	29.8			308	120	238		225	0	1,030	412		2.8		2,340	3.18	188	1,260	1,080	29	2.9	3,170	8.2
Aug. 28-31	20.0			360	71	88		173	0	1,030	110		3.8		1,860	2.53	100	1,190	1,190	14	1.1	2,250	8.2
Sept. 1-4	41.8			286	72	143		187	0	874	172		2.3		1,730	2.35	195	1,010	857	24	2.0	2,310	8.2
Sept. 5-10	14.5			274	28	32		134	0	696	30		3.3		1,210	1.65	47	800	690	8	.5	1,510	8.0
Sept. 11-15	11.8			276	38	66		198	0	682	68		2.3		1,300	1.77	41	845	683	15	1.0	1,670	8.1
Sept. 16-20	10.8			256	49	132		229	0	667	180		1.4		1,470	2.00	43	840	652	25	2.0	2,060	8.2
Sept. 21-28	9.22			224	46	152		252	0	579	185		1.7		1,380	1.88	34	750	544	31	2.4	1,820	8.1
Sept. 29-30	8.00			232	62	221		226	0	677	272		1.7		1,630	2.22	35	835	650	37	3.3	2,420	8.1
Weighted average	237			100	23	31		a141	--	239	32		3.3		551	0.75	353	344	228	16	0.7	758	--

a Includes equivalent of individual carbonate values shown above.

RED RIVER BASIN--Continued

WASHITA RIVER AT CARNEGIE, OKLA.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	--	56	48	38	46	32	--	63	75	77	83	79
2	--	57	--	38	45	32	--	59	74	78	77	87
3	--	57	52	43	46	32	--	54	69	79	81	81
4	--	--	--	--	48	32	--	56	68	89	79	76
5	--	53	--	--	46	--	--	60	75	78	84	83
6	--	51	52	--	51	--	--	62	70	79	88	76
7	--	49	--	--	55	--	--	64	74	79	80	76
8	--	50	--	--	55	--	--	61	79	80	79	76
9	--	50	--	--	55	--	--	62	79	86	86	77
10	59	53	--	--	54	--	--	60	79	87	84	74
11	61	54	48	--	55	--	--	58	79	79	81	69
12	63	54	46	--	56	--	--	54	80	89	84	78
13	66	50	44	--	53	--	--	58	80	81	86	70
14	69	56	43	--	51	--	--	60	78	81	79	80
15	66	54	43	--	56	--	59	62	78	86	87	72
16	64	--	42	34	57	--	59	64	74	78	86	73
17	63	--	41	34	54	--	60	64	77	80	84	79
18	64	--	42	34	52	--	72	68	79	88	79	74
19	64	48	40	35	53	--	74	68	77	83	85	80
20	--	46	41	35	52	--	69	68	84	81	86	83
21	--	48	40	--	32	--	72	75	79	88	80	77
22	63	52	40	32	32	--	72	74	79	81	76	75
23	63	48	37	32	32	--	73	74	79	81	78	66
24	59	46	35	39	32	--	74	67	79	80	78	65
25	59	44	41	41	32	--	73	64	79	89	77	78
26	58	48	42	41	32	--	71	68	79	83	81	--
27	59	--	42	46	32	--	62	72	86	81	78	72
28	55	--	42	44	32	--	61	70	78	80	79	72
29	54	52	41	43	--	--	70	72	77	80	79	75
30	55	--	40	48	--	--	66	72	77	79	78	72
31	54	--	39	49	--	--	--	72	--	80	--	--
Average	--	--	--	--	46	--	--	65	77	82	81	76

RED RIVER BASIN--Continued

WASHITA RIVER NEAR DURWOOD, OKLA.

LOCATION.--At gaging station at bridge on State Highway 18, 1.3 miles downstream from Caddo Creek, 4 miles north of Durwood, Carter County, and at mile 63.4.
DRAINAGE AREA.--7,202 square miles.
RECORDS AVAILABLE.--Chemical analyses: May 1944 to September 1954.
Water temperatures: April 1947 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 1,050 ppm Sept. 11-14; minimum, 160 ppm June 8.
Hardness: Maximum, 575 ppm Sept. 11-14; minimum, 122 ppm Oct. 4-7.
Specific conductance: Maximum daily, 1,600 micromhos Apr. 15; minimum daily, 235 micromhos Oct. 24.
Water temperatures: Maximum observed daily, 85°F June 24; minimum observed daily, freezing point on several days during December and January.
EXTREMES, 1944-54.--Dissolved solids: Maximum, 1,050 ppm June 1-2, 1953, Sept. 11-14, 1954; minimum, 70 ppm Nov. 2, 1951.
Hardness: Maximum, 628 ppm Jan. 21-31, 1951; minimum, 41 ppm Nov. 2, 1951.
Specific conductance: Maximum daily, 1,600 micromhos Apr. 15, 1954; minimum daily, 94.9 micromhos Nov. 2, 1951.
Water temperatures, 1947-54: Maximum observed daily, 87°F Aug. 6, 1950; minimum observed daily, freezing point on many days during winter months.
REMARKS.--Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-3, 1953	36.0	--	--	78	30	62	--	225	2	151	86	--	0.5	--	550	0.75	53	318	130	30	1.5	879	8.3
Oct. 4-7	384	--	--	36	7.8	26	--	125	0	29	32	--	1.2	--	212	.29	220	122	20	32	1.0	368	8.0
Oct. 8-11	125	--	--	60	18	42	--	188	0	86	54	--	.5	--	376	.51	127	224	70	29	1.2	622	8.2
Oct. 12-16	119	--	--	74	26	47	--	207	0	140	53	--	.4	--	480	.65	154	290	120	26	1.2	756	8.1
Oct. 17-20	494	--	--	45	13	23	--	138	0	61	26	--	2.8	--	259	.35	345	165	52	23	.8	432	7.9
Oct. 21-22	210	--	--	63	15	33	--	143	0	107	44	--	1.9	--	351	.48	199	220	103	25	1.0	571	8.0
Oct. 23-31	10,030	--	--	42	10	11	--	121	0	49	14	--	1.9	--	207	.28	5,610	146	47	14	.4	339	7.9
Nov. 1-10	1,039	--	--	66	17	29	--	178	0	81	46	--	1.3	--	354	.48	993	234	88	21	.8	577	7.9
Nov. 11-20	716	13	0.00	96	28	41	3.7	268	0	123	65	0.3	1.7	0.23	524	.71	1,010	354	135	20	.9	821	8.1
Nov. 21	3,240	--	--	46	12	24		154	0	42	32	--	2.9	--	235	.32	2,060	164	38	24	.8	410	7.9
Nov. 22-30	811	--	--	102	21	28	--	176	0	193	44	--	1.1	--	508	.69	1,110	342	198	15	.7	758	8.0
Dec. 1-2	430	--	--	112	22	42	--	205	3	194	66	--	1.8	--	574	.78	666	368	195	20	1.0	864	8.3
Dec. 3-9	2,454	--	--	74	13	24	--	156	0	114	36	--	2.0	--	360	.49	2,390	240	112	18	.7	575	8.2
Dec. 10-20	451	--	--	111	23	47	--	229	3	174	72	--	1.9	--	564	.77	687	372	180	22	1.1	884	8.3
Dec. 21-31	299	--	--	120	35	66	--	279	0	209	101	--	2.0	--	678	.92	547	445	216	24	1.4	1,100	8.0
Jan. 1-10, 1954	258	--	--	134	40	77	--	309	0	249	118	--	2.3	--	808	1.10	563	500	247	25	1.5	1,210	7.8
Jan. 11-20	252	--	--	146	40	84	--	326	0	266	127	--	2.5	--	867	1.18	590	530	263	26	1.6	1,320	8.0
Jan. 21-31	282	--	--	139	42	85	--	323	0	260	132	--	1.9	--	863	1.17	657	520	256	26	1.6	1,310	8.0
Feb. 1-10	257	--	--	114	45	83	--	231	0	281	126	--	1.0	--	814	1.11	565	470	280	28	1.7	1,230	7.9
Feb. 11-20	236	--	--	123	48	81	--	287	0	275	122	--	.4	--	849	1.15	541	504	269	26	1.6	1,260	7.9
Feb. 21-28	324	--	--	116	40	77	--	266	0	247	112	--	1.4	--	768	1.04	672	454	236	27	1.6	1,150	8.1

Mar. 1-10, 1954....	199	--	--	117	51	72	--	252	0	266	108	--	1.2	--	842	1.15	452	500	294	24	1.4	1,170	8.0
Mar. 11-20	179	--	--	119	47	87	--	254	0	292	122	--	.6	--	854	1.16	413	490	282	28	1.7	1,260	7.9
Mar. 21-27, 29.....	252	--	--	119	48	94	--	261	0	282	133	--	1.0	--	939	1.28	639	495	281	29	1.8	1,280	8.2
Mar. 28, 30-31.....	304	--	--	86	35	59	--	238	0	153	90	--	3.1	--	658	.89	540	360	165	26	1.4	915	8.2
Apr. 1-11.....	210	--	--	120	40	78	--	221	0	313	108	--	1.4	--	832	1.13	472	466	285	27	1.6	1,200	8.2
Apr. 12-13.....	576	--	--	74	25	66	--	170	3	142	98	--	2.5	--	574	.78	893	288	144	33	1.7	864	8.3
Apr. 14-20.....	363	--	--	108	40	96	--	265	0	225	148	--	2.0	--	800	1.09	784	435	218	32	2.0	1,250	7.9
Apr. 21-26.....	227	--	--	124	44	80	--	250	0	299	106	--	1.2	--	806	1.10	494	490	285	26	1.6	1,170	8.2
Apr. 27, 29	2,330	--	--	59	14	51	--	151	8	50	86	--	1.9	--	344	.47	2,160	204	66	35	1.6	634	8.4
Apr. 28, 30	6,610	--	--	39	8.7	18	--	123	0	45	20	--	1.7	--	192	.26	3,430	133	32	23	.7	330	8.1
May 1-5.....	11,070	--	--	51	10	17	--	137	0	64	20	--	3.9	--	255	.35	7,620	170	58	18	.6	418	8.2
May 6-10.....	4,328	--	--	77	16	24	--	139	2	145	32	--	5.6	--	402	.55	4,700	256	138	17	.7	608	8.3
May 11-15.....	17,230	--	--	41	9.1	14	--	124	0	42	18	--	1.8	--	204	.28	9,490	140	38	18	.5	344	8.2
May 16-20.....	2,910	--	--	78	19	31	--	165	6	134	48	--	2.4	--	449	.61	3,530	274	129	20	.8	676	8.4
May 21-29.....	2,288	--	--	87	23	34	--	183	0	169	50	--	3.1	--	515	.70	3,180	312	162	19	.8	761	8.2
May 30-31.....	3,960	--	--	61	12	14	--	127	2	103	16	--	4.3	--	336	.46	3,590	201	94	13	.4	466	8.3
June 1-7.....	1,916	--	--	94	17	27	--	163	0	178	38	--	3.2	--	505	.69	2,610	303	170	16	.7	717	8.2
June 8	7,980	--	--	40	5.8	7.7	--	110	4	33	9.5	--	5.9	--	160	.22	3,450	124	25	12	.3	291	8.3
June 9.....	3,400	--	--	81	8.0	50	--	128	0	108	86	--	4.3	--	520	.71	4,770	235	130	32	1.4	702	8.1
June 10.....	1,550	--	--	62	10	22	--	118	6	93	33	--	4.3	--	386	.52	1,620	197	90	20	.7	515	8.3
June 11-15	1,131	--	--	93	23	36	--	162	8	194	53	--	2.6	--	522	.71	1,590	328	182	20	.9	767	8.6
June 16-17	3,285	--	--	48	13	31	--	128	4	60	49	--	2.8	--	296	.40	2,630	172	60	28	1.0	477	8.5
June 18	1,440	--	--	78	18	34	--	154	10	131	44	--	3.2	--	432	.59	1,680	268	126	22	.9	642	8.6
June 19-20.....	974	--	--	99	30	47	--	176	10	217	61	--	1.8	--	604	.82	1,590	372	212	22	1.1	876	8.5
June 21-25	851	--	--	148	37	73	--	206	8	362	80	--	2.4	--	850	1.16	1,950	520	338	23	1.4	1,180	8.5
June 26-30.....	429	--	--	125	26	56	--	198	6	282	59	--	2.6	--	700	.95	811	420	248	23	1.2	981	8.4
July 1-6	296	--	--	88	38	49	--	136	4	265	67	--	1.3	--	596	.81	476	375	257	22	1.1	904	8.4
July 7-10	196	--	--	98	45	66	--	136	4	323	95	--	1.3	--	740	1.01	392	430	312	25	1.4	1,060	8.4
July 11-20	136	20	0.01	116	57	84	6.2	157	0	396	106	0.3	1.1	0.00	887	1.21	326	522	394	26	1.6	1,340	8.2
July 21-31	65.0	--	--	120	64	91	--	208	0	392	116	--	2.2	--	952	1.29	167	564	394	26	1.7	1,400	8.2
Aug. 1-10.....	71.5	--	--	98	54	101	--	156	0	342	132	--	2.6	--	877	1.19	169	465	337	32	2.0	1,330	8.2
Aug. 11-20.....	30.8	--	--	88	55	99	--	188	0	290	135	--	1.9	--	809	1.10	67	445	291	33	2.0	1,270	8.2
Aug. 21-23.....	34.3	--	--	98	72	100	--	195	8	372	150	--	2.2	--	988	1.34	91	540	366	29	1.9	1,490	8.5
Aug. 24-31.....	16.8	--	--	80	45	85	--	230	4	172	155	--	1.4	--	718	.98	33	385	190	32	1.9	1,200	8.3

RED RIVER BASIN--Continued

WASHITA RIVER NEAR DURWOOD, OKLA.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Sept. 1-10, 1954....	22.8	--	--	88	45	116	--	242	3	188	165	--	1.1	--	766	1.04	47	405	202	38	2.5	1,310	8.3
Sept. 11-14	16.2	--	--	124	65	123	--	190	2	432	160	--	1.6	--	1,050	1.43	46	575	416	32	2.2	1,620	8.3
Sept. 15-20	11.1	--	--	92	51	109	--	230	0	273	135	--	1.0	--	796	1.08	24	440	252	35	2.3	1,290	8.2
Sept. 21-30	1.06	10	0.01	88	55	107	5.6	252	0	228	155	0.3	1.3	0.17	781	1.06	232	444	238	34	2.2	1,330	7.9
Weighted average .	1,258	--	--	63	16	26		153	--	101	36	--	2.5	--	350	0.48	1,190	223	98	20	0.8	545	--

RED RIVER BASIN--Continued

WASHITA RIVER NEAR DURWOOD, OKLA.--Continued

Temperature (°F) of water, water year October 1953 to Septe ber 1954

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

RED RIVER BASIN--Continued

RED RIVER AT DENISON DAM NEAR DENISON, TEX.

LOCATION.--Immediately below dam on Red River, 1.7 miles upstream from Sand Creek, 4 miles northwest of Denison, Grayson County, and 3 miles upstream from gaging station near Colbert, Bryan County, Okla.
DRAINAGE AREA.--39,719 square miles above dam, 39,777 square miles above gaging station, of which 5,936 square miles is probably non-contributing.
RECORDS AVAILABLE.--Chemical analyses: May 1944 to September 1954.
Water temperatures: October 1945 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 1,040 ppm Nov. 1-30; minimum, 830 ppm July 1-31.
Hardness: Maximum, 364 ppm Dec. 1-31; minimum, 296 ppm July 1-31.
Specific conductance: Maximum daily, 2,090 micromhos Nov. 6; minimum daily, 1,350 micromhos June 21.
EXTREMES, 1944-54.--Dissolved solids: Maximum, 1,430 ppm Aug. 11-20, Sept. 1-10, 1944; minimum, 464 ppm Oct. 21-31, 1945.
Hardness: Maximum, 522 ppm Aug. 11-20, Sept. 1-10, 1944; minimum, 233 ppm Dec. 21-31, 1945, Jan. 11-20, 1946.
Specific conductance: Maximum daily, 3,520 micromhos Aug. 14, 1944, minimum daily, 656 micromhos Oct. 16, 1945.
REMARKS. Values reported for dissolved solids concentrations less than 1,000 ppm are residues on evaporation and for concentrations more than 1,000 ppm are sums of determined constituents unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for gaging station near Colbert, Okla., for water year October 1953 to September 1954 given in WSP 1341. No appreciable inflow between dam and gaging station except during periods of heavy local rains.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-31, 1953 ..	2,196	11		94	28	200	--	127	218	332	--	1.0	0.20	a946	1.29	5,610	350	246	55	4.7	1,660	7.7
Nov. 1-30	1,186	8.8		100	27	230	5.7	123	239	370	0.5	1.0	.18	a1,040	1.41	3,330	360	260	58	5.3	1,750	7.9
Dec. 1-31	2,221	9.0		98	29	218	5.5	124	254	348	.4	1.2	.17	a1,020	1.39	6,120	364	262	56	5.0	1,760	7.8
Jan. 1-31, 1954 ..	2,010	8.2		94	28	203	5.4	125	226	355	.5	1.5	.15	963	1.31	5,230	350	247	55	4.7	1,690	8.0
Feb. 1-28.....	2,196	12		91	25	187	5.5	128	204	298	.5	1.5	.20	948	1.29	5,620	330	225	55	4.5	1,560	7.9
Mar. 1-31	2,493	12		92	25	190	5.4	128	205	302	.5	1.2	.19	953	1.30	6,410	332	228	55	4.5	1,560	8.1
Apr. 1-30	2,716	9.8		92	26	190	--	128	205	302	.4	2.0	.23	942	1.28	6,910	336	232	55	4.5	1,580	7.8
May 1-31	12,400	9.5		91	26	193	--	131	205	310	.5	1.5	.19	946	1.29	31,670	334	226	56	4.6	1,590	7.9
June 1-30	9,555	15		84	22	164	--	129	177	275	.4	2.2	.20	838	1.14	21,620	300	194	54	4.1	1,420	7.7
July 1-31	4,608	15		84	21	165	--	128	178	275	.3	2.0	.20	830	1.13	10,330	295	191	55	4.2	1,390	7.9
Aug. 1-31.....	3,187	13		85	21	173	4.9	125	179	268	.2	1.5	.08	849	1.15	7,310	298	196	55	4.3	1,430	7.6
Sept. 1-30	2,462	14		86	21	170	--	127	182	270	.4	1.5	.12	851	1.16	5,660	301	197	55	4.2	1,430	7.6
Weighted average	3,950	12		89	24	184	--	128	200	299	0.4	1.7	0.18	908	1.23	9,680	320	216	56	4.5	1,530	--

a Sum of determined constituents.

RED RIVER BASIN--Continued

RED RIVER AT DENISON DAM NEAR DENISON, TEX.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

RED RIVER BASIN--Continued

KIAMICHI RIVER NEAR BELZONI, OKLA.

LOCATION.--At gaging station at bridge on State Highway 7, 1¾ miles northwest of Belzoni, Pushmataha County, 6.5 miles downstream from Cedar Creek, 10 miles upstream from Possum Creek, and at mile 47.7.
DRAINAGE AREA.--1,423 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1954.
Water temperatures: October 1947 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 145 ppm Nov. 6, 24, 27; minimum, 49 ppm Nov. 1-5, 7-23, 25-26, 28-30.
Hardness: Maximum, 50 ppm Nov. 6, 24, 27, Dec. 1-3; minimum, 14 ppm Jan. 1-31, Feb. 1-28.
Specific conductance: Maximum daily, 269 micromhos Dec. 3; minimum daily, 29.8 micromhos Jan. 22.
Water temperatures: Maximum observed daily, 98°F July 5; minimum observed daily, freezing point Jan. 21.
EXTREMES, 1947-54.--Dissolved solids: Maximum, 145 ppm Nov. 6, 24, 27, 1953; minimum, 25 ppm Nov. 26-30, 1952.
Hardness: Maximum, 50 ppm Nov. 6, 24, 27, Dec. 1-3, 1953; minimum, 11 ppm Feb. 11-20, 1949, Jan. 1-10, 1950.
Specific conductance: Maximum daily, 269 micromhos Dec. 3, 1953; minimum daily, 22.5 micromhos Jan. 25, 1948.
Water temperatures: Maximum observed daily, 98°F Aug. 17, 1951, July 3, 1952, July 5, 1954; minimum observed daily, freezing point on several days during winter months.
REMARKS.--Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year October 1953 to September 1954 given in WSP 1341. No flow, July 30-31, Aug. 1, 8-31, Sept. 1-29.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection[a]	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-31, 1953.....	10.7	5.0	0.35	4.1	2.6	6.3	2.1	28	0	4.4	6.0	0.3	0.5	0.74	53	0.07	1.5	22	0	36	0.6	73.1	7.0
Nov. 1-5, 7-23, 25, 26, 28-30	28.3	--	--	5.6	1.5	7.5	--	30	0	4.7	7.0	--	.6	--	49	.07	3.7	20	0	45	1.3	80.7	6.8
Nov. 6, 24, 27	72.3	--	--	14	3.7	21	--	52	0	7.6	36	--	1.1	--	145	.20	28	50	7	48	1.3	217	7.3
Dec. 1-3	71.7	--	--	15	3.1	23	--	57	0	7.7	36	--	1.8	--	144	.20	28	50	3	50	1.4	228	7.2
Dec. 4-31	358	--	--	4.8	1.2	5.4	--	18	0	5.6	6.8	--	.8	--	72	.10	70	17	2	41	.6	65.8	6.8
Jan. 1-31, 1954	3,465	8.0	.70	2.7	1.3	5.4	1.9	13	0	5.7	5.2	.3	1.2	.11	70	.10	655	14	3	42	.6	52.5	6.5
Feb. 1-28.....	703	7.9	.55	3.2	1.5	5.1	1.3	14	0	7.6	5.8	.0	.0	.27	62	.08	118	14	3	39	.6	55.9	6.6
Mar. 1-31	176	8.1	.15	4.7	2.5	7.9	1.3	15	0	14	12	.0	.0	.27	62	.08	29	22	10	42	.7	89.8	6.7
Apr. 1-30.....	1,292	6.8	.35	4.3	2.0	6.6	1.6	17	0	10	9.8	.2	.0	.27	668	.09	237	19	5	39	.7	77.9	6.8
May 1-31.....	3,754	8.1	.55	4.0	1.2	4.6	1.6	20	0	5.8	5.3	.8	.1	.27	66	.09	669	15	0	35	.5	57.0	7.0
June 1-30	124	10	.20	4.2	3.8	5.1	2.0	25	0	5.6	9.5	.3	.4	.00	55	.07	18	26	6	28	.4	73.8	7.2
July 1-29.....	3.83	10	.12	5.3	3.0	8.2	1.5	32	0	7.0	14	.1	1.1	.00	66	.09	.7	26	0	39	.7	102	7.2
Aug. 2-7	.28	9.0	.00	5.4	3.5	7.9	1.9	34	0	5.8	12	.1	2.4	.00	65	.09	.1	28	0	36	.6	99.1	7.3
Sept. 30	72.0	--	--	8.0	2.4	9.0	--	35	0	4.1	13	--	4.0	--	67	.09	13	30	2	39	.7	109	7.4
Weighted average..	830	--	--	3.6	1.4	5.3	--	17	--	6.6	6.1	--	0.5	--	67	0.09	150	15	1	43	0.6	59.4	--

a No flow, July 30-31, Aug. 1, 8-31, Sept. 1-29.

RED RIVER BASIN--Continued

KIAMICHI RIVER NEAR BELZONI, OKLA.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	80	71	63	47	55	52	60	61	80	87	--	
2	81	70	60	50	60	40	63	63	80	86	86	
3	80	68	54	43	58	41	67	64	81	89	85	
4	79	61	55	45	53	39	64	65	78	88	85	
5	70	51	57	43	61	37	60	65	73	98	88	
6	70	55	58	42	50	40	65	69	79	81	87	
7	76	45	52	43	50	49	63	69	77	86	85	
8	77	47	49	40	53	65	67	66	77	84	--	
9	82	49	45	41	57	70	64	64	83	88	--	
10	85	55	49	35	60	71	67	63	79	85	--	
11	83	59	45	43	62	68	70	65	82	89	--	
12	82	60	45	40	55	70	65	58	87	91	--	
13	78	66	49	37	55	48	66	64	84	90	--	
14	76	58	48	39	59	50	69	65	85	87	--	
15	74	54	45	44	60	47	63	65	83	87	--	
16	72	58	46	45	62	50	64	67	86	87	--	
17	70	54	44	46	60	49	67	67	83	86	--	
18	83	59	44	45	61	55	69	68	86	86	--	
19	71	52	48	47	55	57	66	71	86	88	--	
20	73	55	47	47	62	59	67	71	87	89	--	
21	72	54	38	32	65	56	69	70	70	86	--	
22	75	51	36	44	60	60	71	72	87	95	--	
23	72	49	39	44	55	63	74	70	90	89	--	
24	71	51	38	44	64	65	76	73	91	86	--	
25	70	50	41	44	65	68	75	71	87	87	--	
26	69	53	52	46	60	62	76	70	90	89	--	
27	74	56	51	49	62	63	77	70	90	86	--	
28	73	60	45	50	58	64	71	75	87	86	--	
29	69	53	41	47	--	60	68	79	90	85	--	
30	65	54	50	54	--	67	69	78	85	--	--	80
31	60	--	45	55	--	57	--	77	--	--	--	
Average	75	56	48	44	58	56	68	68	83	88	--	--

LITTLE RIVER BELOW LUKFATA CREEK NEAR IDABEL, OKLA.

LOCATION.--At gaging station at bridge on U. S. Highway 70, just downstream from Lukfata Creek, and 5 miles northeast of Idabel, McCurtain County.
DRAINAGE AREA.--1,226 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1954.
Water temperatures: October 1947 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 602 ppm Sept. 1-30; minimum, 48 ppm Feb. 1-28, May 1-31.
Hardness: Maximum, 98 ppm Sept. 1-30; minimum, 13 ppm Jan. 13-31, May 1-31.
Specific conductance: Maximum daily, 1,310 micromhos Sept. 28; minimum daily, 24.4 micromhos Jan. 22.
Water temperatures: Maximum observed daily, 89°F Aug. 30; minimum observed daily, 34°F Nov. 27.
EXTREMES, 1947-54.--Dissolved solids: Maximum, 602 ppm Sept. 1-30, 1954; minimum, 40 ppm July 21-31, 1950.
Hardness: Maximum, 98 ppm Sept. 1-30, 1954; minimum, 9 ppm Apr. 21-30, 1948.
Specific conductance: Maximum daily, 1,310 micromhos Sept. 28, 1954; minimum daily, 21.5 micromhos Feb. 14, 1950.
Water temperatures: Maximum observed daily, 94°F Aug. 16, 1950; minimum, freezing point Feb. 26, 1948, Feb. 14, 1950, Feb. 2-3, 1951.
REMARKS.--Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, water year October 1952 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-10, 1953	19.2	--	--	11	3.5	48	--	43	0	6.9	77	--	0.2	--	186	0.25	9.6	42	7	71	3.2	339	7.4
Oct. 11-20	13.8	--	--	14	3.9	68	--	48	0	7.7	111	--	.1	--	248	.34	9.2	51	12	74	4.1	461	7.4
Oct. 21-31	15.4	--	--	16	3.9	78	--	52	0	8.9	128	--	.1	--	277	.38	12	56	13	75	4.5	523	7.4
Nov. 1-10	24.4	--	--	17	4.0	75	--	50	0	9.5	125	--	.4	--	275	.37	18	59	18	73	4.2	516	7.1
Nov. 11-20	22.3	--	--	16	3.7	53	--	53	0	8.5	95	--	.2	--	220	.30	13	55	12	68	3.1	417	7.4
Nov. 21-30	36.3	--	--	16	3.4	51	--	51	0	8.7	85	--	.2	--	202	.27	20	54	12	67	3.0	380	7.3
Dec. 1-3	47.7	--	--	15	3.3	45	--	46	0	8.9	76	--	.2	--	185	.25	24	51	13	66	2.7	338	7.3
Dec. 4-31	479	--	--	5.6	1.0	6.3	--	19	0	4.1	9.5	--	.6	--	56	.08	72	18	2	43	.6	71.4	6.8
Jan. 1-12, 1954	189	--	--	6.8	1.9	11	--	26	0	4.9	18	--	.5	--	76	.10	39	25	3	49	1.0	109	7.0
Jan. 13-31	4,453	--	--	3.2	1.2	4.0	--	16	0	4.6	4.1	--	.7	--	53	.07	637	13	0	40	.5	45.9	6.5
Feb. 1-28	1,184	7.3	1.5	4.2	1.3	4.5	0.7	20	0	6.7	5.0	0.8	.0	0.25	48	.07	153	16	0	32	.5	60.5	7.0
Mar. 1-31	225	9.0	.15	7.1	2.0	9.8	1.0	31	0	4.0	16	.0	.0	.27	68	.09	41	26	1	43	.8	107	7.0
Apr. 1-8	212	--	--	9.2	1.5	12	--	35	0	2.4	16	--	.8	--	75	.10	43	29	0	47	1.0	116	7.4
Apr. 9-30	1,693	--	--	5.6	2.0	5.1	--	22	0	3.9	6.0	--	1.1	--	59	.08	270	22	4	34	.5	65.0	7.1
May 1-31	3,777	7.1	.25	3.9	.8	3.6	1.0	18	0	4.6	5.4	.0	.0	.27	48	.07	489	13	0	34	.4	47.3	7.2
June 1-20	986	--	--	5.5	2.0	8.4	--	25	0	2.6	13	--	.8	--	64	.09	170	22	2	45	.8	86.5	7.0
June 21-30	65.1	--	--	8.4	2.2	19	--	34	0	4.1	30	--	.6	--	94	.13	17	30	2	58	1.5	161	7.3
July 1-16	25.7	--	--	13	3.1	29	--	42	0	7.9	45	--	.7	--	163	.22	11	45	11	58	1.9	253	7.6
July 17-31	12.1	--	--	13	6.5	46	--	49	0	6.4	82	--	1.3	--	252	.34	8.2	59	19	63	2.6	361	7.4
Aug. 1-31	6.12	12	.01	19	7.4	108	2.4	63	0	9.1	181	.1	1.0	.03	371	.51	6.1	78	26	74	5.3	751	7.3
Sept. 1-30	7.27	13	.01	29	6.2	192	2.4	76	0	12	302	.0	1.1	--	602	.82	12	98	36	81	8.4	1,140	7.7
Weighted average	679	--	--	4.3	1.2	5.2	--	19	--	4.6	7.0	--	0.4	--	54	0.07	99	16	0	43	0.6	59.5	--

RED RIVER BASIN--Continued

LITTLE RIVER BELOW LUKFATA CREEK NEAR IDABEL, OKLA.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

RED RIVER BASIN--Continued

LITTLE RIVER NEAR HORATIO, ARK.

LOCATION.--At gaging station at bridge on State Highway 41, 0.9 mile downstream from Rolling Fork, 2 miles southwest of Horatio, Sevier County, and 28.5 miles upstream from Cossatot River.
DRAINAGE AREA.--2,674 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1954.
Water temperatures: October 1953 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 308 ppm Sept. 21-30; minimum, 41 ppm Apr. 17-21, 23-27, 29-30.
Hardness: Maximum, 59 ppm Sept. 21-30; minimum, 11 ppm Jan. 17-31.
Specific conductance: Maximum daily, 588 micromhos Sept. 28; minimum daily 27.3 micromhos Jan. 23.
Water temperatures: Maximum, 89°F July 14-18; minimum, 35°F Dec. 25.
REMARKS.--Records of specific conductance of daily samples available in district office at Fayetteville, Ark. Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, magnesium	Noncarbonate			
Oct. 1-10, 1953	38.8	8.9	0.01	9.9	3.2	44	2.0	33	4.8	71	0.1	0.5	187	38	11	315	7.3	7
Oct. 11-20	25.8	8.0	.01	11	3.1	45	1.9	34	4.8	78	.1	.6	190	40	12	337	7.3	8
Oct. 21-31	28.7	8.1	.01	13	3.6	56	1.9	35	6.0	98	.1	.3	227	47	19	409	7.1	7
Nov. 1-10	39.5	5.5	.00	15	3.2	58	1.6	37	6.0	100	.2	.4	244	51	20	427	7.2	8
Nov. 11-13, 15	43.5	7.2	.00	15	3.6	61	1.8	40	6.0	106	.2	.1	250	52	19	448	7.7	8
Nov. 14, 16-20	41.5	7.3	.00	14	2.8	51	1.6	39	6.8	86	.1	.6	212	46	14	382	7.9	8
Nov. 21-30	83.4	7.1	.01	14	3.7	57	1.8	45	6.6	93	.1	.0	235	50	13	415	7.7	8
Dec. 1-4	190	4.8	.00	16	4.1	61	1.9	48	9.6	101	.2	.2	252	57	17	445	7.2	8
Dec. 5-7	1,707	--	--	11	2.8	35	--	39	7.8	53	--	.3	154	39	7	295	7.1	7
Dec. 8-14	1,368	6.7	.26	6.5	1.4	8.0	1.4	25	2.6	10	.3	1.0	72	22	1	106	7.2	30
Dec. 15-20	1,224	5.3	.13	4.1	1.0	4.8	1.2	17	2.0	6.0	.3	.7	60	14	0	60.6	7.0	38
Dec. 21-31	441	6.5	.17	4.8	1.2	7.8	1.2	18	3.0	11	.3	.3	62	17	2	77.5	6.9	38
Jan. 1-10, 1954	320	8.3	.15	4.7	2.4	10	1.0	20	4.0	16	.0	.8	77	22	5	102	7.3	32
Jan. 11-16	3,615	6.3	.17	3.6	1.6	5.0	1.0	17	3.4	6.8	.4	.4	58	16	2	61.8	7.2	40
Jan. 17-31	10,190	7.3	.12	3.0	.8	2.6	1.0	11	2.0	2.8	.2	1.0	47	11	2	40.4	6.9	45
Feb. 1-10	2,041	7.3	.01	3.3	1.0	4.1	.9	14	3.6	5.2	.2	1.0	49	12	1	51.6	7.2	25
Feb. 11-16	1,302	7.1	.22	4.1	1.2	6.3	.8	17	3.6	8.5	.3	.9	53	15	1	69.5	7.0	25
Feb. 17-28	5,468	7.1	.11	3.7	.8	3.3	1.0	14	3.6	4.0	.3	1.0	51	13	1	46.7	6.7	40
Mar. 1-10	948	7.7	.19	3.9	2.0	5.8	.8	19	4.0	9.0	.1	1.1	66	18	2	68.4	6.7	25
Mar. 11-20	483	5.7	.23	4.8	2.5	8.8	.8	22	6.2	13	.1	2.1	74	22	4	91.0	6.9	14
Mar. 21-31	610	3.6	.09	4.9	2.4	11	.9	25	6.8	15	.1	1.0	78	22	2	106	6.9	15

Apr. 1-10, 1954	822	4.8	.13	4.8	2.2	8.8	.9	22	6.8	13	.1	.9	68	21	3	92.3	6.7	22
Apr. 11, 13-15	6,190	4.9	.31	5.1	1.5	7.5	1.6	23	4.4	6.2	.4	2.0	73	19	0	72.7	7.0	50
Apr. 12, 16, 22, 28 .	4,090	3.8	.24	6.3	2.0	17	1.5	20	4.8	27	.4	1.6	109	24	8	135	7.3	45
Apr. 17-21, 23-27,29-30	4,496	6.4	.31	4.4	1.0	4.4	1.0	18	4.2	5.0	.3	1.1	41	15	0	56.0	6.8	40
May 1-10	11,900	6.5	.19	3.5	.8	3.4	1.1	14	3.2	4.2	.1	1.5	50	12	1	45.9	6.7	25
May 11-20	7,505	5.6	.18	5.5	.6	3.5	1.0	18	2.8	4.0	.1	.9	54	16	1	52.4	7.0	35
May 21-27, 29.....	1,912	5.4	.19	5.2	1.0	5.8	.9	21	3.0	8.5	.2	.4	56	17	0	68.2	6.8	30
May 28, 30-31.....	6,533	--	--	3.6	1.0	3.1	--	10	2.2	4.5	--	2.3	44	13	5	56.5	6.2	40
June 1-2, 4-5	5,230	5.9	.18	3.6	1.2	3.4	1.2	17	2.0	3.8	.2	1.0	53	14	0	47.8	6.7	42
June 3, 6-10	1,272	5.9	.19	5.4	1.4	7.0	1.1	20	2.0	10	.2	.9	65	19	3	78.7	7.1	35
June 11-14	462	5.3	.27	6.2	1.3	11	1.2	24	1.8	16	.1	1.1	71	21	1	102	6.5	25
June 15-20	262	5.2	.11	6.8	1.7	14	1.2	26	3.6	22	.1	1.2	82	24	3	128	6.4	20
June 21-30	125	3.0	.07	9.0	1.8	20	1.4	34	5.0	30	.2	.5	106	30	2	177	7.6	10
July 1-10	70.8	3.8	.02	8.6	2.2	27	1.3	32	4.9	40	.2	.1	121	30	4	204	6.7	6
July 11-22.....	35.9	5.0	.00	12	1.2	32	1.5	34	5.2	50	.2	.5	143	35	7	239	7.2	5
July 23-31.....	22.3	5.2	.00	11	2.9	45	1.7	33	4.8	73	.1	.6	186	39	12	317	6.7	5
Aug. 1-9	19.8	4.7	.00	11	3.1	47	1.8	33	6.8	79	.1	.4	202	40	13	337	7.4	5
Aug. 10-20.....	9.05	7.1	.00	13	3.6	57	2.7	36	6.0	98	.1	.7	232	47	18	403	7.5	7
Aug. 21-31.....	8.23	7.3	.00	13	3.5	58	1.9	32	5.6	104	.1	.5	234	47	21	405	7.3	5
Sept. 1-10.....	5.26	5.9	.05	15	4.2	70	2.1	33	6.6	123	.3	.7	258	55	28	470	7.0	8
Sept. 11-20	3.84	6.2	.02	16	4.2	77	2.2	32	6.8	136	.3	.2	279	57	31	511	7.1	8
Sept. 21-30	7.01	6.8	.04	16	4.6	85	2.3	30	6.8	147	.3	1.0	308	59	34	556	7.2	8
Average	1,893	6.1	0.11	8.3	2.2	27	1.4	26	4.7	44	0.2	0.8	129	30	8	207	--	21

RED RIVER BASIN--Continued

LITTLE RIVER NEAR HORATIO, ARK.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

RED RIVER AT FULTON, ARK.

LOCATION.--At gaging station at bridge on U. S. Highway 67, at Fulton, Miller County, 0.3 mile downstream from Missouri Pacific Railroad bridge, and 2½ miles downstream from Little River, and at mile 463.0.
DRAINAGE AREA.--52,380 square miles, of which 5,936 square miles is probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1947, October 1952 to September 1954.
Water temperatures: October 1946 to September 1947, October 1952 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 942 ppm Oct. 1-7; minimum, 139 ppm Jan. 21-22, 24-27, 30-31.
Hardness: Maximum, 336 ppm Oct. 21-31, Nov. 1, 9-10; minimum, 46 ppm Jan. 21-22, 24-27, 30-31.
Specific conductance: Maximum daily, 1,780 micromhos Oct. 1, Sept. 24; minimum daily, 121 micromhos Jan. 31.
Water temperatures: Maximum, 87°F on several days during July; minimum, 35°F Dec. 23-24, 26.
EXTREMES, 1952-54.--Dissolved solids: Maximum, 942 ppm Oct. 1-7, 1953; minimum, 55 ppm Mar. 4-9, 1953.
Hardness: Maximum, 372 ppm Nov. 1-10, 1952; minimum, 20 ppm Dec. 6-12, 1952, Mar. 4-9, 1953.
Specific conductance: Maximum daily, 1,780 micromhos Oct. 1, 1953, Sept. 24, 1954; minimum daily, 48.8 micromhos Mar. 8, 1953.
Water temperatures: Maximum, 87°F on several days during summer months: minimum, 35°F Dec. 23-24, 26, 1953.
REMARKS.--Records of specific conductance of daily samples are available in district office at Fayetteville, Ark. Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, Magnesium	Noncarbonate			
Oct. 1-7, 1953	3,674	7.8	0.03	94	24	183	5.6	158	186	296	0.1	1.5	942	333	204	1,500	7.8	13
Oct. 8-20	3,095	7.1	.00	87	23	153	5.3	172	155	242	.1	1.0	795	312	170	1,350	7.8	10
Oct. 21-31, Nov. 1	3,072	6.3	.00	97	23	182	5.5	163	187	272	.1	1.1	938	336	203	1,510	7.9	11
Nov. 2, 4-7	2,960	9.2	.03	84	20	145	2.0	171	143	228	.1	1.2	772	292	152	1,250	8.0	10
Nov. 3, 8	2,685	6.8	--	66	17	110	4.4	150	114	170	--	1.2	643	234	112	970	8.2	16
Nov. 9-10	2,330	6.0	--	95	24	162	5.2	177	162	258	--	1.4	906	336	190	1,390	8.2	16
Nov. 11-14	2,380	6.7	.04	84	22	138	4.6	191	137	217	.1	1.1	747	300	144	1,220	8.2	13
Nov. 15-22	2,255	6.6	.03	78	19	122	4.4	186	116	184	.1	1.0	668	272	120	1,090	8.2	13
Nov. 23-27	3,160	7.0	.00	88	22	151	4.9	175	152	242	.1	1.0	818	310	166	1,290	8.0	15
Nov. 28-30	3,313	6.2	--	54	12	80	3.8	106	81	130	.1	6.8	477	184	97	755	7.7	20
Dec. 1-5	2,680	9.1	.00	64	17	98	3.8	149	99	156	.0	2.0	551	230	108	905	8.2	15
Dec. 6, 8-9	7,230	9.1	.01	50	12	78	3.6	116	74	129	.0	1.8	449	174	79	732	8.0	15
Dec. 7, 14-15	6,933	--	--	23	5.4	34	--	54	33	55	--	1.1	212	80	35	337	7.9	40
Dec. 10-13	6,088	7.7	.00	32	8.3	56	3.0	76	47	89	.0	2.5	294	114	52	511	7.9	25
Dec. 16-22	5,604	7.7	.07	39	8.6	61	3.0	79	62	100	.0	3.9	336	133	68	580	8.0	30
Dec. 23-31	3,816	9.4	.00	68	18	123	4.1	119	134	198	.0	1.4	634	244	146	1,070	8.1	12

RED RIVER BASIN--Continued

RED RIVER AT FULTON, ARK.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, magnesium	Noncarbonate			
Jan. 1-9, 1954	2,899	7.2	0.01	69	18	120	4.2	135	127	190	0.2	1.2	633	246	136	1,080	7.9	12
Jan. 10-12	3,093	8.5	.05	56	17	90	3.2	134	88	150	.3	.7	508	210	100	846	8.2	20
Jan. 13-15	6,560	5.1	.24	28	8.7	48	1.9	74	44	75	.5	.9	274	106	45	457	8.0	32
Jan. 16-20	21,720	5.4	.31	14	4.3	16	1.9	43	20	25	.5	1.4	143	53	17	198	7.6	24
Jan. 21-22, 24-27, 30-31	29,010	8.5	.13	14	2.6	12	1.9	45	13	15	.5	1.1	139	46	9	166	7.6	20
Jan. 23, 28-29, Feb. 1-2	26,060	8.5	.18	23	3.1	24	2.2	57	24	38	.4	1.4	223	70	23	271	7.6	18
Feb. 3-9	8,744	--	--	32	7.7	46	--	67	51	74	--	1.6	275	112	57	478	7.8	25
Feb. 10-17	5,320	8.6	.04	52	14	86	3.1	99	87	142	.1	.8	492	188	106	826	7.8	6
Feb. 18-19, 23-28	13,900	7.0	.15	24	5.7	29	2.1	58	36	46	.2	1.4	202	83	36	320	7.3	45
Feb. 20-22	17,430	7.8	.20	17	3.1	16	1.9	46	23	26	.3	1.6	143	55	17	204	7.8	50
Mar. 1-2	6,520	--	--	26	8.8	36	--	77	41	56	--	2.3	225	101	38	391	7.8	25
Mar. 3-10	4,279	8.3	.01	45	12	68	2.9	107	70	112	.1	1.1	403	162	74	690	7.7	12
Mar. 11-16, 19-21	3,782	7.7	.04	57	17	93	3.6	125	92	155	.1	2.6	537	212	110	903	7.9	9
Mar. 17-18	4,480	--	--	70	19	113	--	136	100	210	--	2.5	698	252	141	1,160	8.0	10
Mar. 22-26, 28	3,698	8.2	.01	66	18	123	4.1	129	101	198	.1	1.5	638	238	133	1,090	7.9	10
Mar. 27, 29-31	4,072	8.2	.04	57	15	93	3.7	119	92	152	.1	1.8	529	204	106	889	7.5	7
Apr. 1-6	3,212	8.4	.00	54	16	94	3.6	115	96	152	.3	1.0	557	201	107	880	8.0	8
Apr. 7-10	3,098	5.7	.00	67	19	128	4.1	125	116	202	.3	1.0	697	245	142	1,100	8.0	7
Apr. 11-13	6,037	6.2	.04	35	7.8	53	2.3	81	46	83	.3	.6	331	119	53	517	7.9	12
Apr. 14-16	21,100	5.9	.35	19	3.8	22	2.0	53	20	36	.5	1.2	184	63	20	262	7.7	20
Apr. 17-21	27,840	6.8	.27	17	3.3	16	1.9	47	18	26	.6	1.2	148	56	17	199	7.7	15
Apr. 22-24	10,020	7.2	.21	23	5.2	33	2.3	56	31	51	.6	.9	234	79	33	333	8.0	15
Apr. 25-26	6,880	--	--	33	8.8	48	--	18	46	75	--	.4	319	119	55	465	7.7	25
Apr. 27, 30	8,760	--	--	44	12	81	--	89	89	122	--	.2	445	160	86	713	8.2	18
Apr. 28-29	7,000	3.3	.18	56	16	112	4.0	97	117	182	--	3.8	626	206	126	973	7.9	18

May 1-4, 1954	31,320	--	--	25	5.8	31	--	64	29	50	--	.9	197	86	34	323	7.9	20
May 5-10	50,980	12	.07	18	3.8	12	2.4	64	16	15	--	1.2	143	60	8	193	7.9	40
May 11-13, 17	66,250	6.4	.02	26	5.4	17	3.9	87	24	24	0.2	1.7	165	87	16	265	7.5	34
May 14-16	80,200	6.5	.01	23	4.5	12	5.4	82	19	14	--	1.4	140	76	9	202	7.8	36
May 18-26, 29	41,830	8.4	.07	56	14	98	3.7	110	86	160	.1	1.0	533	197	107	886	7.8	11
May 27-28, 30-31	30,800	9.2	.17	71	17	135	4.5	126	126	218	.1	1.9	707	247	144	1,160	7.4	7
June 1-3	35,100	--	--	45	9.8	77	--	80	79	120	--	.8	427	153	88	695	7.5	15
June 4-8	22,660	6.6	.07	54	15	110	4.0	a104	94	172	.1	1.7	581	196	111	948	8.4	9
June 9-20	13,420	6.7	.00	77	20	146	5.9	131	147	235	.3	.5	764	274	166	1,260	7.2	7
June 21-30	10,190	4.0	.03	74	19	147	5.5	130	144	235	.1	1.6	764	262	156	1,250	7.7	7
July 1-10	6,484	4.7	.09	77	17	155	6.3	134	154	252	.1	1.9	800	262	152	1,320	8.1	6
July 11-20	6,142	7.1	.11	78	21	155	5.5	136	158	250	.1	1.1	812	281	170	1,340	8.2	5
July 21-31	5,380	8.3	.07	77	21	154	5.4	135	161	248	.1	.9	825	278	168	1,340	8.2	5
Aug. 1-10	4,606	9.0	.01	81	23	148	6.1	142	159	245	.2	.5	813	296	180	1,330	7.9	7
Aug. 11-20	3,827	2.6	.00	87	20	166	5.5	138	174	258	.4	.7	851	299	186	1,370	8.1	20
Aug. 21-31	3,815	7.9	.00	89	19	164	5.6	146	172	252	.4	.8	859	300	180	1,370	8.0	17
Sept. 1-10	3,037	5.3	.00	87	22	164	5.9	150	172	260	.4	.6	864	308	184	1,380	7.5	18
Sept. 11-20	2,850	5.9	.00	89	21	162	5.7	161	169	250	.4	.8	856	308	176	1,370	7.9	17
Sept. 21-30	3,289	5.9	.00	91	23	178	5.9	150	184	280	.4	.7	934	322	198	1,470	7.8	15
Average	10,820	7.1	0.07	55	14	95	4.0	111	96	152	--	1.4	530	195	104	856	--	17

a Includes equivalent of 3 parts per million of carbonate (CO_3).

RED RIVER BASIN--Continued

RED RIVER AT FULTON, ARK.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

TWELVEMILE BAYOU NEAR DIXIE, LA.

LOCATION.--At gaging station at bridge on State Highway 995, 0.1 mile downstream from Cottonwood Bayou, 5.5 miles downstream from Caddo Lake, 4.2 miles southwest of Dixie, Caddo Parish, and 17.3 miles downstream from mouth.
DRAINAGE AREA.--3,137 square miles.
RECORDS AVAILABLE.--Chemical analyses: September 1953 to September 1954.
REMARKS.--Values reported for dissolved solids are sums of determined constituents unless otherwise noted. Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, September 1953 to September 1954

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Sept. 29, 1953	138	9.4	0.05	120	87	1,590		185	114	2,730		--		4,740	6.45		657	506	84	27	8,620	7.3
Oct. 22	10.2	4.8	.03	153	123	2,510		228	122	4,270		--		7,290	9.91		888	700	86	37	12,400	7.3
Nov. 18	12.6	4.6	.10	202	127	3,000		282	102	5,110		--		8,680	11.8		1,030	795	86	41	14,700	7.3
Dec. 15	1,610	11	.05	22	8.8	181		37	8.6	315		0.5		a 628	.85		91	60	81	8.2	1,120	7.1
Jan. 21, 1954	3,770	11	.09	20	6.9	138		20	13	248		.2		447	.61		78	62	79	6.8	890	6.7
Feb. 24	2,080	13	.28	14	5.1	75		17	18	132		.2		266	.36		56	42	74	4.4	529	6.8
Mar. 16	624	13	.16	19	6.1	120		22	19	209		.2		a 438	.60		72	54	78	6.1	772	6.7
Apr. 19	1,150	11	.15	19	6.5	118		23	18	207		.2		a 440	.60		74	55	78	5.9	776	6.9
May 21	4,400	12	.20	13	4.6	74		21	13	128		.2		255	.35		51	34	76	4.5	452	6.6
June 16	2,200	12	.32	9.2	3.7	55		24	11	90		.2		193	.26		38	18	76	3.9	365	6.6
July 8	246	13	.00	69	34	488		98	65	868		1.0		1,590	2.16		312	232	77	12	3,010	7.5
Aug. 19	6.6	11	.03	216	120	2,090		188	190	3,700		--		6,420	8.73		1,030	878	81	28	11,000	7.4
Sept. 19	6.62	11	.02	271	156	3,490		184	192	6,060		--		10,300	14.0		1,320	1,170	85	42	17,000	7.2

a Residue on evaporation at 180°C.

RED RIVER BASIN--Continued

BAYOU BODCAU NEAR SAREPTA, LA.

LOCATION.--At gaging station at bridge on State Highway 70, 2 miles west of Sarepta, Webster Parish, and 9.5 miles upstream from Caney Creek.
DRAINAGE AREA.--546 square miles.
RECORDS AVAILABLE.--Chemical analyses: September 1953 to September 1954.
REMARKS.--Values reported for dissolved solids are sums of determined constituents unless otherwise noted. Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, September 1953 to September 1954

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Sept. 30, 1953	0.42	4.5	0.04	30	8.0	115		23	3.6	237		1.0		410	0.56		108	89	70	4.8	833	6.7
Oct. 23	.57	8.2	.08	17	7.5	50		24	9.2	108		.2		a 241	.33		73	54	60	2.5	429	6.6
Nov. 19	.83	12	.03	20	9.5	56		28	10	126		.2		a 281	.38		89	66	58	2.6	499	6.9
Dec. 15	40.6	9.4	.02	24	5.2	112	5.0	169	13	124		.2		376	.51		82	0	73	5.4	684	7.0
Jan. 20, 1954	1,290	6.4	.02	20	3.5	91		147	11	92		.5		296	.40		64	0	75	4.9	571	7.7
Feb. 23	880	6.4	.08	10	2.8	65		107	9.9	57		.2		204	.28		36	0	80	4.7	381	7.2
Mar. 18	52.9	8.8	.16	16	3.2	71		103	9.1	81		.2		240	.33		53	0	75	4.3	446	7.1
Apr. 27	227	10	.21	16	3.3	63		70	5.2	90		.2		222	.30		53	0	72	3.7	428	7.1
May 19	1,140	8.0	.30	9.3	2.2	33		51	6.8	39		.2		124	.17		32	0	69	2.5	225	6.8
June 15	28.6	13	.87	10	2.9	24		17	2.8	50		.8		112	.15		37	23	58	1.7	205	6.4
July 9	1.22	14	.24	15	4.6	38		37	2.9	75		1.0		169	.23		56	26	60	2.2	305	7.4
Aug. 18	.13	8.8	.02	19	7.0	45		29	2.7	104		.2		a 237	.32		76	52	56	2.2	405	6.6
Sept. 21	.12	9.6	.02	26	11	65		19	2.7	165		.2		289	.39		110	94	56	2.7	585	6.6

a Residue on evaporation at 180°C.

SALINE BAYOU NEAR CLARENCE, LA.

LOCATION.--At gaging station at bridge on U. S. Highway 84, 1.8 miles downstream from Bayou Bourbeaux, 4.0 miles downstream from Saline Lake conservation dam, 4.6 miles east of Clarence, Natchitoches Parish, and 6.7 miles upstream from mouth.
DRAINAGE AREA.--1,382 square miles.
RECORDS AVAILABLE.--Chemical analyses: February 1953 to March 1954.
Water temperatures: February 1953 to March 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 1,300 ppm Nov. 8-19; minimum, 37 ppm May 15-22, 24-31.
Hardness: Maximum, 178 ppm Nov. 8-19; minimum, 12 ppm May 15-22, 24-31.
Specific conductance: Maximum daily, 2,700 micromhos Nov. 16-19; minimum daily, 35.3 micromhos Apr. 29.
Water temperatures: Maximum observed, 89°F on several days during August; minimum observed, 45°F Dec. 18.
REMARKS.--Values reported for dissolved solids concentrations less than 1,000 ppm are residues on evaporation and for concentrations more than 1,000 ppm are sums of determined constituents. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, October 1953 to March 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-20, 1953	10.2	14	0.06	26	11	262		103	7.4	415		3.2		807	1.10	22.2	110	26	84	11	1,470	7.6
Oct. 21-31	13.6	14	.08	31	13	312		122	8.2	495		3.5		964	1.31	35.4	131	31	84	12	1,740	7.7
Nov. 1-7	16.4	15	.05	30	14	316		122	7.2	502		4.2		962	1.31	42.6	132	32	84	12	1,800	7.4
Nov. 8-19	11.0	13	.03	40	19	437		157	10	698		4.5		a1,300	1.77	38.6	178	50	84	14	2,440	7.6
Nov. 20-30	70.7	6.2	.15	8.6	4.6	57		36	2.9	92		1.2		201	.27	38.4	40	11	75	3.9	383	6.9
Dec. 1-9	767	6.8	.32	5.3	2.8	30		19	3.0	50		1.5		139	.19	288	25	9	73	2.6	211	6.7
Dec. 10-31	1,241	9.8	.18	4.6	2.1	18		20	2.6	28		.8		94	.13	315	20	4	66	1.7	135	7.2
Jan. 1-10, 1954	646	10	.08	5.2	2.8	18		25	4.9	26		1.8		109	.15	190	24	4	62	1.6	146	7.3
Jan. 11-31	1,229	9.6	.13	4.0	2.1	15		14	4.5	24		1.2		89	.12	295	19	7	63	1.5	118	7.0
Feb. 1-28	936	9.6	.16	5.4	2.4	21		16	6.7	34		1.5		106	.14	268	23	10	66	1.9	165	7.0
Mar. 1-17	622	10	.20	4.3	2.3	23		11	6.7	38		1.2		114	.16	191	20	11	71	2.2	169	6.8
Mar. 18-22	155	9.4	.18	5.4	3.2	34		18	6.4	56		1.2		150	.20	62.8	27	12	74	2.9	240	6.9

a Sum of determined constituents.

RED RIVER BASIN--*Continued*

SALINE BAYOU NEAR CLARENCE, LA.--Continued

Temperature (°F) of water, October 1953 to March 1954

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1	78	62	58	52	56	60	16	72	55	49	53	--	57
2	78	61	56	53	57	58	17	72	60	50	--	--	60
3	78	62	60	53	57	59	18	72	62	45	--	--	59
4	78	60	60	53	56	57	19	73	64	47	51	63	60
5	78	62	59	51	58	58	20	73	55	50	48	63	60
6	76	50	54	51	59	--	21	73	54	48	47	62	65
7	74	52	52	53	57	55	22	73	50	48	48	63	67
8	73	52	51	52	54	56	23	73	55	47	54	60	--
9	72	--	49	52	58	58	24	72	55	47	54	62	--
10	74	64	50	51	--	59	25	62	53	48	53	61	--
11	74	51	52	51	--	64	26	71	52	48	54	62	--
12	74	55	51	49	--	60	27	61	54	48	57	61	--
13	73	50	50	47	--	--	28	62	55	48	52	60	--
14	72	52	49	50	--	59	29	63	55	48	53	--	--
15	71	52	49	54	--	59	30	63	58	--	54	--	--
							31	62	--	50	51	--	--
Average								72	56	51	52	--	--

RED RIVER AT ALEXANDRIA, LA.

LOCATION.--At gaging station at old bridge on U. S. Highway 165 between Alexandria, Rapides Parish, and Pineville, 1.7 miles downstream from Bayou Rigolette.
DRAINAGE AREA.--67,500 square miles, of which 5,936 square miles above Denison Dam is noncontributing.
RECORDS AVAILABLE.--Chemical analyses: October 1952 to September 1954.
Water temperatures: October 1952 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 846 ppm Oct. 21-31; minimum, 164 ppm Feb. 1-10.
Hardness: Maximum, 360 ppm Oct. 21-31; minimum, 76 ppm Feb. 1-10.
Specific conductance: Maximum daily, 1,510 micromhos Oct. 24; minimum daily, 232 micromhos May 12.
Water temperatures: Maximum observed, 92°F July 15, 16; minimum observed, 45°F Dec. 25.
EXTREMES, 1952-54.--Dissolved solids: Maximum, 846 ppm Oct. 21-31, 1953; minimum, 91 ppm June 1-9, 1953.
Hardness: Maximum, 365 ppm Nov. 1-10, 1952; minimum, 57 ppm June 1-9, 1953.
Specific conductance: Maximum daily, 1,510 micromhos Oct. 24, 1953; minimum daily, 133 micromhos June 2, 4, 1953.
Water temperatures: Maximum observed, 92°F July 15, 16, 1954; minimum observed, 45°F Dec. 25, 1953.
REMARKS.--Values reported for dissolved solids are residues on evaporation unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-6, 1953	4,320	13	--	78	21	111		a240		87	165		1.8		605	0.82	7,060	281	84	46	2.9	1,030	8.6
Oct. 7-20	4,420	18	0.03	92	28	158		215		149	252		2.5		834	1.13	9,950	344	168	50	3.7	1,420	8.2
Oct. 21-31	3,810	17	.03	98	28	158		243		148	248		2.0		846	1.15	8,700	360	161	49	3.6	1,440	8.1
Nov. 1-10	3,950	12	.02	98	26	148		262		134	225		1.2		799	1.09	8,520	352	137	48	3.4	1,330	7.8
Nov. 11-21	3,700	14	.02	97	28	152		242		145	240		.5		844	1.15	8,430	357	158	48	3.5	1,390	8.1
Nov. 22-30, Dec. 1-3	3,860	13	.01	84	23	124		252		91	192		.8		684	.93	7,130	304	98	47	3.0	1,170	8.1
Dec. 4-10	8,760	10	.08	54	15	92		144		72	142		2.2		482	.66	11,400	196	78	50	2.8	817	7.8
Dec. 11-20	11,030	12	.04	48	14	108		123		63	173		1.2		506	.69	15,070	178	76	57	3.5	868	7.8
Dec. 21-31	11,880	11	.16	34	9.8	66		87		48	104		1.2		339	.46	10,870	126	54	53	2.6	573	7.6
Jan. 1-10, 1954	8,600	13	--	42	12	81		107		60	127		1.0		406	.55	9,430	154	67	53	2.8	691	7.7
Jan. 11-20	11,150	13	--	45	13	84		118		63	132		1.0		444	.60	13,370	166	70	52	2.8	725	7.6
Jan. 21-26	31,700	14	.04	33	7.5	59		85		38	93		1.2		306	.42	26,190	113	44	53	2.4	528	7.9
Jan. 27-31	42,240	12	.04	26	4.8	28		77		19	43		1.5		205	.28	23,380	85	22	42	1.3	314	7.9
Feb. 1-10	33,430	13	.04	23	4.6	27		69		21	40		1.0		b164	.22	14,800	76	20	44	1.4	299	7.7
Feb. 11-16, 26-28	20,810	14	.06	28	5.8	40		75		32	60		1.0		b218	.30	12,250	94	32	48	1.8	397	7.5
Feb. 17-25	19,030	16	.04	35	7.7	59		90		49	86		.5		310	.42	15,930	119	46	52	2.3	531	7.8
Mar. 1-11	15,470	16	.08	28	6.2	44		77		33	66		.5		260	.35	10,860	95	32	50	2.0	421	7.9
Mar. 12-20	10,200	17	.03	40	8.8	63		111		47	95		.2		346	.47	9,530	136	45	50	2.4	582	8.0
Mar. 21-31	8,080	17	.05	54	13	91		139		73	138		1.0		470	.64	10,250	188	74	51	2.9	803	8.2

a Includes equivalent of 11 parts per million carbonate (CO_3).
b Sum of determined constituents.

RED RIVER BASIN--Continued

RED RIVER AT ALEXANDRIA, LA.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Apr. 1-10, 1954	7,250	14	0.03	60	16	106		148		88	165		0.5		542	0.74	10,610	216	94	52	3.1	922	8.2
Apr. 11-18	10,130	13	.04	55	15	99		139		79	154		.8		504	.69	13,780	198	84	52	3.1	861	8.2
Apr. 19-22	33,500	14	.05	35	8.4	59		92		44	90		1.8		308	.42	27,860	122	46	51	2.3	547	7.9
Apr. 23-30	24,640	15	.04	27	5.3	37		75		26	57		1.8		216	.29	14,370	89	28	48	1.7	374	7.7
May 1-5, 8-9	33,360	13	.08	28	5.6	37		79		28	55		1.2		217	.30	19,550	93	28	46	1.6	375	7.7
May 6-7, 22-31	56,820	13	.03	43	8.5	64		96		58	100		1.8		344	.47	52,770	142	64	49	2.3	608	7.8
May 10-21	77,350	13	.09	28	5.2	21		91		15	32		1.8		176	.24	36,760	91	17	33	1.0	289	7.8
June 1-10	47,130	20	.01	51	11	84		104		80	132		1.0		441	.60	56,120	172	87	52	2.8	770	7.9
June 11-20	26,890	21	.02	48	11	83		102		78	127		1.2		426	.58	30,930	165	82	52	2.8	748	8.0
June 21-30	17,240	18	.03	60	14	109		119		105	167		1.2		543	.74	25,280	207	110	53	3.3	945	8.1
July 1-10	9,100	14	.02	72	19	123		139		126	198		.5		632	.86	15,530	258	144	51	3.3	1,100	8.1
July 11-20	6,400	12	--	74	23	137		146		145	215		3.0		729	.99	12,590	279	160	52	3.5	1,210	7.9
July 21-31	6,500	12	--	76	24	140		151		147	222		2.5		754	1.03	13,230	288	164	51	3.6	1,240	7.9
Aug. 1-10	5,300	12	--	78	26	149		161		153	235		2.5		795	1.08	11,380	302	170	52	3.7	1,290	7.7
Aug. 11-20	4,370	12	.00	82	23	149		176		149	228		2.0		758	1.03	8,940	299	155	52	3.7	1,300	8.0
Aug. 21-31	4,060	11	.01	78	24	152		167		150	232		3.0		763	1.04	8,360	293	156	53	3.8	1,300	8.0
Sept. 1-10	3,780	12	.00	77	24	158		159		154	242		3.0		782	1.06	7,980	290	160	54	4.0	1,330	7.9
Sept. 11-20	2,920	12	.01	82	26	151		188		146	235		3.5		802	1.09	6,320	312	158	51	3.7	1,300	8.0
Sept. 21-30	3,180	12	.00	88	26	152		219		144	230		2.2		800	1.09	6,870	326	147	50	3.7	1,310	7.9
Average	16,190	14	0.04	57	16	97		140		86	151		1.5		516	0.70	--	208	94	50	2.9	872	--

RED RIVER BASIN--Continued

RED RIVER AT ALEXANDRIA, LA.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

OUACHITA RIVER AT ARKADELPHIA, ARK.

LOCATION.--At gaging station at bridge on State Highway 8, at Arkadelphia, Clark County, 800 feet upstream from Missouri Pacific Railway bridge.
DRAINAGE AREA.--2,311 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1948 to September 1954.
Water temperatures: October 1948 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 73 ppm Mar. 21-31, May 18-31; minimum, 43 ppm May 1, 3-6.
Hardness: Maximum, 37 ppm Mar. 21-31; minimum, 18 ppm Feb. 16-19.
Specific conductance: Maximum daily, 301 micromhos Sept. 27; minimum daily, 48.2 micromhos May 3.
Water temperatures: Maximum, 97°F July 6; minimum, 43°F Dec. 23-24.
EXTREMES, 1948-54.--Dissolved solids: Maximum, 114 ppm Oct. 1-5, 1952; minimum, 33 ppm Jan. 11-20, 1950, Sept. 28-30, 1951.
Hardness: Maximum, 52 ppm Oct. 1-5, 1952; minimum, 11 ppm Jan. 25-31, 1949.
Specific conductance: Maximum daily, 301 micromhos Sept. 27, 1954; minimum daily, 26.7 micromhos Jan. 27, 1949.
Water temperatures: Maximum, 97°F July 6, 1954; minimum, 36°F Jan. 30-31, Feb. 1-2, 1951.
REMARKS.--Records of specific conductance of daily samples available in district office at Fayetteville, Ark. Records of discharge for water year October 1953 to September 1954 furnished by District Office, Corps of Engineers, Vicksburg, Miss.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, magnesium	Noncarbonate			
Oct. 1-11, 1953	324	--	--	8.5	1.6	4.3	--	31	6.0	6.0	--	1.1	63	28	2	89.4	7.6	12
Oct. 12-20	620	--	--	8.0	1.7	3.6	--	32	2.8	4.5	--	1.0	60	27	1	78.8	7.2	12
Oct. 21-31	546	5.1	0.02	7.9	1.7	3.8	1.2	32	2.4	5.8	0.2	.8	55	27	1	78.3	7.3	8
Nov. 1-6	421	--	--	10	1.8	4.5	--	32	7.6	7.0	--	1.5	67	32	6	92.8	7.6	12
Nov. 7-10, 12	554	--	--	8.9	1.3	3.0	--	31	5.0	3.5	--	.8	58	28	2	73.2	7.5	12
Nov. 11, 13-20	513	--	--	9.2	1.7	3.4	--	33	5.0	5.0	--	1.4	62	30	3	81.2	7.5	12
Nov. 21-30	620	--	--	11	1.6	4.2	--	35	6.0	6.0	--	1.1	61	34	5	95.3	7.2	15
Dec. 1-10	983	--	--	9.0	2.4	4.5	--	28	6.8	7.0	--	1.3	59	32	9	98.9	7.6	8
Dec. 11-20	631	--	--	7.9	2.0	4.0	--	30	5.6	5.0	--	1.4	56	28	3	81.0	7.7	8
Dec. 21-31	640	--	--	7.9	2.2	3.9	--	30	5.2	5.5	--	1.1	52	29	4	78.8	7.4	10
Jan. 1-10, 1954	487	--	--	8.7	2.2	5.0	1.3	30	12	6.0	--	1.4	62	31	6	92.8	6.9	18
Jan. 11-20	3,290	2.6	.01	7.6	2.0	3.9	1.3	26	4.0	5.8	.1	1.4	49	27	6	75.0	7.4	10
Jan. 21-31	3,217	--	--	6.3	1.9	4.0	1.2	17	13	5.0	--	1.4	58	24	10	71.1	7.0	30
Feb. 1-10	1,220	--	--	6.6	1.8	4.0	1.1	23	6.8	5.2	--	1.6	53	24	5	72.6	7.0	12
Feb. 11-15	1,194	--	--	7.3	1.8	7.7		24	13	6.0	--	.9	58	26	6	82.5	7.0	10
Feb. 16-19	2,930	--	--	4.9	1.3	5.1		12	12	3.5	--	1.6	56	18	8	55.1	6.9	35
Feb. 20-28	1,909	--	--	7.0	1.2	4.0	1.1	22	8	5.5	--	.9	54	22	4	70.6	7.0	16
Mar. 1-10	1,038	--	--	7.2	2.0	4.9	1.1	26	10	6.5	--	.9	53	26	5	84.1	7.3	12
Mar. 11-20	581	--	--	9.0	2.4	6.1	1.2	37	8.8	5.5	--	.6	71	32	2	98.6	7.5	15
Mar. 21-31	789	--	--	9.4	3.4	6.2	1.1	38	12	5.0	--	.5	73	37	6	95.8	7.3	15

Apr. 1-10, 1954	552	1.8	.03	7.8	2.0	5.6	1.0	27	8.6	7.5	.1	0.8	58	28	6	94.3	7.5	10
Apr. 11-20	1,336	--	--	8.3	1.7	4.3	--	30	4.0	5.5	--	.2	54	28	3	85.2	7.4	18
Apr. 21-30	1,455	--	--	7.1	2.0	4.2	--	28	3.0	5.0	--	.1	50	26	3	77.0	7.4	18
May 1, 3-6	14,700	--	--	5.7	1.1	2.6	--	20	4.2	2.5	--	1.6	43	19	2	57.8	6.6	20
May 2, 7-17	3,776	--	--	7.7	1.7	4.8	--	26	5.4	6.5	--	1.6	54	26	5	82.8	6.8	10
May 18-31	1,294	3.0	.11	7.7	2.0	4.2	1.2	28	6.8	5.0	.4	1.6	73	27	4	82.2	7.2	10
June 1-9	658	--	--	8.2	1.7	5.2	--	30	5.6	6.0	--	1.4	57	27	3	86.1	7.1	5
June 10-20	406	4.6	.00	8.3	2.2	6.4	1.4	32	6.2	6.8	.3	.9	67	30	4	95.7	7.6	6
June 21-30	382	--	--	8.4	1.7	5.2	--	30	5.6	5.5	--	1.5	57	28	3	89.8	6.5	5
July 1-10	344	5.0	.02	8.7	1.9	6.2	1.3	31	7.6	7.0	.1	1.4	70	30	4	101	6.6	5
July 11-20	372	--	--	9.4	2.0	5.2	--	33	6.2	6.0	--	1.5	59	32	5	93.4	7.3	7
July 21-31	328	--	--	9.7	1.7	5.6	--	34	4.0	7.5	--	1.2	66	31	3	101	7.0	5
Aug. 1-10	278	5.3	.00	8.7	2.5	6.2	1.7	35	5.6	6.2	.3	1.0	70	32	3	99.1	7.2	5
Aug. 11-20	322	--	--	9.4	2.3	6.1	--	36	7.4	6.5	--	1.3	60	33	3	103	7.2	5
Aug. 21-31	262	--	--	8.9	2.8	6.0	--	36	8.4	7.0	--	1.4	56	34	4	102	7.5	5
Sept. 1-10	260	--	--	9.6	2.3	6.5	--	37	8.2	7.5	--	.9	69	33	3	104	7.4	5
Sept. 11-20	292	--	--	9.8	2.4	6.3	--	35	8.6	7.5	--	1.6	70	34	6	109	7.3	5
Sept. 21-30	478	--	--	9.4	2.6	5.0	--	36	5.6	6.5	--	1.8	58	34	5	97.5	6.7	5
Average	1,134	--	--	8.3	2.0	4.9	--	30	6.9	5.8	--	1.2	60	29	4	87.0	--	11

RED RIVER BASIN--Continued

OUACHITA RIVER AT ARKADELPHIA, ARK.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

LITTLE MISSOURI RIVER NEAR BOUGHTON, ARK.

LOCATION.--At gaging station at bridge on U. S. Highway 67, 2 miles northeast of Boughton, Nevada County, and 8.7 miles downstream from Antoine Creek.
DRAINAGE AREA.--1,070 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1954.
Water temperatures: October 1947 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 121 ppm Feb. 14-23; minimum, 42 ppm July 1-31, Aug. 2-10, 12-17, 19-21, 23-28, 30-31.
Hardness: Maximum, 70 ppm Feb. 14-23; minimum, 16 ppm July 1-31, Aug. 2-10, 12-17, 19-21, 23-28, 30-31.
Specific conductance: Maximum daily, 199 micromhos Nov. 18; minimum daily, 38.1 micromhos July 16.
Water temperatures: Maximum, 82°F July 21-22, 24, Aug. 5; minimum, 40°F Jan. 13.
EXTREMES, 1947-54.--Dissolved solids: Maximum, 121 ppm Feb. 14-23, 1954; minimum, 25 ppm Feb. 2-3, 5, 9-11, 1950, Sept. 11-20, 1952.
Hardness: Maximum, 96 ppm June 6-8, 1951; minimum, 12 ppm June 1-6, Aug. 6-10, 11-20, Sept. 1-10, 21-30, 1953.
Specific conductance: Maximum daily, 334 micromhos Aug. 1, 1953; minimum daily, 30.5 micromhos June 5, 1953.
Water temperatures: Maximum, 94°F July 29,1948; minimum, not determined.
REMARKS.--Records of specific conductance of daily samples available in district office at Fayetteville, Ark. Records of discharge for water year October 1953 to September 1954 furnished by District Office, Corps of Engineers, Vicksburg, Miss.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Specific conductance (micromhos at 25°C)	pH	Color
Oct. 1-31, 1953	185	3.9	0.12	5.1	1.0	5.6	1.4	22	2.8	8.0	0.1	0.8	49	17	0	68.2	7.2	18
Nov. 1-30	73.3	3.2	.13	5.6	.9	4.7	1.3	25	1.2	5.5	.2	.8	50	18	0	66.2	7.4	12
Dec. 1-31	118	6.5	.01	5.2	1.0	4.0	1.2	21	1.8	4.5	.0	2.1	46	17	0	59.9	7.3	20
Jan. 1-7, 11-12, 19-31, 1954	1,035	6.2	.24	8.3	.8	4.0	1.2	26	6.6	4.5	.3	1.5	66	24	3	76.1	6.7	22
Jan. 8-10, 13-18	953	6.6	.19	16	.9	5.6	1.5	45	7.8	7.0	.3	1.5	97	44	7	124	7.5	20
Feb. 1-13	447	8.8	.25	7.7	1.5	4.0	.9	24	8.0	4.5	.3	1.3	64	25	6	75.9	6.8	28
Feb. 14-23	995	6.4	.19	26	1.3	5.0	1.5	75	10	5.5	.3	2.6	121	70	9	168	7.4	45
Feb. 24-28	409	6.9	.37	12	1.4	4.4	1.1	38	7.8	6.0	.3	1.4	88	36	5	99.9	7.2	40
Mar. 1-31	209	3.1	.25	12	1.1	4.6	.9	37	6.4	4.8	.3	1.3	71	34	4	97.2	7.1	26
Apr. 1-30, May 1-2	1,010	3.6	.26	8.9	3.7	4.5	1.3	41	5.8	5.2	.1	4.1	78	37	4	98.0	7.1	40
May 3-6	7,438	--	--	8.8	1.0	2.3	--	27	4.4	2.0	--	1.8	61	26	4	65.4	6.7	40
May 7-13	1,092	7.8	.41	8.4	2.0	3.2	1.0	30	3.8	4.2	.5	1.0	68	29	5	82.3	7.4	25
May 14-18	1,223	5.9	.26	19	2.6	4.6	1.2	63	9.4	6.0	.5	1.1	105	58	6	146	8.0	35
May 19-31	444	5.9	.41	11	1.6	4.4	1.0	37	6.2	5.8	.4	1.4	68	34	4	97.7	7.6	35
June 1-8	317	5.9	.12	9.8	1.6	4.8	1.2	29	7.4	5.2	.5	3.9	67	31	7	96.3	6.7	10
June 9-30	326	3.0	.03	5.7	1.0	3.0	.8	23	2.4	1.5	.5	1.4	45	18	0	52.8	6.8	10
July 1-31	334	4.4	.03	4.4	1.3	2.8	.9	20	2.4	2.2	.3	1.4	42	16	0	46.8	6.9	10
Aug. 1, 11, 18, 22, 29	465	--	--	5.4	1.5	7.7	--	18	6.0	11	--	1.2	52	20	5	82.8	7.3	6
Aug. 2-10, 12-17, 19-21, 23-28, 30-31	372	4.0	.05	4.7	1.0	2.9	.8	20	1.8	3.2	.3	1.3	42	16	0	46.7	7.3	10
Sept. 1-30	170	5.3	.08	4.7	1.3	3.1	1.2	22	3.0	3.0	.3	1.2	44	17	0	49.5	7.2	10
Average	510	5.4	0.19	9.4	1.4	4.3	1.1	32	5.2	5.0	0.3	1.7	66	29	3	85.0	--	23

RED RIVER BASIN--Continued

LITTLE MISSOURI RIVER NEAR BOUGHTON, ARK.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

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SMACKOVER CREEK NEAR NORPHLET, ARK.

LOCATION.--On county road, 3½ miles north of Norphlet, Union County.
RECORDS AVAILABLE.--Chemical analyses: October 1952 to September 1954.
Water temperatures: October 1952 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 73,000 ppm Sept. 1-4; minimum, 888 ppm Apr. 1-3, 5-7, 9.
Hardness: Maximum, 13,200 ppm Sept. 1-4; minimum, 142 ppm May 1-7.
Specific conductance: Maximum daily, 96,400 micromhos Sept. 4; minimum daily, 731 micromhos Sept. 6.
Water temperatures: Maximum, 102°F July 18, 24, 26, Aug. 17; minimum, 39°F Jan. 22-23.
EXTREMES, 1952-54.--Dissolved solids: Maximum, 73,000 ppm Sept. 1-4, 1954; minimum, 285 ppm May 1-2, 1953.
Hardness: Maximum, 13,200 ppm Sept. 1-4, 1954; minimum, 44 ppm May 1-2, 1953.
Specific conductance: Maximum daily, 96,400 micromhos Sept. 4, 1954; minimum daily, 396 micromhos May 2, 1953.
Water temperatures: Maximum, 102°F July 18, 24, 26, Aug. 17, 1954; minimum, 39°F Jan. 22-23, 1954.
REMARKS.--Records of specific conductance of daily samples available in district office at Fayetteville, Ark. No discharge records available for this station.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH
														Calcium, magnesium	Noncarbonate		
Oct. 1-10, 1953				2,550	774	15,700	210	67	1.0	30,800			54,400	9,540	9,490	71,100	6.7
Oct. 11-14				2,900	669	15,800	208	66	1.0	31,000			55,700	9,990	9,930	71,900	7.2
Oct. 16-20				2,850	610	15,500	203	68	1.0	30,500			53,900	9,620	9,560	70,600	7.3
Oct. 21-25				2,820	710	15,600	203	62	1.0	30,700			54,700	9,960	9,900	70,800	7.3
Oct. 26-27				1,700	398	9,590	114	26	1.0	18,800			33,800	5,880	5,860	47,700	7.2
Oct. 28-31				1,840	451	10,200	124	54	2.0	20,100			35,800	6,450	6,400	49,500	7.2
Nov. 1				1,370	287	7,210	89	30	2.0	14,500			25,600	4,600	4,570	36,300	7.0
Nov. 2-10				1,810	410	10,400	128	50	1.0	20,000			36,700	6,200	6,160	50,100	7.4
Nov. 11-20				1,830	427	10,100	123	53	2.0	19,900			35,700	6,320	6,280	48,900	7.4
Nov. 25, 27, 29-30				1,220	290	6,340	89	26	3.0	13,000			22,700	4,240	4,220	34,800	7.2
Nov. 26, 28				846	219	4,610	58	20	2.0	9,160			15,900	3,010	3,000	24,800	6.6
Dec. 1				943	224	4,860	64	24	3.0	9,840			17,000	3,270	3,250	26,200	7.0
Dec. 2-5, 8				532	128	2,940	36	2	2.0	5,960			10,200	1,850	1,850	16,600	4.7
Dec. 6-7				307	138	2,000	25	0	3.0	3,970			6,960	1,330	1,330	11,700	4.41
Dec. 9-15				700	174	3,430	47	1	18	6,940			11,900	2,460	2,460	17,800	5.4
Dec. 16-18				622	163	3,510	45	20	12	6,890			13,800	2,220	2,210	20,300	6.6
Dec. 19-26, 28				843	294	5,440	70	22	4.0	10,600			17,800	3,310	3,290	28,000	6.6
Dec. 27, 29				433	154	2,660	34	4	5.0	5,270			8,860	1,710	1,710	15,000	5.3
Dec. 30-31				797	134	4,540	55	17	5.0	8,730			14,900	2,540	2,530	23,100	6.6
Jan. 1, 1954				438	187	2,940	37	3	5.0	5,960			9,640	1,860	1,860	16,200	5.2
Jan. 2-5, 7-8				793	160	4,650	56	4	3.0	8,950			15,100	2,640	2,630	24,300	5.0
Jan. 9-10				278	79	1,640	--	0	5.0	3,250			5,840	1,020	1,020	9,580	4.35
Jan. 11, 13, 20				770	237	4,240	58	6	9.0	8,700			15,200	2,900	2,890	22,600	5.6
Jan. 12, 15-16				251	74	1,410	19	2	10	2,830			5,190	931	930	8,160	4.8
Jan. 14				388	85	2,090	27	2	10	4,180			7,440	1,320	1,320	11,900	4.9

RED RIVER BASIN--Continued

SMACKOVER CREEK NEAR NORPHLET, ARK.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH
														Calcium, magnesium	Noncarbonate		
Jan. 17-19, 1954				102	31	520	9.8	3	9.0	1,100			1,970	382	380	3,450	4.8
Jan. 21, 24				79	26	432	9.2	10	12	875			1,650	304	296	2,730	6.5
Jan. 22, 26				233	67	1,220	18	3	11	2,570			4,590	857	854	7,130	5.6
Jan. 23, 25, 27, 29				294	88	1,690	22	7	15	3,380			6,000	1,100	1,090	9,270	5.8
Jan. 28, 30-31				159	32	800	12	3	10	1,610			2,850	528	526	4,690	5.3
Feb. 2, 4-5, 7-10				327	69	1,630	22	6	12	3,320			6,020	1,100	1,090	9,240	6.0
Feb. 3, 6				151	25	667	11	8	11	1,400			2,580	480	474	4,280	6.0
Feb. 11, 14-15, 17				191	64	1,120	16	1	7.0	2,340			4,010	740	738	7,090	4.6
Feb. 12-13, 16				302	98	1,830	24	1	5.0	3,710			6,880	1,180	1,160	11,000	4.8
Feb. 18-28				333	113	2,090	27	5	4.0	4,170			7,700	1,300	1,290	11,800	5.3
Mar. 1-5				369	88	2,020	24	3	3.0	4,090			7,330	1,280	1,280	12,300	5.8
Mar. 6-18				569	149	3,080	37	2	7.0	6,270			11,400	2,030	2,030	18,400	5.0
Mar. 19-31				557	151	3,130	38	2	3.0	6,320			11,300	2,010	2,010	18,300	5.1
Apr. 1-3, 5-7, 9				41	11	234	4.4	4	2.0	455			888	148	144	1,710	5.6
Apr. 4, 8, 11, 14				97	19	503	6.5	1	2.0	980			1,860	320	319	3,240	4.8
Apr. 12-13, 15-16, 19-20				41	11	225	3.8	3	2.0	455			901	148	145	1,560	5.6
Apr. 17-18, 22, 25-26, 28, 30				87	24	494	6.1	3	3.0	970			1,880	316	313	3,240	5.2
Apr. 21, 23-24, 27, 29				41	11	220	3.9	3	2.0	442			929	148	145	1,560	5.3
May 1-7				39	11	210	3.8	4	2.0	425			907	142	139	1,470	5.9
May 10-12				98	28	545	8.9	3	4.0	1,120			2,250	360	357	3,650	5.7
May 13, 17, 20				83	24	460	5.8	3	3.0	940			1,760	306	303	3,150	5.1
May 14-16				61	15	321	4.4	3	4.0	630			1,250	214	211	2,180	5.4
May 18, 23, 28				208	48	1,060	13	3	2.0	2,200			4,020	716	714	6,910	5.5
May 19, 21				125	32	692	9.7	5	4.0	1,420			2,670	444	440	4,510	6.0
May 24, 29-30				281	73	1,500	19	3	3.0	3,150			5,810	1,000	998	9,580	5.4
May 25-27, 31				346	92	1,950	29	0	17	3,920			6,970	1,240	1,240	11,600	4.5
June 1-4				654	184	3,650	47	4	5.0	7,490			13,400	2,390	2,380	20,700	5.2
June 5-6				782	188	4,180	62	2	4.0	8,560			15,500	2,720	2,720	23,800	5.3
June 7-8, 10				989	188	5,100	74	2	4.0	10,300			18,100	3,240	3,240	28,100	4.9
June 9, 11				1,030	286	5,870	88	16	10	11,900			21,200	3,750	3,730	32,300	6.3
June 12				216	68	1,240	21	0	5.0	2,540			4,510	818	818	7,610	4.20

June 13-17, 19-21, 1954				1,450	359	7,940	107	28	4.0	16,000			28,700	5,090	5,070	42,200	7.0
June 22-23				1,050	173	5,490	80	3	4.0	10,900			19,200	3,330	3,330	29,500	5.1
June 24-25				1,240	336	7,160	36	5	3.0	14,300			25,100	4,480	4,470	37,700	5.5
June 26-28				1,610	391	8,920	132	2	3.0	17,700			31,400	5,620	5,620	46,000	4.9
June 29-30				1,930	500	10,900	155	42	6.0	21,800			38,500	6,870	6,840	54,800	7.4
July 1, 4				2,040	434	11,700	170	37	7.0	23,500			41,400	6,870	6,840	58,500	7.0
July 3, 10				1,680	444	9,700	130	11	5.0	19,300			33,900	6,020	6,010	49,100	6.7
July 5-9				2,450	544	12,700	187	11	2.0	26,100			46,600	8,350	8,340	64,200	5.6
July 11-13, 20				2,350	598	13,300	182	3	1.0	26,500			47,600	8,320	8,320	64,800	5.5
July 14-15				2,620	643	14,500	208	10	1.0	29,300			52,000	9,180	9,170	70,400	5.7
July 16-18				2,800	759	16,200	208	4	1.0	32,000			57,900	10,100	10,100	76,800	5.2
July 19, 30				1,940	527	11,700	156	14	2.0	22,000			40,500	7,010	7,000	57,700	6.1
July 21, 26-27, 31				2,410	695	13,900	197	3	2.0	27,500			49,100	8,870	8,870	67,000	5.3
July 22-25, 28-29				2,680	656	14,900	218	6	1.0	29,800			53,300	9,380	9,380	72,200	5.4
Aug. 1-4				2,880	636	15,800	215	57	1.0	31,800			53,800	9,800	9,750	77,700	7.3
Aug. 5-10				3,360	687	18,000	251	73	1.0	36,000			61,500	11,200	11,100	86,200	7.0
Aug. 11-19				3,540	839	19,600	257	80	1.0	39,700			67,700	12,300	12,200	93,700	6.8
Aug. 21-31				3,570	956	20,200	261	81	2.0	40,500			70,100	12,800	12,800	88,400	6.6
Sept. 1-4				3,730	955	21,100	268	52	1.0	41,400			73,000	13,200	13,200	92,000	6.7
Sept. 7, 12-13				3,080	880	18,000	222	65	1.0	35,300			62,100	11,300	11,200	86,600	7.0
Sept. 10-11				1,990	615	12,000	165	82	10	23,400			41,100	7,490	7,430	56,300	6.6
Sept. 14-27				3,360	931	19,300	257	54	1.0	38,200			66,300	12,200	12,200	84,400	6.7
Sept. 28-30				2,140	638	12,500	156	31	2.0	24,800			42,300	7,960	7,940	57,900	6.2
Average				1,200	304	6,730	89	19	4.6	13,400			23,600	4,240	4,230	33,300	--

RED RIVER BASIN--Continued

SMACKOVER CREEK NEAR NORPHLET, ARK.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

OUACHITA RIVER AT CALION, ARK.

LOCATION.--At Rock Island and Pacific Railway bridge in Calion, Union County.
DRAINAGE AREA.--Indeterminate.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1954.
Water temperatures: October 1949 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 9,310 ppm Aug. 6; minimum, 120 ppm Sept. 10.
Hardness: Maximum, 1,520 ppm Aug. 6; minimum, 27 ppm Oct. 11-14.
Specific conductance: Maximum daily, 13,600 micromhos Aug. 6; minimum daily, 165 micromhos Oct. 11.
Water temperatures: Maximum, 94°F on several days during July; minimum, 45°F on several days during December and January.
EXTREMES, 1949-54.--Dissolved solids: Maximum, 9,310 ppm Aug. 6, 1954; minimum, 61 ppm Dec. 7-10, 1952.
Hardness: Maximum, 1,770 ppm Oct. 23, 1952; minimum, 20 ppm May 3, 1950.
Specific conductance: Maximum daily, 14,900 micromhos Oct. 23, 1952; minimum daily, 46.4 micromhos May 18, 1953.
Water temperatures: Maximum, 95°F Aug. 8, 1953; minimum, not determined.
REMARKS.--Once-daily sampling near surface. Records of specific conductance of daily samples available in district office at Fayetteville, Ark.
No discharge records available for this station.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, magnesium	Noncarbonate			
Oct. 1-2, 10, 1953		--	--	12	3.0	35	--	29	11	60	--	2.0	152	42	19	273	6.7	10
Oct. 3, 8-9		5.7	0.13	15	3.6	58	2.5	25	4.8	109	0.3	1.0	242	52	32	440	6.6	12
Oct. 4-7, 27		5.4	.11	21	4.6	93	2.4	25	7.0	177	.2	1.6	360	72	51	665	6.8	12
Oct. 11-14		4.8	.17	7.7	2.0	23	1.4	23	4.0	38	.2	.9	108	27	9	194	7.1	15
Oct. 15-23		6.6	.10	15	3.5	55	2.2	24	5.2	104	.2	1.2	230	52	32	412	7.1	15
Oct. 24-26, 28-31		5.0	.07	16	3.5	53	2.2	30	8.8	101	.1	1.2	242	54	30	410	6.6	10
Nov. 1-9		5.3	.02	14	3.0	39	1.6	32	6.0	72	.2	.2	176	47	21	317	7.5	12
Nov. 10, 22-25		4.5	.00	32	6.6	132	2.9	29	7.2	250	.2	2.5	509	107	83	916	6.9	8
Nov. 11-18, 21, 30		6.2	.13	15	3.3	46	1.7	37	6.8	82	.3	1.1	202	51	21	363	7.7	15
Nov. 19-20		--	--	24	6.1	99	--	35	6.0	187	--	2.5	396	85	56	688	7.6	15
Nov. 26-29		4.8	.00	24	4.9	83	2.3	35	7.8	160	.1	1.2	350	80	52	639	7.1	10
Dec. 1-3		5.8	.27	19	4.1	57	2.0	36	6.4	108	.1	.7	240	64	35	458	7.5	10
Dec. 4-7		6.0	.04	57	13	284	4.8	23	10	545	.1	3.6	1,030	196	176	1,870	7.0	10
Dec. 8-9		5.3	.04	41	9.8	192	3.8	27	9.6	375	.2	3.2	720	143	121	1,370	7.1	10
Dec. 10-13		4.0	.07	31	6.8	140	3.0	24	7.8	270	.1	2.9	534	106	86	982	7.0	10
Dec. 14-20		5.7	.07	23	5.3	96	2.6	25	7.6	178	.1	1.7	370	80	59	710	7.2	15
Dec. 21-22, 29		6.5	.01	26	6.9	114	3.0	25	18	215	.0	4.6	446	94	73	789	7.3	19
Dec. 23-28		6.5	.08	20	4.6	83	2.2	23	17	153	.0	4.4	334	69	50	574	7.3	18
Dec. 30-31		8.3	.03	33	11	155	3.1	13	15	298	.0	10	700	128	117	1,020	6.7	20

RED RIVER BASIN--Continued

OUACHITA RIVER AT CALION, ARK.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, magnesium	Noncarbonate			
Jan. 1, 10-11, 1954		5.9	0.16	28	6.8	131	3.1	21	13	252	0.0	5.3	578	98	81	947	7.0	16
Jan. 2-4		5.9	.08	22	4.2	93	2.1	21	13	180	.0	4.1	441	72	56	633	7.3	12
Jan. 5-9		4.1	.26	15	3.7	56	1.9	29	11	104	.0	1.2	242	53	29	405	7.4	22
Jan. 12-16		5.7	.10	36	10	175	3.5	16	12	350	.0	3.4	746	131	118	1,170	7.0	20
Jan. 17-21, 29		3.3	.20	15	3.0	54	2.4	16	13	105	.1	1.5	247	50	37	394	7.2	50
Jan. 22-24, 27-28,30-31		5.2	.10	21	4.9	88	2.7	12	11	174	.1	5.6	368	72	62	612	6.7	45
Jan. 25-26		6.5	.46	27	7.7	130	3.2	2	20	250	--	12	526	99	98	882	5.1	35
Feb. 1-6		6.8	.15	27	5.6	110	3.1	12	16	210	.1	.9	454	90	80	744	6.6	45
Feb. 7-16, 20		6.8	.15	35	11	176	3.5	12	6.4	358	.2	4.4	746	132	122	1,230	6.8	18
Feb. 17		--	--	55	14	287	--	5	8.8	570	--	7.6	1,050	194	190	1,890	6.0	13
Feb. 18		--	--	23	8.4	114	--	14	7.2	220	--	2.1	458	92	80	794	6.6	10
Feb. 19, 21-23		4.2	.16	17	6.0	73	2.5	11	11	144	--	3.3	322	67	58	547	6.8	38
Feb. 24-27		6.2	.27	21	5.2	85	2.3	17	6.6	171	.2	2.1	380	74	60	637	6.8	38
Feb. 28		--	--	27	10	146	--	16	6.4	285	--	4.0	576	108	96	994	6.9	30
Mar. 1-4		6.4	.24	33	8.8	156	3.2	16	4.6	312	.2	6.1	683	118	106	1,100	6.8	35
Mar. 5-6		5.1	.27	43	12	216	3.8	6	9.0	435	.1	7.7	875	157	152	1,490	5.9	25
Mar. 7-10		4.2	.19	31	9.4	150	2.9	14	9.0	308	.1	4.0	633	116	104	1,060	6.9	20
Mar. 11-16		4.1	.04	29	5.6	128	2.6	15	2.8	245	.3	4.9	524	96	83	894	7.0	10
Mar. 17-20		3.0	.01	23	5.5	96	2.2	21	9.8	180	.3	3.7	413	80	63	674	7.1	15
Mar. 21-23		3.7	.05	55	12	267	4.4	10	10	520	.3	7.1	1,090	186	178	1,760	6.6	15
Mar. 24-30		3.0	.04	45	10	210	3.9	5	13	415	.3	6.9	822	154	150	1,440	6.5	17
Mar. 31, Apr. 1-6		3.6	.09	34	8.0	153	3.2	15	12	300	.3	4.7	626	118	106	1,060	6.9	20
Apr. 7-10		3.1	.08	27	5.7	107	2.8	20	8.8	206	.4	3.6	455	91	74	748	7.1	20
Apr. 11-13		2.4	.17	85	21	463	6.7	2	26	890	.4	14	1,910	298	297	2,900	5.0	18
Apr. 14-15		3.8	.16	52	14	271	4.2	4	19	525	.5	12	1,150	188	184	1,800	5.4	15
Apr. 16-17		2.4	.12	30	8.2	149	3.1	18	18	290	.4	3.8	659	108	94	1,030	6.8	15
Apr. 18-21		6.6	.28	21	4.3	73	2.2	27	14	138	.6	3.8	380	70	48	539	7.6	50
Apr. 22-24		5.6	.32	25	6.1	104	2.7	23	14	199	.5	5.1	511	88	68	736	7.3	45
Apr. 25-26		7.1	.34	41	10	213	3.8	18	15	408	.6	6.3	931	144	128	1,400	7.2	50
Apr. 27-30		6.5	.29	32	8.6	155	2.8	18	15	298	.5	6.5	710	116	100	1,050	7.3	40
May 1		3.8	.73	22	5.1	96	2.2	16	13	185	.5	6.2	486	76	63	677	7.1	40
May 2-3, 6-10		6.2	.30	17	4.0	69	2.5	12	11	135	.6	4.6	360	59	49	507	6.9	50
May 4-5		5.9	.35	9.6	3.0	34	2.1	12	5.8	65	.6	4.4	198	36	26	270	7.0	60
May 11-12, 15-18		12	.04	23	5.2	98	2.5	20	6.2	185	.1	1.4	437	79	62	696	6.2	10

May 13-14, 1954	7.8	.04	46	13	247	3.8	0	10	475	.1	11	1,030	168	168	1,630	4.5	10
May 19-20	15	.03	36	3.6	160	3.2	32	8.8	312	.1	3.3	722	126	100	1,130	6.6	15
May 21-27, 31	5.8	.14	31	6.4	129	2.7	16	9.0	250	.2	5.6	563	104	91	903	6.5	15
May 28	--	--	47	11	227	--	20	15	440	--	3.2	900	162	146	1,530	7.2	12
May 29	--	--	65	14	319	--	12	18	632	--	9.4	1,270	220	210	2,130	6.6	6
May 30	--	--	29	5.9	112	--	22	16	220	--	5.9	470	97	79	802	7.0	22
June 1-7	5.7	.06	27	5.9	111	2.4	28	9.0	212	.2	4.3	485	92	69	783	6.8	18
June 8-12	6.2	.17	16	3.5	45	1.1	30	8.2	84	.2	1.5	234	54	30	361	7.7	22
June 13-19	5.8	.29	12	2.4	26	1.4	32	6.6	44	.1	2.4	148	39	14	231	7.2	22
June 20-22	4.8	.05	22	4.6	88	2.3	34	9.2	160	.2	2.0	381	74	46	623	7.2	18
June 23, 27-30	4.2	.04	17	4.2	63	2.1	34	9.4	115	.1	1.2	289	60	32	470	7.2	20
June 24-26	5.4	.12	14	3.1	43	1.7	35	12	74	.2	1.9	205	48	19	332	7.8	20
July 1	--	--	19	4.6	73	--	32	8.6	130	--	1.0	304	66	40	505	7.1	5
July 2-10	5.9	.12	13	2.9	41	1.8	30	7.8	70	.2	1.2	198	44	20	313	7.4	20
July 11-17	7.1	.09	12	3.0	36	1.7	30	7.2	62	.2	1.8	175	42	18	281	7.3	15
July 18-19	5.3	.08	17	3.7	60	1.9	32	7.4	110	.2	.9	296	58	31	444	7.2	15
July 20	--	--	31	6.8	148	--	32	12	268	--	1.5	517	106	80	955	7.5	5
July 21-22	--	--	19	4.9	73	--	35	10	135	--	.4	290	68	39	537	7.7	5
July 23, 28-31	3.1	.11	14	2.9	47	2.1	29	8.4	84	.5	.5	216	47	23	362	7.0	15
July 24-27	3.6	.27	12	2.6	33	1.8	32	6.6	56	.4	1.6	160	41	14	264	7.4	15
Aug. 1-5, 8-9	4.0	.05	13	2.3	33	2.8	35	9.2	54	.5	.5	157	42	13	264	7.3	15
Aug. 6	4.5	.04	429	110	2,330	36	0	40	4,660	.2	5.0	9,310	1,520	1,520	13,600	4.38	15
Aug. 7	--	--	19	4.6	71	--	32	11	131	--	1.5	283	66	40	525	7.5	5
Aug. 10-12, 19-20	3.0	.10	14	2.9	46	2.1	32	9.2	79	.5	1.3	212	47	21	363	7.3	15
Aug. 13-18	5.0	.13	12	2.8	32	1.8	34	7.6	53	.5	.9	158	41	14	256	7.2	15
Aug. 21, 26	--	--	13	3.5	45	--	31	8.4	80	--	1.3	189	47	21	343	7.4	10
Aug. 22-25	2.8	.09	17	3.7	66	2.3	29	7.6	120	.5	.8	294	58	24	474	7.1	15
Aug. 27-31	3.1	.08	11	2.3	28	1.8	28	6.6	47	.5	.6	141	37	14	226	7.3	15

RED RIVER BASIN--Continued

OUACHITA RIVER AT CALION, ARK.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, magnesium	Noncarbonate			
Sept. 1, 1954		--	--	16	3.5	53	--	30	8.6	101	--	0.0	241	54	30	412	7.7	8
Sept. 2-9.....		2.4	0.02	13	3.0	42	1.9	26	6.8	73	0.5	.8	190	45	24	311	7.4	15
Sept. 10		--	--	9.4	2.6	25	--	31	7.6	39	--	.1	120	34	9	207	7.7	8
Sept. 11, 15-16, 19-20		2.4	.07	11	2.4	32	1.9	28	5.4	56	.5	1.2	155	37	14	252	7.1	15
Sept. 12-14, 17-18..		4.3	.03	13	2.9	46	2.0	30	6.4	80	.5	.6	210	44	20	333	7.1	15
Sept. 21, 25-28.....		2.4	.01	11	2.3	28	1.7	33	8.0	44	.5	.4	139	37	10	224	7.2	15
Sept. 22-24		4.1	--	14	3.4	51	2.0	30	7.2	89	--	1.0	228	49	24	368	7.1	15
Average		5.2	0.14	30	7.3	134	3.1	23	10	258	0.3	3.4	559	105	86	904	--	19

RED RIVER BASIN--Continued

OUACHITA RIVER NEAR CALION, ARK.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

RED RIVER BASIN--Continued

HURRICANE CREEK NEAR SHERIDAN, ARK.

LOCATION.--At bridge on U. S. Highway 270,5 miles east of Sheridan, Grant County.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1954.
Water temperatures: October 1949 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 1,680 ppm Dec. 1-2; minimum, 119 ppm May 4-6.
Hardness: Maximum, 166 ppm Jan. 13-15; minimum, 4 ppm Jan. 1-4.
Specific conductance: Maximum daily, 2,540 micromhos Dec. 1; minimum daily, 137 micromhos Feb. 20.
Water temperatures: Maximum, 89°F June 22; minimum, freezing point on several days during December and January.
EXTREMES, 1949-54.--Dissolved solids: Maximum, 1,680 ppm Dec. 1-2, 1953; minimum, 41 ppm May 3, 7-9, 1950.
Hardness: Maximum, 370 ppm Sept. 5-6, 1953; minimum, 4 ppm Jan. 1-4, 1954.
Specific conductance: Maximum daily, 2,540 micromhos Dec. 1, 1953; minimum daily, 33.6 micromhos Feb. 12, 1950.
Water temperatures: Maximum, 89°F June 22, 1954; minimum, freezing point on several days during December and January 1954.
REMARKS.--Records of specific conductance of daily samples available in district office at Fayetteville, Ark. No discharge records available for this station.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Specific conductance (micromhos at 25°C)	pH	Color
Oct. 1-6, 1953		2.0	0.02	19	2.6	225	11	195	365	15	5.0	0.8	773	58	0	1,160	7.9	18
Oct. 7-16		3.1	.00	22	2.8	302	13	a 257	497	1.8	5.0	1.1	1,000	66	0	1,510	8.3	10
Oct. 17-22		1.3	.03	17	2.0	277	11	189	426	32	11	.7	866	50	0	1,300	8.1	18
Oct. 23-28, 30		1.2	.01	12	1.8	335	12	244	473	18	30	.8	1,000	38	0	1,540	8.1	20
Nov. 1-10		.6	.01	6.0	.6	338	12	b 310	395	26	35	.7	986	18	0	1,500	8.7	22
Nov. 11-18, 20		1.2	.01	11	1.1	358	13	c 333	478	31	30	1.0	1,100	32	0	1,650	8.7	23
Nov. 19, 21, 25-30		1.4	.41	2.9	.7	414		d 794	410	47	35	.4	1,470	10	0	2,100	9.8	40
Nov. 22-24		.6	.00	4.1	.1	343	13	e 316	409	36	40	.0	1,030	10	0	1,590	9.1	12
Dec. 1-2		3.3	.01	2.3	.1	562	21	f 690	581	65	55	--	1,680	6	0	2,470	9.8	35
Dec. 3, 6-7		.8	.00	14	1.5	344	15	g 256	575	28	5.0	1.1	1,160	41	0	1,680	8.7	20
Dec. 4-5, 8-10		1.7	.00	24	2.8	228	11	132	438	22	5.0	2.0	846	72	0	1,260	7.7	15
Dec. 11-13, 16-20		1.9	.00	36	6.1	198	9.6	106	420	26	2.0	2.1	787	115	28	1,150	7.6	10
Dec. 14-15		1.2	.00	16	2.3	303	12	76	533	32	15	2.2	1,020	50	0	1,500	7.6	10
Dec. 21, 27-28		--	.01	6.8	2.4	312	--	h 206	473	30	--	1.1	974	27	0	1,510	8.7	15
Dec. 22-26, 29-31		1.4	.01	11	3.0	240	10	170	351	32	3.0	1.6	762	40	0	1,140	8.2	8
Jan. 1-4, 1954		.5	.00	1.4	.2	258	11	i 333	221	34	5.0	.8	728	4	0	1,140	9.6	10

a Includes equivalent of 4 parts per million of carbonate (CO_3).
b Includes equivalent of 15 parts per million of carbonate (CO_3).
c Includes equivalent of 18 parts per million of carbonate (CO_3).
d Includes equivalent of 284 parts per million of carbonate (CO_3).
e Includes equivalent of 40 parts per million of carbonate (CO_3).
f Includes equivalent of 192 parts per million of carbonate (CO_3).
g Includes equivalent of 20 parts per million of carbonate (CO_3).
h Includes equivalent of 13 parts per million of carbonate (CO_3).
i Includes equivalent of 66 parts per million of carbonate (CO_3).

Jan. 5-8, 1954		.6	.31	1.4	0.9	369	14	j613	284	38	7.0	1.6	1,120	7	0	1,560	9.9	18
Jan. 9-12		1.2	.00	12	.6	248	11	k201	363	26	3.0	2.1	797	32	0	1,180	8.8	16
Jan. 13-15		--	.01	57	5.8	86	--		74	263	9.5	--	1.5	499	166	106	743	7.7	6
Jan. 16-22, 24-26		3.2	.00	35	3.0	60	3.4		74	149	7.0	4.0	1.9	312	100	39	498	7.7	10
Jan. 23, 27-31		4.9	.13	21	3.1	36	3.0		55	77	12	1.0	1.1	226	65	20	321	7.5	32
Feb. 1-3		3.7	.04	18	2.5	62	3.3		63	129	7.8	1.0	1.4	244	55	3	415	7.4	12
Feb. 4-7		2.3	.00	18	2.0	90	4.6		85	162	15	1.0	1.5	357	53	0	559	7.7	10
Feb. 8-10		1.4	.01	9.8	1.3	165	7.1		m166	230	16	3.0	1.6	502	30	0	818	8.4	7
Feb. 11-16		1.2	.03	11	2.2	118	5.3		m131	171	12	5.0	1.9	388	36	0	612	8.3	8
Feb. 17-19		3.6	.02	26	3.0	27	2.7		64	78	3.0	1.0	1.1	188	77	25	286	7.9	15
Feb. 21-24		5.0	.09	16	2.4	20	1.9		46	49	3.8	.7	2.4	138	50	12	205	7.1	17
Feb. 25-28		4.8	.02	27	2.4	38	2.2		54	105	5.8	.9	1.3	225	77	33	341	7.3	9
Mar. 1-4, 6-8		3.4	.04	19	2.8	46	2.4		60	90	6.5	2.0	1.5	218	59	10	345	7.2	7
Mar. 9-10, 14, 16-18		3.7	.01	29	4.0	91	4.2		69	205	17	2.0	1.0	401	89	32	623	7.4	7
Mar. 11-13, 15, 19-21		3.0	.41	16	3.0	72	4.0		79	131	8.2	2.0	1.4	286	52	0	454	7.6	8
Mar. 22-31		5.4	.11	17	1.6	39	2.4		57	69	8.5	2.0	1.0	189	49	2	292	7.1	17
Apr. 1-3, 8-10		4.4	.19	10	1.4	51	3.4		72	64	8.8	4.0	.6	192	31	0	302	7.4	22
Apr. 4-7		4.2	.17	39	2.8	59	3.5		66	162	6.8	4.0	.5	327	109	55	485	7.6	10
Apr. 11-16		6.2	.44	9.2	1.5	49	3.6		68	58	8.0	4.0	.6	195	29	0	291	7.4	40
Apr. 17-20		6.6	.44	16	1.8	26	2.6		55	44	4.0	3.0	1.0	150	47	2	216	7.2	40
Apr. 21-23, 25-26		6.2	.22	13	2.0	41	2.8		71	58	6.5	1.6	1.2	190	41	0	285	7.7	24
Apr. 27-29		7.2	.13	28	2.5	66	3.8		75	137	9.0	1.6	.9	324	80	19	477	7.5	19
May 1, 3		--	.06	28	2.8	30	--		63	88	5.0	--	1.4	212	81	30	325	7.8	25
May 2, 7-10		7.7	.29	22	2.5	29	2.0		62	69	5.0	1.6	1.5	205	65	14	285	7.6	20
May 4-6		--	.05	17	3.0	14	--		59	30	3.0	--	1.1	119	55	6	180	7.5	25
May 11-14		9.4	.13	13	2.3	41	2.8		65	67	7.0	1.0	1.4	190	42	0	303	7.4	17
May 15-20		5.3	.08	16	2.8	51	3.0		61	97	7.5	1.0	.6	231	51	1	357	7.1	11
May 21-24		5.0	.08	19	2.4	72	4.3		90	123	9.8	1.0	.7	296	57	0	468	7.3	10
May 25-31		2.6	.10	27	3.2	90	5.0		99	183	11	1.0	1.0	380	80	0	602	7.4	9

j Includes equivalent of 215 parts per million of carbonate (CO_3).
k Includes equivalent of 12 parts per million of carbonate (CO_3).
m Includes equivalent of 2 parts per million of carbonate (CO_3).

RED RIVER BASIN--Continued

HURRICANE CREEK NEAR SHERIDAN, ARK.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Specific conductance (micromhos at 25°C)	pH	Color
June 1-2, 1954		--	0.05	11	2.0	115	--	121	150	18	--	0.4	395	36	0	617	7.2	10
June 4-10		1.8	.08	17	2.2	147	6.9	146	202	23	2.0	.7	475	52	0	769	7.8	9
June 11, 13-15		2.9	.03	9.4	1.9	164	8.1	204	182	19	2.0	.9	503	32	0	806	7.7	8
June 12, 16-20		2.0	.17	5.2	1.4	254	14	k368	234	23	6.0	1.1	738	19	0	1,150	8.7	17
June 21-30		1.0	.04	9.0	.6	227	12	246	279	20	7.0	.4	657	25	0	1,100	8.2	10
July 1-10		1.8	.00	6.8	.8	232	11	h321	195	30	8.0	.7	658	20	0	1,020	8.5	15
July 11-18		3.0	.03	6.9	.7	240	13	n342	191	34	8.0	1.0	674	20	0	1,080	8.5	16
July 19-31		2.3	.00	6.3	.6	189	11	o276	148	29	6.0	.7	532	18	0	860	8.6	15
Aug. 1, 3		--	.02	7.2	.7	197	--	283	163	28	--	1.2	575	21	0	900	8.0	10
Aug. 2, 4-10		2.4	.01	11	1.0	255	14	o266	324	31	6.0	1.9	771	32	0	1,190	8.6	13
Aug. 11-20		2.3	.04	14	1.3	249	16	m252	327	35	6.0	.9	806	40	0	1,260	8.3	20
Aug. 21-31		3.9	.00	15	1.3	264	14	p278	311	35	6.0	.4	820	43	0	1,230	8.4	12
Sept. 1-10		3.0	.01	13	1.3	252	13	m347	254	33	5.0	1.0	758	38	0	1,200	8.3	20
Sept. 11-20		3.0	.00	13	1.0	266	13	g362	249	39	6.0	.6	770	36	0	1,210	8.8	18
Sept. 21-24		3.8	.05	13	.7	260	13	g373	223	34	5.0	.4	753	36	0	1,200	8.8	18
Sept. 25-30		3.0	.01	10	.7	332	14	q478	269	44	7.0	.0	920	28	0	1,450	8.8	18
Average		3.1	0.08	16	2.0	178	8.4	198	237	20	7.6	1.1	592	48	0	903	--	16

g Includes equivalent of 20 parts per million of carbonate (CO_3).
h Includes equivalent of 13 parts per million of carbonate (CO_3).
k Includes equivalent of 12 parts per million of carbonate (CO_3).
m Includes equivalent of 2 parts per million of carbonate (CO_3).
n Includes equivalent of 6 parts per million of carbonate (CO_3).
o Includes equivalent of 8 parts per million of carbonate (CO_3).
p Includes equivalent of 5 parts per million of carbonate (CO_3).
q Includes equivalent of 21 parts per million of carbonate (CO_3).

RED RIVER BASIN--Continued

HURRICANE CREEK NEAR SHERIDAN, ARK.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	69	49	43	34	45	46	49	64	74	86	85	85
2	69	48	43	33	43	43	50	64	78	84	84	85
3	68	50	44	34	43	44	52	65	76	86	86	85
4	68	48	42	34	44	46	55	62	78	85	85	87
5	66	48	43	34	45	43	59	64	78	84	86	87
6	66	47	43	34	44	44	59	65	76	87	87	84
7	65	46	43	35	43	45	60	63	79	88	85	85
8	65	46	42	36	43	45	62	64	80	85	87	84
9	63	44	42	34	44	46	61	65	82	86	88	84
10	62	43	42	34	43	48	60	64	84	84	87	85
11	62	43	42	32	--	48	60	64	86	86	88	83
12	62	42	42	32	44	50	59	64	86	85	87	79
13	62	44	42	--	46	48	60	64	88	85	88	78
14	62	43	44	31	48	46	60	65	86	88	88	78
15	60	44	42	32	50	45	60	65	86	87	88	76
16	60	44	41	33	46	46	60	68	86	88	--	76
17	61	46	41	34	48	45	59	67	88	87	88	77
18	60	47	42	34	49	45	59	68	87	88	86	76
19	62	48	42	35	47	45	58	67	--	78	88	78
20	60	46	42	37	46	44	60	68	87	79	88	76
21	60	45	40	34	47	45	62	68	88	85	86	78
22	60	45	38	35	46	48	65	69	89	87	86	70
23	60	44	36	34	46	48	64	70	88	85	86	70
24	59	45	34	34	47	49	64	69	88	85	86	69
25	59	44	33	36	48	50	65	69	87	86	86	69
26	56	43	32	34	48	49	66	69	87	86	87	68
27	54	42	33	38	47	50	67	70	88	85	87	69
28	53	43	33	39	46	51	64	74	87	85	86	76
29	52	44	32	42	--	56	65	74	87	86	86	74
30	50	43	31	44	--	50	63	75	83	85	85	76
31	48	--	33	44	--	49	--	78	--	86	84	--
Average	61	45	39	35	46	47	60	67	84	85	86	78

RED RIVER BASIN--Continued

SALINE RIVER NEAR RYE, ARK.

LOCATION.--At gaging station at bridge on State Highway 15, 4 miles southwest of Rye, Cleveland County, and 5 miles upstream from Hudgin Creek.
DRAINAGE AREA.--2,062 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1947, October 1948 to September 1954.
Water temperatures: October 1946 to September 1947, October 1948 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 140 ppm Dec. 7-31; minimum, 62 ppm May 1-20.
Hardness: Maximum, 49 ppm Jan. 1-15; minimum, 19 ppm Sept. 1-30.
Specific conductance: Maximum daily, 286 micromhos Dec. 16; minimum daily 40.0 micromhos May 8.
Water temperatures: Maximum, 89°F Aug. 11; minimum, 39°F Jan. 12, 14, 23.
EXTREMES, 1946-47, 1948-54.--Dissolved solids: Maximum, 145 ppm Nov. 26-28, 1952; minimum, 18 ppm Jan. 11-14, 1950.
Hardness: Maximum, 77 ppm Jan. 24, 30, 1949; minimum, 8 ppm June 1-7, 9-10, 1947.
Specific conductance: Maximum daily, 534 micromhos Jan. 18, 1949; minimum daily, 19.7 micromhos June 24, 1947.
Water temperatures: Maximum, not determined; minimum, 36°F Feb. 1, 1951.
REMARKS.--Records of specific conductance of daily samples available in district office at Fayetteville, Ark. Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, magnesium	Noncarbonate			
Oct. 1-31, 1953	24.2	6.1	0.05	10	2.6	18	1.9	46	30	6.0	0.3	1.9	117	36	0	170	7.6	5
Nov. 1-30	55.8	7.2	.00	12	2.3	11	1.8	48	16	5.8	.3	.5	95	39	0	142	7.6	8
Dec. 1-6	124	6.2	.00	12	3.0	12	2.0	49	18	5.5	.0	2.6	98	42	2	159	7.7	15
Dec. 7-31	151	6.3	.00	13	3.2	26	2.3	59	41	5.9	.7	3.2	140	46	0	221	7.5	12
Jan. 1-15, 1954	175	8.0	.05	14	3.4	22	2.2	53	42	7.0	.7	1.6	118	49	6	221	7.7	12
Jan. 16-31	2,702	6.1	.07	7.1	2.1	8.6	1.9	20	21	3.5	.4	4.0	81	26	10	107	7.0	40
Feb. 1-8	1,976	6.4	.02	7.9	2.4	5.9	1.5	20	19	2.8	.4	2.6	75	30	13	96.9	7.2	36
Feb. 9-19	556	6.2	.14	10	2.2	11	1.4	30	26	5.0	.4	2.1	89	34	9	133	7.3	22
Feb. 20-28	3,230	6.2	.19	6.7	2.2	6.2	1.7	19	18	4.0	.3	1.2	79	26	10	92.5	7.2	45
Mar. 1-7, 9-10	1,574	3.0	.16	8.1	3.0	7.7	1.6	24	23	3.8	.3	2.4	92	33	13	113	6.9	40
Mar. 8, 11-31	561	4.9	.30	9.8	2.6	11	1.3	34	24	5.8	.4	1.4	102	35	7	131	7.0	35
Apr. 1-20	871	7.1	.41	10	2.3	8.1	1.6	33	17	5.0	.6	2.1	105	34	7	119	6.9	35
Apr. 21-30	1,362	6.5	.52	8.7	2.0	6.0	1.7	28	12	4.5	.6	2.8	98	30	7	103	7.2	50
May 1-20	7,007	3.2	.15	5.1	1.9	3.8	1.4	20	8.0	2.5	.2	1.4	62	20	4	64.1	7.2	45
May 21-31	515	5.3	.34	10	2.6	7.6	1.2	35	13	5.5	.1	1.6	83	36	7	116	7.3	45
June 1-6, 8-14, 16-17, 19-30, 1954	147	6.4	0.12	11	2.8	10	1.2	47	16	4.8	0.1	1.6	79	39	0	130	7.0	11
June 7-15, 18	139	--	--	13	2.8	15	--	46	17	14	--	2.2	104	44	6	169	7.4	15
July 1-31	32.5	5.4	.03	10	2.9	11	1.1	52	14	6.2	.1	.9	94	37	0	134	7.5	6
Aug. 1-31	10.6	5.4	.03	6.0	2.7	11	1.2	35	11	5.8	.6	2.3	85	26	0	109	7.2	8
Sept. 1-30	4.95	4.5	.04	4.6	1.8	12	1.2	29	11	5.8	.5	1.9	79	19	0	96.6	7.5	8
Average	858	5.8	0.14	9.4	2.5	11	1.6	36	20	5.5	0.4	2.0	94	34	4	131	--	25

RED RIVER BASIN--Continued

SALINE RIVER NEAR RYE, ARK.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

RED RIVER BASIN--Continued

BAYOU LAPILE NEAR STRONG, ARK.

LOCATION.--On county road about 1 mile north of Strong, Union County.
DRAINAGE AREA.--Indeterminate.
RECORDS AVAILABLE.--Chemical analyses: October 1952 to September 1954.
Water temperatures: October 1952 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 84,000 ppm Sept. 28-29; minimum, 446 ppm Apr. 29-30.
Hardness: Maximum, 15,600 ppm Sept. 28-29; minimum, 74 ppm Apr. 29-30.
Specific conductance: Maximum daily, 111,000 micromhos Sept. 28; minimum daily, 745 micromhos Apr. 30.
Water temperatures: Maximum, 98°F Aug. 25, Sept. 3, 6-7, 18; minimum, 36°F Jan. 22.
EXTREMES, 1952-54.--Dissolved solids: Maximum, 84,000 ppm Sept. 28-29, 1954; minimum, 306 ppm Apr. 29-30, 1953.
Hardness: Maximum, 15,600 ppm Sept. 28-29, 1954; minimum, 50 ppm Apr. 29-30, 1953.
Specific conductance: Maximum daily, 111,000 micromhos Sept. 28, 1954; minimum daily, 441 micromhos Apr. 30, 1953.
Water temperatures: Maximum, 98°F on several days during summer months; minimum, 36°F Jan. 22, 1954.
REMARKS.--Records of specific conductance of daily samples available in district office at Fayetteville, Ark. No discharge records available for this station.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH
														Calcium, magnesium	Noncarbonate		
Oct. 1-8, 1953				2,790	538	13,500	134	0	1.0	27,600			48,400	9,170	9,170	64,900	4.23
Oct. 9-20				2,990	590	15,100	146	0	1.0	30,100			53,200	9,890	9,890	69,000	4.35
Oct. 21-25				2,930	587	14,300	143	0	1.0	29,600			51,800	9,720	9,720	68,400	4.48
Oct. 26-31				1,840	362	9,300	89	0	1.0	18,600			32,100	6,080	6,080	46,300	4.35
Nov. 1-3				2,250	267	10,200	101	2	1.0	20,500			36,100	6,710	6,710	49,800	4.8
Nov. 4-10				2,430	475	12,300	115	3	1.0	24,300			42,400	8,020	8,010	57,900	4.8
Nov. 11-12, 14				2,090	190	8,870	88	2	1.0	18,300			32,000	6,000	5,990	45,300	4.8
Nov. 13, 15-16				2,500	451	12,200	114	2	1.0	24,500			42,700	8,090	8,090	58,400	4.9
Nov. 17-18				2,320	426	11,300	106	2	1.0	22,800			40,300	7,540	7,540	55,300	4.9
Nov. 19-21				1,000	233	5,030	57	2	2.0	10,100			17,200	3,450	3,450	25,200	4.7
Nov. 22-28				1,070	215	5,570	62	2	1.0	11,000			19,400	3,550	3,550	29,200	4.8
Nov. 29-30				1,070	300	6,110	67	2	1.0	12,000			20,900	3,900	3,900	32,000	4.9
Dec. 1-3				1,460	281	7,260	79	3	3.0	14,400			24,900	4,800	4,800	36,900	5.2
Dec. 4-5				618	137	3,140	33	2	2.0	6,290			11,000	2,110	2,100	18,100	4.7
Dec. 6-11				1,250	234	6,290	66	1	3.0	12,500			21,800	4,080	4,080	32,300	4.6
Dec. 12-15				611	118	3,070	31	2	2.0	6,160			10,600	2,010	2,010	17,600	4.6
Dec. 16				432	79	2,100	22	2	3.0	4,230			7,250	1,400	1,400	12,100	4.9
Dec. 17				1,120	237	5,940	62	0	4.0	11,700			20,400	3,770	3,770	30,600	4.5
Dec. 18-21				686	156	3,670	38	2	3.0	7,190			12,700	2,350	2,350	19,900	4.6
Dec. 22-23, 25-31				537	103	2,710	28	1	3.0	5,420			9,370	1,760	1,760	15,300	4.6
Dec. 24				1,280	295	6,890	72	0	3.0	13,700			23,500	4,410	4,410	34,900	4.23

Jan. 1, 5, 7, 9, 1954				873	148	4,410	50	1	4.0	8,920		15,400	2,790	2,790	23,300	4 6
Jan. 2-4				1,210	302	6,660	71	0	5.0	13,100		22,100	4,260	4,260	32,100	4.42
Jan. 6, 8				998	261	5,000	58	0	6.0	10,500		18,400	3,560	3,560	26,900	4.19
Jan. 10				698	179	3,610	40	1	6.0	7,350		12,700	2,480	2,480	20,600	4.6
Jan. 11-17				353	78	1,760	21	3	8.0	3,540		6,350	1,200	1,200	10,200	4.8
Jan. 18-24				171	36	878	12	3	6.0	1,840		3,270	574	572	5,400	5.0
Jan. 25-26				335	81	1,730	20	1	5.0	3,560		6,340	1,170	1,170	9,900	4.6
Jan. 27-31				580	163	3,060	34	0	6.0	6,360		11,000	2,120	2,120	16,600	4.5
Feb. 1, 3-5				619	165	3,340	37	0	7.0	6,800		11,700	2,220	2,220	17,800	4.35
Feb. 2, 6-7				506	113	2,600	29	0	4.0	5,270		9,110	1,730	1,730	14,100	4.5
Feb. 8-9				278	65	1,380	16	0	5.0	2,830		5,020	961	961	8,030	4.5
Feb. 10-16				1,010	193	4,770	53	0	3.0	9,790		17,200	3,310	3,310	25,100	4.5
Feb. 17-18, 22				128	40	646	7.4	3	4.0	1,390		2,510	484	482	4,460	5.2
Feb. 19-21				457	89	2,140	27	3	4.0	4,480		7,750	1,510	1,500	12,200	5.0
Feb. 23-26				525	135	2,690	30	0	4.0	5,440		9,500	1,860	1,860	14,500	4.5
Feb. 27-28				668	143	3,190	38	0	5.0	6,630		11,600	2,250	2,250	18,100	4.5
Mar. 1-10				812	200	4,460	41	0	4.0	8,940		15,700	2,850	2,850	24,500	4.5
Mar. 11-15				998	275	5,730	55	0	2.0	11,500		20,500	3,620	3,620	30,800	4.18
Mar. 16-20				889	254	5,080	48	0	1.0	10,200		18,500	3,260	3,260	27,900	4.20
Mar. 21-22				1,060	282	5,900	55	0	1.0	12,000		21,600	3,800	3,800	32,100	4.25
Mar. 23-31				537	196	3,350	31	0	6.0	6,770		12,400	2,150	2,150	19,000	4.38
Apr. 1-11				267	67	1,480	15	2	4.0	3,000		5,420	942	940	8,750	4.7
Apr. 12-14, 16-17, 20-24				482	170	3,040	28	0	3.0	5,980		10,700	1,900	1,900	17,200	4.14
Apr. 15, 18-19				702	227	4,220	38	0	2.0	8,490		15,400	2,680	2,680	23,400	4.11
Apr. 25-28				936	275	5,330	50	0	5.0	10,900		19,800	3,470	3,470	29,500	3.62
Apr. 29-30				19	6.6	115	2.3	4	5.0	230		446	74	71	786	5.5
May 1-10				315	90	1,860	18	2	3.0	3,740		6,630	1,160	1,150	10,600	4.8
May 11-16				110	45	730	8.6	4	2.0	1,460		2,850	460	456	4,620	5.6
May 17-22				311	139	2,130	20	1	2.0	4,240		7,870	1,350	1,350	12,400	4.6
May 23-28				531	126	2,920	27	0	2.0	5,770		10,600	1,640	1,840	16,400	4.27
May 29-31				529	206	3,310	30	0	1.0	6,560		12,500	2,170	2,170	19,100	4.16
June 1-5				795	160	4,160	59	0	1.0	8,370		14,700	2,640	2,640	23,100	4.42
June 6-10				1,020	213	5,460	69	0	1.0	10,900		19,300	3,420	3,420	29,600	4.48
June 11-17				1,350	322	6,850	87	0	1.0	14,000		25,600	4,690	4,690	38,300	3.81

RED RIVER BASIN--Continued

BAYOU LAPILE NEAR STRONG, ARK.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH
														Calcium, magnesium	Noncarbonate		
June 18-21, 1954				1,740	323	8,690	105	0	1.0	17,300			31,200	5,670	5,670	45,100	3.65
June 22-30				2,030	399	10,300	123	0	1.0	20,600			37,200	6,710	6,710	52 500	3.90
July 1-4.....				2,280	443	11,400	131	0	1.0	22,900			41,500	7,510	7,510	57,800	3.69
July 5-8				2,400	567	12,500	142	0	1.0	25,300			45,200	8,320	8,320	61,200	4.12
July 9-10				2,690	446	12,900	145	0	1.0	26,100			45,900	8,550	8,550	63,200	3.84
July 11-12, 19-20, 25				2,690	473	13,900	145	0	1.0	27,400			48,000	8,660	8,660	66,400	3.85
July 13-14				2,900	614	14,800	192	2	1.0	29,600			53,100	9,760	9,760	71,900	4.9
July15-18				2,970	654	15,300	171	0	1.0	30,900			54,700	10,100	10,100	73,800	4.18
July 21-23				2,760	582	14,800	170	0	1.0	29,600			52,600	9,280	9,280	71,400	4.48
July 24, 26-29				2,600	488	13,200	145	0	1.0	26,100			46,500	8,490	8,490	64,300	3.92
July 30-31				2,380	498	12,300	148	0	1.0	24,700			43,700	7,990	7,990	61,100	3.80
Aug. 1-6, 8-10				2,480	488	12,200	141	0	1.0	24,700			56,100	8,190	8,190	62,300	3.79
Aug. 7, 11-13				2,580	598	13,400	151	0	1.0	27,300			48,700	8,900	8,900	66,400	4.22
Aug. 16-20.....				3,090	595	15,700	177	0	1.0	31,600			55.000	10,200	10,200	75,000	3.73
Aug. 21-28.....				3,190	608	16,100	177	0	1.0	32,500			56,800	10,500	10,500	77,200	4.10
Aug. 29-31				3,910	760	19,500	207	0	1.0	39,800			70,700	12,900	12,900	91,200	3.85
Sept. 1-3, 6				3,540	751	18,000	193	0	1.0	36,400			63,400	11,900	11,900	81,700	4.5
Sept. 4-5, 7-10				4,000	833	20,500	218	0	1.0	40,500			71,200	13,400	13,400	90,400	4.08
Sept. 11-13, 15-17, 30				3,740	924	20,200	--	0	1.0	40,300			69,400	13,100	13,100	88,800	3.83
Sept. 14, 18-27.....				4,350	904	22,300	236	0	1.0	44,300			78,000	14,600	14,600	97,400	4.00
Sept. 28-29.....				4,590	1,010	23,900	259	0	1.0	48,200			84,000	15,600	15,600	102,000	3.82
Average				1,540	325	7,900	83	1	2.5	15,900			28,200	5,180	5,180	39,100	--

RED RIVER BASIN--Continued

BAYOU LAPILE NEAR STRONG, ARK.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

OUACHITA RIVER NEAR FELSENTHAL, ARK.

LOCATION.--At U. S. Engineers Lock No. 6, 3 miles south of Felsenthal, Union County.
DRAINAGE AREA.--10,787 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1954.
Water temperatures: October 1949 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 2,230 ppm Dec. 16-18; minimum, 100 ppm May 11-13.
Hardness: Maximum, 428 ppm Dec. 16-18; minimum, 25 ppm May 7-10.
Specific conductance: Maximum daily, 4,120 micromhos Jan. 17; minimum daily, 137 micromhos May 9.
Water temperatures: Maximum, 96°F Aug. 29; minimum, 40°F Dec. 24, 31.
EXTREMES, 1949-54.--Dissolved solids: Maximum, 2,430 ppm Nov. 20-30, 1952; minimum, 44 ppm Jan. 23-31, Mar. 1-9, 1950.
Hardness: Maximum, 494 ppm Nov. 20-30, 1952; minimum, 15 ppm Jan. 23-31, Mar. 1-9, 1950.
Specific conductance: Maximum daily, 5,110 micromhos Nov. 27, 1952; minimum daily 55.7 micromhos Mar. 4, 1950.
Water temperatures: Maximum, 96°F June 9, 1953, Aug. 29, 1954; minimum, 35°F Feb. 3, 1951.
REMARKS.--Once-daily sampling near surface. Records of specific conductance of daily samples available in district office at Fayetteville, Ark. No discharge records available for this station.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Specific conductance (micromhos at 25°C)	pH	Color
Oct. 1-6, 1953		5.1	0.01	36	8.5	179	3.3	20	7.6	345	0.1	2.0	695	125	108	1,230	6.6	7
Oct. 7-10		5.3	.01	69	17	365	5.5	19	10	698	.1	3.3	1,330	242	226	2,380	6.3	7
Oct. 11-13		5.3	.01	70	3.0	282	4.4	21	9.6	538	.1	2.6	1,050	187	170	1,860	6.7	8
Oct. 14-20		5.7	.01	22	19	194	3.5	21	11	380	.1	2.1	746	133	116	1,320	7.1	7
Oct. 21-23		7.9	.01	41	10	204	3.6	22	9.2	398	.1	1.6	778	144	126	1,380	7.3	7
Oct. 24-31		8.9	.01	50	11	253	4.1	22	8.4	495	.1	2.7	934	170	152	1,690	6.9	7
Nov. 1-5		6.3	.00	42	8.9	195	3.3	23	6.0	385	.1	1.5	757	142	122	1,350	6.7	8
Nov. 6-13		5.6	.01	54	14	275	4.0	19	6.4	535	.1	2.0	970	192	177	1,830	7.3	7
Nov. 14-20		5.4	.01	68	16	336	5.0	20	4.6	675	.1	5.2	1,260	236	219	2,220	7.2	7
Nov. 21-24		4.3	.00	83	19	416	5.8	18	9.6	810	.1	4.1	1,480	285	270	2,760	6.6	8
Nov. 25-28		5.3	.02	98	24	495	6.9	19	11	960	.1	5.9	1,740	343	328	3,080	7.0	8
Nov. 29-30		5.3	.04	88	20	420	5.9	22	12	840	.1	4.4	1,530	302	283	2,760	6.6	8
Dec. 1-8		4.5	.00	112	29	585	7.4	17	10	1,130	.0	8.6	2,030	398	384	3,590	7.2	12
Dec. 9-15, 19-20		5.3	.07	100	24	525	7.2	15	6.4	1,020	.0	10	1,820	348	336	3,250	7.0	10
Dec. 16-18		6.5	.00	119	32	622	8.4	8	5.6	1,240	.0	15	2,230	428	422	3,950	6.3	12
Dec. 21-26, 31		5.3	.00	67	15	336	4.7	19	8.4	655	.0	7.4	1,220	228	213	2,210	7.0	15
Dec. 27-30		6.2	.04	54	13	262	3.7	21	7.0	525	.0	7.6	963	188	171	1,740	6.8	15
Jan. 1-10, 1954		4.3	.09	66	15	321	5.4	18	8.8	628	.4	9.0	1,210	226	211	2,140	7.0	15
Jan. 11-17		5.8	.15	81	21	412	6.6	1	26	810	.0	13	1,410	288	288	2,560	5.1	10
Jan. 18-19		--	--	29	8.3	144	--	15	10	280	--	5.0	586	106	94	1,000	6.6	15
Jan. 20-31		4.8	.12	16	4.8	67	2.5	12	10	130	.2	2.3	298	60	50	501	6.5	35

Feb. 1-2, 6-10, 1954...	7.6	.09	17	4.8	70	2.4	20	11	138	.2	1.9	316	62	46	522	6.6	30
Feb. 3-5.....	7.1	.15	14	4.5	58	2.3	15	10	112	--	2.4	272	53	41	434	7.2	38
Feb. 11-12.....	8.5	.13	21	5.7	87	2.4	13	6.0	174	.1	1.7	411	76	66	640	6.7	32
Feb. 13-14.....	7.7	.07	26	7.9	123	2.8	12	9.6	246	.1	3.3	540	98	88	882	6.7	25
Feb. 15-19.....	7.7	.24	31	10	154	3.1	15	8.6	305	.1	3.6	660	118	106	1,080	6.7	25
Feb. 20.....	--	--	44	12	228	--	9	9.8	445	--	7.4	1,090	160	152	1,530	6.4	13
Feb. 21-23.....	4.7	.20	21	6.0	95	2.3	12	7.8	192	.2	2.3	418	77	67	695	6.6	35
Feb. 24-28.....	5.9	.21	16	4.5	59	2.4	15	11	118	.2	1.0	294	58	46	455	6.9	45
Mar. 1-6.....	6.5	.27	15	4.4	54	2.4	18	11	107	.1	1.1	270	56	41	418	6.8	40
Mar. 7-9.....	7.7	.30	25	6.6	109	3.1	19	12	209	--	1.8	442	90	74	761	7.0	38
Mar. 10-20.....	6.2	.19	31	7.6	141	2.9	16	16	270	.2	4.3	510	108	96	957	6.7	32
Mar. 21-23.....	3.3	.15	30	6.5	122	2.5	19	13	245	.1	4.9	490	102	86	874	7.0	22
Mar. 24-27.....	3.3	.09	41	10	198	3.2	12	15	390	.1	8.6	744	144	134	1,340	6.6	13
Mar. 28-31.....	3.1	.13	57	18	308	4.1	7	18	615	.1	12	1,240	216	210	2,060	6.3	16
Apr. 1-2.....	3.3	.13	51	12	236	3.8	15	16	480	.1	6.3	943	176	164	1,640	6.9	22
Apr. 3-10.....	3.9	.20	41	10	187	3.1	16	18	370	.1	8.6	737	144	130	1,300	6.9	27
Apr. 11-15.....	3.9	.19	34	7.7	160	2.9	18	14	302	.4	2.2	646	116	102	1,060	6.8	20
Apr. 16, 18.....	3.3	.07	38	11	207	3.6	8	13	390	.4	2.6	808	140	134	1,330	6.4	15
Apr. 17.....	--	--	68	19	341	--	0	10	705	--	10	1,320	248	248	2,310	4.5	12
Apr. 19-20.....	4.5	.35	24	8.0	128	2.8	14	10	240	.6	3.2	524	93	82	853	7.2	45
Apr. 21-22, 24-28.....	7.1	.49	17	3.9	63	2.2	28	11	116	.4	1.6	294	58	36	464	7.4	45
Apr. 23, 29-30.....	7.7	.42	20	4.9	77	2.5	24	11	146	.4	1.5	358	70	50	561	7.3	45
May 1-2.....	5.9	.39	30	7.0	138	2.8	18	9.8	258	.4	3.3	564	104	89	923	7.3	40
May 3-5.....	4.2	.58	14	4.3	68	2.3	14	5.6	127	--	1.5	307	53	41	460	6.9	45
May 6.....	--	--	12	1.8	35	--	12	6.0	70	--	2.4	178	37	28	288	6.1	45
May 7-10.....	5.3	.51	7.5	1.6	19	1.9	14	5.2	36	--	.7	132	25	14	162	6.9	45
May 11-13.....	5.3	.34	7.2	2.1	18	1.9	14	4.4	36	--	1.4	100	27	15	166	7.1	--
May 14, 18-21.....	4.3	.28	8.8	2.5	31	1.8	14	1.8	60	.4	1.3	155	32	21	242	7.0	50
May 15-17, 22-23.....	5.4	.00	13	2.8	44	2.1	18	3.0	84	.3	1.6	202	44	29	331	6.7	45
May 24-29.....	6.2	.35	18	3.9	66	1.3	22	6.0	125	--	.9	294	61	43	482	6.9	45
May 30-31.....	6.0	1.4	24	6.5	101	3.2	22	6.0	195	--	1.6	388	86	68	701	7.2	--

RED RIVER BASIN--Continued

OUACHITA RIVER NEAR FELSENTHAL, ARK.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, magnesium	Noncarbonate			
June 1, 1954		--	--	26	5.8	98	--	24	14	190	--	2.0	421	89	70	711	7.1	22
June 2-3, 6		5.3	0.42	32	6.8	137	2.8	22	7.8	270	0.1	2.0	537	108	90	966	7.4	45
June 4-5		6.0	.11	47	10	228	4.3	56	7.8	412	--	4.8	857	158	112	1,530	7.0	--
June 7-20		8.5	.10	25	5.8	106	2.9	27	9.4	200	.4	1.8	441	86	64	745	7.2	20
June 21-30		4.6	.12	28	6.7	116	2.7	32	7.6	225	.1	1.2	451	98	72	819	7.3	20
July 1-6		8.9	.02	29	8.3	140	2.8	36	12	262	.1	1.5	531	106	77	942	7.5	10
July 7-15		5.3	.04	40	11	202	7.2	33	12	388	.1	2.0	767	145	118	1,350	7.7	7
July 16-20		6.4	.04	44	12	233	2.9	31	11	438	.1	1.2	869	160	134	1,520	7.6	7
July 21-31		7.3	.02	52	12	255	4.9	29	10	500	.3	1.3	991	179	155	1,700	7.2	7
Aug. 1-7		4.8	.02	53	14	276	4.1	26	11	535	.2	1.8	1,050	190	168	1,830	6.8	10
Aug. 8-10		4.3	.15	61	14	312	4.2	21	11	610	.2	3.6	1,180	210	192	2,080	7.2	10
Aug. 11-20		6.3	.02	62	18	321	5.1	26	12	630	.3	1.9	1,120	228	207	2,080	7.3	5
Aug. 21-31		4.4	.03	68	17	348	5.7	23	12	680	.3	3.7	1,240	240	220	2,260	7.3	5
Sept. 1-10		5.1	.01	68	16	341	5.5	23	14	660	.3	3.7	1,210	236	216	2,180	7.0	8
Sept. 11-20		5.2	.02	64	15	310	5.4	25	14	620	.3	3.6	1,150	221	200	2,080	7.3	8
Sept. 21-30		4.3	.05	67	16	333	5.3	22	12	.660	.3	4.1	1,210	233	215	2,180	7.1	10
Average		5.6	0.15	43	11	211	3.8	19	10	413	0.2	3.9	805	153	137	1,410	--	21

RED RIVER BASIN--Continued

OUACHITA RIVER NEAR FELSENTHAL, ARK.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

RED RIVER BASIN--Continued

CORNIE CREEK NEAR JUNCTION CITY, ARK.

LOCATION.--At bridge on State Highway 15, about 13 miles west of Junction City, Union County, and about 20 miles southwest of El Dorado.
RECORDS AVAILABLE.--Chemical analyses: October 1952 to September 1954. (Specific conductance, chloride, and pH: May 1950 to September 1952.)
Water temperatures: May 1950 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 20,600 ppm July 15-21; minimum, 997 ppm May 1-5.
Hardness: Maximum, 6,270 ppm July 15-21; minimum, 267 ppm May 1-5.
Specific conductance: Maximum daily, 31,600 micromhos July 16; minimum daily, 1,590 micromhos May 4-5.
Water temperatures: Maximum, 90°F Aug. 3, 5-6; minimum, 43°F Jan. 1-2, 4.
EXTREMES, 1950-54.--Dissolved solids (1952-54); maximum, 20,600 ppm July 15-21, 1954; minimum, 287 ppm Apr. 28-30, 1953.
Hardness (1952-54): Maximum, 6,270 ppm July 15-21, 1954; minimum, 62 ppm Apr. 28-30, 1953.
Specific conductance: Maximum daily, 31,600 micromhos July 16, 1954; minimum daily, 359 micromhos Apr. 30, 1953.
Water temperatures: Maximum, 95°F July 8, 1953; minimum, freezing point Jan. 30, 1951.
REMARKS.--Records of specific conductance of daily samples available in district office at Fayetteville, Ark. No discharge records available for this station.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH
														Calcium, magnesium	Noncarbonate		
Oct. 1-10, 1953				310	25	632	17	7	2.0	1,630			2,830	876	870	4,980	6.0
Oct. 11-20				286	46	655	16	0	1.0	1,670			2,860	902	902	4,980	4.35
Oct. 21-26				264	30	558	16	0	2.0	1,480			2,640	782	782	4,530	4.33
Oct. 27-31				128	19	310	10	0	3.0	750			1,430	398	398	2,450	4.48
Nov. 1-2				131	16	309	10	3	3.0	750			1,420	393	390	2,420	5.3
Nov. 3-9				101	12	242	8.8	3	4.0	572			1,200	302	299	1,880	5.6
Nov. 10-16				97	13	232	8.4	4	5.0	562			1,160	296	292	1,840	6.1
Nov. 17-21				146	17	328	10	2	7.0	790			1,460	434	433	2,570	5.2
Nov. 22-24, 28-30				185	20	386	12	5	8.0	975			1,810	544	540	3,110	6.2
Nov. 25-27				230	32	459	14	5	8.0	1,240			2,250	706	702	3,890	5.7
Dec. 2, 4				463	74	1,060	29	2	12	2,720			4,820	1,460	1,460	7,550	4.7
Dec. 3, 5-10				625	118	1,460	35	1	12	3,740			6,650	2,040	2,040	10,200	4.7
Dec. 11-12, 15-16				283	40	630	18	2	11	1,550			2,490	870	869	4,690	4.8
Dec. 13-14				330	46	712	20	2	8.0	1,860			3,320	1,010	1,010	5,270	4.8
Dec. 17-18				295	169	981	26	0	15	2,620			4,640	1,430	1,430	7,330	4.5
Dec. 19-24				519	69	1,050	28	0	7.0	2,850			5,090	1,580	1,580	7,960	4.10
Dec. 25-31				454	79	970	26	1	14	2,580			4,750	1,460	1,460	7,440	4.6
Jan. 1-7, 1954				657	76	1,410	36	0	15	3,610			6,330	1,950	1,950	10,000	4.38
Jan. 8-14				318	47	720	20	3	15	1,850			3,340	986	984	5,420	4.7
Jan. 15-21				237	40	497	17	1	15	1,350			2,460	756	755	3,970	4.6
Jan. 22-31				280	40	600	17	0	16	1,580			2,900	863	863	4,600	4.45

Feb. 1-4, 1954			258	48	573	16	0	7.0	1,520		2,720	841	841	4,730	4.5
Feb. 5-11			462	76	1,020	25	0	8.0	2,690		4,610	1,460	1,460	7,760	4.5
Feb. 12-18			826	147	1,870	57	0	14	4,880		8,140	2,670	2,670	13,300	4.5
Feb. 19-24			440	72	1,010	27	0	7.0	2,530		4,320	1,690	1,690	7,490	4.5
Feb. 25-28			392	64	878	24	1	7.0	2,310		3,830	1,240	1,240	6,650	4.6
Mar. 1, 4-5, 7			399	64	846	24	2	5.0	2,280		3,880	1,260	1,260	6,790	4.6
Mar. 2-3, 6, 8-14, 16			483	76	1,090	27	0	8.0	2,850		4,800	1,520	1,520	8,300	4.5
Mar. 15, 17-22			653	92	1,450	37	0	12	3,740		6,390	2,010	2,010	10,900	4.5
Mar. 23-31			656	80	1,480	36	1	5.0	3,640		6,410	1,970	1,960	10,700	4.6
Apr. 1-7			544	115	1,380	24	0	2.0	3,490		6,370	1,830	1,830	10,300	4.29
Apr. 8-14			383	79	960	18	0	5.0	245		4,550	1,280	1,280	7,230	4.5
Apr. 15-21			221	60	555	12	2	2.0	1,480		2,870	798	796	4,550	4.6
Apr. 22-28			267	75	738	14	0	2.0	1,880		3,600	974	974	5,630	3.90
Apr. 29-30			80	27	194	4.4	64	3.0	495		1,110	310	258	1,680	5.7
May 1-5			89	11	183	5.8	10	2.0	480		997	267	259	1,670	6.8
May 6-11			117	19	258	6.4	4	3.0	680		1,340	370	366	2,270	6.2
May 12-17			157	23	337	8.4	1	5.0	870		1,760	486	485	2,970	4.7
May 18-25			183	29	386	10	0	6.0	1,030		2,030	576	576	3,470	4.5
May 26-31			232	28	502	12	0	6.0	1,320		2,620	694	694	4,330	4.5
June 1-5			502	89	1,170	27	0	4.0	2,980		5,220	1,620	1,620	9,220	3.70
June 6-16			648	92	1,500	36	0	3.0	3,760		6,670	2,000	2,000	11,100	3.50
June 17-30			593	73	1,350	29	0	3.0	3,370		6,040	1,780	1,780	10,100	3.50
July 1-5			861	110	1,960	46	0	3.0	4,860		8,570	2,600	2,600	14,200	3.10
July 6-9			1,380	179	3,030	67	0	2.0	7,600		13,700	4,180	4,180	21,300	3.02
July 10-11			1,500	235	3,310	71	0	1.0	8,470		15,200	4,710	4,710	23,600	3.00
July 12-14			1,900	241	4,240	86	0	1.0	10,600		19,000	5,730	5,730	28,800	3.00
July 15-21			2,100	251	4,700	94	0	3.0	11,600		20,600	6,270	6,270	31,200	3.05
July 22-25, 27-30			1,750	239	3,770	94	0	1.0	9,790		17,500	5,350	5,350	26,800	3.11
July 26			1,430	202	3,060	78	0	1.0	8,080		15,400	4,400	4,400	22,700	3.07
Aug. 3-6			1,760	220	3,930	92	0	1.0	9,840		14,600	5,300	5,300	26,900	3.00
Aug. 7-9			1,310	150	2,880	74	0	2.0	7,380		12,400	3,890	3,890	19,200	3.32
Aug. 10-20			1,650	204	3,530	91	0	2.0	9,250		15,800	4,960	4,960	25,800	3.18
Aug. 21-31			1,480	190	3,280	89	0	2.0	8,280		14,300	4,470	4,470	22,800	3.30

RED RIVER BASIN--Continued

CORNIE CREEK NEAR JUNCTION CITY, ARK.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH
														Calcium, magnesium	Noncarbonate		
Sept. 1-10				1,550	188	3,390	88	0	3.0	8,760			15,100	4,640	4,640	22,500	3.30
Sept. 11-20				1,580	213	3,410	90	0	2.0	8,950			15,400	4,820	4,820	24,600	3.37
Sept. 21-30				1,670	202	3,630	93	0	2.0	9,250			15,900	5,000	5,000	25,800	3.35
Average				646	93	1,440	36	2	5.8	3,650			6,480	1,990	1,990	10,400	--

RED RIVER BASIN--Continued

CORNIE CREEK NEAR JUNCTION CITY, ARK.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

THREE CREEKS NEAR JUNCTION CITY, ARK.

LOCATION.--At bridge on State Highway 15, about 10 miles northwest of Junction City, Union County, and about 17 miles southwest of El Dorado.
RECORDS AVAILABLE.--Chemical analyses: October 1952 to September 1954. (Specific conductance, chloride, and pH: May 1950 to September 1952.)
Water temperatures: May 1950 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 10,700 ppm Dec. 25-27; minimum, 376 ppm Aug. 25-27.
Hardness: Maximum, 3,530 ppm Dec. 25-27; minimum, 68 ppm Aug. 14-20, Aug. 25-27.
Specific conductance: Maximum daily, 16,600 micromhos Dec. 26; minimum daily, 504 micromhos May 3.
Water temperatures: Maximum, 85°F July 9; minimum, 33°F Dec. 31.
EXTREMES, 1950-54.--Dissolved solids (1952-54); Maximum, 13,200 ppm July 29-31, 1953; minimum, 133 ppm Apr. 28-30, 1953.
Hardness (1952-54): Maximum, 4,390 ppm July 29-31, 1953; minimum, 30 ppm Apr. 28-30, May 12-15, 1953.
Specific conductance: Maximum daily, 20,300 micromhos Sept. 4, 1952; minimum daily, 45.7 micromhos Feb. 1, 1952.
Water temperatures: Maximum, 89°F Sept. 1, 1951, Aug. 4, 1953; minimum, freezing point Dec. 16, 1952.
REMARKS.--Records of specific conductance of daily samples available in district office at Fayetteville, Ark. No discharge records available for this station.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Specific conductance (micromhos at 25°C)	pH	Color
Oct. 1-3, 5-6, 1953				989	73	1,820	60	79	10	4,930			8,660	2,770	2,700	13,800	7.4	10
Oct. 7-14				830	62	1,540	51	87	7.0	4,030			7,390	2,330	2,250	11,500	7.9	10
Oct. 15-20				581	72	1,140	40	98	6.0	3,050			5,520	1,750	1,660	8,920	7.1	10
Oct. 21-31				589	48	1,130	39	96	6.0	2,980			5,380	1,670	1,590	7,960	7.9	12
Nov. 2-4				680	98	1,420	45	56	4.0	3,620			6,490	2,100	2,050	10,400	7.6	8
Nov. 5-7				415	45	850	29	91	12	2,170			3,900	1,220	1,150	6,580	7.6	10
Nov. 8-10, 12				345	41	740	25	89	13	1,820			3,300	1,030	956	5,600	8.0	10
Nov. 11, 14-15				197	27	432	15	99	9.0	1,000			2,000	602	522	3,390	7.9	10
Nov. 16-18, 21				303	31	625	21	101	9.0	1,540			2,910	884	800	4,850	7.9	10
Nov. 19-20, 22				264	21	541	19	86	4.0	1,360			2,500	745	674	4,540	7.8	--
Nov. 23, 26-30				177	21	383	13	81	3.0	898			1,760	528	462	3,040	7.1	--
Nov. 24-25				127	11	288	11	87	3.0	632			1,320	362	290	2,200	7.0	--
Dec. 1-3				195	23	364	15	73	18	940			1,910	581	521	3,000	7.8	--
Dec. 5-7				330	26	620	22	47	23	1,680			3,120	972	933	4,820	7.5	--
Dec. 8-10				359	51	752	24	38	18	1,980			3,710	1,100	1,070	5,700	7.4	--
Dec. 11-14				193	24	397	14	50	15	1,030			1,940	580	539	3,310	7.1	--
Dec. 15-19				215	60	525	18	61	18	1,340			2,450	783	733	4,050	7.2	--
Dec. 20-24				226	29	495	16	65	8.0	1,220			2,270	683	630	3,720	7.2	--
Dec. 25-27				1,210	125	2,050	78	35	7.0	5,660			10,700	3,530	3,500	15,800	7.4	--
Dec. 28, 30-31				621	71	1,170	44	27	7.0	3,170			5,870	1,840	1,820	8,980	7.3	--
Dec. 29				841	234	1,930	71	33	8.0	5,210			9,500	3,060	3,030	14,100	7.2	--

Jan. 1, 5-6, 1954.....				573	69	1,130	36	26	15	3,030		5,470	1,710	1,690	8,550	7.0	--
Jan. 2-4, 7.....				508	27	894	29	25	18	2,440		4,490	1,380	1,360	6,950	7.3	--
Jan. 8-9.....				278	74	715	23	40	10	1,860		3,490	998	965	5,360	7.4	--
Jan. 11, 15-18.....				168	14	332	11	16	18	860		1,650	476	464	2,680	6.8	--
Jan. 12-13.....				260	26	528	18	30	12	1,360		2,560	756	731	4,100	7.2	--
Jan. 19-21.....				131	20	284	10	12	15	735		1,420	409	399	2,320	6.7	--
Jan. 23-24, 29-31.....				180	23	386	8.2	16	18	940		1,830	544	530	2,890	6.6	--
Jan. 25-28.....				107	20	238	8.8	12	14	620		1,280	349	339	1,970	6.6	--
Feb. 1-2.....				456	70	988	30	8	12	2,480		4,280	1,430	1,420	7,370	6.3	--
Feb. 3-7.....				316	58	715	24	9	13	1,850		3,130	1,030	1,020	5,450	6.3	--
Feb. 8-12.....				410	73	944	30	23	7.0	2,330		4,040	1,320	1,300	6,880	7.0	--
Feb. 13-15.....				288	49	635	23	40	3.0	1,620		2,870	920	887	5,100	7.1	--
Feb. 16-17.....				226	34	485	17	32	6.0	1,200		2,170	704	678	3,890	7.2	--
Feb. 18-19.....				341	30	677	25	54	7.0	1,780		3,150	974	930	5,310	7.2	--
Feb. 20, 22.....				101	14	228	8.2	11	5.0	550		1,020	310	300	1,850	6.2	--
Feb. 21, 23.....				130	23	282	10	19	3.0	740		1,340	419	404	2,290	6.7	--
Feb. 25-28, Mar. 1.....				210	43	452	16	16	4.0	1,180		2,120	701	688	3,750	6.7	--
Mar. 2-3, 6, 9.....				156	25	386	11	38	12	890		1,660	492	461	2,950	7.2	--
Mar. 4-5, 7-8, 10.....				136	22	327	10	40	8.0	780		1,450	430	397	2,580	7.2	--
Mar. 11-16.....				130	23	333	9.8	51	6.0	765		1,440	419	377	2,550	7.3	--
Mar. 17-20.....				179	33	424	14	48	4.0	1,070		1,930	582	542	3,480	7.5	--
Mar. 21-26.....				164	25	395	14	52	9.0	940		1,750	512	470	3,130	7.4	--
Mar. 27-28.....				99	13	238	8.0	32	6.0	558		1,080	300	274	1,880	7.2	--
Mar. 30-31.....				188	37	446	14	38	7.0	1,120		2,060	621	590	3,600	7.3	--
Apr. 2-10, 13.....				194	30	420	14	34	4.0	1,080		2,280	608	580	3,590	7.4	--
Apr. 11-12.....				47	11	130	3.8	23	5.0	298		637	162	143	1,060	7.3	--
Apr. 14-21.....				108	22	250	7.5	9	6.0	650		1,540	360	352	2,130	6.7	--
Apr. 22-24.....				175	38	395	10	18	4.0	1,040		2,130	592	578	3,370	7.4	--

RED RIVER BASIN--Continued

THREE CREEKS NEAR JUNCTION CITY, ARK.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Color
														Calcium, magnesium	Noncarbonate			
Apr. 25-27, 1954				335	64	750	18	24	6.0	2,000			3,800	1,100	1,080	5,980	7.4	--
Apr. 28-30				252	58	632	16	32	3.0	1,580			3,240	867	841	4,930	7.4	--
May 1-2, 6-7, 10				77	9.7	171	4.6	10	3.0	430			937	232	224	1,540	6.7	--
May 3-5				31	4.4	68	3.8	8	2.0	167			442	95	89	633	6.6	--
May 8-9				112	15	258	6.6	10	4.0	635			1,260	341	333	2,190	6.8	--
May 11-15, 20-21				48	6.8	106	3.9	6	4.0	262			602	148	143	961	6.3	--
May 16-17				101	17	224	6.1	8	6.0	565			1,170	322	316	1,980	6.3	--
May 18-19				66	9.8	143	4.6	10	2.0	365			810	205	197	1,300	7.0	--
May 22-23				82	9.2	176	4.4	8	4.0	455			995	242	236	1,600	6.7	--
May 24-25				112	13	249	6.1	14	5.0	612			1,290	333	322	2,140	7.1	--
May 26-29				131	15	297	7.2	29	4.0	740			1,520	388	364	2,520	7.0	--
May 30-31				222	27	475	14	37	3.0	1,200			2,320	665	634	4,020	7.2	--
June 1-5				234	30	527	17	42	14	1,300			2,470	708	673	4,180	7.0	--
June 6-7, 14-15				160	21	397	14	81	8.0	930			1,910	486	419	3,110	7.1	--
June 8-9				127	18	329	11	81	10	750			1,560	391	324	2,550	7.3	--
June 10-13				337	33	742	22	67	10	1,780			3,270	976	922	5,550	7.0	--
June 16-17				104	13	310	11	133	5.0	640			1,320	313	204	2,280	7.5	--
June 18-19				78	8.9	234	9.1	136	5.0	460			1,080	231	120	1,710	7.5	--
June 20-21				58	7.5	192	7.3	144	6.0	335			763	176	58	1,340	7.5	--
June 22-23, 29-30				94	12	282	9.8	152	4.0	565			1,260	284	160	2,060	7.4	--
June 24-28				161	22	468	15	130	5.0	990			1,980	492	386	3,290	7.0	--
July 1-5				73	9.4	251	8.8	158	6.0	455			1,010	220	91	1,710	7.9	--
July 6-9				275	32	615	18	109	7.0	1,500			2,740	818	728	4,840	7.5	--
July 10-11				392	68	866	32	93	7.0	2,180			3,840	1,260	1,180	6,670	8.2	--
July 12-14				284	50	677	24	104	6.0	1,640			2,950	914	829	5,160	7.3	--
July 15-17				218	29	563	21	118	5.0	1,300			2,380	663	567	4,180	7.7	--
July 18-19				115	13	340	11	144	5.0	670			1,320	340	222	2,410	7.7	--
July 20-21				83	12	301	6.9	148	6.0	550			1,110	256	135	2,010	7.9	--
July 22-23, 28-30				53	7.3	208	6.8	176	5.0	325			733	162	18	1,370	8.0	--
July 24-27, 31				41	5.4	172	6.0	189	6.0	240			588	124	0	1,090	7.6	--
Aug. 1-7, 10				29	4.1	144	4.1	a212	6.0	160			477	90	0	850	8.5	--
Aug. 8-9, 11-13				39	5.8	186	5.0	195	5.0	258			617	122	0	1,140	8.0	--

a Includes equivalent of 7 parts per million of carbonate (CO_3).

Aug. 14-20, 1954				22	3.0	124	4.0	234	6.0	96			398	68	0	682	8.1	--
Aug. 21, 23-24				57	7.5	209	6.2	b 187	7.0	335			750	173	20	1,380	8.3	--
Aug. 22, 28-30				79	12	308	7.1	148	6.0	555			1,130	246	125	2,020	8.2	--
Aug. 25-27				21	3.6	114	3.6	c 220	5.0	94			376	68	0	657	8.6	--
Sept. 1-3, 9, 11				64	8.5	236	6.0	179	6.0	390			860	194	48	1,540	7.9	--
Sept. 4, 6-8				31	3.8	150	3.9	d 213	6.0	165			492	93	0	896	8.6	--
Sept. 5, 10				41	6.0	186	4.9	d 207	8.0	258			651	127	0	1,160	8.5	--
Sept. 12-13				209	26	475	12	b 126	6.0	1,080			2,180	628	525	3,610	8.3	--
Sept. 14-17				156	13	444	13	e 139	7.0	940			1,840	442	328	3,160	8.4	--
Sept. 18-20				60	7.1	217	6.6	f 187	6.0	358			781	178	25	1,470	8.6	--
Sept. 21-30				25	2.1	122	3.3	e 219	6.0	106			400	71	0	706	8.4	--
Average				231	31	509	17	77	7.7	1,250			2,370	704	641	3,890	--	--

b Includes equivalent of 3 parts per million of carbonate (CO_3).
c Includes equivalent of 8 parts per million of carbonate (CO_3).
d Includes equivalent of 9 parts per million of carbonate (CO_3).
e Includes equivalent of 4 parts per million of carbonate (CO_3).
f Includes equivalent of 10 parts per million of carbonate (CO_3).

RED RIVER BASIN--Continued

THREE CREEKS NEAR JUNCTION CITY, ARK.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

BAYOU D'ARBONNE NEAR DUBACH, LA.

LOCATION.--At gaging station at bridge on U. S. Highway 167, 1½ miles south of Dubach, Lincoln Parish, and 8 miles upstream from Middle Fork Bayou D'Arbonne.
DRAINAGE AREA.--355 square miles.
RECORDS AVAILABLE.--Chemical analyses: September 1952 to July 1954.
REMARKS.--Values reported for dissolved solids are sums of determined constituents. Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 21, 1953	--	10	0.02	71	11	278		30		22	552		0.5		960	1.31		222	198	73	8.2	1,860	7.0
Nov. 18	0.04	10	.21	170	23	699		50		90	1,350		.5		2,370	3.22		518	478	75	13	4,370	6.8
Dec. 17	118	16	.46	6.3	1.9	22		8		7.4	40		.2		98	.13		24	17	67	2.0	172	6.1
Jan. 27, 1954	353	16	.28	4.4	1.5	13		8		7.8	21		.8		69	.09		17	11	62	1.3	110	6.0
Feb. 18	143	14	.46	7.3	2.3	23		12		7.5	42		.2		103	.14		28	18	64	1.9	192	6.5
Mar. 25	87.0	14	.30	9.7	2.4	31		17		6.1	57		.2		129	.18		34	20	66	2.3	239	6.5
Apr. 21	419	17	.56	5.0	1.8	13		12		6.8	22		.8		73	.10		20	10	59	1.3	121	6.3
May 14	3,400	11	.18	3.1	1.3	7.9	--	8		5.0	13		.5		46	.06		13	7	57	1.0	72.9	5.8
June 9	46	17	.74	9.6	2.3	34		19		5.8	61		.8		140	.19		33	18	69	2.6	253	6.4
July 16	.01	8.8	.02	62	9.2	238		42		13	468		2.0		822	1.12		192	158	73	7.5	1,570	6.9

RED RIVER BASIN--Continued

BAYOU LA FOURCHE NEAR CREW LAKE, LA.

LOCATION.--At gaging station at bridge on U. 8. Highway 80, 1.1 miles upstream from Illinois Central Railroad bridge, and 2.5 miles west of town of Crew Lake, Richland Parish.
RECORDS AVAILABLE.--Chemical analyses: October 1953 to 8eptember 1954.
REMARKS.--Values reported for dissolved solids are sums of determined constituents unless otherwise noted. Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 19, 1953	14.7	18	0.42	62	19	233	4.9	427		18	260		1.0		826	1.12		232	0	68	6.7	1,470	7.3
Nov. 16	28.5	16	.10	62	15	318	5.9	464		18	352		1.0		1,020	1.39		216	0	76	9.4	1,790	7.5
Dec. 15	617	13	.00	46	12	140	4.4	273		17	151		.5		518	.70		164	0	64	4.7	918	7.3
Jan. 25, 1954	2,610	8.6	.08	17	4.2	51		96		16	54		.2		198	.27		60	0	65	2.9	373	6.9
Feb. 16	527	7.8	.12	17	4.6	56		110		11	57		.2		208	.28		61	0	66	3.1	392	7.3
Mar. 23	13.2	5.2	.05	34	10	21		138		34	15		1.5		a213	.29		126	13	26	.8	347	7.3
Apr. 19	672	10	.01	29	9.8	17		131		19	15		1.2		165	.22		113	5	25	.7	296	7.5
May 10	7,800	6.8	.10	11	3.1	6.8	--	52		5.1	5.2		.8		65	.09		40	0	27	.5	113	6.9
June 7	418	7.4	.20	22	5.8	38		114		10	41		.8		181	.25		79	0	51	1.9	346	7.1
July 14	2.5	16	.02	47	17	38		283		6.5	21		2.8		287	.39		188	0	31	1.2	491	7.8
Aug. 6	1.90	18	.03	49	18	38		300		4.9	18		2.2		a303	.41		196	0	29	1.2	510	7.8
Sept. 9	--	20	.01	40	16	44		284		3.1	18		1.2		282	.38		166	0	37	1.5	487	7.5

a Residue on evaporation at 180°C.

BAYOU MACON NEAR DELHI, LA.

LOCATION.--At gaging station at bridge on U. S. Highway 80, 150 feet upstream from Illinois Central Railroad bridge and 1 mile east of Delhi, Richland Parish.
DRAINAGE AREA.--782 square miles.
RECORDS AVAILABLE.--Chemical analyses: September 1952 to September 1954.
REMARKS.--Values reported for dissolved solids are sums of determined constituents. Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 20, 1953....	114	17	0.01	52	20	26		257	17	28		0.2		286	0.39		212	1	21	0.8	511	7.7
Nov. 17.....	109	16	.02	55	21	28		270	18	32		.2		303	.41		224	2	21	.8	533	7.8
Dec. 15.....	278	13	.05	42	15	20		198	17	20		1.0		225	.31		166	4	20	.7	409	7.5
Jan. 26,1954.....	919	5.8	.17	24	8.5	13		109	13	14		1.8		134	.18		95	6	24	.6	255	7.3
Feb. 16.....	930	4.6	.16	19	7.2	11		89	9.5	12		1.2		109	.15		77	4	24	.5	206	7.5
Mar. 23.....	442	7.0	.02	21	7.0	11		98	9.1	10		1.8		115	.16		81	1	23	.5	214	7.0
Apr. 19.....	474	9.2	.13	26	8.7	14		124	11	12		2.0		144	.20		101	0	24	.6	266	7.4
May 12.....	2,820	5.8	.10	10	3.5	5.6	--	47	5.6	4.0		2.5		60	.08		39	1	24	.4	109	6.9
June 7.....	667	8.8	.46	17	5.9	10		83	6.7	8.2		2.8		101	.14		67	0	25	.5	181	7.1
July 14	84.7	16	.03	40	15	25		204	14	23		1.2		234	.32		162	0	25	.8	402	8.2
Aug. 4.....	106	19	.01	49	20	32		249	16	38		.5		297	.40		204	0	26	1.0	521	7.7
Sept. 8.....	56.4	22	.00	57	25	52		312	13	62		.5		384	.52		245	0	31	1.4	685	7.7

RED RIVER BASIN--Continued

BAYOU CASTOR NEAR GRAYSON, LA.

LOCATION.--At gaging station at bridge on State Highway 110, 6 miles upstream from Bayou Beaucoup and 6½ miles northwest of Grayson, Caldwell Parish.
DRAINAGE AREA.--271 square miles.
RECORDS AVAILABLE.--Chemical analyses: December 1953 to July 1954.
REMARKS.--Values reported for dissolved solids are sums of determined constituents. Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, December 1953 to July 1954

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Dec. 28, 1953	37.6	16	0.78	2.4	0.7	4.1	1.7	8	6.2	5.0		0.5		41	0.06		9	2	45	0.6	50.3	5.8
Jan. 29, 1954	151	15	.52	2.8	1.2	4.2	.8	12	4.1	4.5		.8		40	.05		12	2	41	.5	51.2	6.1
Feb. 18	19.5	15	.96	3.4	1.2	5.1	1.9	17	3.1	5.8		.5		45	.06		13	0	41	.6	60.4	6.3
Mar. 18	17.6	15	.90	4.2	1.6	6.5	1.2	24	1.9	6.8		.5		51	.07		17	0	43	.7	72.3	6.6
Apr. 30	10.3	16	1.3	5.3	1.9	5.5	1.7	29	2.0	5.8		.5		53	.07		21	0	34	.5	72.1	6.6
May 28	170	10	.42	3.4	1.3	3.5	--	17	2.3	2.8		1.0		33	.04		14	0	35	.4	47.3	6.1
June 21	.02	13	.54	7.8	2.8	4.8	--	41	1.4	4.2		.5		55	.07		31	0	25	.4	85.2	6.6
July 20	.02	5.0	.36	11	3.6	9.3	--	64	1.8	4.8		2.2		69	.09		42	0	32	.6	114	6.9

MISCELLANEOUS ANALYSES OF STREAMS IN RED RIVER BASIN IN OKLAHOMA

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Discharge (cfs)	Temperature (°F)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_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	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
LEBOS CREEK NEAR ELDORADO, JACKSON COUNTY																							
Nov. 16, 1953	5.79	64		633	134			201	0		1,360							2,130	1,970			7,010	7.9
Mar. 25, 1954	4.04	44		684	152			201	0		1,450							2,330	2,170			7,370	7.5
SALT FORK RED RIVER NEAR VINSON, HARMON COUNTY																							
Nov. 16, 1953	9.30	56		497	85	176		135	0		240							1,590	1,480	19	1.9	3,080	8.0
Feb. 10, 1954	18.1	60		493	83	188		140	0		250							1,570	1,460	20	2.1	3,090	7.8
SALT FORK RED RIVER AT MANGUM, GREER COUNTY																							
Feb. 10, 1954	14.8	52		517	90	191		123	0		252							1,660	1,560	20	2.0	3,250	7.8
TURKEY CREEK NEAR OLUSTEE, JACKSON COUNTY																							
Nov. 16, 1953	1.99	60		220	36	89		139	0		142							700	586	22	1.5	1,590	8.0
Mar. 25, 1954	.94	46		680	166	419		178	0		675							2,380	2,230	28	3.7	4,990	7.5
NORTH FORK RED RIVER NEAR TEXOLA, BECKHAM COUNTY																							
Nov. 16, 1953	0.05	53		375	108	359		228	0		502							1,380	1,190	36	4.2	3,670	8.0
SWEETWATER CREEK NEAR TEXAS LINE, BECKHAM COUNTY																							
Nov. 16, 1953	3.44	52		214	63	231		280	0		268							795	566	39	3.6	2,300	8.1
Mar. 16, 1954	3.66	38		96	29	109		234	0		100							360	168	40	2.5	1,270	7.9
ELK CREEK NEAR HOBART, KIOWA COUNTY																							
Dec. 2, 1953	1.01	55		75	25	43		226	0		46							292	107	24	1.1	746	7.6
Jan. 6, 1954	.83	42		102	28	79		237	0		92							370	176	32	1.8	1,070	7.3
Feb. 1	.81	42		188	60	118		252	0		130							715	508	26	1.9	1,710	7.5
Feb. 16	.93	42		206	74	135		268	0		146							820	600	26	2.0	1,930	8.0
Apr. 28	304	54		108	35	42		253	0		26							415	208	18	.9	924	7.5
May 12	477	46		30	6.1	6.8		100	0		9.0							100	18	13	.3	241	7.0

MISCELLANEOUS ANALYSES OF STREAMS IN RED RIVER BASIN IN OKLAHOMA--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Discharge (cfs)	Temperature (°F)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Total	Noncarbonate				
NORTH FORK RED RIVER NEAR HEADRICK, JACKSON COUNTY																							
Nov. 23, 1953	37.0	51		311	38			114	0		950							930	836			4,290	7.2
Jan. 8, 1954	8.47	49		538	116			159	0		5,020							1,820	1,690			15,800	7.7
Feb. 2	7.67	46		549	138			157	0		5,660							1,940	1,810			17,400	7.8
Mar. 15	4.42	38		587	160			188	0		6,050							2,120	1,960			18,400	7.8
DEEP RED RUN NEAR RANDLETT, COTTON COUNTY																							
Jan. 7, 1954	0.17	44		119	34	343		475	0		435							436	47	63	7.1	1,360	7.6
Jan. 27	.66	40		139	45	338		471	0		478							530	144	58	6.4	2,430	7.9
Feb. 17	.10	43		156	56	388		445	0		620							620	256	58	6.8	2,850	8.0
Apr. 13	265	48		24	4.9	26		100	0		34							80	0	41	1.3	290	7.0
Apr. 19	3.76	58		37	10	53		164	0		67							132	0	47	2.0	507	7.7
May 27	1,930	52		22	4.6	15		101	0		16							74	0	31	.8	228	7.1
WEST CACHE CREEK NEAR COOKIETOWN, COTTON COUNTY																							
Nov. 17, 1953	3.80	56		25	4.9	18		114	0		18							82	0	32	0.9	249	7.8
Jan. 7, 1954	.81	45		42	8.3	47		154	0		74							138	12	42	1.7	505	8.1
CACHE CREEK NEAR WALTERS, COTTON COUNTY																							
Jan. 7, 1954	26.3	44		91	14	76		327	0		72							286	18	37	2.0	888	7.5
Apr. 13	183	46		37	7.7	41		159	0		38							124	0	42	1.6	437	7.0
Apr. 19	24.1	56		51	12	75		227	0		68							176	0	48	2.5	674	7.7
LITTLE BEAVER CREEK NEAR DUNCAN, STEPHENS COUNTY																							
Nov. 16, 1953	12.9	54		180	64	185		355	0		412							720	429	36	3.0	2,260	8.0
Jan. 28, 1954	13.8	35		174	56	118		360	0		225							665	370	28	2.0	1,690	7.8
Feb. 24	8.35	54		160	56	133		328	0		252							630	361	31	2.3	1,730	8.0
May 26	35.1	74		82	78	126		236	0		325							525	331	34	2.4	1,780	8.1
July 13	.20	89		48	80	116		430	7		172							450	86	26	2.4	1,520	8.3

BEAVER CREEK NEAR WAURIKA, JEFFERSON COUNTY

Oct. 26, 1953	2,580	59		18	4.9	12		66	0		18							65	11	29	0.6	191	7.2
Nov. 27	45.7	46		126	40	103		356	0		187							480	188	32	2.0	1,350	8.2
Jan. 8, 1954	18.6	42		138	60	119		417	0		192							590	248	30	2.1	1,580	7.8
Jan. 27	29.8	34		146	67	173		414	0		305							640	301	37	3.0	1,900	7.9
Feb. 5	23.7	49		139	67	127		397	0		192							620	294	31	2.2	1,570	8.0
Feb. 17	22.1	46		132	61	124		386	0		182							580	264	32	2.2	1,530	7.9
Mar. 19	15.1	40		134	60	125		420	0		182							582	238	32	2.3	1,580	7.6
Apr. 19	28.0	56		102	40	75		294	0		100							418	177	28	1.6	1,070	7.5
May 4	2,130	48		35	7.9	14		108	0		22							120	32	20	.6	306	6.8
May 5	395	48		53	21	45		161	0		75							220	88	31	1.3	597	7.4
May 27	297	58		88	35	57		306	0		95							364	113	25	1.3	992	7.5

RAINEY MOUNTAIN CREEK NEAR MOUNTAIN VIEW, KIOWA COUNTY

Nov. 3, 1953	1.07	55		85	28	108		186	0		152							330	178	42	2.6	1,130	8.2
Dec. 1	.05	58		114	49	250		304	0		285							485	236	53	4.9	1,950	8.0
Jan. 18, 1954	.05	49		204	101	249		449	0		192							925	557	37	3.5	2,510	7.9
Feb. 15	.05	63		216	112	286		439	0		222							1,000	640	38	3.9	2,800	8.0
Mar. 15	.05	56		212	121	341		465	0		230							1,020	644	42	4.6	2,780	7.8
May 5	6.09	67		44	15	45		149	0		26							170	48	37	1.5	508	8.1
June 3	5.78	72		84	30	78		187	16		65							334	154	34	1.9	940	8.7

STINKING CREEK NEAR CARNEGIE, KIOWA COUNTY

Nov. 3, 1953	0.55	54		65	16	36		227	0		44							228	42	26	1.0	592	8.0
Dec. 1	.05	67		107	36	86		370	0		94							414	111	31	1.8	1,130	8.2
Jan. 19, 1954	.05	39		127	52	198		427	0		220							530	180	45	3.7	1,780	7.9
Feb. 15	.05	60		123	53	181		462	0		185							525	146	43	3.4	1,700	8.1
Mar. 16	.05	43		94	52	222		418	0		255							450	108	52	4.5	1,930	7.9
May 5	3.88	62		63	21	48		255	9		40							244	20	30	1.3	724	8.5
June 3	3.79	72		46	32	66		212	6		92							246	62	37	1.8	863	8.3

RED RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN RED RIVER BASIN IN OKLAHOMA--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Discharge (cfs)	Temperature (°F)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_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	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
CEDAR CREEK NEAR CARNEGIE, CADDO COUNTY																							
Sept. 15, 1954	1.12	71		132	23	24		112	2		16							425	330	11	0.5	865	8.3
WASHITA RIVER NEAR CARNEGIE, CADDO COUNTY																							
Oct. 2, 1953	3.26	69		202	30	107		268	0		136							630	410	27	1.9	1,570	8.0
POND CREEK NEAR FORT COBB, CADDO COUNTY																							
Oct. 2, 1953	5.18	66		105	25	31		249	0		16							364	160	16	0.7	779	8.1
Nov. 17	22.3	57		111	21	26		305	8		15							364	100	13	.6	749	8.3
Dec. 2	25.3	56		111	21	30		314	7		16							364	95	15	.7	768	8.4
Jan. 19, 1954	28.7	40		111	21	29		320	0		15							366	104	15	.7	768	7.9
Feb. 16	26.3	52		100	21	30		295	0		15							336	94	16	.7	730	7.8
Mar. 16	24.3	44		104	24	35		307	0		16							360	108	17	.8	753	7.7
May 6	26.5	61		91	23	33		280	0		16							320	90	18	.8	719	8.2
June 4	24.7	66		70	26	26		194	6		13							280	111	17	.7	672	8.4
June 30	9.65	77		88	30	27		201	10		17							344	163	14	.6	789	8.5
SUGAR CREEK NEAR ANADARKO, CADDO COUNTY																							
Nov. 3, 1953	5.68	63		121	18	27		278	6		15							378	140	13	0.6	772	8.3
Dec. 2	7.34	58		122	19	30		281	0		16							384	154	14	.7	805	8.2
Jan. 19, 1954	9.68	45		111	17	29		266	0		15							344	126	15	.7	740	7.4
Feb. 16	6.43	52		107	18	30		262	0		15							340	126	16	.7	732	8.0
Mar. 16	7.40	47		97	22	28		260	0		14							332	119	16	.7	722	7.7
May 6	7.60	68		113	21	31		233	0		18							370	179	15	.7	878	8.1
May 24	633	66		60	8.9	11		117	0		7.5							186	90	11	.4	414	8.1
June 4	5.89	69		112	30	39		220	6		22							428	238	17	.8	944	8.3

WEST BITTER CREEK NEAR CHICKASHA, GRADY COUNTY

Oct. 2, 1953	0.05	73		52	71	58		454	0		19							420	48	23	1.2	938	8.2
Nov. 3	.92	64		69	45	34		369	14		14							360	34	17	.8	791	8.5
Dec. 2	1.31	57		106	63	46		487	0		20							525	126	16	.9	1,060	8.2
Jan. 19, 1954	1.25	49		103	73	57		441	0		23							560	198	18	1.0	1,170	7.8
Feb. 16	1.37	56		99	73	62		426	0		26							545	196	20	1.2	1,190	8.0
Mar. 16	1.01	47		81	72	60		418	0		24							498	156	21	1.2	1,150	7.9
May 6	1.59	72		38	36	30		238	0		14							242	47	21	.8	667	8.2
June 4	.71	81		31	54	40		251	7		16							300	83	22	1.0	752	8.4
June 30	.05	92		58	80	93		311	13		28							475	198	18	.9	1,160	8.5

LITTLE WASHITA RIVER NEAR NINNEKAH, GRADY COUNTY

Nov. 16, 1953	14.7	52		367	35	162		255	0		302							1,060	851	25	2.2	2,480	8.0
Jan. 11, 1954	12.3	33		389	41	159		280	0		290							1,140	910	23	2.0	2,510	7.7
Feb. 24	20.2	52		361	41	136		257	0		238							1,070	860	22	1.8	2,330	7.9
May 26	41.2	75		294	40	94		184	0		175							900	749	18	1.4	1,990	7.7
July 13	.95	90		304	163	223		126	0		455							1,430	1,280	25	2.6	3,390	7.9

FINN CREEK NEAR STORY, McCLAIN COUNTY

Nov. 18, 1953	1.66	58		73	59	35		525	0		14							425	0	15	0.7	848	8.0
Jan. 29, 1954	2.03	36		66	65	38		532	0		16							432	0	16	.8	867	8.0
Feb. 26	.81	55		45	69	43		526	0		18							395	0	19	.9	861	8.2
Apr. 19	2.04	66		74	59	39		178	6		34							425	269	16	.8	882	8.4
May 28	--	76		22	53	30		328	9		14							272	3	19	.8	623	8.4
July 14	.43	89		22	68	49		456	13		20							336	0	24	1.2	790	8.4
Aug. 23	.04	76		33	47	38		281	8		18							275	31	23	1.0	647	8.5
Sept. 15	.07	72		57	56	34		413	0		18							350	12	17	.8	759	7.9

RED RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN RED RIVER BASIN IN OKLAHOMA--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Discharge (cfs)	Temperature (°F)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_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	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
WASHITA RIVER NEAR PAULS VALLEY, GARVIN COUNTY																							
Oct. 1, 1953	20.7	74		94	33	49		263	0		44							368	152	22	1.1	873	8.2
Nov. 17	162	57		120	29	40		281	6		53							420	180	17	.8	917	8.3
Nov. 20	2,170	48		51	11	23		154	0		38							172	46	23	.8	444	8.2
Dec. 1	208	58		170	50	64		276	0		82							630	404	18	1.1	1,320	7.6
Dec. 16	228	39		137	31	47		297	0		64							470	226	18	.9	1,050	8.1
Dec. 30	113	34		170	39	75		337	0		94							585	309	22	1.3	1,380	8.2
Jan. 12, 1954	120	34		178	49	84		323	0		119							645	380	22	1.4	1,490	8.0
Jan. 29	138	36		204	44	90		339	0		129							690	412	22	1.5	1,560	8.0
Feb. 9	118	38		188	45	87		324	0		120							655	390	22	1.5	1,500	8.2
Feb. 25	144	57		123	30	51		220	0		66							430	250	21	1.1	1,000	8.0
Mar. 12	112	66		140	51	95		198	0		115							560	398	27	1.7	1,390	8.1
Mar. 24	107	63		92	44	89		184	0		85							410	259	32	1.9	1,240	8.1
Mar. 31	142	46		120	45	94		152	0		105							485	360	30	1.9	1,320	8.1
Apr. 6	104	73		120	37	78		174	0		90							450	308	27	1.6	1,150	8.2
Apr. 19	149	64		160	54	97		208	0		165							620	450	25	1.7	1,500	8.1
Apr. 28	756	72		78	28	47		207	0		60							308	138	25	1.2	775	8.1
May 1	2,780	67		70	17	22		163	6		22							244	101	16	.6	559	8.4
May 2	9,560	61		36	11	11		145	0		10							136	17	13	.4	276	8.1
May 4	2,340	63		86	16	15		139	0		14							282	168	10	.4	591	8.2
May 12	9,000	57		39	8.4	12		113	0		8.5							132	40	17	.5	288	7.9
May 14	1,920	59		82	15	21		128	0		20							268	163	15	.6	598	8.2
May 27	3,370	72		84	20	24		181	0		16							290	141	15	.6	651	8.0
May 29	3,920	70		67	8.0	10		124	0		11							200	98	10	.3	450	8.2
June 1	1,930	75		83	18	14		130	0		14							280	174	10	.4	610	8.2
June 17	563	78		126	38	49		205	6		58							470	292	18	1.0	1,110	8.3
June 28	278	85		130	35	41		182	7		38							468	308	16	.8	1,000	8.4
July 14	61.6	82		162	73	93		245	0		110							705	504	22	1.5	1,620	8.1
Aug. 9	33.6	62		150	82	123		176	12		135							710	546	27	2.0	1,820	8.5
Aug. 23	11.6	78		130	102	148		189	7		175							745	578	30	2.4	1,800	8.5
Aug. 26	9.60	78		128	91	123		192	0		162							695	538	28	2.0	1,710	8.2
Sept. 8	15.5	88		150	97	173		147	0		200							775	654	31	2.7	2,010	7.3

RUSH CREEK AT PURDY, GARVIN COUNTY

Oct. 23, 1953	560	68		55	13	11		119	0		23							192	94	11	0.3	430	7.9
Nov. 18	10.4	59		132	61	148		276	0		325							580	354	38	2.7	1,770	8.1
Nov. 20	67.4	46		56	15	26		122	0		55							200	100	22	.8	518	8.2
Dec. 2	15.4	56		110	69	168		177	0		345							560	415	40	3.1	1,790	7.9
July 13, 1954	--	--		96	99	238		222	0		520							648	460	44	4.1	2,290	7.7

RUSH CREEK NEAR MAYSVILLE, GARVIN COUNTY

Dec. 11, 1953	15.5	45		123	62	139		324	7		280							560	283	35	2.6	1,680	8.4
Jan. 29, 1954	15.5	35		128	66	141		329	0		278							590	320	34	2.5	1,710	7.8
Feb. 9	12.5	38		119	72	158		322	0		302							595	331	37	2.8	1,780	7.9
Feb. 26	9.48	54		105	79	165		297	0		320							585	342	38	3.0	1,860	8.2
Apr. 6	11.8	75		88	74	177		220	0		300							525	345	42	3.4	1,690	8.1
Apr. 28	32.1	75		66	35	63		161	0		300							310	178	31	1.6	916	7.7
Apr. 30	488	68		29	11	30		113	0		21							116	21	36	1.2	285	7.3
May 2	1,680	59		39	14	21		139	0		12							154	40	23	.7	321	7.9
May 4	48.5	66		75	33	119		219	10		100							324	128	44	2.9	877	8.5
May 12	3,380	59		32	11	17		113	0		12							124	32	23	.7	266	8.1
May 13	200	57		62	19	89		182	0		65							232	83	45	2.6	624	8.1
May 17	60.3	68		102	60	231		320	0		230							500	238	50	4.5	1,530	8.0
May 27	36.5	69		89	35	74		183	4		142							365	208	31	1.7	1,100	8.3
June 17	46.0	83		88	1.6	48		168	8		79							226	75	32	1.4	679	8.5
June 28	8.65	87		68	95	154		307	14		300							560	285	37	2.8	1,880	8.4
July 14	2.30	100		52	130	301		318	15		430							665	380	50	5.1	2,340	8.5

WILDHORSE CREEK NEAR HOOVER, GARVIN COUNTY

Jan. 12, 1954	15.0	35		95	58	102		379	0		198							475	164	32	2.0	1,370	7.8
Feb. 24	19.4	55		78	32	79		269	0		152							326	106	34	1.9	1,020	8.2
Apr. 19	19.5	73		62	31	56		222	7		95							282	88	30	1.5	821	8.4
May 28	313	72		70	58	98		298	6		220							415	161	34	2.1	1,320	8.3
July 13	4.83	92		39	40	55		281	4		81							260	24	31	1.5	840	8.3
Sept. 15	.30	74		58	28	41		222	0		74							260	78	26	1.1	667	7.9

RED RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN RED RIVER BASIN IN OKLAHOMA--Contonued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Discharge (cfs)	Temperature (°F)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_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	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
HONEY CREEK NEAR TURNER FALLS, MURRAY COUNTY																							
Sept. 15, 1954	1.50	79		57	18	4.0		225	0		10							218	34	4	0.1	400	7.7
ROCK CREEK NEAR DOUGHERTY, MURRAY COUNTY																							
Oct. 1, 1953	5.43	74		87	38	331		222	0		550							372	190	66	7.5	2,270	8.2
Nov. 17	9.70	59		79	34	182		284	0		305							334	102	54	4.3	1,500	8.2
Feb. 24, 1954	8.60	54		86	31	182		288	3		340							340	99	54	4.3	1,580	8.3
Apr. 19	6.19	70		82	35	173		265	0		310							350	133	52	4.0	1,760	8.2
May 27	53.6	86		41	20	73		161	5		119							186	46	46	2.3	754	8.4
July 13	6.90	93		62	32	234		193	6		395							285	117	64	6.0	1,750	8.4
Aug. 23	3.87	80		67	41	28		198	7		460							335	162	15	.7	1,940	8.5
Sept. 15	2.00	77		72	61	408		166	0		730							430	294	67	8.6	2,820	7.5
MILL CREEK NEAR MILL CREEK; JOHNSTON COUNTY																							
Nov. 17, 1953	3.74	57		65	38	4.7		380	0		7.5							320	8	3	0.1	565	8.1
Jan. 12, 1954	2.67	38		59	38	4.6		368	0		6.5							306	4	3	.1	557	8.0
Feb. 25	3.51	57		53	39	4.5		356	0		6.5							292	0	3	.1	535	8.2
Apr. 20	1.68	66		60	40	3.4		363	0		19							314	16	2	.1	570	7.8
May 28	14.3	75		18	34	5.4		207	8		7.5							184	1	6	.2	362	8.5
July 14	4.82	78		36	44	4.5		335	0		8.0							272	0	3	.1	524	8.1
Aug. 24	3.03	72		27	40	5.4		230	6		7.0							230	32	5	.2	447	8.5
Sept. 16	1.25	76		51	44	4.7		329	0		7.0							310	40	3	.1	528	7.9
PENNINGTON CREEK NEAR REAGAN, JOHNSTON COUNTY																							
Nov. 17, 1953	10.8	56		61	38	2.6		374	0		2.8							308	2	2	0.1	548	8.1
Jan. 12, 1954	10.2	40		56	37	3.0		358	0		3.8							294	0	2	.1	485	8.2
Feb. 25	13.8	59		48	37	2.7		349	0		4.5							274	0	2	.1	532	8.2
Apr. 20	7.74	64		60	40	2.6		345	0		24							312	30	2	.1	566	8.0

May 28, 1954	52.3	73		14	38	2.0		206	9		4.5							190	6	2	.1	356	8.6
July 14	17.0	82		18	44	2.2		306	0		4.5							224	0	2	.1	496	8.2
Aug. 24	10.6	78		19	46	2.5		225	8		5.0							235	37	2	.1	402	8.6
Sept. 16	6.73	70		47	47	1.7		328	0		5.0							310	41	1	.0	510	8.0
BLUE CREEK AT CONNERVILLE, JOHNSTON COUNTY																						
Nov. 17, 1953	22.7	60		84	30	3.6		405	0		2.8							334	2	2	0.1	592	8.0
Jan. 12, 1954	23.2	43		74	37	2.4		404	0		3.5							338	7	1	.1	591	8.1
Feb. 25	22.7	57		61	27	2.4		378	0		3.5							264	0	2	.1	559	8.1
Apr. 20	16.0	68		38	33	2.4		308	0		3.0							232	0	2	.1	448	7.9
May 28	67.9	69		11	44	2.0		223	8		4.0							210	14	2	.1	361	8.5
July 14	28.9	75		28	55	1.9		366	0		3.5							298	0	2	.1	548	7.9
Aug. 24	23.4	73		34	43	3.7		427	0		3.0							260	0	3	.1	524	8.2
Sept. 16	20.7	68		64	43	2.2		375	0		4.5							335	28	1	.1	577	7.8
BLUE RIVER NEAR BLUE, BRYAN COUNTY																						
Oct. 1, 1953	--	76		54	30	7.8		312	0		7.8							258	2	6	0.2	490	8.2
Nov. 17	36.0	52		53	26	7.6		269	10		9.0							238	1	6	.2	451	8.5
Dec. 22	--	42		49	21	8.1		245	5		8.0							208	0	8	.2	423	8.3
Feb. 1, 1954	--	50		50	15	9.2		217	0		9.2							188	10	10	.3	386	8.1
Feb. 25	51.9	56		60	25	10		305	3		12							252	0	8	.3	501	8.3
Mar. 4	--	46		62	29	9.5		320	0		10							272	10	7	.2	516	8.1
Apr. 12	857	64		34	10	9.7		127	0		5.5							128	24	14	.4	256	8.1
May 2	5,950	68		29	4.7	4.4		105	0		4.5							92	6	9	.2	193	8.0
CLEAR BOGGY CREEK NEAR CANEY, ATOKA COUNTY																						
Oct. 7, 1953	7.12	66		87	27	162		234	0		335							326	134	52	3.9	1,460	8.2
Nov. 17	33.6	55		66	18	68		213	0		120							238	64	38	1.9	777	8.2
Jan. 6, 1954	35.9	45		51	25	101		168	0		205							232	94	49	2.9	973	8.1
Feb. 1	105	52		83	13	66		249	0		121							260	56	36	1.8	818	8.0

RED RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN RED RIVER BASIN IN OKLAHOMA--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Discharge (cfs)	Temperature (°F)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_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	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
CLEAR BOGGY CREEK NEAR CANEY, ATOKA COUNTY--Continued																							
Mar. 4, 1954	37.4	46		35	22	110		106	0		192							180	93	57	3.6	910	8.1
Apr. 12	214	63		51	12	38		143	2		60							175	54	32	1.2	482	8.3
May 4	6,800	63		32	5.8	13		107	0		18							104	16	22	.6	242	8.2
July 22	11.8	88		58	40	198		124	0		410							310	208	58	4.9	1,540	8.2
MUDDY BOGGY CREEK NEAR FARRIS, ATOKA COUNTY																							
Oct. 7, 1953	188	67		10	3.6	8.6		48	0		8.2							41	2	31	0.6	127	7.0
Nov. 17	12.6	54		16	5.1	19		70	0		22							62	4	40	1.1	220	7.7
Jan. 6, 1954	22.1	47		15	3.9	12		51	0		14							53	11	33	.7	174	7.4
Feb. 2	168	48		8.4	2.4	7.7		27	0		9.2							31	9	35	.6	105	7.4
Mar. 3	43.1	47		12	5.8	15		46	0		15							54	16	38	.9	161	7.8
Apr. 13	12,500	64		14	5.6	17		56	0		18							58	12	39	1.0	184	7.8
May 4	10,900	64		8.0	3.6	4.9		29	0		7.5							35	11	23	.4	80.8	7.5

MISCELLANEOUS ANALYSES OF STREAMS IN RED RIVER BASIN IN TEXAS

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chlorids (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
NORTH GROESBECK CREEK NEAR NORTH GROESBECK																						
Dec. 8, 1953.....	2.84	16							1,810	570		5.9									4,550	
SOUTH GROESBECK CREEK NEAR ACME																						
Dec. 8, 1953	4.57	13							1,720	270		5.1									3,570	
GROESBECK CREEK NEAR QUANAH																						
Dec. 8, 1953	11.0	15				268			1,740	415		4.4									4,070	
WANDERERS CREEK AT ODELL																						
Oct. 31, 1953.....	6.69	22						187	663	192		9.5					770	617			2,090	8.0
Dec. 8.....	2.73	20				177			610	195		8.3									2,170	
LELIA LAKE CREEK NEAR HEDLEY																						
Nov. 24, 1953	6.82	38				59			225	54		9.3									961	
DOZIER CREEK NEAR WELLINGTON																						
Nov. 25, 1953.....	0.40	24							1,640	73		9.3									2,820	
NORTH FORK RED RIVER NEAR SHAMROCK																						
Dec. 8, 1953.....	13.0	26							445	388		0.25									2,320	

RED RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN RED RIVER BASIN IN TEXAS--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chlorids (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
SWEET WATER CREEK NEAR WHEELER																						
Dec. 8, 1953.....	5.91	36				29			20	19		1.0									506	
ELM CREEK NEAR SHAMROCK																						
Dec. 8, 1953.....	1.93	26							377	98		3.0									1,300	
ROARING SPRINGS NEAR ROARING SPRINGS																						
Jan. 20, 1954.....	1.34	43							76	95		9.2									948	
NORTH FORK WICHITA RIVER 10 MILES SOUTHEAST OF PADUCAH																						
Feb. 10, 1954.....	3.53					3,060		110	2,110	4,930											16,800	7.8
SALT CREEK 6½ MILES SOUTHEAST OF PADUCAH																						
Feb. 10, 1954.....	2.31					11,300		89	3,800	18,400											48,500	7.8
NORTH FORK WICHITA RIVER 14 MILES SOUTHEAST OF PADUCAH																						
Feb. 10, 1954.....	10.2					4,820		128	2,460	7,660											24,000	7.8
NORTH FORK WICHITA RIVER 4½ MILES NORTH OF TRUSCOTT																						
Feb. 10, 1954.....	13.7					3,860		128	2,590	6,360											20,800	7.9
SOUTH FORK WICHITA RIVER 6 MILES EAST OF GUTHRIE																						
Feb. 10, 1954.....	5.19					7,870		114	2,950	13,100											36,800	7.8

SOUTH FORK WICHITA RIVER 4 MILES NORTH OF BENJAMIN

Feb. 10, 1954	5.90					6,530		105	3,000	11,100											32,200	7.7

WICHITA RIVER NEAR SEYMOUR

Feb. 10, 1954.....	17.6					3,490		102	2,240	5,860											19,100	7.8

LAKE KEMP NEAR SEYMOUR

June 15, 1954.....		4.7	0.02	140	28	324	5.6	78	373	520	0.4	0.5	0.31	1,430	1.94		464	400	60	6.5	2,430	7.2

LAKE WICHITA NEAR WICHITA FALLS

June 15, 1954.....		6.6	0.37	34	8.8	66	5.7	104	36	109	0.5	0.2	0.04	319	0.43		121	36	53	2.6	592	7.2

LAKE KICKAPOO NEAR ARCHER CITY

June 15, 1954.....		3.1	0.04	24	8.4	23		139	7.7	15	0.5	2.8	0.00	153	0.21		94	0	35	1.0	274	7.6

LAKE TEXOMA AT PERRIN AIR FORCE BASE

Oct. 1, 1953.....		6.3	0.01	97	28	243		111	236	388	0.3	1.5		1,060	1.44		357	266	60	5.6	1,850	7.6

CANEY LAKE AT RED RIVER ARSENAL NEAR TEXARKANA

June 18, 1954.....		4.9	0.03	2.8	1.9	3.4		18	4.4	0.2	0.7	0.8		28	0.04		15	0	33	0.4	45.2	7.0

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RED RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN RED RIVER BASIN IN ARKANSAS

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (residue on evaporation at 180°C)	Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH
														Calcium, magnesium	Noncarbonate		
RED RIVER AT INDEX																	
Feb. 5, 1954	5,180							73	24	29		1.1		86	26	264	7.9
July 14	a 5,500							b 122	163	255		1.6		274	174	1,410	8.3
ROLLING FORK RIVER NEAR DE QUEEN																	
Jan. 29, 1954	435							8	3.0	3.8		0.4		8	1	34.5	6.1
July 12	a 2.0							26	3.0	6.8		2.5		17	0	74.4	7.4
COSSATOT RIVER NEAR DE QUEEN																	
Feb. 3, 1954	277							12	1.0	3.0		0.6		9	.0	35.5	6.1
July 14	a 9.7							26	3.0	6.5		1.7		17	0	77.8	6.6
SALINE RIVER NEAR DIERKS																	
Feb. 23, 1954	120							16	2.0	22		0.4		10	0	42.3	7.3
Aug. 19	0							44	5.0	31		5.9		26	0	196	6.8
OUACHITA RIVER NEAR MOUNT IDA																	
Jan. 25, 1954	1,120							14	3.0	3.8		2.1		12	1	38.7	7.0
July 27	12.2							36	2.0	5.0		.4		37	7	106	6.8
SOUTH FORK OUACHITA RIVER NEAR MOUNT IDA																	
Jan. 25, 1954	83.8							76	5.0	2.5		1.4		65	3	143	8.1
July 27	1.62							c 109	6.0	2.5		.1		93	4	193	8.4

a Mean daily discharge (cfs).
b Includes equivalent of 2 parts per million of carbonate (CO_3).
c Includes equivalent of 3 parts per million of carbonate (CO_3).

OUACHITA RIVER AT BLAKLEY MOUNTAIN DAM NEAR HOT SPRINGS

Jan. 26, 1954	a5							64	4.0	2.2		1.0		58	5	133	7.8
July 27	a488							89	2.0	3.0		1.0		33	1	82.0	7.1

OUACHITA RIVER NEAR MALVERN

Jan. 26, 1954	a784							20	4.0	2.2		2.3		24	8	72.2	7.2
Mar. 31	a360							25	8.0	2.5		.4		24	4	70.0	7.4

MUDDY FORK CREEK AT MURFREESBORO DAMSITE NEAR MURFREESBORO

Jan. 28, 1954	a147							17	11	6.8		0.7		22	8	65.8	6.5
July 14	0							29	2.0	6.0		1.0		22	0	78.5	7.3

LITTLE MISSOURI RIVER AT NARROWS DAM NEAR MURFREESBORO

Jan. 28, 1954	a28							14	1.0	2.8		0.6		12	1	42.4	6.5
Sept. 29	a30							22	2.0	3.8		1.6		14	0	56.9	7.6

LITTLE MISSOURI RIVER NEAR MURFREESBORO

Dec. 28, 1953	18.7							9	11	3.0		1.8		23	16	64.6	6.7
July 14, 1954	a681							14	1.0	3.5		2.8		12	1	44.2	7.1

a Mean daily discharge (cfs).

MISSISSIPPI RIVER DELTA

ATCHAFALAYA RIVER AT KROTZ SPRINGS, LA.

LOCATION.--At gaging station at bridge on U. S. Highway 190, half a mile north of town of Krotz Springs, St. Landry Parish, 0.6 mile upstream from New Orleans, Texas and Mexico Railroad Bridge, 10 miles upstream from Bayou Courtableau, and 42 miles downstream from confluence of Red River and Old River (head of Atchafalaya River).
RECORDS AVAILABLE.--Chemical analyses: August 1952 to September 1954.
Water temperatures: August 1952 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 472 ppm Dec. 11-20; minimum, 183 ppm May 11-20.
Hardness: Maximum, 214 ppm Oct. 21-31, Nov. 1-10, Nov. 11-20; minimum, 94 ppm Jan. 30-31, Feb. 1-10.
Specific conductance: Maximum daily, 945 micromhos Jan. 16, minimum daily, 273 micromhos May 5, 15, 21, 22.
Water temperatures: Maximum observed, 88°F on many days during July; minimum observed, 44°F Dec. 27.
EXTREMES, 1952-54.--Dissolved solids: Maximum, 486 ppm Dec. 1-11, 1952; minimum, 115 ppm June 11-20, 1953.
Hardness: Maximum, 218 ppm Oct. 21-31, Nov. 1-10, 11-20, 21-30, 1952; minimum, 57 ppm June 11-20, 1953.
Specific conductance: Maximum daily, 945 micromhos Jan. 16, 1954; minimum daily, 164 micromhos June 18-19, 1953.
Water temperatures: Maximum observed, 88°F on many days during July, 1954; minimum observed, 44°F Dec. 27, 1953.
REMARKS.--Values reported for dissolved solids are residues on evaporation unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate					
Oct. 1-10, 1953	42,050	12	0.04	50	16	30		185	61	29		1.2		328	0.45	37,240	191	40	26	1.0	553	8.2	
Oct. 11-20	39,720	11	.03	54	17	51		192	71	58		1.0		360	.49	38,610	204	47	35	1.5	624	8.2	
Oct. 21-31	39,840	12	.03	56	18	57		195	79	67		1.2		392	.53	42,170	214	54	38	1.7	669	8.0	
Nov. 1-10	40,450	12	.03	56	18	53		192	74	66		1.0		381	.52	41,610	214	56	35	1.6	653	8.1	
Nov. 11-20	39,750	11	.02	58	17	75		190	73	102		1.5		458	.62	49,150	214	59	43	2.2	744	7.9	
Nov. 21-30	39,600	11	.03	56	17	63		189	73	81		1.5		419	.57	44,800	210	54	39	1.9	681	7.9	
Dec. 1-10	45,300	15	.05	54	17	72		182	64	103		1.5		444	.60	54,310	204	56	43	2.2	727	7.9	
Dec. 11-20	50,260	11	.09	47	16	92		144	54	148		1.8		472	.64	64,050	184	66	52	3.0	803	7.9	
Dec. 21-31	50,870	9.6	.08	45	14	78		132	54	123		2.0		420	.57	57,690	170	62	50	2.6	708	7.9	
Jan. 1-10, 1954	48,670	11	--	45	14	68		134	59	102		3.0		384	.52	50,460	170	60	47	2.3	645	7.7	
Jan. 11-13, 24-29	106,900	17	.10	38	11	58		110	45	90		2.5		324	.44	93,520	140	50	47	2.1	611	8.0	
Jan. 14-23	63,710	20	.10	46	13	87		122	49	145		2.5		432	.59	74,310	168	68	53	2.9	772	8.1	
Jan. 30-31, Feb. 1-10	183,900	11	.32	27	6.5	24		73	31	36		3.2		191	.26	94,840	94	34	35	1.1	312	7.9	
Feb. 11-19	96,950	11	.03	27	7.2	31		75	27	51		2.5		214	.29	56,020	97	36	41	1.3	369	7.7	
Feb. 20-28	86,080	12	.02	32	9.1	42		89	34	70		2.2		270	.37	62,750	117	44	44	1.7	457	7.7	
Mar. 1-10	109,500	11	.04	27	7.1	29		76	33	43		3.2		206	.28	60,900	97	34	40	1.3	347	7.8	
Mar. 11-20	108,800	11	.01	32	8.4	28		90	41	40		3.8		223	.30	65,510	114	41	35	1.1	373	7.8	
Mar. 21-31	99,250	13	.05	34	9.3	33		94	48	45		5.0		239	.33	64,050	123	46	37	1.3	404	8.0	

Apr. 1-10, 1954	102,000	12	0.05	35	10	36	100	59	49		4.0		251	0.34	69,130	128	46	38	1.4	424	8.0
Apr. 11-20	112,400	12	.05	38	11	46	105	52	69		4.0		296	.40	89,830	140	54	42	1.7	503	8.0
Apr. 21-29	126,300	13	.04	36	10	46	96	47	71		3.8		283	.38	96,510	131	52	43	1.7	491	7.7
Apr. 30, May 1-10	181,300	11	.06	30	8.0	24	86	34	36		3.5		200	.27	97,900	108	37	32	1.0	334	7.8
May 11-20	224,300	14	.04	28	6.1	23	88	26	31		3.0		183	.25	110,800	95	23	35	1.0	296	7.8
May 21-31	197,900	15	.03	30	6.5	31	84	33	45		3.0		225	.31	120,200	102	33	40	1.3	359	7.7
June 1-19	131,300	18	.08	35	9.2	47	99	49	66		2.2		278	.38	98,550	125	44	45	1.8	488	8.0
June 20-30	106,500	16	.04	40	10	43	116	53	58		4.0		283	.38	81,300	141	46	40	1.6	494	8.0
July 1-10	93,560	14	--	42	14	34	128	60	46		4.0		295	.40	74,520	162	57	31	1.1	483	8.1
July 11-20	83,440	13	.02	42	13	33	139	52	43		4.5		282	.38	63,530	158	44	31	1.2	468	7.9
July 21-31	69,860	14	.03	44	14	35	149	55	43		4.0		300	.41	56,590	167	45	31	1.2	500	8.0
Aug. 1-10	64,880	9.6	.02	46	14	43	143	72	50		3.8		324	.44	56,760	172	56	35	1.4	538	7.9
Aug. 11-20	51,720	12	.00	50	15	41	153	79	46		3.0		330	.45	46,080	186	61	32	1.3	552	8.0
Aug. 21-31	54,780	9.6	.00	45	14	45	155	74	43		3.0		a 310	.42	45,850	170	43	36	1.5	525	7.8
Sept. 1-10	61,390	8.8	.00	40	13	30	128	59	35		3.0		260	.35	43,100	153	48	30	1.1	454	7.9
Sept. 11-20	55,290	11	.01	42	14	35	140	59	42		3.2		280	.38	41,800	162	48	32	1.2	477	7.8
Sept. 21-30	43,200	13	.02	45	14	36	157	53	44		3.2		292	.40	34,060	170	41	32	1.2	499	7.9
Weighted average	88,910	13	0.05	41	12	46	129	54	63		2.9		309	0.42	74,180	152	46	40	1.6	524	--

a Sum of determined constituents.

MISSISSIPPI RIVER DELTA--Continued

ATCHAFALAYA RIVER AT KROTZ SPRINGS, LA.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	77	67	54	45	46	56	58	71	--	88	87	86
2	78	66	54	45	46	53	58	71	--	88	86	86
3	78	65	54	45	47	54	58	71	--	88	86	86
4	78	64	54	45	47	53	58	71	--	88	86	85
5	78	64	54	45	47	53	58	70	--	88	86	85
6	77	63	54	45	47	52	58	70	--	88	86	85
7	76	63	55	45	47	51	58	69	--	88	86	85
8	76	62	55	45	47	51	59	69	78	88	86	85
9	76	61	55	45	48	51	60	69	79	88	86	84
10	75	60	55	45	48	52	60	69	79	88	86	85
11	74	59	54	45	49	--	62	68	80	88	87	85
12	74	59	54	45	49	53	63	68	80	88	87	84
13	74	57	53	45	49	53	63	68	81	88	87	84
14	73	56	52	46	49	53	65	66	81	88	87	84
15	73	56	51	46	50	53	64	66	81	88	87	84
16	73	56	50	47	50	52	63	66	81	88	87	84
17	73	56	50	47	50	52	63	66	81	88	87	84
18	74	56	50	47	51	52	63	66	81	88	87	84
19	73	56	49	47	52	52	64	67	81	88	87	83
20	73	56	49	48	53	52	65	67	81	88	87	82
21	73	57	48	48	54	52	65	68	82	88	87	81
22	73	57	47	47	54	53	66	68	82	88	87	81
23	72	57	46	48	54	54	66	69	83	88	87	81
24	72	57	45	47	55	52	68	69	84	88	87	80
25	72	57	45	46	55	55	69	69	84	88	87	80
26	71	57	45	45	55	58	69	70	85	88	87	80
27	71	57	44	45	55	58	70	70	85	88	87	80
28	70	55	45	45	56	56	71	71	85	87	86	80
29	--	55	45	45	--	56	71	72	86	87	86	79
30	69	54	45	45	--	56	71	--	87	86	86	79
31	68	--	45	45	--	58	--	--	--	86	86	--
Average	74	59	50	46	50	54	64	69	--	88	87	83

MISSISSIPPI RIVER DELTA--Continued

BAYOU COCODRIE NEAR CLEARWATER, LA.

LOCATION.--At gaging station at bridge on State Highway 26, seven-eights of a mile downstream from Chicago, Rock Island and Pacific Railroad bridge, 1½ miles east of Clearwater, Evangeline Parish, 4 miles south of Meeker, and 5 miles downstream from Hurricane Creek.
DRAINAGE AREA.--240 square miles.
RECORDS AVAILABLE.--Chemical analyses: August 1952 to September 1954 (discontinued).
Water temperatures: August 1952 to September 1954 (discontinued).
Sediment Records: August 1952 to September 1954 (discontinued).
EXTREMES, 1953-54.--Dissolved solids: Maximum, 212 ppm Mar. 15, 28-30; minimum, 23 ppm May 11-20.
Hardness: Maximum, 156 ppm Mar. 15, 28-30; minimum, 5 ppm Dec. 11-20.
Specific conductance: Maximum daily, 374 micromhos Mar. 29-30; minimum daily, 34.7 micromhos May 13.
Water temperatures: Maximum observed, 87°F July 3-7, Aug. 10; minimum observed, 38°F Dec. 24, 25.
Sediment concentration: Maximum daily, 720 ppm Oct. 25; minimum daily, 8 ppm composite period Dec. 26-31.
Sediment loads: Maximum daily, 2,250 tons May 15; minimum daily, 3.1 tons composite period Oct. 21-24.
EXTREMES, 1952-54.--Dissolved solids: Maximum, 212 ppm Mar. 15, 28-30, 1954; minimum, 17 ppm May 8-9, 18-31, 1953.
Hardness: Maximum, 156 ppm Mar. 15, 28-30, 1954; minimum, 5 ppm Dec. 11-20, 1953.
Specific conductance: Maximum daily, 374 micromhos Mar. 29-30, 1954; minimum daily, 15.0 micromhos May 24, 1953.
Water temperatures: Maximum observed, 87°F July 3-7, Aug. 10, 1954; minimum observed, 38°F Dec. 24, 25, 1953.
Sediment concentrations: Maximum daily, 1,610 ppm June 11, 1953; minimum daily, 4 ppm Aug. 21, Nov. 30, Dec. 1, 1952.
Sediment loads: Maximum daily, 5,630 tons June 5, 1953; minimum daily, 0.7 ton Aug. 21, 1952.
REMARKS.--Values reported for dissolved solids are sums of determined constituents. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1953 to September 1954 given in WSP 1341.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-13, 1953...	83.3	39	0.37	2.4	1.1	7.0	1.1	24	0.9	6.0		0.2		70	0.10	15.7	10	0	56	0.9	56.7	7.3
Oct. 14-24.....	82.0	40	.39	2.3	1.1	6.8	1.0	22	1.0	6.0		.2		70	.10	15.5	10	0	56	.9	57.1	7.2
Oct. 25-31.....	115	34	.63	2.3	1.2	11		26	4.3	6.5		.2		73	.10	22.7	11	0	70	1.5	73.4	7.3
Nov. 1-10	153	24	.28	2.5	.7	6.9	1.2	12	5.6	7.8		.5		56	.08	23.1	9	0	58	1.0	62.4	6.9
Nov. 11-20.....	134	26	.36	2.2	.7	6.9	1.2	15	2.9	7.2		.8		56	.08	20.3	8	0	60	1.0	56.7	6.9
Nov. 21-30.....	188	24	.50	2.2	.5	7.1	1.2	14	2.9	7.2		.5		54	.07	27.4	8	0	63	1.1	54.8	6.9
Dec. 1-10	293	20	.57	2.4	.6	6.4	1.4	13	2.6	7.5		.5		49	.07	38.8	8	0	58	1.0	54.7	6.9
Dec. 11-20.....	316	20	.70	1.6	.3	7.0	1.3	12	2.1	6.8		.2		47	.06	40.1	5	0	69	1.3	47.9	6.9
Dec. 21-31.....	244	21	.69	3.4	.8	7.0	1.0	14	2.3	8.5		.2		50	.07	32.9	12	0	54	.9	51.4	6.9
Jan. 1-12, 1954...	351	16	.42	2.0	1.2	5.6	1.0	12	2.3	7.8		.8		43	.06	40.8	10	0	52	.8	51.1	6.9
Jan. 13-15, 19-23, 30-31.....	401	15	.52	2.2	1.2	4.6	.8	12	2.0	6.2		.5		39	.05	42.2	10	1	47	.6	46.1	6.8
Jan. 16-18, 24-29.	393	14	.57	4.6	2.7	8.4	2.8	38	3.8	6.5		.8		63	.09	66.8	23	0	41	.8	97.6	7.3
Feb. 1-10, 21-28 .	179	20	.37	2.0	1.1	7.0		16	1.2	7.2		.2		47	.06	22.7	10	0	61	1.0	53.8	7.0
Feb. 11-20.....	125	21	.46	5.4	2.8	7.7		34	2.7	7.5		.5		65	.09	21.9	25	0	40	.7	34.1	7.3

MISSISSIPPI RIVER DELTA--Continued

BAYOU COCODRIE NEAR CLEARWATER, LA.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Mar. 1-10, 16-18, 22-27, 31, 1954..	145	23	0.54	3.5	1.2	6.0		20	1.8	5.5		1.0		52	0.07	20.4	14	0	49	0.7	61.7	7.3
Mar. 11-14, 19-21.	124	20	.42	12	4.3	9.8		62	4.2	8.0		3.0		92	.13	30.8	48	0	31	.6	150	7.7
Mar. 15, 28-30...	339	22	.10	36	16	17		211	8.9	6.5		1.8		212	.29	194	156	0	19	.6	362	8.2
Apr. 1-12.....	332	15	1.1	2.8	1.4	6.0	--	18	1.6	6.5		.8		44	.06	39.4	13	0	51	.7	57.3	7.2
Apr. 13-21.....	297	14	.70	2.6	1.5	5.2	--	16	2.4	5.0		1.8		41	.06	32.9	13	0	47	.6	54.6	7.0
Apr. 22-30.....	294	13	.84	2.6	1.3	4.7	--	16	1.6	5.0		1.0		38	.05	30.2	12	0	46	.6	49.6	7.0
May 1-10.....	1,301	5.4	.10	2.2	.9	3.5	--	11	1.9	3.2		2.0		24	.03	84.3	9	0	45	.5	45.1	6.9
May 11-20.....	1,171	4.6	.16	2.2	1.1	3.2	--	12	1.4	2.8		1.8		23	.03	72.7	10	0	41	.4	38.7	6.9
May 21-31.....	869	5.2	.18	2.2	1.0	3.2	--	12	1.4	3.0		1.8		24	.03	57.2	10	0	42	.4	37.0	6.9
June 1-10,.....	598	12	.36	2.8	1.1	6.1	--	22	1.3	3.5		1.0		39	.05	63.0	12	0	54	.8	45.5	7.9
June 11-20.....	386	18	.74	3.0	1.4	7.5	--	22	1.6	5.5		3.5		52	.07	54.2	13	0	55	.9	60.5	7.7
June 21-30.....	182	22	.68	2.9	1.2	8.9	--	23	1.4	6.5		3.8		58	.08	28.5	12	0	61	1.1	64.4	7.7
July 1-11.....	82.5	24	.28	4.6	1.3	8.3		29	1.3	6.2		1.2		61	.08	13.6	17	0	52	.9	73.5	7.5
July 12-20.....	76.6	28	.13	2.4	1.1	9.2		22	1.3	7.0		1.5		62	.08	12.8	10	0	66	1.2	62.2	7.4
July 21-31.....	81.5	24	.20	3.3	1.6	8.3		21	2.6	7.5		3.0		60	.08	13.2	15	0	55	.9	69.5	7.4
Aug. 1-10.....	97.2	25	.54	2.9	1.3	7.7		18	3.0	7.0		2.0		58	.08	15.2	13	0	57	.9	64.1	7.2
Aug. 11-20.....	68.3	26	.08	2.2	.9	7.2	1.5	18	1.9	6.2		2.2		57	.08	10.5	9	0	59	1.0	61.7	7.1
Aug. 21-31.....	63.3	27	.10	2.4	.9	7.9	1.7	20	1.5	6.8		2.0		60	.08	10.3	10	0	59	1.1	63.5	7.2
Sept. 1-10.....	59.3	26	.10	2.0	.9	7.6	1.5	19	1.6	6.2		2.0		57	.08	9.13	9	0	61	1.1	61.4	7.2
Sept. 11-20.....	58.5	27	.06	2.1	.6	7.9	1.7	18	1.5	6.8		2.2		59	.08	9.32	8	0	64	1.3	63.0	7.1
Sept. 21-30.....	58.9	28	.10	2.2	.8	8.1	1.6	20	1.4	7.0		2.0		61	.08	9.70	9	0	62	1.2	64.9	7.1
Average	273	21	0.41	3.9	1.7	7.8		26	2.3	6.3		1.4		58	0.08	42.8	17	0	51	0.8	70.2	-

MISSISSIPPI RIVER DELTA--Continued

BAYOU COCODRIE NEAR CLEARWATER, LA.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	78	63	58	55	50	50	63	69	75	85	78	80
2	80	63	58	55	49	50	63	70	73	85	78	80
3	80	64	58	55	49	50	65	70	72	87	80	80
4	81	59	58	55	49	50	68	70	72	87	82	79
5	78	49	58	55	49	50	68	70	74	87	85	81
6	78	45	56	55	49	50	68	70	74	87	85	81
7	78	40	56	52	49	50	68	70	74	87	85	82
8	66	51	55	50	49	50	71	67	76	85	85	82
9	66	54	55	50	49	50	71	67	76	85	85	82
10	66	46	55	50	49	50	71	67	76	85	87	80
11	68	49	56	50	49	50	71	70	76	85	80	75
12	68	49	56	50	50	50	74	67	78	85	85	75
13	70	48	56	52	50	53	74	67	80	85	85	75
14	72	48	52	55	50	53	76	67	80	84	85	75
15	72	50	52	55	50	53	70	68	80	84	85	72
16	72	50	49	55	50	56	70	70	80	85	85	72
17	72	52	46	52	50	57	72	70	80	85	85	72
18	70	55	46	50	50	57	72	71	80	85	85	72
19	68	55	46	55	55	59	68	71	82	85	85	80
20	68	55	46	57	57	60	68	71	83	85	85	80
21	68	58	46	50	57	60	69	71	83	85	85	81
22	68	58	46	50	57	60	69	72	83	85	85	80
23	68	58	46	50	57	60	70	73	83	85	85	83
24	68	58	38	50	57	60	72	73	83	85	85	83
25	68	58	38	50	55	60	72	74	83	85	85	83
26	67	58	40	50	55	62	72	73	85	85	86	85
27	67	55	43	50	56	62	72	74	85	83	86	85
28	65	55	45	50	56	65	72	75	80	80	85	85
29	65	55	48	50	--	65	70	78	85	80	85	85
30	65	53	50	50	--	65	70	75	85	80	85	85
31	62	--	50	50	--	65	--	75	--	80	82	--
Average	70	54	50	52	52	56	70	71	79	85	84	80

MISSISSIPPI RIVER DELTA--Continued

BAYOU COCODRIE NEAR CLEARWATER, LA.--Continued

Suspended sediment, water year October 1953 to September 1954

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	85			146			178		
2	85			140			168		
3	85			134			192		
4	85			134			231		
5	85			146			305	16	12
		18	4.1		20	8.3			
6	83			155			375		
7	83			161			385		
8	83			171			375		
9	82			174			365		
10	82			168			355		
11	82			161			345		
12	82			152			345	12	11
13	82			146			345		
14	82			137			335		
15	82			132			325		
		16	3.5		16	5.8			
16	82			126			325		
17	82			124			315		
18	82			122			295		
19	82			119			276		
20	82			119			258		
								10	7.0
21	82			119			249		
22	82	14	3.1	149			240		
23	82			164			240		
24	82			192			231		
25	82	720	159	222			222		
					18	9.1			
26	93	416	104	231			214		
27	107			222			199		
28	114			206			214	8	5.4
29	124	18	6.1	192			240		
30	140			185			285		
31	146			--	--	--	345		
Total	2,792	--	381.9	4,749	--	232.0	8,772	--	279.4

Day	January			February			March		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	365			285	--	e 15	124		
2	355			276	--	e 15	122		
3	345			258	156	109	122		
4	335			240	168	109	122		
5	335			214	190	110	124		
		10	9.0					15	5.0
6	325			199			126		
7	325			178			129		
8	325			164			126		
9	305			152			126		
10	345	190	177	146			124		
11	395	188	201	140	20	7.8	124	44	15
12	455			134			122	54	18
13	485			129			119	45	14
14	475	112	142	126			116	44	14
15	465			124			114		
16	465			122			110	16	4.7
17	445			119			107		
18	435	13	15	119	26	8.4	107		
19	415			119	42	13	122	47	15
20	405			122	51	17	130	35	12
21	395			129			132	42	15
22	385			140			138	40	15
23	375			146			138		
24	385			146			135		
25	385	19	19	143	18	6.7	132	42	17
26	385			137			130		
27	365			134			200		
28	345			129			352		
29	325			--	--	--	430	48	55
30	305	19	16	--	--	--	460		
31	305			--	--	--	450		
Total	11,755	--	1,429	4,470	--	543.6	5,113	--	491.8

e Estimated.

MISSISSIPPI RIVER DELTA--Continued

BAYOU COCODRIE NEAR CLEARWATER, LA.--Continued

Suspended sediment, water year October 1953 to September 1954--Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	440			580			710		
2	420			1,090			686		
3	400			1,360	125	411	684		
4	390			1,520			631		
5	370	10	9.6	1,540			609		
6	352			1,490			587	26	41
7	334			1,430			565		
8	307			1,370	172	643	532		
9	280			1,340			510		
10	255			1,290			490		
11	231			1,240	270	904	470		
12	202			1,240	210	703	450	266	323
13	174			1,260	230	782	430	326	378
14	156	115	61	1,240	600	2,010	410	302	334
15	156			1,210	690	2,250	390	332	350
16	263			1,170	400	1,260	370	285	285
17	316			1,140	208	640	352	224	213
18	390			1,100	168	499	334	154	139
19	420	54	56	1,070	220	636	334	154	139
20	410			1,040	230	646	316	162	138
21	390			1,010	197	537	298	187	150
22	370			974	249	655	271	225	165
23	352			950	131	336	239	366	236
24	334			926	125	313	209	343	194
25	316	14	12	890	260	625	181	408	199
26	298			866	210	491	156	595	251
27	271			842	225	512	132		
28	247			818	250	552	117	84	26
29	223	56	36	794	360	772	110		
30	239			758	108	221	102		
31	--	--	--	734	15	30	--	--	--
Total	9,306	--	922	34,282	--	20,644	11,655	--	4,049

Day	July			August			September		
1	95			114			60	510	83
2	91			114			60	490	79
3	87			114	104	31	59	350	56
4	85			107			59	380	61
5	83	27	6.1	100			59	640	102
6	81			93	215	54	59	561	89
7	79			87	214	50	59	570	91
8	79			83	244	55	59	480	76
9	77			81	177	39	59	380	61
10	75			79	148	32	60	300	49
11	75			77	174	36	59	256	41
12	77			73	133	26	59	400	64
13	77			71	140	27	58	365	57
14	75	16	3.2	69	169	31	58	372	58
15	73			69	176	33	58	346	54
16	71			67	169	31	58	331	52
17	75			65	134	24	58	322	50
18	79	157	33	64	121	21	59	346	55
19	79	200	43	64	300	52	59	346	55
20	83	220	49	64	253	44	59	332	53
21	83	188	42	64	243	42	59	311	50
22	83	380	85	64	192	33	59	288	46
23	81	260	57	64	168	29	59	262	42
24	79	164	36	64	160	28	59	238	38
25	77	184	38	64	208	36	59	212	34
26	75	293	59	64	285	49	58	200	31
27	73	56	11	64	328	57	58	196	31
28	71	238	46	64	289	50	59	268	43
29	77	238	49	62	274	46	59	219	35
30	91	252	62	62	250	42	60	201	33
31	107	362	105	60	296	48	--	--	--
Total	2,493	--	798.4	2,351	--	1,170	1,767	--	1,669

Total discharge for year (cfs-days) 99,505
Total load for year (tons) 32,610.1

MISSISSIPPI RIVER DELTA--Continued

BAYOU COCODRIE NEAR CLEARWATER, LA.--Continued

Particle-size analyses of suspended sediment, water year October 1953 to September 1954
(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 (cfs)	Water temperature (°F)	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. 25, 1953		a 82		1,530	3,730	44	49	52	65	80	94	99	100				SBCW
May 15, 1954		a 1,210		1,150	1,790	60	63	66	75	88	99	100					SBCW
July 31		a 107		477	1,160	80	90	93	95	99	99	100					SBCW

a Average discharge for day.

MISSISSIPPI RIVER DELTA--Continued

VERMILION RIVER AT BANCKER'S FERRY, LA.

LOCATION.--At Bancker's Ferry about 6 miles south of Abbeville, Vermilion Parish.
RECORDS AVAILABLE.--Chemical analyses: January 1949 to September 1954.
Water temperatures: January 1949 to September 1954.
EXTREMES, 1953-54.--Specific conductance: Maximum daily, 21,200 micromhos Sept.18; minimum daily, 60.2 micromhos Jan. 12.
Water temperatures: Maximum observed, 90°F July 2, 4; minimum observed, 48°F Dec. 24.
EXTREMES, 1949-54.--Specific conductance: Maximum daily, 21,200 micromhos Sept.18,1954; minimum daily, 47.7 micromhos May 20, 1953.
Water temperatures: Maximum observed, 98°F Aug. 9, Sept. 3, 1951; minimum observed, 38°F Jan. 30, 1951.
REMARKS.--No discharge records available for this station.

Specific conductance (micromhos at 25°C) and chloride, in parts per million, water year October 1953 to September 1954

Day	October		November		December	
	Conductance	Chloride	Conductance	Chloride	Conductance	Chloride
1	1,160	300	1,260	315	459	115
2	1,770	485	1,160	288	309	69
3	2,280	642	2,110	585	472	117
4	1,960	582	3,250	960	154	27
5	1,790	485	2,320	635	108	23
6	486	109	395	65	207	42
7	400	--	3,840	1,160	392	102
8	460	102	1,500	390	485	131
9	628	148	389	58	504	132
10	682	--	419	68	272	59
11	1,210	320	526	101	167	17
12	1,070	280	465	82	93.2	14
13	722	172	465	--	246	61
14	534	119	467	--	523	137
15	395	79	509	--	516	135
16	347	--	502	91	532	138
17	347	--	815	186	257	54
18	343	64	1,200	305	270	--
19	748	185	1,420	370	256	--
20	1,670	458	654	130	221	--
21	1,870	508	1,240	322	184	38
22	2,170	598	1,190	318	158	28
23	1,590	420	78.6	16	149	--
24	1,540	410	157	31	165	--
25	2,000	550	431	111	184	--
26	4,600	1,400	236	52	184	--
27	371	64	291	66	191	--
28	371	67	253	54	199	36
29	504	106	260	56	202	38
30	730	172	332	77	233	45
31	1,850	510	--	--	161	24

MISSISSIPPI RIVER DELTA--Continued

VERMILION RIVER AT BANCKER'S FERRY, LA.--Continued

Specific conductance (micromhos at 25°C) and chloride, in parts per million, water year October 1953 to September 1954--Continued

Day	January		February		March	
	Conductance	Chloride	Conductance	Chloride	Conductance	Chloride
1	192	--	227	--	389	81
2	305	65	229	43	718	172
3	216	36	172	31	411	83
4	199	33	243	44	406	--
5	431	101	273	53	388	--
6	137	22	243	--	387	70
7	125	21	296	59	292	38
8	216	50	417	94	289	37
9	460	123	360	77	451	83
10	272	63	275	52	451	--
11	116	15	248	--	469	--
12	60.2	7.5	263	48	469	--
13	135	26	247	42	417	78
14	453	117	263	--	544	113
15	390	101	253	--	496	101
16	278	66	249	41	483	--
17	245	56	527	124	479	95
18	268	60	506	117	632	139
19	188	34	471	108	1,000	240
20	213	44	516	120	493	91
21	198	--	432	91	533	101
22	211	--	450	--	591	120
23	209	38	382	71	517	96
24	253	50	520	114	583	115
25	232	42	568	126	2,730	768
26	224	--	446	90	631	--
27	224	38	477	97	618	120
28	273	53	1,080	280	469	72
29	299	61	--	--	469	--
30	297	60	--	--	473	--
31	227	42	--	--	493	--

	April		May		June	
1	590	--	1,590	408	154	20
2	583	108	7,430	2,290	303	65
3	790	181	365	56	203	37
4	386	77	344	--	236	--
5	241	36	370	68	213	--
6	211	--	260	48	170	--
7	227	33	128	18	179	--
8	371	76	137	--	208	--
9	338	65	124	--	234	45
10	241	32	193	34	1,090	280
11	226	27	178	30	1,070	270
12	238	--	149	20	1,570	415
13	217	--	148	--	1,090	--
14	215	--	176	--	1,500	395
15	214	--	173	--	2,870	830
16	222	22	145	--	3,990	1,150
17	223	22	145	--	2,240	608
18	380	--	135	--	926	231
19	355	--	173	24	265	46
20	344	65	129	13	281	--
21	391	--	134	--	248	--
22	273	34	149	19	225	--
23	352	58	236	44	236	40
24	341	--	353	78	247	--
25	401	76	312	63	250	--
26	300	47	244	45	255	--
27	236	32	169	23	260	--
28	223	--	132	--	272	--
29	230	--	240	--	259	44
30	270	38	168	--	491	108
31	--	--	--	--	--	--

MISSISSIPPI RIVER DELTA--Continued

VERMILION RIVER AT BANCKER'S FERRY, LA.--Continued

Specific conductance (micromhos at 25°C) and chloride, in parts per million, water year October 1953 to September 1954--Continued

Day	July		August		September	
	Conductance	Chloride	Conductance	Chloride	Conductance	Chloride
1	5,460	1,640	335	75	8,940	2,850
2	8,050	2,500	334	78	10,700	3,520
3	9,150	2,870	402	96	12,800	4,240
4	9,460	2,990	598	149	14,500	4,930
5	9,450	--	471	--	14,500	--
6	9,340	--	458	--	14,300	--
7	9,390	2,980	458	105	13,500	--
8	2,920	840	358	73	13,500	--
9	1,270	320	319	--	12,600	--
10	399	87	322	--	12,500	--
11	393	87	365	--	11,800	--
12	288	57	368	75	11,200	--
13	576	136	1,780	--	12,900	4,290
14	4,630	1,410	2,190	--	14,700	5,000
15	4,690	--	4,410	--	16,100	5,500
16	5,700	1,740	4,560	--	18,400	6,370
17	7,860	2,450	6,130	1,880	20,800	7,250
18	8,860	2,770	7,690	2,400	21,200	--
19	9,750	3,100	8,690	2,770	20,100	--
20	9,870	--	8,910	--	18,500	--
21	10,300	--	8,590	--	17,600	--
22	10,400	--	6,940	--	14,300	--
23	10,200	--	6,330	1,950	13,900	4,660
24	9,630	--	6,720	2,110	16,000	5,530
25	9,510	--	4,300	--	17,300	--
26	9,600	3,020	2,350	--	18,300	--
27	10,700	3,440	3,920	--	17,900	--
28	10,700	--	5,190	--	18,400	--
29	11,500	3,740	5,190	--	15,900	--
30	799	202	4,090	--	15,700	5,330
31	690	154	8,850	2,800	--	--

MISSISSIPPI RIVER DELTA--Continued

VERMILION RIVER AT BANCKER'S FERRY, LA.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	80	69	60	54	60	61	70	79	84	89	81	85
2	80	61	61	54	59	63	71	80	83	90	82	85
3	80	69	62	50	60	60	70	78	84	89	83	85
4	80	67	64	56	60	59	71	73	82	90	84	86
5	80	69	64	55	60	58	73	73	81	89	85	85
6	79	67	62	57	60	58	73	72	82	88	86	86
7	77	65	60	57	60	--	75	71	82	88	88	85
8	76	64	60	56	57	--	75	71	83	85	87	85
9	76	65	61	56	60	--	74	72	83	84	89	85
10	76	62	57	50	58	--	75	73	83	83	89	84
11	75	61	57	55	60	--	75	74	84	85	88	84
12	75	61	57	51	59	--	77	74	85	86	87	83
13	76	60	55	50	59	--	77	74	85	84	88	82
14	75	61	52	50	60	--	78	73	85	85	87	84
15	75	60	50	52	61	--	78	71	85	87	86	83
16	75	59	50	55	63	--	77	72	86	87	86	82
17	75	61	50	56	63	60	74	73	85	87	87	82
18	75	61	50	56	65	61	74	74	86	88	87	81
19	75	62	50	57	65	64	75	74	85	88	88	83
20	75	62	50	59	64	62	74	75	84	88	86	83
21	75	63	51	59	64	65	75	75	85	88	86	84
22	75	63	50	56	64	64	76	74	85	87	86	83
23	75	63	52	55	64	65	77	75	85	88	85	81
24	75	60	48	55	63	67	75	76	86	89	85	80
25	75	60	49	56	63	67	75	76	85	89	86	82
26	74	59	49	57	63	68	78	77	86	89	85	83
27	73	60	50	58	64	68	78	78	87	88	85	83
28	71	60	50	55	63	68	77	78	87	87	86	83
29	71	60	51	57	--	70	78	79	87	86	85	83
30	71	60	53	58	--	69	78	80	87	78	86	83
31	70	--	52	59	--	71	--	--	--	--	88	--
Average	75	62	54	55	61	--	75	75	85	87	86	83

MERMENTAU RIVER AT LAKE ARTHUR, LA.

LOCATION.--At bridge on State Highway 14, about half a mile east of Lake Arthur, Jefferson Davis Parish.
RECORDS AVAILABLE.--Chemical analyses: January 1949 to September 1954.
Water temperatures: January 1949 to September 1952.
EXTREMES, 1953-54.--Specific conductance: Maximum daily, 1,370 micromhos July 4; minimum daily, 68.1 micromhos May 13.
EXTREMES, 1949-54.--Specific conductance: Maximum daily, 6,330 micromhos June 30, 1952, minimum daily, 30.8 micromhos Aug. 10, 1951.
REMARKS.--No discharge records available for this station.

Chemical analyses, in parts per million, September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Sept. 12-20, 1954..		16	0.04	12	9.5	63		77	11	92		1.2		255			69	6	66		462	7.7
Sept. 21-30		15	.05	14	12	84		79	16	131		1.5		326			84	20	68		601	7.6

MERMENTAU RIVER BASIN--Continued

MERMENTAU RIVER AT LAKE ARTHUR, LA.--Continued

Specific conductance (micromhos at 25°C) and chloride, in parts per million, water year October 1953 to September 1954

Day	October		November		December	
	Conductance	Chloride	Conductance	Chloride	Conductance	Chloride
1	152	16	153	18	410	91
2	138	14	161	18	224	41
3	135	--	160	--	224	--
4	137	--	159	20	225	--
5	160	21	148	16	225	--
6	138	14	160	18	233	--
7	133	--	164	18	225	--
8	143	--	155	18	255	57
9	140	15	155	--	225	42
10	147	16	--	--	527	141
11	143	--	149	--	528	143
12	143	--	149	20	534	142
13	142	--	160	22	169	32
14	147	16	162	--	160	--
15	165	19	161	--	159	--
16	156	18	164	23	169	--
17	149	16	190	25	165	31
18	157	19	164	--	203	42
19	148	17	164	--	184	39
20	148	--	165	--	240	53
21	140	--	174	24	243	--
22	140	--	399	89	245	--
23	145	--	412	89	245	55
24	145	--	407	--	277	61
25	145	--	408	--	258	56
26	146	18	415	--	245	54
27	155	18	409	--	249	55
28	154	17	411	--	416	108
29	151	17	408	--	411	102
30	151	--	407	--	365	94
31	150	--	--	--	411	--

	January		February		March	
1	396	--	101	--	144	--
2	390	--	--	--	141	--
3	390	99	110	--	144	21
4	324	78	104	16	150	23
5	306	--	112	17	165	23
6	312	73	112	--	--	--
7	--	--	116	18	145	24
8	306	74	136	22	146	--
9	309	74	115	17	148	--
10	104	16	113	16	150	--
11	108	17	113	--	148	26
12	116	18	112	--	135	22
13	125	20	114	--	136	22
14	117	--	--	--	148	25
15	109	--	--	--	152	25
16	101	--	117	--	147	--
17	96.9	--	119	--	144	--
18	96.4	17	123	--	141	--
19	89.6	11	123	18	139	23
20	79.6	--	119	18	141	23
21	78.6	--	134	20	146	24
22	79.4	--	135	--	144	--
23	78.7	11	141	--	150	--
24	83.0	12	134	--	158	--
25	80.1	11	137	21	183	--
26	--	--	135	20	180	29
27	113	17	146	21	160	26
28	100	15	142	21	158	--
29	98.0	--	--	--	159	26
30	101	--	--	--	187	34
31	101	--	--	--	185	--

MERMENTAU RIVER BASIN--Continued

MERMENTAU RIVER AT LAKE ARTHUR, LA.--Continued

Specific conductance (micromhos at 25°C) and chloride, in parts per million, water year October 1953 to September 1954--Continued

Day	April		May		June	
	Conductance	Chloride	Conductance	Chloride	Conductance	Chloride
1	189	34	173	--	90.0	--
2	192	--	165	--	88.7	--
3	192	--	166	--	92.4	12
4	192	--	167	--	142	23
5	190	--	165	--	142	--
6	195	36	191	--	132	--
7	190	35	193	--	122	--
8	192	--	192	34	149	--
9	190	35	97.2	13	185	38
10	188	34	147	25	330	71
11	184	32	82.6	12	331	--
12	228	44	75.6	--	330	71
13	198	33	68.1	8.0	459	102
14	178	31	102	16	456	103
15	182	--	94.2	--	459	104
16	182	--	94.8	--	503	117
17	184	--	94.5	--	507	--
18	197	34	89.3	--	510	--
19	182	33	89.8	11	511	--
20	185	--	103	15	491	--
21	186	30	95.0	--	489	--
22	183	--	--	--	508	--
23	182	--	97.8	--	490	--
24	180	--	91.1	--	490	111
25	178	--	98.7	--	584	136
26	178	--	89.0	--	587	--
27	180	--	96.2	--	582	--
28	182	--	90.8	12	584	135
29	173	--	88.0	12	642	153
30	171	28	87.4	--	962	243
31	--	--	--	--	--	--

	July		August		September	
1	971	--	332	--	347	--
2	974	--	325	43	409	73
3	968	242	283	43	390	67
4	1,370	352	285	--	353	66
5	1,330	--	293	--	351	--
6	1,330	--	282	42	353	--
7	1,290	--	336	52	352	--
8	1,320	--	287	44	349	--
9	1,280	--	289	--	351	65
10	1,280	330	285	--	353	--
11	829	--	301	--	--	--
12	826	204	281	43	395	--
13	1,090	282	284	--	378	--
14	1,090	275	283	--	377	--
15	1,090	--	278	--	331	--
16	1,100	275	294	--	514	--
17	397	79	290	37	522	--
18	397	78	278	43	519	--
19	1,080	278	294	--	521	--
20	1,080	--	256	--	521	--
21	1,090	278	258	--	531	--
22	1,090	281	268	--	504	--
23	398	--	266	--	512	--
24	394	--	248	39	530	--
25	--	--	252	37	513	--
26	406	--	253	--	524	--
27	401	--	257	--	515	--
28	402	--	253	--	777	--
29	400	78	253	--	794	--
30	325	43	255	--	791	--
31	332	--	253	37	--	--

CALCASIEU RIVER BASIN

BECKWITH CREEK NEAR DE QUINCY, LA.

LOCATION.--At gaging station at bridge on State Highway 7, a quarter of a mile upstream from New Orleans, Texas & Mexico Railway bridge, 2½ miles upstream from unnamed tributary and 4 miles northeast of De Quincy, Calcasieu Parish.
DRAINAGE AREA.--148 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1954.
REMARKS.--Values reported for dissolved solids are sums of determined constituents. Records of discharge for water year October 1953 to September 1954 given in WSP 1342.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 20, 1953	1.5	18	0.92	2.6	2.0	6.9	0.9	18	1.3	9.5		0.5		52	0.07		15	0	49	0.8	67.0	6.3
Nov. 17	3.03	16	.68	1.8	2.2	4.4	1.0	14	1.8	7.5		.2		43	.06		14	2	39	.5	49.7	6.5
Dec. 16	74	14	.53	1.8	1.0	5.8	.8	8	3.6	8.2		.5		40	.05		9	2	57	.9	48.8	5.8
Feb. 11, 1954	243	15	.78	2.0	1.2	6.4	1.8	10	2.0	11		.2		45	.06		10	2	53	.9	58.3	6.2
Mar. 17	13.1	4.3	.60	2.8	1.4	13		13	1.4	20		.2		50	.07		13	2	68	1.5	94.2	6.5
Apr. 15	--	8.0	.32	2.0	1.0	4.6	.7	10	2.4	6.5		.2		31	.04		9	1	50	.7	47.7	5.9
May 14	980	3.0	.02	.8	.5	3.1	--	6	1.2	3.5		.2		15	.02		4	0	62	.7	24.2	5.6
June 16	--	17	.54	3.0	1.5	9.7	--	18	1.4	13		.8		56	.08		14	0	61	1.1	77.0	6.7
Aug. 11	--	7.8	.32	2.2	1.3	5.9	1.1	12	2.6	8.8		.8		37	.05		11	1	51	.8	58.8	6.4
Aug. 30	5.03	8.8	.32	2.4	1.5	6.0	.9	16	2.0	8.0		.5		38	.05		12	0	50	.8	59.0	6.2

CALCASIEU RIVER BASIN--Continued

CALCASIEU RIVER AT MOSS BLUFF, LA.

LOCATION.--At bridge on U. S. Highway 171 at Moss Bluff, Calcasieu Parish, 5 miles northeast of Lake Charles.
RECORDS AVAILABLE.--Chemical analyses: October 1951 to September 1954.
Water temperatures: October 1951 to September 1954.
EXTREMES, 1953-54.--Specific conductance: Top samples- Maximum daily, 22,700 micromhos Sept. 19; minimum daily, 25.8 micromhos May 9. Bottom samples- Maximum daily, 36,200 micromhos Sept. 18; minimum daily, 34.6 micromhos May 13.
Water temperatures: Maximum observed, 88°F July 1; minimum observed, 43°F Dec. 24.
EXTREMES, 1952-54.--Specific conductance: Top samples- Maximum daily, 22,700 micromhos Sept. 19, 1954; minimum daily, 23.9 micromhos May 7-9, 1953. Bottom samples- Maximum daily, 36,200 micromhos Sept. 18, 1954; minimum daily, 26.8 micromhos May 5, 1953.
Water temperatures: Maximum observed, 88°F June 22, 25, July 9-10, 1953, July 1, 1954: minimum observed, 43°F Dec. 24, 1953.
REMARKS.--Top and bottom samples collected at this station. No discharge records available.

Specific conductance (micromhos at 25°C) and chloride, in parts per million, water year October 1953 to September 1954

Day	October				November				December			
	Conductance		Chloride		Conductance		Chloride		Conductance		Chloride	
	Top	Bottom	Top	Bottom	Top	Bottom	Top	Bottom	Top	Bottom	Top	Bottom
1	5,880	26,400	1,760	9,650	1,550	27,100	--	--	2,010	29,500	578	11,400
2	5,050	26,800	--	--	1,800	28,000	--	--	2,330	29,700	--	--
3	6,190	27,700	--	--	2,280	28,400	642	10,300	6,870	29,700	--	--
4	5,410	28,200	--	--	2,650	28,700	--	--	5,280	23,800	1,700	8,920
5	6,110	28,900	--	--	2,290	28,400	--	--	5,120	11,000	1,620	3,650
6	6,900	28,200	--	--	3,040	28,700	890	10,400	3,030	11,000	900	3,720
7	7,910	28,400	--	--	3,180	30,400	--	--	2,100	2,800	600	800
8	7,670	29,700	--	--	3,250	29,900	960	11,000	1,290	1,540	355	425
9	8,170	30,000	2,550	11,100	6,530	29,900	2,020	11,100	740	1,240	194	340
10	8,030	30,000	--	--	4,260	30,400	1,270	11,200	873	953	240	261
11	7,850	30,700	2,420	11,200	4,670	30,000	1,440	11,400	456	463	119	122
12	--	--	--	--	4,150	30,300	--	--	198	252	48	63
13	5,950	29,700	1,850	11,100	3,600	31,100	--	--	170	226	--	--
14	5,490	29,700	--	--	3,290	31,100	970	11,900	174	246	--	--
15	5,270	29,900	--	--	3,790	30,800	1,170	12,000	190	259	--	--
16	4,980	29,900	--	--	4,210	30,800	1,320	12,000	186	244	--	--
17	5,200	29,700	--	--	4,270	31,700	--	--	142	232	31	56
18	5,520	29,200	--	--	5,070	31,400	1,600	12,200	151	15,800	34	5,480
19	6,940	28,900	2,200	10,700	5,950	31,700	1,900	12,400	412	24,400	107	9,020
20	8,710	29,200	2,800	10,800	9,250	31,400	3,120	12,200	961	25,900	270	9,880
21	9,830	29,200	3,180	10,900	8,480	30,000	--	--	1,220	25,000	--	--
22	10,500	29,200	3,420	10,800	9,430	30,300	--	--	508	22,600	--	--
23	12,300	29,400	4,100	10,900	7,340	22,700	2,370	8,300	572	15,400	153	5,380
24	11,200	28,900	--	--	4,490	27,200	1,370	10,400	1,200	24,000	325	9,080
25	12,300	28,400	--	--	3,730	25,600	1,140	9,580	597	26,500	159	10,000
26	12,100	29,400	4,000	10,000	2,880	25,900	870	9,720	681	26,700	184	10,100
27	11,700	18,000	3,920	6,250	2,270	26,500	650	11,100	673	26,700	--	--
28	4,840	10,700	1,460	3,500	4,290	25,700	1,340	9,650	399	27,400	102	10,300
29	1,940	11,200	562	3,650	2,010	28,800	560	11,000	842	25,500	--	--
30	1,850	23,100	518	8,220	5,400	29,500	1,760	12,400	732	15,900	--	--
31	1,490	26,900	402	9,820	--	--	--	--	752	3,540	206	1,120

CALCASIEU RIVER BASIN--Continued

CALCASIEU RIVER AT MOSS BLUFF, LA.--Continued

Specific conductance (micromhos at 25°C) and chloride, in parts per million, water year October 1953 to September 1954--Continued

Day	January				February				March			
	Conductance		Chloride		Conductance		Chloride		Conductance		Chloride	
	Top	Bottom	Top	Bottom	Top	Bottom	Top	Bottom	Top	Bottom	Top	Bottom
1	514	809	131	222	137	256	30	60	731	22,100	188	7,750
2	296	1,060	74	305	70.0	94.4	12	18	1,180	22,900	315	8,020
3	199	448	48	123	83.9	115	16	24	1,070	19,000	--	--
4	210	422	--	--	78.8	79.4	14	14	951	17,800	--	--
5	184	241	--	--	86.5	102	--	--	1,330	20,800	--	--
6	257	318	--	--	82.0	83.7	--	--	1,210	19,500	--	--
7	185	330	44	85	83.5	143	14	30	1,490	22,600	--	--
8	122	144	27	32	131	2,850	25	820	1,490	23,000	--	--
9	117	121	--	--	447	16,000	111	5,400	1,360	24,500	--	--
10	125	168	--	--	509	17,800	128	6,020	1,210	24,300	322	8,620
11	116	203	24	46	524	16,500	--	--	2,090	24,600	588	8,800
12	93.0	132	18	28	459	16,200	--	--	1,960	8,790	552	2,750
13	61.2	60.8	11	10	748	21,500	194	7,500	1,040	24,000	275	8,480
14	53.4	54.5	8.8	8.5	806	22,300	--	--	839	24,300	218	8,620
15	55.3	57.1	--	--	965	20,600	255	7,150	1,280	22,100	--	--
16	55.9	56.4	--	--	1,440	21,700	392	7,550	1,510	21,400	--	--
17	61.0	59.9	--	--	800	21,200	209	7,420	1,590	25,400	432	9,050
18	74.3	76.9	--	--	734	21,900	--	--	1,850	22,700	515	8,000
19	89.1	94.7	18	18	800	23,200	--	--	2,100	22,600	585	7,950
20	89.6	105	16	21	3,450	19,500	1,020	6,700	1,890	20,800	--	--
21	87.8	88.3	16	16	1,160	22,000	318	7,700	2,160	25,900	615	9,350
22	83.5	84.2	--	--	973	22,400	--	--	1,870	22,900	--	--
23	90.2	90.9	17	16	1,000	17,200	--	--	1,940	21,400	--	--
24	100	101	19	19	991	22,300	--	--	1,360	23,700	372	8,400
25	114	116	--	--	997	22,400	--	--	4,060	26,200	1,210	9,480
26	86.3	88.9	16	17	1,050	19,700	--	--	2,140	25,100	605	8,980
27	66.2	66.2	11	12	1,340	17,700	370	5,980	2,040	21,400	--	--
28	60.1	61.3	--	--	879	19,900	230	6,900	1,500	25,800	--	--
29	70.4	69.6	13	12	--	--	--	--	1,240	25,900	--	--
30	102	1,280	22	345	--	--	--	--	1,230	25,500	335	9,150
31	86.9	714	16	188	--	--	--	--	926	19,100	249	--

	April				May				June			
1	1,020	19,100	280	4,850	2,760	10,200	--	--	126	202	--	--
2	1,070	18,400	260	6,250	2,710	11,700	780	3,840	96.4	354	16	86
3	1,020	18,200	--	--	1,330	2,060	358	552	122	164	23	34
4	1,120	24,800	--	--	169	204	38	45	--	109	--	--
5	866	24,900	234	9,050	67.1	--	12	--	107	163	--	--
6	884	25,100	--	--	39.4	--	--	--	93.4	620	14	158
7	875	24,500	--	--	27.7	--	--	--	262	4,390	61	1,320
8	1,030	24,300	--	--	26.8	--	--	--	364	8,130	86	2,550
9	748	24,000	201	6,420	25.8	--	--	--	699	3,580	180	1,050
10	766	18,800	205	4,300	27.6	--	--	--	834	6,220	--	--
11	659	13,100	172	3,900	27.6	--	--	--	765	5,560	--	--
12	517	16,200	131	5,480	30.3	--	--	--	856	5,020	224	1,510
13	1,060	16,700	288	5,650	32.6	34.6	3.5	3.2	1,150	5,480	302	1,660
14	790	20,500	--	--	38.6	40.1	--	--	1,540	6,090	--	--
15	627	21,300	--	--	45.0	42.3	--	--	1,910	7,100	--	--
16	676	15,300	179	5,120	39.9	41.4	--	--	2,280	9,780	--	--
17	531	13,600	137	4,520	41.1	42.2	5.0	4.8	2,490	10,200	702	3,250
18	577	2,530	151	710	39.5	40.0	--	--	2,500	7,950	705	2,500
19	462	949	117	256	41.4	42.6	--	--	2,070	10,800	578	3,520
20	410	1,040	106	282	43.6	43.9	--	--	2,180	13,100	--	--
21	425	774	104	200	47.0	47.8	--	--	2,540	11,700	722	3,840
22	231	615	55	159	52.1	52.4	--	--	1,930	15,000	--	--
23	197	289	46	70	55.6	55.2	--	--	2,090	16,500	--	--
24	144	237	--	--	54.4	54.5	--	--	2,470	17,200	--	--
25	117	138	--	--	57.6	58.7	--	--	2,960	18,300	870	6,320
26	74.9	130	--	--	61.6	81.8	--	--	3,570	16,800	--	--
27	72.9	318	12	77	59.1	110	8.2	22	3,800	18,200	--	--
28	79.7	5,120	14	1,560	195	639	44	166	3,810	18,200	--	--
29	440	8,010	112	2,500	298	738	--	--	4,300	16,800	--	--
30	723	11,900	189	3,890	162	672	--	--	4,140	16,300	1,240	5,530
31	--	--	--	--	217	502	--	--	--	--	--	--

CALCASIEU RIVER BASIN--Continued

CALCASIEU RIVER AT MOSS BLUFF, LA.--Continued

Specific conductance (micromhos at 25°C) and chloride, in parts per million, water year October 1953 to September 1954--Continued

Day	July				August				September			
	Conductance		Chloride		Conductance		Chloride		Conductance		Chloride	
	Top	Bottom	Top	Bottom	Top	Bottom	Top	Bottom	Top	Bottom	Top	Bottom
1	4,520	17,500	--	--	7,770	24,100	--	--	8,140	34,000	--	--
2	4,680	17,300	--	--	5,190	25,100	1,560	9,170	--	34,400	--	--
3	5,070	16,900	--	--	3,720	24,100	1,090	8,680	7,980	34,300	--	--
4	4,900	19,400	--	--	2,520	23,500	--	--	8,830	32,200	--	--
5	5,170	19,000	1,580	6,560	2,610	29,400	--	--	7,260	35,400	2,270	13,500
6	5,570	21,300	--	--	2,580	29,400	--	--	12,050	32,800	4,020	12,600
7	6,160	23,000	--	--	2,650	25,500	--	--	8,430	32,400	--	--
8	5,720	23,400	--	--	2,940	25,300	--	--	10,100	33,800	--	--
9	5,670	23,900	--	--	3,570	28,800	--	--	10,900	32,300	3,540	12,300
10	5,550	23,400	1,690	8,410	3,400	27,200	990	9,900	12,600	35,600	4,190	13,800
11	5,450	23,200	1,700	8,280	3,830	28,300	1,140	10,500	14,000	34,900	4,830	13,700
12	6,760	8,520	2,090	2,720	4,950	26,000	--	--	14,000	32,600	--	--
13	7,090	8,340	--	--	5,490	30,000	1,680	11,300	13,000	34,600	--	--
14	8,340	8,660	--	--	6,800	31,400	2,100	11,800	15,200	33,200	--	--
15	9,780	22,700	3,170	8,160	6,860	31,700	--	--	14,600	33,700	--	--
16	10,000	20,600	--	--	10,600	31,700	3,470	11,900	19,100	36,100	6,760	14,400
17	9,420	22,800	--	--	7,540	32,500	--	--	19,300	29,000	6,910	10,900
18	9,260	11,900	--	--	8,210	32,900	--	--	21,300	36,200	--	--
19	8,540	23,900	2,700	8,580	9,170	33,900	--	--	22,700	36,000	--	--
20	7,970	24,400	--	--	8,660	33,800	2,770	12,900	21,600	33,400	--	--
21	7,000	22,400	--	--	8,610	33,400	--	--	20,800	35,100	--	--
22	6,900	27,100	--	--	7,820	32,800	--	--	18,700	34,700	--	--
23	6,190	27,100	1,890	9,900	8,260	33,800	--	--	15,200	35,100	--	--
24	5,930	27,600	--	--	8,820	34,000	2,850	13,000	13,800	35,400	--	--
25	5,080	26,700	--	--	9,410	33,700	3,050	12,800	13,900	34,800	--	--
26	5,200	26,400	--	--	9,610	33,900	--	--	14,100	34,900	--	--
27	5,760	14,200	1,780	4,710	9,850	34,300	--	--	14,400	34,900	--	--
28	6,010	24,300	1,860	8,920	9,790	33,700	--	--	14,300	35,400	--	--
29	6,560	24,900	--	--	9,390	33,900	--	--	14,700	35,000	--	--
30	9,780	27,300	3,150	9,900	8,000	33,300	--	--	15,000	35,700	5,230	14,300
31	8,850	28,100	--	--	8,370	34,400	--	--	--	--	--	--

Temperature (°F) of water, water year October 1953 to September 1954

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	80	63	60	53	56	58	68	76	79	88	84	83
2	80	65	61	53	55	61	62	76	79	86	85	83
3	80	68	63	53	61	58	67	72	80	87	86	82
4	81	66	61	54	61	57	69	68	79	86	86	82
5	79	64	63	54	62	55	70	66	78	82	86	84
6	76	62	62	54	59	54	70	68	78	86	86	84
7	73	60	58	53	58	55	71	68	81	84	85	83
8	73	59	59	54	54	56	73	68	82	86	87	84
9	72	58	58	55	57	58	69	69	82	85	87	83
10	73	59	53	56	59	59	72	68	83	86	87	85
11	73	58	53	51	60	62	73	70	83	--	85	83
12	--	59	54	51	56	63	75	68	84	--	85	80
13	77	58	54	50	57	62	75	66	84	--	86	80
14	72	59	53	52	59	56	75	68	84	--	87	82
15	73	59	51	56	58	56	76	69	84	87	87	82
16	73	60	52	53	64	55	72	70	85	86	87	81
17	73	60	51	53	61	58	71	71	85	85	87	81
18	74	63	50	53	60	60	72	71	85	86	87	84
19	75	66	48	--	64	64	72	71	83	85	86	85
20	76	63	52	57	60	63	70	72	82	84	86	86
21	74	80	51	57	61	62	69	69	84	86	85	85
22	76	79	52	52	61	63	71	73	84	87	84	80
23	73	81	47	52	62	66	70	74	84	87	84	77
24	74	74	43	54	61	66	71	74	85	86	83	78
25	73	58	48	57	62	68	72	74	86	86	82	81
26	72	59	49	57	63	65	73	74	86	87	85	80
27	71	58	50	57	65	66	75	76	86	86	86	82
28	77	58	53	54	62	66	73	76	87	84	85	83
29	66	57	50	57	--	68	75	77	86	82	84	81
30	64	64	51	58	--	69	77	78	86	84	84	82
31	64	--	50	57	--	70	--	78	--	82	85	--
Average	74	63	54	54	60	61	71	72	83	85	85	83

SABINE RIVER BASIN

SABINE RIVER NEAR EMORY, TEX.

LOCATION.--At gaging station at bridge on State Highway 19, 3.0 miles upstream from Giladon Creek, 7.5 miles south of Emory, Rains County, 8.0 miles downstream from McBees Creek, and at mile 501.
DRAINAGE AREA.--965 square miles.
RECORDS AVAILABLE.--Chemical analyses: July 1952 to September 1954 (discontinued).
Water temperatures: July 1952 to September 1954 (discontinued).
EXTREMES, 1953-54.--Dissolved solids: Maximum, 236 ppm July 1-7; minimum, 71 ppm Jan. 11-12, 14-19.
Hardness: Maximum, 146 ppm July 1-7; minimum, 36 ppm Jan. 11-12, 14-19.
Specific conductance: Maximum daily, 420 micromhos May 6; minimum daily, 67.3 micromhos Feb. 19.
Water temperatures: Minimum observed, 35°F Dec. 24.
EXTREMES, 1952-54.--Dissolved solids: Maximum, 238 ppm July 1-8, 15, 1953; minimum, 47 ppm Apr. 24, 29-30, 1953.
Hardness: Maximum, 156 ppm June 22-30, 1953; minimum, 23 ppm Dec. 19-20, 1953.
Specific conductance: Maximum daily, 442 micromhos July 8, 1953; minimum daily, 48.8 micromhos July 18, 1953.
Water temperatures: Maximum observed, 98°F June 11, 1953; minimum observed, 35°F Dec. 24, 1953.
REMARKS.--Values reported for dissolved solids are residues on evaporation unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1953 to September 1954 given in WSP 1342.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 6, 1953.....	a0	--		--	--	--		108	--	3.5		--		--	--	--	81	0	--	--	186	8.0
Nov. 1-4,12-14, 21	38.2	13		19	2.7	12		71	15	5.5		4.5		138	0.19	14.2	58	0	31	0.7	173	7.9
Nov. 5-11, 15-20..	82.9	14		29	3.6	21		103	25	12		6.3		182	.25	40.7	88	3	34	1.0	265	7.9
Nov. 22-30	141	12		33	2.7	16		114	20	8.0		3.0		172	.23	65.5	94	0	27	.7	252	7.9
Dec. 1-2,6-11, 18-20.....	400	12		27	3.2	17		95	18	14		2.2		156	.21	168	80	3	32	.8	226	7.6
Dec. 3-5, 12-17...	1,033	11		16	2.6	11		60	13	7.5		2.0		135	.18	377	51	1	32	.7	154	7.6
Dec. 21-31.....	12.0	11		27	3.4	16		98	21	8.8		2.0		160	.22	5.18	81	1	30	.8	235	7.7
Jan. 1-10, 1954 ...	17.7	12		29	3.6	18		106	22	10		3.0		163	.22	7.79	87	0	31	.8	253	7.9
Jan. 11-12, 14-19.	3,256	8.8		11	2.1	6.5	3.1	44	10	4.2		3.0		b 71	.10	624	36	0	26	.5	114	7.7
Jan. 13, 20-31	874	9.6		28	2.8	18		101	22	8.8		4.0		170	.23	401	81	0	33	.9	243	8.0
Feb. 1-11.....	139	11		27	3.1	15		96	15	12		2.2		158	.21	59.3	80	1	29	.7	238	7.8
Feb. 12-18, 24-28.	19.0	10		30	3.8	16		107	18	12		2.0		167	.23	8.57	90	3	28	.7	259	7.4
Feb. 19-23	579	7.8		17	2.9	8.1	1.2	62	12	5.2		2.2		b86	.12	134	54	4	24	.5	154	7.2
Mar. 1-11	4.77	15		34	3.9	19		122	23	11		2.5		183	.25	2.36	101	1	29	.8	292	8.1
Mar. 12-23.....	2.42	12		39	5.0	22		139	27	16		1.5		203	.28	1.33	118	4	29	.9	329	8.0
Mar. 24-31	2.79	15		41	5.1	24		149	26	18		.5		225	.31	1.69	123	1	30	.9	353	8.1
Apr. 1-9, 11-12...	59.9	13		42	2.7	34		154	30	22		1.5		228	.31	36.9	116	0	39	1.4	375	8.0
Apr. 10, 13-19....	1,346	13		27	3.1	15		95	19	8.0		4.5		166	.23	603	80	2	29	.7	228	7.8
Apr. 20-30	13.8	14		42	7.0	18		147	28	13		5.4		219	.30	8.16	134	13	22	.7	348	8.1

a Less than 0.05 second-foot flow Oct. 1-31, July 2 to Sept. 30.
b Sum of determined constituents.

May 1, 3-10, 1954.	120	12		32	3.7	25	113	22	22		4.8		199	0.27	64.5	95	2	37	1.1	318	7.8
May 2, 11-20.....	1,355	12		24	3.4	14	90	14	7.5		5.5		166	.23	607	74	0	28	.7	219	7.6
May 21-31.....	91.5	12		36	4.7	16	132	20	8.5		4.0		187	.25	46.2	109	1	24	.7	296	7.7
June 1-10.....	306	22		34	3.1	16	124	18	7.2		3.5		172	.23	142	98	0	27	.7	266	8.0
June 11-20.....	4.03	20		41	3.9	21	150	22	11		2.2		201	.27	2.19	118	0	27	.8	324	8.0
June 22-30.....	1.28	19		45	4.7	22	171	22	11		1.8		213	.29	.74	132	0	27	.8	352	8.0
July 1-7.....	a .01	14		48	6.4	21	187	21	11		2.2		236	.32	.01	146	0	24	.8	373	7.8
Weighted average	248	11		21	2.8	14	78	15	7.5		3.6		134	0.18	89.7	64	0	32	0.8	191	--

a Less than 0.05 second-foot flow Oct. 1-31, July 2 to Sept. 30.

SABINE RIVER BASIN--Continued

SABINE RIVER NEAR EMORY, TEX.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

SABINE RIVER BASIN--Continued

SABINE RIVER NEAR TATUM, TEX.

LOCATION.--At gaging station at bridge on State Highway 43, 5 miles upstream from Potters Creek, 5.2 miles northeast of Tatum, Rusk County, 7 miles downstream from Cherokee Bayou, and at mile 339.
DRAINAGE AREA.--3,586 square miles.
RECORDS AVAILABLE.--Chemical analyses: February 1952 to September 1954.
Water temperatures: February 1952 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 682 ppm Dec. 7-10, 13; minimum, 178 ppm Jan. 22-31.
Hardness: Maximum, 106 ppm Sept. 1-10; minimum, 39 ppm May 12-23.
Specific conductance: Maximum daily, 1,200 micromhos Dec. 7-10; minimum daily, 187 micromhos May 15.
Water temperatures: Maximum observed, 95°F July 7, 13; minimum observed, 45°F on several days during December and January.
EXTREMES, 1952-54.--Dissolved solids: Maximum, 682 ppm Dec. 7-10, 13, 1953; minimum, 82 ppm May 10-20, 1953.
Hardness: Maximum, 106 ppm Sept. 1-10, 1954; minimum, 29 ppm Sept. 9-10, 12-18, 1953.
Specific conductance: Maximum daily, 1,200 micromhos Dec. 7-10, 1953; minimum daily, 123 micromhos May 10-11, 1953.
Water temperatures: Maximum observed 95°F July 7, 13, 1954; minimum observed, 45°F on several days during December 1953 and January 1954.
REMARKS.--Values reported for dissolved solids are residues on evaporation. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1953 to September 1954 given in WSP 1342.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-11, 1953	91.4	15		16	6.0	126		38	16	205		1.5		432	0.59	107	64	34	81	6.8	786	7.2
Oct. 12-23, 27-28	80.6	14		15	5.8	105		47	18	165		.8		367	.50	79.9	62	23	79	5.8	664	7.5
Oct. 24-26, 29-31	126	13		18	6.9	144		47	19	232		1.0		470	.64	160	74	35	81	7.3	869	7.3
Nov. 1-7, 20-23	360	11		17	6.0	144		40	19	232		1.2		480	.65	467	67	34	82	7.7	802	7.0
Nov. 8-11, 14-19	289	14		12	4.6	66		32	17	104		1.0		255	.35	199	49	23	74	4.1	446	7.0
Nov. 12-13, 24-30	520	14		14	5.0	78		29	18	129		1.2		302	.41	424	56	32	75	4.6	524	6.8
Dec. 1-5, 18-19, 29-31, 6, 11-12, 14-17, 20-28	1,401	18		14	4.6	78		25	25	125		1.2		318	.43	1,200	54	33	76	4.6	521	6.8
	1,944	17		14	4.1	42		30	22	67		1.0		228	.31	1,200	52	27	64	2.5	323	7.0
Dec. 7-10, 13	1,956	18		20	4.9	207		18	38	330		.8		682	.93	3,600	70	56	87	11	1,200	6.6
Jan. 1-15, 1954	815	28		16	5.2	77		18	34	126		1.2		301	.41	662	61	47	73	4.3	529	6.8
Jan. 16-21	3,247	18		13	4.5	52		12	30	86		1.2		236	.32	2,070	51	41	69	3.2	381	6.9
Jan. 22-31	4,639	17		11	3.2	28		26	21	40		1.5		178	.24	2,230	41	19	60	1.9	225	7.2
Feb. 1-9	3,608	23		19	5.3	43		46	34	62		2.0		230	.31	2,240	69	32	57	2.2	358	7.5
Feb. 10-25	1,239	24		17	6.4	64		28	39	102		1.2		287	.39	960	69	46	67	3.4	479	7.4
Feb. 26-28, Mar. 1-5	2,046	18		14	4.9	45		28	33	67		2.2		231	.31	1,280	55	32	64	2.7	346	7.2
Mar. 6-15	652	28		16	6.4	64		26	35	104		1.5		281	.38	495	66	45	68	3.4	476	7.2
Mar. 16-23	613	23		16	6.8	72		25	37	117		1.8		310	.42	513	68	47	70	3.8	512	7.2
Mar. 24-31	694	23		17	7.4	71		23	39	118		1.0		314	.43	588	73	54	68	3.6	529	7.2

SABINE RIVER BASIN--Continued

SABINE RIVER NEAR TATUM, TEX.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Apr. 1-15, 1954...	588	18		20	8.2	95		29	46	154		1.0		380	0.52	603	84	60	71	4.5	665	7.2
Apr. 16-19, 26-30.	1,141	19		21	5.9	55		51	35	83		2.0		263	.36	810	77	35	61	2.7	440	7.3
Apr. 20-25.....	2,253	17		20	4.5	32		64	26	40		3.0		197	.27	1,200	68	16	51	1.7	296	7.5
May 1-11	1,095	20		14	4.1	56		33	24	84		2.5		236	.32	698	52	25	70	3.3	399	7.4
May 12-23	4,520	15		11	2.8	37		25	20	54		3.5		192	.26	2,340	39	18	68	2.6	274	7.3
May 24-31	1,926	20		18	3.7	46		51	20	67		3.0		210	.29	1,090	60	18	62	2.6	346	7.8
June 1-10.....	1,108	22		15	5.1	54		38	22	85		1.5		226	.31	676	58	27	67	3.0	390	7.1
June 11-22.....	430	24		25	5.3	52		86	20	74		1.5		244	.33	283	84	14	57	2.5	432	7.7
June 23-30.....	113	23		26	6.7	88		84	18	139		.5		348	.47	106	92	24	67	4.0	641	7.6
July 1-10	53.5	24		25	7.3	100		91	11	158		1.8		398	.54	57.5	92	18	70	4.5	694	7.7
July 11-20	30.0	22		24	8.0	111		96	8.4	174		2.0		420	.57	34.0	93	14	72	5.0	747	7.7
July 21-31	27.5	21		25	8.1	123		99	6.4	195		1.5		460	.63	34.1	96	15	74	5.5	825	7.6
Aug. 1-10.....	22.6	19		23	7.2	116		93	13	176		1.5		416	.57	25.4	87	11	74	5.4	761	7.8
Aug. 11-20.....	14.1	15		23	7.2	117		92	16	176		.8		416	.57	15.8	87	12	74	5.4	764	7.9
Aug. 21-31.....	13.9	14		24	8.2	138		95	15	212		1.0		469	.64	17.6	94	16	76	6.2	864	7.6
Sept. 1-10	10.8	18		28	8.7	163		98	12	260		2.0		553	.75	16.1	106	26	77	6.9	1,060	8.1
Sept. 11-20	11.1	16		27	8.6	158		100	13	248		1.8		526	.72	15.8	103	21	77	6.8	1,020	8.1
Sept. 21-30	10.3	14		25	8.4	153		108	9.7	235		.8		509	.69	14.2	97	8	77	6.8	984	8.1
Weighted average	1,004	19		15	4.6	55		32	27	85		1.9		252	0.34	683	56	30	68	3.2	398	--

SABINE RIVER BASIN--Continued

SABINE RIVER NEAR TATUM, TEX.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

SABINE RIVER BASIN--Continued

SABINE RIVER NEAR RULIFF, TEX.

LOCATION.--At gaging station at bridge on State Highway 235, 2.4 miles north of Ruliff, Newton County, 4.2 miles upstream from Kansas City-Southern Railway bridge, 4.5 miles downstream from Cypress Creek and at mile 40.
DRAINAGE AREA.--9,440 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1946, October 1947 to September 1954.
Water temperatures: October 1947 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 326 ppm Dec. 16-22; minimum, 57 ppm May 4-10, 15.
Hardness: Maximum, 52 ppm Dec. 16-22; minimum, 16 ppm May 4-10, 15.
Specific conductance: Maximum daily, 588 micromhos Dec. 21; minimum daily, 61.6 micromhos May 6.
Water temperatures: Maximum observed, 89°F June 9; minimum observed, 50°F Jan. 20-23.
EXTREMES, 1945-46, 1947-54.--Dissolved solids: Maximum, 411 ppm Dec. 26-27, 1948; minimum, 35 ppm June 5-11, 1950.
Hardness: Maximum, 64 ppm Aug. 1, 11, 16-19, 21-23, 1948; minimum, 8 ppm May 20-24, 1953.
Specific conductance: Maximum daily, 774 micromhos Dec. 26, 1948; minimum daily, 32.9 micromhos May 22, 1953.
Water temperatures (1947-54): Maximum observed, 95°F Aug. 12, 1953; minimum observed, 34°F Jan. 24, 1948.
REMARKS.--Values reported for dissolved solids are residues on evaporation unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1953 to September 1954 given in WSP 1342.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-2, 10-20, 1953	9,784	23		7.3	3.0	29		36	6.7	40		1.0		134	0.18	3,540	30	1	68	2.3	211	7.2
Oct. 3-9	1,141	21		9.1	3.3	54		32	8.6	83		.5		196	.27	604	36	10	76	3.9	346	7.1
Oct. 21-31	9,192	22		6.5	2.5	24		34	5.7	31		1.2		114	.16	2,830	26	0	66	2.0	178	7.0
Nov. 1-10	1,001	20		6.4	2.4	28		31	6.1	38		1.2		139	.19	376	26	0	70	2.4	193	6.9
Nov. 11-20	1,067	21		6.9	2.8	37		33	6.6	53		.5		147	.20	423	28	2	74	3.0	247	7.1
Nov. 21-30	1,419	20		6.9	2.8	41		32	8.4	59		.2		156	.21	598	28	2	76	3.3	266	6.9
Dec. 1-15	4,799	11		7.0	2.5	29		18	11	46		1.5		146	.20	1,890	28	14	70	2.4	219	6.9
Dec. 16-22	4,977	14		13	4.9	86		18	25	141		1.0		326	.44	4,380	52	38	78	5.2	543	6.6
Dec. 23-31	5,233	13		8.2	2.8	21		22	14	31		1.5		a102	.14	1,440	32	14	58	1.6	182	6.6
Jan. 1-11, 15-17, 1954	5,112	14		7.0	2.5	20		18	13	31		.8		a97	.13	1,340	28	14	61	1.7	186	7.2
Jan. 12-14, 18-23	6,182	15		7.7	3.8	37		16	21	56		1.0		a150	.20	2,500	34	22	70	2.7	278	6.8
Jan. 24-31	7,670	13		8.0	3.7	30		14	22	46		.8		a130	.18	2,690	35	24	65	2.2	243	7.1
Feb. 1-8	7,972	12		9.7	3.7	26		26	20	36		1.0		a121	.16	2,600	39	18	59	1.8	218	7.1
Feb. 9-18	5,990	15		13	4.1	30		31	26	44		1.2		a148	.20	2,390	50	24	57	1.9	269	7.2
Feb. 19-28	3,750	16		12	4.5	35		32	25	51		.8		a160	.22	1,620	48	22	61	2.2	288	7.3
Mar. 1-9	4,444	16		11	4.8	39		23	26	61		.8		201	.27	2,410	47	28	65	2.5	305	7.2
Mar. 10-20	2,754	19		11	4.8	27		30	21	42		1.0		170	.23	1,260	47	22	56	1.7	245	7.2
Mar. 21-31	2,433	20		11	4.2	36		32	20	54		1.5		177	.24	1,160	45	19	64	2.4	286	7.2

a Sum of determined constituents.

Apr. 1-10, 1954 ...	2,229	18	11	5.0	38	34	21	57	.5	182	.25	1,100	48	20	63	2.4	305	7.3
Apr. 11-16, 26-30..	4,071	14	9.8	4.3	39	27	24	56	.5	176	.24	1,930	42	20	67	2.6	285	7.0
Apr. 17-25.....	1,281	9.0	5.0	1.8	20	17	11	26	.5	a 81	.11	280	20	6	68	1.9	145	6.6
May 1-3, 11-14, 16-20.....	12,550	11	5.4	2.2	17	12	10	26	3.5	a 81	.11	2,740	22	12	62	1.6	133	6.4
May 4-10, 15.....	20,380	9.6	3.8	1.7	11	12	6.4	16	2.5	a 57	.08	3,140	16	6	60	1.2	83.6	6.4
May 21-31.....	15,640	12	6.2	2.2	17	14	12	26	1.8	a 84	.11	3,550	24	13	60	1.5	138	6.5
June 1-10	6,428	20	10	3.0	25	37	14	31	2.8	136	.18	2,360	38	7	59	1.7	201	7.4
June 11-20	2,830	24	11	2.1	40	39	15	52	1.5	182	.25	1,390	36	4	70	2.9	273	7.3
June 21-30	1,759	24	11	4.0	34	42	14	49	1.2	161	.22	765	44	10	63	2.3	272	7.2
July 1-10	1,039	22	11	4.5	32	50	12	44	1.2	159	.22	446	46	5	61	2.1	269	7.6
July 11-20.....	749	22	11	4.3	30	53	9.2	39	2.5	153	.21	309	45	2	59	1.9	243	7.4
July 21-31.....	601	21	10	4.2	31	51	8.4	40	2.5	149	.20	242	42	0	61	2.1	243	7.2
Aug. 1-10.....	693	20	9.0	3.2	29	44	7.2	38	.8	a 129	.18	241	36	0	64	2.1	223	7.0
Aug. 11-20.....	438	20	9.4	3.4	30	48	7.5	38	1.0	a 133	.18	157	38	0	63	2.1	223	6.9
Aug. 21-31.....	421	20	9.1	3.2	30	47	6.7	38	1.0	134	.18	152	36	0	64	2.2	225	6.9
Sept. 1-10	371	21	8.8	3.3	32	48	6.1	42	1.0	141	.19	141	36	0	67	2.4	231	7.4
Sept. 11-20	344	22	8.8	3.3	34	48	6.1	44	1.0	147	.20	137	36	0	67	2.5	242	7.5
Sept. 21-30	329	20	7.1	2.8	33	49	5.4	39	1.0	138	.19	123	29	0	71	2.7	225	7.7
Weighted average.	4,097	14	8.3	2.9	26	22	14	38	1.6	121	0.16	1,340	32	14	63	2.0	202	--

a Sum of determined constituents.

SABINE RIVER BASIN--Continued

SABINE RIVER NEAR RULIFF, TEX.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	83	70	68	55	55	61	70	72	77	86	81	86
2	86	70	68	--	54	60	71	70	80	85	81	86
3	87	74	68	55	53	58	70	69	80	86	81	85
4	85	72	68	55	55	58	72	69	80	86	82	84
5	85	71	68	57	53	55	73	72	80	86	83	84
6	83	70	60	55	53	54	74	72	80	86	84	83
7	75	69	68	54	52	53	75	72	80	86	85	83
8	74	68	67	55	52	55	75	72	89	86	84	83
9	72	67	67	56	54	55	76	72	81	86	84	83
10	76	68	68	56	56	59	76	72	82	86	84	83
11	77	68	67	54	57	60	75	70	83	86	85	83
12	78	68	65	52	55	57	75	70	84	86	85	73
13	80	68	66	52	56	58	76	69	84	86	85	83
14	80	67	64	52	56	63	76	68	84	86	85	82
15	76	67	63	52	57	--	76	68	84	86	85	82
16	77	67	63	52	57	--	75	68	84	86	86	82
17	80	66	64	51	59	58	73	68	84	86	86	82
18	79	67	64	51	60	58	69	68	84	85	86	82
19	82	67	64	51	59	59	69	70	84	86	86	82
20	80	65	64	50	63	65	69	70	83	86	86	82
21	79	67	63	50	62	65	69	70	83	76	85	82
22	80	67	63	50	64	66	69	71	84	--	85	82
23	77	67	64	50	62	--	69	71	84	86	85	82
24	79	67	64	51	62	--	70	73	85	86	85	82
25	78	68	61	52	62	69	72	70	86	86	85	82
26	77	65	63	52	62	70	74	70	86	86	85	81
27	76	66	62	53	62	69	76	70	86	86	85	81
28	75	67	65	53	61	70	77	71	86	86	85	81
29	75	67	65	54	--	70	78	73	86	86	85	81
30	75	68	65	--	--	70	78	74	86	--	85	80
31	75	--	64	55	--	70	--	75	--	81	85	--
Average	79	68	65	53	58	62	73	71	83	85	85	82

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COW BAYOU RIVER NEAR MAURICEVILLE, TEX.

LOCATION.--At gaging station at bridge on State Highway 235, half a mile upstream from Kansas City Southern Railway bridge, and 3 miles southeast of Mauriceville, Orange County.
DRAINAGE AREA.--127 square miles.
RECORDS AVAILABLE.--Chemical analyses: March 1952 to September 1954.
Water temperatures: March 1952 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 639 ppm Oct. 14-25; minimum, 30 ppm May 14-22, 25-29.
Hardness: Maximum, 164 ppm Oct. 14-25; minimum, 9 ppm May 14-22, 25-29.
Specific conductance: Maximum daily, 1,180 micromhos Sept. 14; minimum daily, 28.8 micromhos May 26.
Water temperatures: Maximum observed, 84°F Oct. 3; minimum observed, 41°F Dec. 24.
EXTREMES, 1952-54.--Dissolved solids: Maximum, 1,030 ppm July 29-31, 1953; minimum, 23 ppm Apr. 23-30, 1952.
Hardness: Maximum, 186 ppm Nov. 1-9, 1953; minimum, 9 ppm Dec. 4-5, 19-23, 30-31, 1952, Apr. 1-3, 23-30, 1953, May 14-22, 25-29, 1954.
Specific conductance: Maximum daily, 2,190 micromhos Aug. 24, 1953; minimum daily, 22.0 micromhos Apr. 24, 1952.
Water temperatures: Maximum observed, 96°F Aug. 10, 1953; minimum observed, 41°F Dec. 24, 1954.
REMARKS.--Values reported for dissolved solids are sums of determined constituents unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1953 to September 1954 given in WSP 1342.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-13, 1953	0.10	30		33	16		147	101	19	258		1.2		a 579	0.79	0.16	148	66	68	5.2	1,020	7.6
Oct. 14-25	b.09	30		36	18		163	108	21	288		1.0		a 639	.87	.16	164	76	68	5.5	1,120	7.5
Oct. 26-31	.12	24		28	14		129	77	17	232		1.0		a 518	.70	.17	128	64	69	5.0	895	7.5
Nov. 1-6, 10-19	b.08	34		26	12		125	82	18	212		1.2		a 510	.69	.11	114	48	70	5.1	851	7.4
Nov. 7-9, 25-26	.10	22		16	8.7		81	55	12	137		1.0		305	.41	.08	76	31	70	4.0	565	7.4
Nov. 20-24, 27-30	.19	14		8.8	4.5		45	31	7.4	74		.8		170	.23	.09	40	15	71	3.1	315	6.7
Dec. 1-2, 22	15.1	17		9.6	4.3		59	27	11	96		1.2		211	.29	8.61	42	20	75	4.0	386	7.2
Dec. 3-4, 8-14, 20, 25-29	41.2	9.6		3.0	1.6	9.9	2.0	8	6.0	18		.8		55	.07	6.1	14	8	56	1.1	90.6	6.3
Dec. 5-7, 15-19, 21, 23-24, 30-31	35.3	9.6		3.8	1.8		36	6.0	5.4	59		.8		119	.16	11.3	17	12	82	3.8	188	6.1
Jan. 1-9, 1954	64.9	7.1		2.6	1.5	8.3	1.3	9	4.6	14		.5		44	.06	7.7	13	5	56	1.0	76.9	6.6
Jan. 10, 12, 20-31	33.9	7.8		3.7	1.7		18	9	3.5	31		.5		70	.10	6.4	16	9	70	2.0	130	6.4
Jan. 11, 13-19	130	5.9		2.5	1.4	7.8	1.3	8	3.9	14		.5		41	.06	14.4	12	5	55	1.0	71.9	6.4
Feb. 1-10	11.5	12		3.6	1.8	5.0	1.1	6	2.1	14		.5		43	.06	1.3	16	12	38	.5	76.9	6.1
Feb. 11-19	3.31	13		3.8	2.0	7.1	1.3	8	2.3	18		.5		52	.07	.46	18	11	44	.7	85.1	6.3
Feb. 20-28	1.40	13		4.3	2.2	8.6	1.5	8	2.5	22		.5		59	.08	.22	20	13	46	.8	101	6.4
Mar. 1-13	4.31	13		3.8	2.1		8.7	6	3.0	20		1.0		55	.07	.64	18	13	51	.9	94.5	6.4

a Residue on evaporation at 180°C.
b Includes day of less than 0.05 second-foot flow.

SABINE RIVER BASIN--Continued

COW BAYOU RIVER NEAR MAURICEVILLE, TEX.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Mar. 14-21, 23, 28, 30-31, 1954	2.52	12		3.5	1.8	8.5		7	3.0	18		0.5		50	0.07	0.34	16	10	53	0.9	89.0	6.4
Mar. 22, 24-27, 29	1.12	12		5.2	2.5	17		10	4.2	33		1.0		80	.11	.24	23	15	61	1.5	147	6.8
Apr. 1-6, 11-17	34.2	9.0		6.2	2.8	34		8	5.8	61		1.8		125	.17	11.5	27	20	73	2.8	235	6.4
Apr. 7-9	5.43	8.4		15	6.0	95		9	4.5	182		1.2		a 386	.52	5.7	62	54	77	5.3	633	6.5
Apr. 10, 18-30	196	7.8		3.1	.9	6.5		8	3.5	10		1.5		37	.05	19.6	11	5	55	.8	63.4	6.1
May 1-10	189	6.2		3.0	1.3	11		7	3.6	18		1.5		48	.07	24.5	13	7	64	1.3	82.1	6.4
May 11-13, 23-24, 30-31	92.0	6.2		2.6	1.0	8.0		6	2.1	14		1.5		38	.05	9.4	11	6	62	1.1	62.0	5.9
May 14-22, 25-29	181	5.4		2.0	.9	5.7		8	2.2	7.8		1.5		30	.04	14.7	9	2	59	.8	46.5	6.5
June 1-8	13.1	12		3.4	1.6	8.3		8	2.8	16		1.5		50	.07	1.8	15	9	55	.9	89.8	6.2
June 9-13, 16-20	.25	17		7.8	3.4	33		22	6.0	57		1.5		137	.19	.09	33	15	68	2.5	245	7.3
June 14-15, 21-25	.13	22		14	7.1	61		41	9.8	107		2.0		a 330	.45	.12	64	31	67	3.3	454	7.5
June 26-30	b .02	26		22	12	106		70	15	185		1.2		a 458	.62	.02	104	47	69	4.5	765	7.8
July 1-11	0	32		29	16	139		90	18	246		1.2		a 583	.79	--	138	65	69	5.1	997	7.8
July 12-16, 25-31	b .23	18		8.7	5.1	39		28	9.1	67		1.5		162	.22	.10	43	20	67	2.6	300	7.1
July 17-24	.26	15		3.9	1.9	18		12	7.1	28		1.2		81	.11	.06	18	8	70	1.9	130	7.0
Aug. 1-4	.22	18		--	--	22		12	7.7	37		1.0		a 206	.28	.12	23	13	68	2.0	166	6.5
Aug. 5-6	.10	22		11	6.2	52		34	11	89		1.2		a 293	.40	.08	53	25	68	3.1	379	7.2
Aug. 7-10	0	26		19	9.2	86		59	13	149		1.2		a 378	.51	--	86	37	69	4.1	613	7.7
Aug. 11-20	0	31		26	14	121		82	17	212		1.2		a 490	.67	--	122	56	68	4.7	878	7.5
Aug. 21-31	b .05	32		31	17	142		96	18	255		.8		a 569	.77	.08	148	69	68	5.1	1,030	7.6
Sept. 1-4, 14-20	0	34		34	19	159		113	18	282		1.5		a 634	.86	--	163	70	68	5.4	1,140	8.0
Sept. 21-30	0	30		33	19	158		110	18	280		1.5		a 612	.83	--	160	70	68	5.4	1,120	8.1
Weighted average	32.5	7.1		3.0	1.3	11		8	3.6	18		1.3		49	0.07	4.3	13	6	65	1.3	82.7	--

a Residue on evaporation at 180°C.
b Includes day of less than 0.05 second-foot flow.

SABINE RIVER BASIN--Continued

COW BAYOU NEAR MAURICEVILLE, TEX.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

NECHES RIVER BASIN

NECHES RIVER AT EVADALE, TEX.

LOCATION.--At gaging station at bridge on U. S. Highway 96, 200 feet upstream from Gulf, Colorado and Santa Fe Railway bridge at Evadale, Jasper County, 600 feet downstream from Mill Creek, 15 miles upstream from Village Creek and at mile 55.
DRAINAGE AREA.--7,908 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1954.
Water temperatures: October 1947 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 188 ppm Sept. 1-10; minimum, 88 ppm May 18-31.
Hardness: Maximum, 61 ppm Sept. 1-10; minimum, 25 ppm May 18-31.
Specific conductance: Maximum daily, 328 micromhos Aug. 28; minimum daily, 120 micromhos May 15.
Water temperatures: Maximum observed, 88°F July 13; minimum observed, 43°F Jan. 23.
EXTREMES, 1947-54.--Dissolved solids: Maximum, 218 ppm Dec. 11-20, 1948; minimum, 36 ppm May 5-12, 26-27, 1953.
Hardness: Maximum, 70 ppm Nov. 1-10, 1947, minimum, 16 ppm Sept. 22-25, 27, 1950.
Specific conductance: Maximum daily, 415 micromhos Nov. 29, 1952; minimum daily, 49.3 micromhos May 9, 1953.
Water temperatures: Maximum observed, 94°F June 29, 1953; minimum observed, 37°F Jan. 30-31, 1948, Jan. 31, 1949.
REMARKS.--Values reported for dissolved solids are residues on evaporation unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1953 to September 1954 given in WSP 1342.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-10, 1953 ...	707	25		9.0	3.6	25		43	10	31	0.3	1.5		139	0.19	265	38	2	59	1.7	199	7.4
Oct. 11-20.....	306	28		10	4.0	25		49	9.9	30	.3	1.8		134	.18	111	42	2	57	1.7	202	7.4
Oct. 21-31.....	405	26		11	4.0	26		43	11	36	.2	1.8		147	.20	161	44	9	56	1.7	217	7.2
Nov. 1-10	432	26		10	4.4	28		42	9.8	41	.3	1.5		152	.21	177	43	8	59	1.9	229	7.3
Nov. 11-20	410	26		10	3.9	39		44	9.9	55	.3	1.0		174	.24	193	41	5	67	2.7	275	7.4
Nov. 21-30	442	24		9.0	3.7	42		44	11	56	.3	1.0		184	.25	220	38	2	71	3.0	280	7.3
Dec. 1-10	591	15		9.1	2.7	29		34	13	37	.4	1.2		154	.21	246	34	6	65	2.1	214	7.4
Dec. 11-20	815	15		7.9	2.5	26		34	12	32	.4	1.0		137	.19	301	30	2	66	2.1	187	7.0
Dec. 21-31	3,532	13		6.4	2.9	25		20	16	33	.5	1.0		138	.19	1,320	28	12	66	2.0	180	6.8
Jan. 1-10, 1954 ...	2,414	16		7.3	3.1	25		18	16	37	.5	.8		a115	.16	750	30	16	64	2.0	203	7.1
Jan. 11-20.....	5,189	16		7.2	3.2	24		16	18	35	.5	.5		a112	.15	1,570	31	18	63	1.9	195	7.0
Jan. 21-31.....	3,495	14		7.0	3.0	19		17	18	26	.5	1.0		a96	.13	906	30	16	58	1.5	167	7.0
Feb. 1-10	3,233	18		8.6	4.1	26		19	24	37	.5	.8		a128	.17	1,120	38	23	59	1.8	214	7.1
Feb. 11-19	2,569	20		9.4	4.9	29		19	26	44	.5	1.0		165	.22	1,140	44	28	59	1.9	251	7.1
Feb. 20-28	2,030	18		9.6	4.7	28		20	26	42	.5	.8		159	.22	871	44	27	58	1.8	241	7.1
Mar. 1-10	2,319	17		10	4.9	30		23	26	44	.4	.5		165	.22	1,030	45	26	59	1.9	251	7.1
Mar. 11-20	1,782	16		10	4.9	32		26	27	45	.5	.8		165	.22	794	45	24	61	2.1	256	7.2
Mar. 21-31	1,143	16		10	4.5	30		28	23	42	.5	.5		158	.21	488	44	20	60	2.0	245	7.2

a Sum of determined constituents.

Apr. 1-10, 1954 ...	1,660	17		10	4.7	33	28	26	46	.3	1.0		167	.23	748	44	22	62	2.2	264	7.0
Apr. 11-15, 21-22.	3,561	15		10	4.4	33	29	24	45	.4	2.0		170	.23	1,630	43	19	63	2.2	265	7.1
Apr. 16-20, 23-30.	3,981	13		7.9	4.1	21	25	16	31	.3	1.0		a106	.14	1,140	36	16	56	1.5	189	7.2
May 1-2, 7-11	7,436	20		8.0	3.0	23	24	15	31	.7	3.0		152	.21	3,050	32	13	61	1.8	190	7.2
May 3-6, 12-17 ...	6,510	16		6.5	2.3	18	20	13	22	.7	2.2		a91	.12	1,600	26	9	60	1.5	140	7.0
May 18-31.....	7,512	16		6.2	2.3	17	17	14	21	.8	2.5		a88	.12	1,780	25	11	60	1.5	139	7.0
June 1-10	4,045	17		6.6	2.9	21	23	14	27	.7	1.5		127	.17	1,390	28	10	62	1.7	166	7.1
June 11-20	2,134	18		7.7	3.2	21	28	14	26	.7	1.5		130	.18	749	32	9	58	1.6	169	7.3
June 21-30	1,384	19		9.0	3.4	23	38	13	27	.7	1.0		132	.18	493	36	6	57	1.6	179	7.4
July 1-10.....	1,496	16		10	4.2	23	41	14	30	.5	1.0		137	.19	553	42	9	54	1.5	198	7.3
July 11-20.....	1,097	16		11	4.4	27	45	14	36	.5	1.2		145	.20	429	46	8	57	1.8	226	7.1
July 21-31.....	853	17		12	4.8	32	50	14	43	.5	1.2		159	.22	366	50	8	58	2.0	257	7.2
Aug. 1-10	379	22		12	4.4	31	51	13	41	.2	1.0		158	.21	162	48	6	58	1.9	251	7.5
Aug. 11-20	682	22		13	4.8	36	61	12	47	.2	.8		173	.24	319	52	2	60	2.2	284	7.4
Aug. 21-31	464	22		13	4.7	42	69	11	52	.2	1.0		187	.25	234	52	0	64	2.5	305	7.7
Sept. 1-10.....	255	28		15	5.7	36	81	8.6	44	.3	.8		188	.26	129	61	0	56	2.0	299	7.7
Sept. 11-20.....	277	26		15	5.2	36	85	7.5	41	.3	.8		181	.25	135	59	0	57	2.0	291	7.6
Sept. 21-30.....	204	24		16	5.2	39	91	7.4	43	.4	1.0		187	.25	103	59	0	59	2.2	303	7.5
Weighted average	2,114	17		8.1	3.4	24	25	17	32	0.5	1.5		127	0.17	704	34	14	60	1.8	194	--

a Sum of determined constituents.

NECHES RIVER BASIN--Continued

NECHES RIVER AT EVADALE, TEX.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	80	63	57	46	55	55	65	75	78	--	79	84
2	80	63	60	49	56	58	64	75	79	86	80	82
3	80	64	62	50	54	55	66	69	79	84	82	80
4	79	65	59	51	56	54	69	68	78	85	83	81
5	78	64	60	50	55	53	70	67	76	86	84	82
6	77	--	57	50	55	50	70	66	78	85	84	83
7	72	59	54	50	55	50	71	68	79	85	85	81
8	72	58	58	--	55	51	72	69	--	84	85	82
9	70	54	57	52	54	54	70	69	80	85	--	79
10	70	--	53	55	55	56	70	71	80	85	87	82
11	71	55	53	49	57	60	73	70	86	85	83	82
12	71	54	54	48	55	63	73	71	81	87	82	77
13	71	56	54	45	55	64	74	69	83	88	85	76
14	72	53	50	49	58	55	74	67	83	86	86	78
15	70	57	46	51	60	55	74	70	82	86	86	80
16	72	55	48	--	61	56	70	70	84	86	86	79
17	72	57	49	52	60	54	68	70	83	83	81	80
18	72	60	49	50	60	57	66	72	84	83	85	80
19	70	62	47	52	62	59	68	71	84	84	83	81
20	73	60	50	56	60	60	69	71	84	85	84	83
21	75	59	50	55	58	60	68	71	--	86	85	82
22	72	59	51	45	58	62	74	70	83	84	86	78
23	72	55	47	43	60	64	73	--	85	85	86	74
24	--	57	45	50	58	65	69	86	85	86	83	79
25	72	55	45	51	60	57	73	73	85	--	86	77
26	70	58	46	53	60	66	73	--	85	85	83	77
27	68	54	45	54	63	67	74	--	85	86	84	79
28	65	57	46	51	60	55	74	--	85	86	81	80
29	65	58	47	59	--	67	75	75	86	84	82	78
30	62	58	48	56	--	69	76	75	87	80	84	81
31	63	--	48	57	--	71	--	--	--	80	84	--
Average	72	58	51	51	58	59	71	71	82	85	84	80

MISCELLANEOUS ANALYSES OF STREAMS IN NECHES RIVER BASIN IN TEXAS

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
NECHES RIVER AT STATE HIGHWAY 103 WEST OF LUFKIN																						
Dec. 18, 1953		20	0.39	7.7	4.6	23	27	21	31		1.0		146	0.20		38	16	57	0.8	184	6.9
WOLF CREEK 6 MILES NORTHWEST OF TOWN BLUFF																						
Sept. 13, 1954	19.7	19		4.1	0.9	5.9	20	1.2	6.2		0.5		53	0.07		14	0	48	0.7	55.8	6.7
RUSH CREEK 4½ MILES NORTHWEST OF TOWN BLUFF																						
Oct. 14, 1953	2.16						203			75							115	21			552	8.2
Sept. 3, 1954	1.24	32				95	225	2.9		103		0.8		397	0.54		126	0	62	3.7	675	7.7
SANDY CREEK ON COUNTY ROAD 10 MILES SOUTHWEST OF JASPER																						
Sept. 13, 1954	20.4	20		2.2	0.6	5.0	10	2.0	5.0		1.8		46	0.06		8	0	57	0.8	66.9	6.4
VILLAGE CREEK AT U. S. HIGHWAY 69, 9 MILES NORTHWEST OF KOUNTZE																						
Oct. 15, 1953	18.8						19			8.0							7	0			57.7	6.9
Sept. 2, 1954	15.1	11					18			7.5		0.2					15	3			63.5	6.6
HICKORY CREEK 3½ MILES WEST OF WARREN																						
Sept. 1, 1954	5.71	11				4.8	16	1.2	7.0		0.2		49	0.07		14	1	43	0.6	53.1	6.6
HORSEPEN CREEK 9½ MILES WEST OF WOODVILLE																						
Oct. 15, 1953	1.68						18			8.5							9	0			56.3	7.4
Sept. 1, 1954	1.27	14					15			8.2		0.2					13	1			53.6	6.5
HORSEPEN CREEK 9 MILES SOUTHWEST OF WOODVILLE																						
Oct. 15, 1953	7.57						12			7.5							5	0			45.1	7.3
Sept. 1, 1954	6.30	12					12			7.0		0.2					10	0			44.6	6.6

NECHES RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN NECHES RIVER BASIN IN TEXAS--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
HORSEPEN CREEK 3 MILES WEST OF WARREN																						
Sept. 1, 1954.....	7.34	13						12		6.8		0.2					10	0			45.1	6.6
HICKORY CREEK AT U. S. HIGHWAY 69, 3½ MILES SOUTH OF WARREN																						
Sept. 2, 1954.....	12.7	12				5.0		14	1.3	6.8		0.5		47	0.06		12	1	47	0.6	50.0	6.6
BIG TURKEY CREEK 6 MILES SOUTHEAST OF WARREN																						
Oct. 14, 1953.....	25.7							16		7.5							8	0			55.4	7.4
Sept. 2, 1954.....	17.9	14						18		7.8		0.2					14	0			58.4	6.7
BEECH CREEK AT FARM TO MARKET ROAD 1013, 1 MILE WEST OF SPURGER																						
Oct. 14, 1953.....	0.89							11		6.2							4	0			43.3	7.2
Sept. 3, 1954.....	.06	9.6						11		6.0		0.5					10	1			41.0	6.3
BEECH CREEK 2½ MILES NORTHWEST OF FRED																						
Oct. 14, 1953.....	0.37							9		7.2							2	0			39.9	7.0
Sept. 3, 1954.....	.23	9.8						8		7.5		0.5					7	0			38.2	6.7
THEUVENINS CREEK 7 MILES SOUTHEAST OF WARREN																						
Oct. 14, 1953.....	5.94	19		16	6.1	313		9	1.2	522		1.5		939	1.28		65	58	91	17	1,700	6.6
Sept. 3, 1954.....	1.41	13				55		8	1.6	100		.5		204	.28		29	22	81	4.5	353	6.4
CYPRESS CREEK 1 MILE WEST OF KOUNTZE																						
Sept. 2, 1954.....	0.20	1.9				65		82	3.2	62		0.5		203	0.28		[illegible]	0	89	6.6	339	7.1

TRINITY RIVER NEAR OAKWOOD, TEX.

LOCATION.--At gaging station at bridge on U. S. Highways 79 and 84, 1½ miles upstream from International-Great Northern Railroad bridge, 6 miles northeast of Oakwood, Leon County, and at mile 313.
DRAINAGE AREA.--12,912 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1954 (discontinued).
Water temperatures: October 1947 to September 1954 (discontinued).
EXTREMES, 1953-54.--Dissolved solids: Maximum, 2,110 ppm Sept. 11; minimum, 236 ppm May 12, 15-22.
Hardness: Maximum, 274 ppm Sept. 11; minimum, 95 ppm Dec. 2, 4-6.
Specific conductance: Maximum daily, 3,700 micromhos Sept. 11; minimum daily, 326 micromhos Jan. 23, May 18.
Water temperatures: Maximum observed, 88°F July 26, Aug. 7; minimum observed, 45°F Jan. 23-24, Mar. 6.
EXTREMES, 1947-54.--Dissolved solids: Maximum, 4,500 ppm Sept. 7, 1953; minimum, 165 ppm Feb. 11-19, 1950.
Hardness: Maximum, 365 ppm Sept. 7, 1953; minimum, 85 ppm May 15-23, 1953.
Specific conductance: Maximum daily, 7,820 micromhos Sept. 7, 1953; minimum daily, 198 micromhos May 17, 1953.
Water temperatures: Maximum observed, 90°F Aug. 14, 1952; June 13, 1953; minimum observed, freezing point Feb. 5, 1949, Dec. 15, 21-22, 1951.
REMARKS.--Values reported for dissolved solids concentrations less than 1,000 ppm are residues on evaporation and for concentrations more than 1,000 ppm are sums of determined constituents unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1953 to September 1954 given in WSP 1342.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-10, 1953..	138	15		60	8.5	345		252	121	422		8.7		1,100	1.50	410	184	0	80	11	1,980	8.0
Oct. 11-20	176	24		66	10	397		311	160	445		25		1,280	1.74	608	206	0	81	12	2,210	7.9
Oct. 21-28	388	32		67	12	452		285	165	550		22		1,440	1.96	1,510	216	0	82	13	2,550	7.9
Oct. 29-30, Nov. 5-6.....	1,372	14		40	5.1	126		139	57	152		10		482	.66	1,790	121	7	69	5.0	860	7.7
Oct. 31, Nov. 1-4, 7-9	695	17		48	7.9	207		145	97	258		23		744	1.01	1,400	152	34	75	7.3	1,300	7.5
Nov. 10, 22-24 ..	921	13		44	8.1	304		130	51	452		9.9		947	1.29	2,350	144	37	82	11	1,770	7.7
Nov. 11-13, 25-26, 28-30	473	16		44	6.6	139		158	90	145		14		a 533	.72	681	137	8	69	5.2	943	7.4
Nov. 14-21, 27 ..	391	17		49	7.6	214		169	84	268		18		746	1.01	788	154	15	75	7.5	1,340	7.7
Dec. 1, 3, 7-18,23	1,980	15		54	11	246		154	101	330		21		883	1.20	4,720	180	54	75	8.0	1,550	7.7
Dec. 2, 4-6	4,845	9.2		30	5.0	54		102	28	68		4.2		280	.38	3,660	95	12	55	2.4	466	7.7
Dec. 19-22, 24-25	585	17		55	12	456		183	81	658		18		1,390	1.89	2,200	186	36	84	15	2,550	7.8
Dec. 26-31	385	16		43	7.9	186		143	98	222		15		687	.93	714	140	23	74	6.8	1,170	7.5
Jan. 1-9, 1954 ..	393	20		46	8.2	195		148	108	230		17		702	.95	745	148	27	74	7.0	1,230	7.5
Jan. 10-15, 17-20	2,731	15		46	6.3	78		132	68	87		12		392	.53	2,890	141	33	55	2.9	669	7.7
Jan. 16, 23-25..	2,342	15		36	4.8	40		109	37	46		8.1		260	.35	1,640	110	20	45	1.7	420	8.0
Jan. 21-22, 26-31	2,120	14		49	6.3	95		138	76	108		13		442	.60	2,530	148	36	58	3.4	758	7.5

a Sum of determined constituents.

TRINITY RIVER BASIN--Continued

TRINITY RIVER NEAR OAKWOOD, TEX.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Feb. 1-9, 1954...	826	14		48	6.4	95		132	83	105		14		459	0.62	1,020	146	38	59	3.4	751	7.9
Feb. 10-20	391	13		55	7.8	197		150	102	252		17		726	.99	766	169	46	72	6.6	1,260	7.8
Feb. 21-24	742	15		59	10	221		183	138	250		28		860	1.17	1,720	188	38	72	7.0	1,420	8.0
Feb. 25-28, Mar. 1	540	14		37	7.0	126		122	78	146		12		509	.69	742	122	22	69	5.0	834	7.9
Mar. 2, 6, 9-10, 18, 21-22, 26, 30-31	327	12		64	11	428		173	124	598		25		1,350	1.84	1,190	204	62	82	13	2,430	7.9
Mar. 3, 5, 7-8, 11-17, 27-29 ...	315	13		50	9.0	199		169	125	218		24		750	1.02	638	162	24	73	6.8	1,280	7.9
Mar. 4, 19-20, 23-25.....	314	14		52	8.5	260		181	135	298		25		900	1.22	763	164	16	77	8.8	1,550	7.9
Apr. 1-6, 10-13..	457	18		52	10	267		189	149	298		25		924	1.26	1,140	170	16	77	8.9	1,560	8.0
Apr. 7-9	295	17		54	11	347		192	155	422		25		1,120	1.52	892	180	22	81	11	1,950	8.0
Apr. 14-15, 19, 21-30	707	14		44	6.4	79		136	56	94		6.0		384	.52	733	136	25	56	2.9	637	7.7
Apr. 16-18, 20..	2,798	14		47	6.3	144		156	93	156		13		562	.76	4,250	144	22	68	5.2	948	7.9
May 1, 8-11, 13.	1,431	20		42	4.8	129		141	60	157		6.6		493	.67	1,900	124	9	69	5.0	880	8.0
May 2-3, 5-7 ...	1,417	22		57	5.9	198		163	84	260		12		730	.99	2,790	166	33	72	6.7	1,320	8.2
May 4, 14, 23-31	1,443	20		52	4.8	84		154	63	95		6.6		406	.55	1,580	149	23	55	3.0	702	8.1
May 12, 15-22 ..	7,526	17		40	2.8	34		121	36	31		7.0		236	.32	4,800	111	12	40	1.4	388	7.9
June 1-6, 9, 11 .	401	21		66	6.1	151		196	94	178		10		631	.86	683	190	29	63	4.8	1,090	8.2
June 7-8, 10, 12, 14-20	312	11		62	6.6	221		204	110	265		9.9		810	1.10	682	182	14	73	7.1	1,420	7.8
June 13	242	16		78	9.0	430		b 208	103	625		10		1,370	1.86	895	232	61	80	12	2,510	8.4
June 21-30	307	14		66	6.9	219		218	161	220		16		859	1.17	712	193	14	71	6.9	1,410	8.0
July 1-10	184	14		67	8.1	208		198	102	270		4.2		791	1.08	393	200	38	69	6.4	1,390	8.2
July 11-20.....	182	17		69	7.9	259		c 248	171	270		7.5		953	1.30	468	204	2	73	7.9	1,590	8.4
July 21-31.....	266	19		60	8.8	266		d 257	176	255		12		927	1.26	666	186	0	76	8.5	1,540	8.4
Aug. 1-4, 14-20.	250	16		64	7.0	226		240	104	262		7.2		832	1.13	562	188	0	72	7.2	1,410	8.2
Aug. 5-13	243	14		59	5.6	144		229	79	149		5.6		586	.80	384	170	0	65	4.8	994	8.2
Aug. 21-31	168	18		64	8.1	332		c 260	144	388		6.0		1,090	1.48	494	193	0	79	10	1,910	8.3
Sept. 1-10, 12-30	136	22		62	9.1	393		261	209	432		6.0		1,260	1.71	463	192	0	82	12	2,180	8.2
Sept. 11	140	18		87	14	697		d 263	187	975		6.5		2,110	2.87	798	274	58	85	18	3,700	8.3
Weighted average	871	16		47	6.3	137		149	75	165		12		547	0.74	1,290	144	22	67	5.0	944	--

b Includes equivalent of 3 parts per million of carbonate (CO_3).
c Includes equivalent of 4 parts per million of carbonate (CO_3).
d Includes equivalent of 5 parts per million of carbonate (CO_3).

TRINITY RIVER BASIN--Continued

TRINITY RIVER NEAR OAKWOOD, TEX.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	79	62	55	56	50	53	56	75	82	84	82	83
2	79	60	57	54	53	55	67	70	83	85	81	83
3	79	63	59	55	52	51	65	65	79	85	83	80
4	78	62	56	56	53	51	69	61	78	85	83	83
5	75	60	57	53	52	51	69	64	75	85	84	80
6	60	58	53	56	53	45	70	67	77	85	84	82
7	65	64	57	56	50	50	70	70	80	85	88	83
8	68	65	56	57	50	51	70	71	81	84	83	83
9	65	54	56	56	50	52	70	73	80	85	85	83
10	65	52	56	54	52	59	71	72	81	84	85	83
11	68	52	56	54	53	65	70	68	81	85	85	82
12	68	51	54	53	52	65	73	62	82	85	84	81
13	65	53	56	52	53	60	72	62	83	85	82	81
14	65	53	56	52	65	64	71	64	82	86	85	81
15	67	52	58	53	60	55	73	65	80	--	85	80
16	68	53	56	54	60	54	70	65	83	84	84	--
17	67	58	58	54	55	54	68	68	83	85	85	--
18	65	60	57	53	60	55	70	68	84	85	85	--
19	67	62	56	53	62	58	68	50	84	86	84	--
20	65	62	56	52	58	65	69	70	85	86	85	--
21	68	55	57	48	58	61	70	70	84	84	84	--
22	65	56	54	47	56	60	71	71	85	84	82	--
23	84	55	57	45	58	65	71	73	83	85	83	--
24	63	54	56	45	55	68	70	74	84	85	84	--
25	71	52	56	50	56	65	72	74	85	84	83	--
26	60	52	56	50	56	65	73	74	83	88	83	--
27	65	52	57	50	60	68	72	75	84	87	83	--
28	65	53	58	49	55	65	71	76	85	87	85	--
29	60	53	54	53	--	65	75	76	84	84	85	--
30	60	55	55	53	--	64	75	80	85	82	84	--
31	62	--	56	52	--	64	--	82	--	84	83	--
Average	67	57	56	52	55	59	70	70	82	85	84	--

TRINITY RIVER BASIN--Continued

TRINITY RIVER AT ROMAYOR, TEX.

LOCATION.--At gaging station at bridge on State Highway 105, 1.9 miles south of Romayor, Liberty County, 2.0 miles downstream from Gulf, Colorado and Santa Fe Railway bridge, 4.1 miles downstream from Big Creek, and at mile 94.
DRAINAGE AREA.--17,192 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to November 1949, February 1950 to September 1951, April 1953 to September 1954.
Water temperatures: February 1950 to September 1951, April 1953 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 1,900 ppm Nov. 7; minimum, 82 ppm July 31.
Hardness: Maximum, 228 ppm Nov. 7; minimum, 32 ppm Nov. 1-3.
Specific conductance: Maximum daily, 3,170 micromhos Nov. 7; minimum daily, 108 micromhos Nov. 2.
Water temperatures: Maximum observed, 93°F June 30, July 16-17; minimum observed, 40°F Dec. 27, Jan. 1.
EXTREMES, 1945-50, 1953-54.--Dissolved solids: Maximum, 1,900 ppm Nov. 7, 1953; minimum, 82 ppm July 31, 1954.
Hardness: Maximum, 242 ppm Sept. 28-30, 1953; minimum, 32 ppm Nov. 1-3, 1953.
Specific conductance: Maximum daily, 3,170 micromhos Nov. 7, 1953; minimum daily, 103 micromhos Nov. 9, 1946.
REMARKS.--Values reported for dissolved solids concentrations less than 1,000 ppm are residues on evaporation and for concentrations more than 1,000 ppm are sums of determined constituents unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1953 to September 1954 given in WSP 1342.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-3, 1953	268	17		59	6.7	329		225		78	442		1.8		1,040	1.41	753	174	0	80	11	1,820	8.2
Oct. 4-8, 28-30	1,204	18		48	5.2	155		182		59	190		.8		a565	.77	1,840	142	0	70	5.7	980	8.2
Oct. 9-27, 31	404	20		46	4.8	103		170		39	126		1.2		430	.58	469	134	0	62	3.9	739	8.1
Nov. 1-3	2,310	7.8		10	1.6	19		35		14	20		1.2		a91	.12	568	32	3	56	1.4	159	7.5
Nov. 4, 9, 21-27	1,238	15		44	5.6	170		145		73	212		11		609	.83	2,040	133	14	74	6.4	1,060	7.8
Nov. 5-6, 8	1,460	17		56	7.9	388		206		109	512		15		1,210	1.65	4,770	172	3	83	13	2,120	7.9
Nov. 7	1,250	28		70	13	628		216		136	892		22		1,900	2.58	6,410	228	51	86	18	3,170	8.2
Nov. 10-15, 19-20	861	16		36	3.7	103		134		52	111		9.3		414	.56	962	105	0	68	4.4	694	7.8
Nov. 16-18, 28-30	935	14		27	4.3	70		97		40	79		6.8		317	.43	800	85	6	64	3.3	508	7.6
Dec. 1-4, 9, 20	3,547	14		39	5.1	134		111		46	189		5.8		516	.70	4,940	118	29	71	5.4	898	7.5
Dec. 5-8, 10-19, 21, 31	5,029	12		26	3.7	47		76		31	60		4.2		267	.36	3,630	80	18	56	2.3	396	7.4
Dec. 22-30	3,770	10		15	2.6	21		47		19	24		1.8		187	.25	1,900	48	10	49	1.3	209	7.1
Jan. 1-10, 18-20, 22, 24, 1954	2,379	21		33	4.9	77		88		45	105		4.5		356	.48	2,290	102	30	62	3.3	579	7.4
Jan. 11-17	1,946	21		28	3.7	60		87		26	82		3.0		272	.37	1,430	85	14	61	2.9	449	7.3
Jan. 21	6,420	21		--	--	202		132		84	262		14		716	.97	12,410	137	29	76	7.5	1,240	8.1
Jan. 23, 25-31	3,176	19		33	3.7	40		105		37	39		5.8		246	.33	2,110	98	12	47	1.8	375	7.6
Feb. 1-4, 21-26	1,342	24		36	6.4	49		102		41	67		3.8		302	.41	1,090	116	33	48	2.0	489	7.9
Feb. 5-13	1,226	32		45	6.8	91		126		65	114		7.2		438	.60	1,450	140	38	58	3.3	731	7.9
Feb. 14-20, 27	998	32		48	6.6	98		137		68	121		7.7		462	.63	1,240	147	34	59	3.5	768	7.9

Feb. 28, Mar. 2-8, 13-14, 1954	858	19		48	6.9	132	131		71	178		4.8		534	.73	1,240	148	41	66	4.7	938	7.9
Mar. 1, 9-12, 25, 28-31	729	15		54	7.6	177	150		78	242		5.0		671	.91	1,320	166	26	70	6.0	1,200	8.0
Mar. 15-24, 26-27	648	21		46	7.0	123	137		60	166		4.0		500	.68	875	144	32	65	4.5	880	8.0
Apr. 1-10, 19-20	903	14		51	8.3	167	156		84	216		6.5		630	.86	1,540	161	33	69	5.7	1,110	7.9
Apr. 11, 17, 26-30	1,003	12		39	5.4	75	119		47	93		5.6		345	.47	934	120	22	58	3.0	596	7.8
Apr. 12-16, 18, 21-25	1,654	11		40	6.6	124	130		68	150		8.2		483	.66	2,160	127	20	68	4.8	845	7.8
May 1-4, 9, 17-20	6,163	15		33	4.5	48	102		30	62		4.1		274	.37	4,560	101	18	51	2.1	448	7.5
May 5-8, 13-16	9,371	9.8		17	2.8	25	71		5.0	32		.0		a127	.17	3,210	54	0	50	1.5	238	6.2
May 10-12	2,500	16		43	7.0	135	118		60	190		4.5		526	.72	3,550	136	40	68	5.0	936	7.9
May 21-31	5,036	16		37	4.3	29	108		34	32		4.1		238	.32	3,240	110	22	36	1.2	364	7.6
June 1-11	936	26		49	6.3	49	149		42	61		2.8		338	.46	854	148	26	42	1.7	525	8.0
June 12-25	605	19		55	7.5	93	158		53	130		1.8		468	.64	764	168	38	55	3.1	778	8.0
June 26-30	738	11		54	7.4	140	161		76	182		2.0		601	.82	1,200	165	33	65	4.7	994	8.0
July 1-10	314	13		60	8.0	173	164		82	238		3.0		669	.91	567	182	48	67	5.6	1,200	7.9
July 11-20	254	14		49	8.3	213	163		75	288		4.0		743	1.01	510	156	23	75	7.4	1,360	7.9
July 21-30	544	14		51	7.4	177	181		92	210		2.0		647	.88	950	158	9	71	6.1	1,160	7.9
July 31	4,400	6.4		--	--	--	41		--	21		2.8		82	.11	974	36	2	--	--	154	7.6
Aug. 1-4	1,918	9.0		24	2.2	63	84		28	76		2.2		263	.36	1,360	69	0	67	3.3	454	7.5
Aug. 5-10	670	15		52	5.1	147	167		50	198		1.0		558	.76	1,010	150	14	68	5.2	1,010	7.8
Aug. 11-20	333	19		67	7.4	228	237		122	262		2.5		867	1.18	780	198	4	71	7.0	1,440	8.0
Aug. 21-31	186	14		58	7.2	196	221		105	218		1.5		a709	.96	356	174	0	71	6.4	1,260	7.9
Sept. 1-10	247	15		59	7.5	205	236		100	230		1.8		739	1.01	493	178	0	71	6.7	1,310	8.2
Sept. 11-20	201	20		62	7.0	158	245		70	178		1.5		617	.84	335	184	0	65	5.1	1,100	8.2
Sept. 21-30	194	20		64	7.0	150	247		53	182		1.2		600	.82	314	188	0	63	4.8	1,090	8.1
Weighted average	1,694	15		34	4.7	75	105		40	95		4.0		342	0.47	1,560	104	18	61	3.2	568	--

a Sum of determined constituents.

TRINITY RIVER BASIN--Continued

TRINITY RIVER AT ROMAYOR, TEX.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	80	60	55	40	--	58	68	77	86	92	80	84
2	80	65	60	50	50	58	72	76	86	88	82	84
3	73	65	58	--	50	55	71	72	86	86	82	84
4	80	65	60	50	55	58	73	72	85	88	85	83
5	80	65	55	50	50	55	73	68	80	88	85	88
6	75	65	55	50	45	52	73	70	85	88	85	86
7	75	60	60	50	50	54	74	71	86	89	85	84
8	75	60	60	50	45	55	--	75	87	89	91	84
9	75	60	60	50	50	59	74	75	87	90	88	84
10	75	65	60	50	50	62	75	76	86	89	88	83
11	75	60	58	50	50	68	75	76	88	92	88	84
12	78	65	60	50	55	68	72	74	86	91	88	84
13	80	60	50	50	55	68	76	68	89	91	88	83
14	75	65	50	50	55	59	78	68	88	91	88	80
15	80	65	50	50	55	58	76	70	88	92	88	81
16	80	60	50	50	60	58	72	70	87	93	88	82
17	75	65	50	50	60	58	69	73	90	93	88	82
18	75	60	50	50	60	59	73	74	91	88	88	82
19	75	60	50	50	60	60	74	74	88	88	88	82
20	80	65	50	55	60	61	75	74	85	88	88	82
21	75	60	50	45	60	62	74	74	88	89	88	82
22	79	60	48	45	60	67	75	72	87	88	85	81
23	70	60	45	45	60	67	76	73	90	90	85	79
24	75	60	45	48	60	68	75	76	91	92	84	78
25	75	60	45	50	--	70	76	74	91	88	84	78
26	70	60	50	50	60	70	75	77	91	91	84	82
27	70	62	40	50	60	69	78	78	91	91	84	81
28	70	62	50	55	60	72	78	75	92	88	84	81
29	--	65	--	55	--	72	80	82	92	86	--	82
30	65	55	45	55	--	75	75	84	93	76	85	83
31	65	--	45	55	--	73	--	85	--	76	87	--
Average	75	62	52	50	55	63	74	74	88	89	86	82

TRINITY RIVER NEAR MOSS BLUFF, TEX.

LOCATION.--At Devers pumping plant number one, one mile west of Moss Bluff, Liberty County.
RECORDS AVAILABLE.--Chemical analyses: Short periods during summers of 1946 to 1949, daily records October 1949 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 1,830 ppm Aug. 21-31; minimum, 157 ppm Nov. 13-14.
Hardness: Maximum, 416 ppm Aug. 21-31, minimum, 41 ppm Nov. 13-14.
Specific conductance: Maximum daily, 4,090 micromhos Aug. 22; minimum daily, 167 micromhos May 16.
EXTREMES, 1949-54.--Dissolved solids: Maximum, 3,640 ppm Aug. 26-27, 1952; minimum, 110 ppm Oct. 4-10, 1949.
Hardness: Maximum, 782 ppm Aug. 26-27, 1952; minimum, 41 ppm Nov. 13-14, 1953.
Specific conductance: Maximum daily, 7,630 micromhos Aug. 27, 1952; minimum daily, 127 micromhos Oct. 7, 1949.
REMARKS.--Values reported for dissolved solids concentrations less than 1,000 ppm are residues on evaporation and for concentrations more than 1,000 ppm are sums of determined constituents unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex.
No discharge records available for this station.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-4, 13-18,1953		18		65	9.2	209		240	70	272		2.0		781	1.06		200	0	69	6.4	1,380	8.2
Oct. 5-12		17		86	11	313		259	68	465		1.8		1,090	1.48		260	0	72	8.4	2,000	8.2
Oct. 19-31		23		54	5.8	101		199	35	125		1.5		460	.63		158	0	58	3.5	778	7.7
Nov. 1-12		14		34	5.1	106		127	45	129		3.8		425	.58		106	2	68	4.5	722	7.4
Nov. 13-14		10		--	--	25		44	16	29		1.5		157	.21		41	5	57	1.7	203	7.3
Nov. 15-25		18		39	4.9	96		139	45	113		7.8		398	.54		118	4	64	3.9	694	7.5
Nov. 26-30		19		51	7.6	181		136	66	253		8.2		a658	.89		158	46	71	6.2	1,200	7.4
Dec. 1-2, 9-16		12		28	2.2	44		82	24	56		4.4		250	.34		79	12	55	2.1	382	7.3
Dec. 3-8		15		40	3.9	154		110	44	220		5.5		574	.78		116	26	74	6.2	975	7.2
Dec. 17-31		12		16	1.7	23		45	17	29		2.2		191	.26		47	10	52	1.5	217	7.3
Jan. 1-2, 1954		19		--	--	30		61	18	42		1.5		187	.25		63	13	51	1.7	278	8.0
Jan. 11-21		21		27	5.1	65		78	34	90		4.0		310	.42		88	24	62	3.0	497	7.4
Jan. 22		23		--	--	192		132	80	248		15		708	.96		136	28	75	7.2	1,190	8.2
Jan. 23-31		18		35	3.8	42		101	36	49		5.9		249	.34		103	20	47	1.8	405	7.4
Feb. 1-5, 7-8		15		38	5.2	54		105	40	73		4.5		304	.41		116	30	50	2.2	507	7.7
Feb. 6, 9-16		18		48	6.9	95		129	58	131		6.3		448	.61		148	43	58	3.4	762	7.2
Feb. 17-28		15		43	6.6	58		114	46	83		3.2		336	.46		134	41	48	2.2	568	7.2
Mar. 1-3,12-20,29-31		12		56	11	157		164	73	220		5.4		636	.86		184	50	65	5.0	1,120	8.0
Mar. 7-11, 21-28		12		51	8.3	105		149	56	146		2.5		468	.64		161	39	59	3.6	822	7.9
Apr. 1-9, 13-14, 23		12		55	8.0	167		162	68	233		2.0		636	.86		170	38	68	5.6	1,130	7.8
Apr. 10-12, 15, 22, 24-30		15		46	5.9	133		148	72	161		7.2		523	.71		140	18	68	4.9	919	7.9
Apr. 16-21		10		30	3.8	78		90	35	105		2.5		318	.43		90	17	65	3.6	565	7.6
May 1-5, 12-13, 17		17		38	5.2	60		114	32	82		4.2		312	.42		116	23	53	2.4	536	7.8
May 6-11, 14-16, 18-21		14		20	4.8	23		65	20	29		4.5		199	.27		70	16	41	1.2	262	7.7
May 22-31		19		40	4.8	34		116	33	42		5.2		250	.34		120	24	38	1.3	410	8.0

a Sum of determined constituents.

TRINITY RIVER BASIN--Continued

TRINITY RIVER NEAR MOSS BLUFF, TEX.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
June 1-6, 8-11, 14-15, 17, 1954...		19		48	6.3	46		143	36	63		2.8		308	0.42		146	28	41	1.7	512	8.0
June 7, 9-10, 12-13, 16, 18-20		20		59	7.1	66		174	42	93		2.0		388	.53		176	34	45	2.1	663	8.2
June 21-30.....		15		50	6.6	88		140	46	126		3.2		410	.56		152	38	56	3.1	735	7.9
July 1-5,7,10,14-18 .		16		66	13	223		171	85	335		2.0		839	1.14		218	78	69	6.5	1,500	7.8
July 6, 8, 29-31....		15		33	3.5	77		110	48	86		4.5		334	.45		97	7	68	3.4	566	8.0
July 9, 11-13, 19-28		16		69	25	337		180	100	535		2.0		1,170	1.59		275	128	73	8.8	2,210	7.7
Aug. 1, 5-10		13		29	3.6	62		89	31	82		1.8		279	.38		87	14	61	2.9	482	7.6
Aug. 2-4		8.4		17	2.3	36		54	22	44		1.8		163	.22		52	8	60	2.2	280	6.9
Aug. 11-20.....		17		58	6.8	133		176	47	190		1.2		550	.75		172	28	63	4.4	982	7.4
Aug. 21-31.....		15		78	54	535		200	166	880		2.8		1,830	2.49		416	252	74	11	3,310	7.6
Sept. 1-13		19		76	38	418		218	140	658		3.8		1,460	1.99		346	167	72	9.8	2,650	7.8
Sept. 14-25		18		66	11	215		247	95	265		2.0		807	1.10		210	7	69	6.4	1,400	7.9
Sept. 26-30		17		65	8.8	167		247	70	200		3.8		678	.92		198	0	65	5.2	1,180	7.8

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OLD RIVER NEAR COVE, TEX.

LOCATION.--At Barber Hill pumping plant, 5 miles northeast of Cove, Chambers County.
RECORDS AVAILABLE.--Chemical analyses: Short periods during summers of 1946 to 1949, daily records October 1949 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 9,140 ppm Aug. 31; minimum, 184 ppm Dec. 19-26, 30-31.
Hardness: Maximum, 1,780 ppm Aug. 31; minimum, 63 ppm Dec. 19-26, 30-31.
Specific conductance: Maximum daily, 14,900 micromhos Aug. 31; minimum daily, 223 micromhos Dec. 21.
EXTREMES, 1949-54.--Dissolved solids: Maximum, 9,140 ppm Aug. 31, 1954; minimum, 156 ppm Jan. 26-31, Apr. 21-30, 1952.
Hardness: Maximum, 1,780 ppm Aug. 31, 1954; minimum, 57 ppm Jan. 26-31, 1952.
Specific conductance: Maximum daily, 14,900 micromhos Aug. 31, 1954; minimum daily, 223 micromhos Dec. 21, 1953.
REMARKS.--Values reported for dissolved solids concentrations less than 1,000 ppm are residues on evaporation and for concentrations more than 1,000 ppm are sums of determined constituents. Records of specific conductance of daily samples available in district office at Austin, Tex. No discharge records available for this station.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-10, 1953...		--		--	--	--		--	--	770		--		--	--		--	--	--	--	2,830	--
Oct. 11-16		--		--	--	--		--	--	760		--		--	--		--	--	--	--	2,820	--
Oct. 21-31		--		--	--	--		--	--	286		--		--	--		--	--	--	--	1,190	--
Nov. 1-10		--		--	--	--		--	--	132		--		--	--		--	--	--	--	703	--
Nov. 11-20		15		46	7.0	88		115	57	129		0.2		420	0.57		144	50	57	3.2	709	7.8
Nov. 21-30		9.6		21	5.1	57		73	24	79		.2		248	.34		73	14	63	2.9	423	7.4
Dec. 1-10		15		23	4.6	39		80	18	54		1.8		225	.31		76	11	53	2.0	352	7.2
Dec. 11-18		17		26	2.6	43		87	16	56		1.8		234	.32		76	4	55	2.1	359	7.3
Dec. 19-26, 30-31.		13		20	3.1	28		66	13	38		1.5		184	.25		63	9	49	1.5	267	7.2
Dec. 27-29		11		32	7.6	75		94	27	118		2.2		353	.48		111	34	59	3.1	606	7.4
Jan. 1-10, 1954...		17		28	3.7	37		93	15	51		2.2		218	.30		85	9	49	1.7	349	7.6
Jan. 11-21		17		24	3.3	32		84	13	42		2.5		201	.27		73	5	49	1.6	298	7.6
Jan. 22-31		17		36	4.5	44		123	14	62		1.0		259	.35		108	8	47	1.8	425	7.4
Feb. 1-7		15		38	5.8	46		129	13	70		1.5		284	.39		119	13	46	1.8	468	7.6
Feb. 8-17		16		43	6.8	51		144	14	80		1.2		314	.43		135	17	45	1.9	521	7.6
Feb. 18-28		14		46	7.1	60		154	20	89		1.8		338	.46		144	18	47	2.2	573	7.6
Mar. 1-12		13		54	7.6	67		170	26	102		2.0		382	.52		166	26	47	2.3	637	7.9
Mar. 13-24, 31 ...		6.6		57	9.3	122		153	55	185		1.0		542	.74		180	54	60	4.0	941	7.7
Mar. 25, 27-30 ...		7.6		59	14	153		153	51	252		4.5		675	.92		204	79	62	4.7	1,180	7.8
Mar. 26.....		7.0		85	79	685		145	202	1,200		7.0		2,340	3.18		537	418	74	13	4,170	8.0
Apr. 1-14		24		59	12	164		168	59	250		2.5		687	.93		196	59	64	5.1	1,200	8.2
Apr. 15-25		17		21	3.0	36		60	26	45		3.0		200	.27		65	16	54	1.9	312	7.5
Apr. 26-30		17		40	6.7	120		130	64	150		6.0		486	.66		128	21	67	4.6	833	8.1
May 1-2, 5-11, 17		20		42	6.9	109		127	55	146		5.0		465	.63		134	30	64	4.1	821	7.8
May 3-4, 12-16, 18		21		34	4.7	63		100	35	85		3.0		309	.42		104	22	57	2.7	524	7.9
May 19-31		17		32	4.9	45		108	32	52		4.2		256	.36		100	12	50	2.0	421	7.8

TRINITY RIVER BASIN--Continued

OLD RIVER NEAR COVE, TEX.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
June 1-10, 1954		24		38	6.0	52		131	30	65		3.0		292	0.40		119	12	49	2.1	487	8.1
June 11-20		19		52	13	150		147	56	232		2.8		607	.83		183	62	64	4.8	1,090	7.8
June 21-23, 25-27, 30		18		78	13	319		144	111	500		2.5		1,110	1.51		248	130	74	8.8	2,010	8.0
June 28-29		19		98	17	501		145	162	790		2.5		1,660	2.26		314	196	78	12	2,950	7.9
July 1-3, 30		20		68	13	207		154	70	385		2.8		812	1.10		223	97	67	6.0	1,460	8.0
July 4-6, 21, 26		23		93	31	494		161	152	810		2.8		1,680	2.28		360	228	75	11	3,050	8.1
July 7-8		20		108	55	805		134	235	1,340		2.5		2,630	3.58		496	386	78	16	4,690	7.9
July 9-13, 17-19, 22		16		115	107	1,080		144	287	1,880		3.0		3,560	4.84		727	609	76	17	6,280	7.9
July 14-16		15		141	225	2,020		128	515	3,570		--		6,550	8.91		1,280	1,147	77	25	11,100	7.9
July 20, 23-25, 27-29		17		98	56	578		169	161	1,010		2.0		2,000	2.72		475	336	73	12	3,680	8.0
July 31, Aug. 1, 9-10		14		38	8.8	123		95	38	198		1.8		481	.65		131	53	67	4.7	877	7.6
Aug. 2, 6-8		15		51	14	177		102	53	305		2.0		725	.99		184	101	68	5.7	1,270	7.8
Aug. 3-5		18		77	35	387		119	115	680		1.8		1,370	1.86		336	238	71	9.2	2,520	7.7
Aug. 11-17		16		44	26	262		97	71	448		2.0		934	1.27		217	138	72	7.8	1,710	7.5
Aug. 18-30		13		97	137	1,190		112	307	2,120		--		3,920	5.33		806	714	76	18	6,970	7.5
Aug. 31		12		164	334	2,830		122	707	5,030		--		9,140	12.43		1,780	1,680	78	29	14,900	7.8
Sept. 1-10		16		103	103	953		168	248	1,670		2.5		3,180	4.32		680	548	75	16	5,620	7.6
Sept. 11-13, 28, 14, 22, 24, 26-27, 29-30		19		116	103	967		198	258	1,690		2.0		3,250	4.42		713	551	75	16	5,760	8.0
Sept. 15-18, 23, 25		20		102	55	581		217	180	990		2.2		2,020	2.75		480	302	72	12	3,620	8.1
		15		62	21	242		144	74	405		1.5		932	1.27		241	123	69	6.8	1,650	7.8

TRINITY RIVER AT ANAHUAC, TEX.

LOCATION.--At Lone Star pumping plant in Anahuac, Chambers County.
RECORDS AVAILABLE.--Chemical analyses: Short periods during summers of 1946 to 1949, daily records December 1949 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 18,000 ppm Sept. 11-20; minimum, 167 ppm Aug. 1, 3.
Hardness: Maximum, 3,440 ppm Sept. 11-20; minimum, 55 ppm Aug. 1, 3.
Specific conductance: Maximum daily, 30,200 micromhos Sept. 17-18; minimum daily, 246 micromhos May 16.
EXTREMES, 1949-54.--Dissolved solids: Maximum, 18,000 ppm Sept. 11-20, 1954; minimum, 167 ppm Aug. 1, 3, 1954.
Hardness: Maximum, 3,550 ppm Oct. 21-31, 1952; minimum, 52 ppm Dec. 25-31, 1949.
Specific conductance: Maximum daily, 30,200 micromhos Sept. 17-18, 1954; minimum daily, 210 micromhos May 5, 1953.
REMARKS.--Values reported for dissolved solids concentrations less than 1,000 ppm are residues on evaporation and for concentrations more than 1,000 ppm are sums of determined constituents. Records of specific conductance of daily samples available in district office at Austin, Tex. No discharge records available for this station.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chlorids (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-2, 4-5, 12-18, 22, 24, 1953		16		105	109	1,070		187	307	1,820		2.5		3,520	4.79		710	557	77	17	6,280	8.2
Oct. 3, 6-11, 27, 29.		18		91	58	663		186	207	1,090		2.0		2,220	3.02		466	156	76	13	3,970	7.9
Oct. 19-21, 23, 25-26, 28		13		165	301	2,580		173	649	4,560		--		8,350	11.4		1,650	1,360	77	28	13,900	7.8
Oct. 30-31, Nov. 1-2		18		54	9.6	180		180	71	242		1.8		674	.92		174	26	69	5.9	1,200	8.1
Nov. 3-10		12		28	8.4	95		103	27	140		1.2		382	.52		104	20	66	4.0	688	7.8
Nov. 11, 13-14, 22-23, 26-30		16		38	7.0	131		125	51	178		4.0		497	.68		124	22	70	5.1	897	7.9
Nov. 12		14		77	127	1,120		120	289	1,950		--		3,640	4.95		714	616	77	18	6,900	8.2
Nov. 15-17, 20-21, 24-25		17		43	9.9	226		136	68	320		6.1		773	1.05		148	36	77	8.1	1,400	7.8
Nov. 18-19		--		55	22	523		178	118	770		12		1,620	2.20		228	82	83	15	2,790	8.2
Dec. 1, 5, 7-25		11		29	8.7	115		109	39	160		2.2		453	.62		108	19	70	4.8	800	7.7
Dec. 2, 4, 6		12		47	28	294		142	91	465		5.5		1,010	1.37		232	116	73	8.3	1,880	7.9
Dec. 3		12		69	90	820		145	218	1,400		7.0		2,690	3.66		542	423	77	15	4,740	7.9
Dec. 26-31		11		20	4.9	66		58	21	101		1.2		316	.43		70	22	87	3.4	477	7.2
Jan. 1-10, 1954		10		23	7.4	72		75	27	109		1.8		319	.43		88	26	64	3.4	554	7.6
Jan. 11-20		12		25	6.3	68		73	25	105		2.0		310	.42		88	28	62	3.1	538	7.7
Jan. 21-31		11		30	8.1	85		116	36	111		4.3		360	.49		108	14	63	3.5	648	7.9
Feb. 1-9, 11-12		16		34	6.9	75		95	37	112		3.5		362	.49		114	36	59	3.1	620	7.4
Feb. 10, 13-18, 21-22, 24-27		15		53	11	162		129	80	238		6.6		663	.90		177	72	67	5.3	1,160	7.2
Feb. 19, 23		--		61	22	253		145	98	402		6.8		999	1.36		242	124	69	7.0	1,660	7.8
Feb. 20		--		66	49	454		131	142	775		6.1		1,570	2.14		366	258	73	10	2,810	7.7

TRINITY RIVER BASIN--Continued

TRINITY RIVER AT ANAHUAC, TEX.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Mar. 1-9, 14-15, 1954		18		52	15	207		124	79	322		4.5		781	1.06		191	90	70	6.5	1,400	8.2
Mar. 10-13, 16-17, 19-20, 24, 28		13		73	35	497		142	144	770		4.0		1,610	2.19		276	160	80	13	2,880	8.2
Mar. 18, 21-23, 25-27, 29-31		12		90	79	844		159	239	1,420		4.0		2,770	3.77		550	419	77	16	4,980	8.2
Apr. 1, 12-15		11		90	63	798		161	212	1,320		4.5		2,580	3.51		484	352	78	16	4,630	8.2
Apr. 2, 9, 11		9.6		122	161	1,580		154	414	2,720		--		5,080	6.91		966	840	78	22	8,880	8.0
Apr. 3-4, 6, 8, 10, 29		14		154	307	2,650		145	680	4,660		--		8,540	11.6		1,650	1,530	78	28	14,300	8.0
Apr. 5, 7		14		216	567	4,700		136	1,180	8,330		--		15,100	20.5		2,870	2,760	78	38	23,300	8.1
Apr. 16-17, 23-25, 27-28		13		45	13	227		123	93	322		7.8		817	1.11		166	65	75	7.6	1,450	8.0
Apr. 18-22, 26		16		34	4.9	120		95	51	166		.8		489	.66		105	27	71	5.1	820	8.0
May 2		24		122	237	1,980		137	544	3,470		--		6,440	8.76		1,280	1,170	77	24	11,100	8.1
May 3-4, 15-17		15		32	15	160		80	58	255		5.1		619	.84		142	76	71	5.9	1,100	7.8
May 5-6, 11-14		19		40	9.6	137		94	58	210		4.8		533	.72		140	62	68	5.0	966	7.9
May 7-10, 18-31		17		35	4.0	55		99	36	72		4.5		292	.40		104	23	54	2.4	491	7.9
June 1, 3-4		18		42	7.9	124		114	47	185		3.0		491	.67		138	44	66	4.6	872	7.8
June 2, 5-14		17		61	39	431		124	123	722		3.2		1,460	1.99		312	211	75	11	2,660	7.8
June 15-16		13		108	168	1,560		124	397	2,720		--		5,030	6.84		960	859	78	21.9	8,670	7.8
June 17-30		14		147	296	2,510		125	647	4,440		--		8,120	11.0		1,580	1,480	77	27	13,500	7.5
July 1-13		11		182	388	3,380		129	832	5,970		--		10,800	14.7		2,050	1,940	78	32	17,400	7.9
July 21-31		8.6		240	559	4,650		135	1,150	8,290		--		15,000	20.4		2,900	2,790	78	38	23,400	7.8
Aug. 1, 3		12		16	3.7	32		50	13	49		1.2		167	.23		55	14	56	1.9	265	7.6
Aug. 2, 4		16		24	9.6	99		63	35	160		1.2		396	.54		100	48	68	4.3	700	7.7
Aug. 5-6		17		34	30	285		78	83	480		2.0		974	1.32		208	144	75	8.6	1,820	7.7
Aug. 7-10		19		88	157	1,320		98	348	2,330		--		4,310	5.86		865	784	77	19	7,690	7.8
Aug. 11-19		12		173	389	3,320		120	823	5,880		--		10,700	14.6		2,030	1,930	78	32	17,200	7.5
Aug. 20-31		11		263	626	5,220		132	1,300	9,300		--		16,800	22.8		3,230	3,120	78	40	25,700	7.4
Sept. 1-10		14		248	583	4,830		137	1,190	8,630		--		15,600	21.2		3,020	2,900	78	38	24,300	7.6
Sept. 11-20		13		271	673	5,620		138	1,380	10,000		--		18,000	24.5		3,440	3,330	78	42	27,400	7.6
Sept. 21-30		11		260	588	4,960		148	1,230	8,820		--		15,900	21.6		3,070	2,940	78	39	24,700	7.6

TRINITY BAY AT MOUTH OF TRINITY RIVER NEAR ANAHUAC, TEX.

LOCATION.--At four sampling stations in Trinity Bay opposite mouth of Trinity River, near Anahuac, Chambers County. Station 2 - In Anahuac Channel immediately below delta. Station 3 - In Anahuac Channel about 1½ miles southwest of Station 2. Station 6 - In Anahuac Channel at south end. Station 7 - In Trinity Bay about 1½ miles west of Station 6.
RECORDS AVAILABLE.--Chemical analyses: Bi-weekly, October 1950 to September 1954.

Specific conductance (micromhos at 25°C) and chloride in parts per million, water year October 1953 to September 1954

Station number	Specific conductance	Chloride	Specific conductance	Chloride	Specific conductance	Chloride	Specific condnctance	Chloride	Specific condnctance	Chloride	Specific conductance	Chloride
	Oct. 2, 1953		Oct. 16, 1953		Oct. 30, 1953		Dec. 2, 1953		Jan. 13, 1954		Feb. 24, 1954	
2	10,100	3,220	15,700	5,300	1,820	425	21,700	7,800	736	144	--	--
3	11,100	3,620	15,400	5,230	8,900	2,900	22,700	8,180	739	144	976	179
6	13,200	4,360	21,000	7,450	22,300	8,090	23,600	8,510	745	145	--	--
7	15,700	5,280	20,800	7,350	22,400	8,210	23,600	8,530	796	163	1,170	222
	Oct. 5, 1953		Oct. 19, 1953		Nov. 2, 1953		Dec. 9, 1953		Jan. 20, 1954		Mar. 3, 1954	
2	9,530	3,020	13,300	4,440	1,140	220	1,880	445	566	112	1,720	418
3	13,100	4,360	16,500	5,670	15,800	5,500	693	136	14,400	4,740	3,210	880
6	18,400	6,410	21,500	7,570	24,700	9,120	18,100	6,270	21,900	7,520	11,800	3,810
7	18,900	6,590	21,200	7,550	23,900	8,920	18,400	6,320	22,000	7,600	11,700	3,710
	Oct. 7, 1953		Oct. 21, 1953		Nov. 4, 1953		Dec. 16, 1953		Jan. 27, 1954		Mar. 10, 1954	
2	5,200	1,510	21,700	7,770	12,000	4,090	650	116	606	76	2,650	688
3	5,710	1,700	21,900	7,870	19,600	6,860	609	112	561	73	2,550	660
6	9,300	2,950	23,100	8,380	25,800	9,700	609	113	15,200	5,000	2,330	590
7	11,400	3,740	23,300	8,430	25,800	9,680	606	113	15,500	5,080	2,340	595
	Oct. 9, 1953		Oct. 23, 1953		Nov. 11, 1953		Dec. 23, 1953		Feb. 3, 1954		Mar. 17, 1954	
2	14,800	5,030	22,000	7,750	16,200	5,550	855	184	9,940	3,150	13,000	4,190
3	16,700	5,750	23,000	8,310	18,000	6,190	840	179	14,100	4,590	18,100	6,120
6	22,400	8,110	24,500	8,970	23,700	8,610	829	177	16,300	5,430	21,400	7,400
7	22,300	8,040	24,400	8,970	24,300	8,800	825	175	17,000	5,720	21,600	7,400
	Oct. 12, 1953		Oct. 26, 1953		Nov. 18, 1953		Dec. 30, 1953		Feb. 10, 1954		Mar. 24, 1954	
2	15,900	5,300	19,500	6,760	20,200	7,200	380	66	852	156	5,530	1,570
3	17,400	5,900	19,700	6,910	22,000	7,940	370	67	772	142	5,830	1,700
6	22,100	7,820	22,000	7,850	25,200	9,220	392	74	723	125	11,000	3,490
7	22,100	7,820	21,000	7,450	25,200	9,220	406	75	741	132	10,900	3,470
	Oct. 14, 1953		Oct. 28, 1953		Nov. 25, 1953		Jan. 6, 1954		Feb. 17, 1954		Mar. 31, 1954	
2	14,000	4,610	13,000	4,360	1,070	210	524	103	1,510	345	8,320	2,550
3	15,100	5,080	12,900	4,360	7,450	2,350	522	104	1,660	375	9,140	2,800
6	20,500	7,200	17,700	6,090	13,500	4,590	524	102	12,200	3,940	25,400	9,020
7	20,700	7,250	17,600	6,140	15,300	5,250	537	108	12,600	4,020	24,800	8,770

TRINITY RIVER BASIN--Continued

TRINITY BAY AT MOUTH OF TRINITY RIVER NEAR ANAHUAC, TEX.--Continued

Specific conductance (micromhos at 25°C) and chloride in parts per million, water year October 1953 to September 1954--Continued

Station number	Specific conductance	Chloride	Specific conductance	Chloride	Specific conductance	Chloride	Specific conductance	Chloride	Specific conductance	Chloride	Specific conductance	Chloride
	Apr. 5, 1954		Apr. 19, 1954		May 3, 1954		May 17, 1954		May 31, 1954		June 14, 1954	
2	27,400	9,800	698	143	3,140	810	290	46	524	75	6,470	1,910
3	27,600	9,830	1,310	312	3,120	840	268	42	528	77	13,100	4,210
6	27,400	9,780	7,920	2,440	3,100	820	10,000	3,200	4,110	1,160	16,900	5,620
7	27,500	9,800	8,060	2,460	3,110	830	10,900	3,470	4,020	1,120	16,900	5,620
	Apr. 7, 1954		Apr. 21, 1954		May 5, 1954		May 19, 1954		June 2, 1954		June 16, 1954	
2	27,900	10,000	835	179	1,140	238	370	60	6,740	2,030	15,900	5,250
3	28,200	10,100	17,400	5,770	18,400	6,170	359	57	7,160	2,150	17,100	5,750
6	28,100	10,000	20,000	6,410	22,000	7,670	372	62	8,360	2,610	18,100	6,120
7	28,500	10,200	20,500	6,960	22,100	7,650	370	62	7,530	2,600	18,000	6,070
	Apr. 9, 1954		Apr. 23, 1954		May 7, 1954		May 21, 1954		June 4, 1954		June 18, 1954	
2	11,200	3,490	1,120	250	594	88	534	67	1,020	2210	16,400	5,500
3	11,400	3,590	11,400	3,590	5,600	1,650	515	64	1,380	312	16,700	5,580
6	24,000	8,330	24,800	8,660	22,200	7,770	15,300	5,080	4,140	1,180	17,400	5,850
7	24,000	8,280	25,000	8,750	22,100	7,700	15,300	5,100	4,050	1,150	17,300	5,820
	Apr. 12, 1954		Apr. 26, 1954		May 10, 1954		May 24, 1954		June 7, 1954		June 21, 1954	
2	9,790	3,020	851	164	478	94	426	39	7,070	2,150	17,600	5,950
3	20,600	6,710	856	166	473	92	435	39	9,390	2,920	18,000	6,040
6	27,000	9,630	16,300	5,380	2,920	810	408	34	10,100	3,200	20,800	7,170
7	27,500	9,780	16,000	5,230	2,930	820	438	38	10,500	3,320	20,800	7,170
	Apr. 14, 1954		Apr. 28, 1954		May 12, 1954		May 26, 1954		June 9, 1954		June 23, 1954	
2	10,600	3,300	1,220	238	1,450	365	480	60	2,950	790	14,700	4,910
3	10,600	3,320	13,300	4,390	5,820	1,710	487	62	5,450	1,600	18,400	6,390
6	18,800	6,370	21,300	7,220	20,700	7,160	1,420	335	9,770	3,100	20,500	7,200
7	17,500	5,850	21,700	7,450	20,700	7,160	3,100	850	9,970	3,170	20,600	7,200
	Apr. 16, 1954		Apr. 30, 1954		May 14, 1954		May 28, 1954		June 11, 1954		June 25, 1954	
2	2,020	510	22,000	7,620	1,030	182	549	74	6,850	2,060	18,400	6,370
3	2,020	510	23,600	8,260	900	175	548	71	12,800	4,110	19,300	6,730
6	2,120	538	25,300	8,990	16,800	5,650	769	138	16,500	5,500	20,600	7,250
7	2,100	532	25,500	9,070	16,400	5,500	883	163	16,500	5,500	20,600	7,250

TRINITY BAY AT MOUTH OF TRINITY RIVER NEAR ANAHUAC, TEX.--Continued

Specific conductance (micromhos at 25°C) and chloride in parts per million, water year October 1953 to September 1954--Continued

Station number	Specific conductance	Chloride	Specific conductance	Chloride	Specific conductance	Chloride	Specific conductance	Chloride	Specific conductance	Chloride	Specific conductance	Chloride
	June 28, 1954		July 12, 1954		July 30, 1954		Aug. 13, 1954		Aug. 27, 1954		Sept. 10, 1954	
2	17,600	6,040	21,900	7,750	28,100	10,400	20,000	7,250	28,800	10,600	27,700	10,100
3	19,600	6,860	21,800	7,750	28,100	10,200	22,000	7,750	28,700	10,500	27,900	10,200
6	20,700	7,250	25,200	9,420	28,500	10,500	25,400	9,070	28,300	10,500	28,400	10,400
7	20,700	7,270	25,200	9,170	28,300	10,400	25,400	9,070	28,900	10,600	28,100	10,300
	June 30, 1954		July 19, 1954		Aug. 2, 1954		Aug. 16, 1954		Aug. 30, 1954		Sept. 13, 1954	
2	15,700	5,200	25,800	9,650	537	100	22,600	7,940	22,300	7,940	28,600	10,400
3	16,600	5,650	26,500	9,900	529	95	24,000	8,480	23,200	8,180	28,900	10,700
6	18,900	6,590	--	--	23,400	8,280	25,400	9,170	27,300	9,900	29,100	10,700
7	18,900	6,560	--	--	23,600	8,480	25,800	9,220	27,300	9,900	29,300	10,800
	July 2, 1954		July 21, 1954		Aug. 4, 1954		Aug. 18, 1954		Sept. 1, 1954		Sept. 15, 1954	
2	18,200	6,220	25,300	9,170	784	185	22,600	7,940	24,000	8,530	28,300	10,300
3	18,500	6,370	26,400	9,650	11,500	3,740	23,900	8,480	25,600	9,320	28,900	10,600
6	18,900	6,590	27,900	10,400	15,600	6,880	23,500	8,280	26,500	9,800	29,900	11,000
7	18,900	6,560	28,100	10,400	15,900	5,380	25,800	9,270	27,000	9,700	29,600	11,000
	July 5, 1954		July 23, 1954		Aug. 6, 1954		Aug. 20, 1954		Sept. 3, 1954		Sept. 17, 1954	
2	17,100	5,850	26,400	9,900	15,300	5,180	28,200	10,300	27,800	10,100	31,300	11,700
3	18,300	6,340	26,800	9,900	22,900	8,180	28,600	10,400	27,800	10,100	31,300	11,700
6	19,600	6,860	26,300	9,650	26,600	9,650	28,300	10,500	27,900	10,300	31,300	11,700
7	19,600	6,810	26,300	9,650	26,600	9,600	27,800	10,500	27,900	10,300	31,300	11,700
	July 7, 1954		July 26, 1954		Aug. 9, 1954		Aug. 23, 1954		Sept. 6, 1954		Sept. 20, 1954	
2	19,900	6,960	26,500	9,900	16,300	5,480	28,800	10,500	28,500	10,500	31,300	11,700
3	19,700	6,960	26,800	9,900	18,300	6,270	28,800	10,500	28,600	10,500	31,600	11,800
6	19,800	6,910	30,300	11,600	25,600	9,220	28,800	10,700	28,600	10,500	31,600	11,800
7	19,800	6,910	30,400	11,600	25,500	9,020	28,600	10,600	28,100	10,200	31,600	11,800
	July 9, 1954		July 28, 1954		Aug. 11, 1954		Aug. 25, 1954		Sept. 8, 1954		Sept. 22, 1954	
2	19,200	6,660	28,700	10,600	20,300	7,060	28,800	10,600	27,400	9,990	29,100	10,700
3	19,400	6,760	28,700	10,600	22,600	7,940	28,600	10,600	27,400	9,990	29,900	11,100
6	20,800	7,220	29,000	10,900	25,900	9,320	28,900	10,700	28,600	10,500	30,200	11,200
7	20,600	7,200	28,800	10,900	26,000	9,420	28,800	10,700	28,600	10,500	30,400	11,400

TRINITY RIVER BASIN--Continued

TRINITY BAY AT MOUTH OF TRINITY RIVER NEAR ANAHUAC, TEX.--Continued

Specific conductance (micromhos at 25°C) and chloride in parts per million, water year October 1953 to September 1954--Continued

Station number	Specific conductance	Chloride	Specific conductance	Chloride	Specific conductance	Chloride
	Sept. 24, 1954		Sept. 27, 1954		Sept. 29, 1954	
2	31,300	11,500	29,100	10,900	30,500	11,500
3	31,600	11,800	29,100	10,800	31,600	11,800
6	31,400	11,800	31,900	12,000	31,700	12,000
7	31,600	11,700	31,900	11,900	31,600	11,800

SAN JACINTO RIVER NEAR HUFFMAN, TEX.

LOCATION.--At Sheldon pumping plant of City of Houston, 5½ miles downstream from site of Huffman gaging station (discontinued) at Beaumont, Sour Lake & Western Railway bridge, 0.4 mile downstream from confluence of East and West Forks, and 3.4 miles southwest of Huffman, Harris County.
DRAINAGE AREA.--2,791 square miles, at gaging station.
RECORDS AVAILABLE.--Chemical analyses: September 1945 to July 1948, December 1948 to April 1954.
Water temperatures: January 1949 to April 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 282 ppm Mar. 23-31, Apr. 1-5; minimum, 120 ppm Nov. 5-6, 8-11, 21.
Hardness: Maximum, 103 ppm Mar. 23-31, Apr. 1-5; minimum, 40 ppm Dec. 21-31.
Specific conductance: Maximum daily, 561 micromhos Mar. 28; minimum daily, 163 micromhos Dec. 7.
Water temperatures: Maximum observed, 86°F Oct. 6; minimum observed, 43°F Dec. 26, Mar. 6.
EXTREMES, 1945-54.--Dissolved solids: Maximum, 2,820 ppm Nov. 21-23, 28, 1951; minimum, 44 ppm Oct. 4-10, 1949.
Hardness: Maximum, 566 ppm Nov. 21-23, 28, 1951; minimum, 16 ppm Oct. 4-10, 1949.
Specific conductance: Maximum daily, 6,340 micromhos Nov. 23, 1951; minimum daily, 78.9 micromhos Sept. 1, 1945.
Water temperatures (1949-54): Maximum observed 92°F July 3, 1952; minimum observed, freezing point Feb. 2, 1951.
REMARKS.--Values reported for dissolved solids are sums of determined constituents. Records of specific conductance of daily samples available in district office at Austin, Tex. Gaging station discontinued Sept. 30, 1953

Chemical analyses, in parts per million, October 1953 to April 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chlorids (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-13, 1953....		21		24	4.1	61		86	5.4	94		1.2		253	0.34		77	6	63	3.0	461	7.6
Oct. 14-26		19		24	3.9	57		80	5.4	90		1.0		239	.33		76	10	62	2.8	429	7.4
Oct. 27-31		12		16	3.8	46		56	5.7	72		1.8		185	.25		56	10	64	2.7	341	7.4
Nov. 1-4, 23-25 ...		17		18	1.9	24		64	5.0	33		1.5		131	.18		53	0	50	1.4	222	7.3
Nov. 5-6, 8-11, 21.		16		14	2.2	23		46	5.9	34		2.0		120	.16		44	6	53	1.5	204	7.3
Nov. 7, 12-20, 22, 26-30		19		21	2.6	42		66	6.6	66		1.5		191	.26		63	0	59	2.3	331	7.5
Dec. 1-4, 14-15 ...		22		23	3.7	48		72	9.2	76		2.0		219	.30		72	6	59	2.5	387	7.5
Dec. 5-13, 16-20 ..		18		21	2.7	24		65	6.5	39		1.2		144	.20		64	10	45	1.3	251	7.4
Dec. 21-31.....		14		13	1.9	22		41	5.6	34		1.8		122	.17		40	7	54	1.5	195	7.3
Jan. 1-5,14-20,1954		14		17	3.0	28		49	6.6	49		.8		142	.19		55	15	53	1.7	256	7.5
Jan. 6,10-13,21-25		18		22	3.7	36		64	6.8	62		1.0		180	.24		70	18	53	1.9	330	7.7
Jan. 7-9, 26-31....		21		27	4.5	48		74	7.8	86		1.5		232	.32		86	26	55	2.3	423	7.8
Feb. 1-11.....		22		32	4.9	52		91	8.2	91		1.2		256	.35		100	26	53	2.2	469	7.8
Feb. 12-22.....		20		33	4.9	59		93	8.0	103		.8		275	.37		102	26	55	2.5	509	7.9
Feb. 23-28.....		17		27	4.6	38		77	6.7	70		1.2		202	.27		86	24	49	1.8	375	7.9
Mar. 1-11.....		20		31	3.8	47		90	7.5	80		1.8		235	.32		93	20	53	2.1	431	7.8
Mar. 12-22		20		33	4.4	55		96	7.0	94		1.0		261	.35		100	22	54	2.4	480	7.8
Mar. 23-31,Apr.1-5		18		34	4.4	63		96	6.8	108		1.0		282	.38		103	24	57	2.7	524	7.8

SAN JACINTO RIVER BASIN--Continued

SAN JACINTO RIVER NEAR HUFFMAN, TEX.--Continued

Temperature (°F) of water, October 1953 to April 1954

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

BRAZOS RIVER AT POSSUM KINGDOM DAM NEAR GRAFORD, TEX.

LOCATION.--Immediately below dam on Brazos River, 2.6 miles upstream from Loving Creek, 11.3 miles southwest of Graford, Palo Pinto County, and 20 miles upstream from gaging station near Palo Pinto.
DRAINAGE AREA.--22,550 square miles, approximately, of which 9,240 square miles is probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: January 1942 to September 1954.
Water temperatures: October 1949 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 1,790 ppm Feb. 6-19; minimum, 1,120 ppm July 1-31.
Hardness: Maximum, 493 ppm Feb. 6-19; minimum, 356 ppm May 1-31.
Specific conductance: Maximum daily, 3,430 micromhos Feb. 18, minimum daily, 1,830 micromhos Nov. 20, 27.
Water temperatures: Maximum observed, 75°F Oct. 10; minimum observed, 48°F on several days during January and February.
EXTREMES, 1942-54.--Dissolved solids: Maximum, 2,130 ppm Feb. 2-9, 1942; minimum, 829 ppm Sept. 1-10, 1942.
Hardness: Maximum, 661 ppm Feb. 2-9, 1942; minimum, 318 ppm Dec. 21-31, 1942.
Specific conductance: Maximum daily, 3,750 micromhos Feb. 11, 1942; minimum daily, 1,100 micromhos June 20, 1942.
Water temperatures (1949-54): Maximum observed 76°F Sept. 27-30, 1950; minimum observed, 45°F on several days in February 1951.
REMARKS.--Values reported for dissolved solids are sums of determined constituents. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for gaging station near Palo Pinto for water year October 1953 to September 1954 given in WSP 1342. No appreciable inflow between dam and gaging station except during periods of heavy local rains.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-31, 1953..	850	12		133	24	320		121	260	535		2.0		1,350	1.84	3,100	430	229	62	6.7	2,390	7.6
Nov. 1-30.....	899	15		124	18	285		104	261	458		1.5		1,210	1.65	2,940	384	298	62	6.3	2,090	7.4
Dec. 1-31.....	368	15		114	19	282		106	249	445		1.8		1,180	1.60	1,170	362	276	63	6.5	2,030	7.6
Jan. 1-31, 1954..	233	13		123	21	314		109	268	500		3.8		1,300	1.77	818	394	304	63	6.9	2,220	7.7
Feb. 1-5, 20-28 .	325	14		131	25	357		118	281	578		3.5		1,450	1.97	1,270	430	334	64	7.5	2,530	7.9
Feb. 6-19.....	39.6	12		148	30	463		124	324	750		4.0		1,790	2.43	191	493	392	67	9.0	3,170	7.9
Mar. 1-31.....	234	17		124	19	316		115	251	510		1.0		1,300	1.77	821	388	294	64	7.0	2,300	7.7
Apr. 1-30.....	663	13		118	18	294		114	241	470		.8		1,210	1.65	2,170	368	275	63	6.7	2,090	7.7
May 1-31.....	5,431	14		116	16	291		116	235	460		1.0		1,190	1.62	17,400	356	260	64	6.7	2,090	7.9
June 1-30	1,669	14		114	18	271		109	230	438		1.8		1,140	1.55	5,140	358	269	62	6.2	1,990	7.8
July 1-31	985	16		114	20	259		111	250	410		1.0		1,120	1.52	2,980	366	276	61	5.9	1,960	7.6
Aug. 1-31.....	826	11		123	17	283		110	272	438		1.0		1,200	1.63	2,680	377	287	62	6.4	2,080	7.7
Sept. 1-30	171	13	0.00	127	20	298		110	297	458	0.4	1.0		1,270	1.73	586	399	309	62	6.5	2,150	7.4
Weighted average	1,052	14	--	118	18	289		113	245	460	--	1.3		1,200	1.63	3,410	368	276	63	6.6	2,100	--

BRAZOS RIVER BASIN--Continued

BRAZOS RIVER AT POSSUM KINGDOM DAM NEAR GRAFORD, TEX.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

BRAZOS RIVER NEAR WHITNEY, TEX.

LOCATION.--At Whitney Dam on State Highway 22, 3.4 miles upstream from gaging station which is 1.0 miles downstream from Coon Creek, 7.5 miles south of Whitney, Hill County, and at mile 439.
DRAINAGE AREA.--26,190 square miles, approximately, above gaging station of which 9,240 square miles is probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: October 1947 to May 1948, October 1948 to September 1954.
Water temperatures: October 1947 to May 1948, October 1948 to September 1954. Thermograph installed at gaging station July 1953.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 1,220 ppm Nov. 19-20, 22-23; minimum, 824 ppm Oct. 1-13.
Hardness: Maximum, 380 ppm Nov. 19-20, 22-23; minimum, 293 ppm Oct. 1-13.
Specific conductance: Maximum daily, 2,150 micromhos Nov. 23; minimum daily, 1,360 micromhos Oct. 1.
Water temperatures: Maximum, 87°F July 27, 28; minimum, 42°F Jan. 22.
EXTREMES, 1947-54.--Dissolved solids: Maximum, 1,560 ppm Oct. 1-10, 1948, minimum, 183 ppm June 11-20, 1952.
Hardness: Maximum, 542 ppm Oct. 1-10, 1948; minimum, 96 ppm June 11-20, 1952.
Specific conductance: Maximum daily, 2,660 micromhos Oct. 1, 1948; minimum daily, 203 micromhos May 23, 1952.
Water temperatures: Maximum, 87°F July 12, 1949, July 27, 28, 1954; minimum, freezing point Jan. 28-29, 1948.
REMARKS.--Values reported for dissolved solids are sums of determined constituents unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1953 to September 1954 given in WSP 1342.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-13, 1953	56.2	14		91	16	185		150	144	298		2.0		824	1.12	125	293	170	58	4.7	1,440	7.8
Oct. 14-15, 19-20, 26-31	56.0	10		100	17	217		143	175	348		1.5		938	1.28	142	320	202	60	5.3	1,660	7.7
Oct. 16-18, 21-25	50.2	10		108	19	255		133	202	412		2.5		1,070	1.46	145	348	238	61	5.9	1,870	7.6
Nov. 1-15	68.1	12		100	17	214		144	165	350		1.5		a1,000	1.36	184	320	202	59	5.2	1,660	7.9
Nov. 16-18, 21, 24-30	211	11		104	16	225		138	179	365		1.2		a1,030	1.40	6,450	326	212	60	5.4	1,720	8.0
Nov. 19-20, 22-23	76.8	13		124	17	291		119	235	475		1.5		1,220	1.66	253	380	282	63	6.5	2,140	8.0
Dec. 1-10	70.7	11		106	17	231		137	185	375		2.2		a1,080	1.47	206	334	222	60	5.5	1,800	8.0
Dec. 11-20	98.7	13		103	17	225		141	178	365		1.2		a1,050	1.43	280	327	209	60	5.4	1,750	8.1
Dec. 21-31	77.8	13		104	16	228		142	181	365		1.0		a1,040	1.41	218	326	209	60	5.5	1,740	8.1
Jan. 1-10, 1954	65.9	9.4		102	19	228		143	184	368		1.5		982	1.34	175	332	216	60	5.5	1,740	7.9
Jan. 11-20	70.2	10		102	19	224		142	184	362		2.0		973	1.32	184	332	216	59	5.4	1,720	7.9
Jan. 21-31	81.1	6.8		110	18	233		142	200	375		2.0		1,010	1.37	221	348	232	59	5.4	1,780	7.8
Feb. 1-28	62.4	7.0		102	19	233		142	189	370		4.0		a1,060	1.44	179	332	216	60	5.5	1,740	8.1
Mar. 1-10	81.9	11		105	16	224		143	176	365		1.0		968	1.32	214	328	211	60	5.4	1,740	8.0
Mar. 11-20	47.5	11		104	16	222		143	176	360		2.0		961	1.31	123	326	208	60	5.4	1,740	8.0
Mar. 21-31	288	7.0		105	16	229		145	180	368		1.0		977	1.33	760	328	209	60	5.5	1,760	7.9
Apr. 1-10	735	13		104	17	233		144	188	370		1.5		a1,080	1.47	2,140	330	212	61	5.6	1,760	7.9
Apr. 11-20	824	12		106	17	231		147	184	370		2.2		a1,070	1.46	2,380	334	214	60	5.5	1,770	8.0
Apr. 21-30	292	15		104	18	230		147	185	368		1.5		a1,070	1.46	844	334	213	60	5.5	1,760	8.2

a Residue on evaporation at 180°C.

BRAZOS RIVER BASIN--Continued

BRAZOS RIVER NEAR WHITNEY, TEX.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
May 1-10, 1954 ...	1,239	9.6		106	19	232		143	188	378		1.5		1,000	1.36	3,350	342	226	60	5.5	1,790	7.9
May 11-20	10,070	8.4		108	19	231		139	188	382		2.0		1,010	1.37	27,460	348	234	59	5.4	1,810	7.7
May 21-31	4,647	8.2		104	18	230		132	193	370		2.0		990	1.35	12,420	334	226	60	5.5	1,770	7.7
June 1-10.....	3,164	11		106	18	246		117	206	398		1.0		1,040	1.41	8,880	338	242	61	5.8	1,870	7.9
June 11-20.....	1,454	12		110	17	264		122	217	420		1.5		1,100	1.50	4,320	344	244	63	6.2	1,950	7.8
June 21-30.....	1,568	9.4		110	19	263		122	219	422		1.5		1,100	1.50	4,660	352	252	62	6.1	1,960	7.8
July 1-10	970	9.0		110	17	264		118	218	420		2.5		1,100	1.50	2,880	348	250	62	6.2	1,960	7.8
July 11-20	1,101	9.4		110	18	263		121	219	420		1.2		1,100	1.50	3,270	344	248	62	6.1	1,950	7.8
July 21-31	1,395	9.5		110	19	262		122	216	422		1.2		1,100	1.50	4,140	352	252	62	6.1	1,960	7.8
Aug. 1-10.....	901	12		110	16	265		125	210	422		1.5		1,100	1.50	2,680	340	238	63	6.3	1,950	7.8
Aug. 11-20.....	1,126	11		110	16	268		126	211	425		2.0		1,100	1.50	3,340	340	238	63	6.3	1,960	7.7
Aug. 21-31.....	591	8.7		112	17	277		124	219	440		1.0		1,140	1.55	1,820	350	248	63	6.4	2,010	7.8
Sept. 1-10	252	16		112	18	253		147	197	408		4.0		1,080	1.47	735	354	233	61	5.8	1,910	8.0
Sept. 11-20	347	13		114	19	264		131	211	430		2.2		1,120	1.52	1,050	362	255	61	6.0	1,990	7.7
Sept. 21-30	331	14		114	19	270		124	221	435		5.0		1,140	1.55	1,020	362	261	62	6.2	2,030	7.7
Weighted average.	912	9.6		107	18	242		131	198	392		1.8		1,040	1.41	2,560	341	234	61	5.7	1,850	--

BRAZOS RIVER BASIN--Continued

BRAZOS RIVER NEAR WHITNEY, TEX.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

BRAZOS RIVER AT RICHMOND, TEX.

LOCATION.--At gaging station at bridge on U. S. Highway 59 in Richmond, Fort Bend County, 925 feet downstream from Texas and New Orleans Railroad bridge and at mile 93.
DRAINAGE AREA.--44,050 square miles, approximately, of which 9,240 square miles is probably non-contributing.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1954.
Water temperatures: November 1950 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 1,020 ppm June 11-20, Aug. 21-31; minimum, 168 ppm Oct. 29-31.
Hardness: Maximum, 330 ppm June 11-20; minimum, 88 ppm Nov. 1-11.
Specific conductance: Maximum daily, 1,910 micromhos Sept. 2; minimum daily, 208 micromhos Oct. 31.
Water temperatures: Maximum observed, 86°F Aug. 12, 14-17; minimum observed, 40°F Dec. 24.
EXTREMES, 1945-54.--Dissolved solids: Maximum, 1,400 ppm Sept. 1-10, 1951; minimum, 133 ppm Aug. 27-31, 1947.
Hardness: Maximum, 446 ppm Sept. 1-10, 1948; minimum, 74 ppm Jan. 13,14, 18-20, 1950.
Specific conductance: Maximum daily, 2,540 micromhos Sept. 4, 1951; minimum daily, 187 micromhos Aug. 31, 1947.
Water temperatures (1950-54): Maximum observed, 91°F Aug. 5, 1951; minimum observed, 40°F Dec. 24, 1953.
REMARKS.--Values reported for dissolved solids are residues on evaporation unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1953 to September 1954 given in WSP 1342.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-10, 28, 1953	1,961	19		52	13	52	4.1	190	41	76	0.4	1.0	0.18	a352	0.48	1,860	183	28	38	1.7	611	8.0
Oct. 11-20	494	21		53	15	54	4.0	203	48	72	.3	.8	.21	a368	.50	491	194	27	37	1.7	639	8.0
Oct. 21-27	1,251	19		60	16	64	4.0	224	63	79	.3	1.8	.24	a417	.57	1,410	216	32	39	1.9	715	8.1
Oct. 29-31	23,870	14		32	3.7	14	3.3	111	18	13	.4	4.8	--	168	.23	10,830	95	4	24	.6	244	8.0
Nov. 1-11	6,146	16		30	3.3	19	4.0	99	17	24	.5	1.5	.14	178	.24	2,950	88	8	31	.9	279	8.0
Nov. 12-16, 19-23, 25-26	2,004	15		41	5.6	33	4.1	131	24	45	.4	1.5	.11	242	.33	1,310	126	18	35	1.3	400	8.1
Nov. 17-18, 24, 27-30	1,277	14		55	7.9	44	4.2	179	35	60	.5	1.2	.30	312	.42	1,080	170	23	35	1.5	524	8.0
Dec. 1-4	3,478	13		56	9.9	62	4.0	176	47	86	.6	4.2	.16	384	.52	2,610	180	36	42	2.0	658	7.8
Dec. 5-18	11,030	18		32	3.6	16	3.8	100	22	18	.7	2.5	.09	187	.25	5,570	95	16	26	.7	273	7.7
Dec. 19-31	8,503	17		29	4.4	20	3.6	96	19	28	.5	2.0	.10	203	.28	4,660	90	12	31	.9	290	7.9
Jan. 1-9, 1954	3,268	20		31	5.0	25	3.8	102	23	34	.5	2.0	.10	203	.28	1,790	98	14	35	1.1	326	7.8
Jan. 10-20	1,759	22		52	8.1	35	4.0	168	38	47	.3	2.0	.19	a292	.40	1,390	163	26	31	1.2	490	8.0
Jan. 21-31	1,915	20		61	11	58	4.3	178	61	84	.3	2.5	.12	392	.53	2,030	197	38	38	1.8	660	8.1
Feb. 1-10	1,135	20		61	11	70	4.4	186	51	105	.4	1.5	.14	416	.57	1,270	197	44	43	2.2	715	8.2
Feb. 11-19	898	18		54	14	95	4.4	210	70	110	1.8	1.2	.12	a472	.64	1,140	192	20	51	3.0	787	8.2
Feb. 20-28	810	17		55	15	76	4.2	176	70	111	.3	1.2	.11	442	.60	967	198	54	45	2.3	763	8.1
Mar. 1-10	629	18		66	16	84	4.4	218	76	115	.9	1.0	.14	496	.67	842	230	52	44	2.4	836	8.2
Mar. 11-20	489	17		56	17	87	--	189	73	119	.3	1.0	.20	a464	.63	613	210	54	47	2.6	805	8.1
Mar. 21-31	239	18		66	17	86	--	227	72	112	.3	.8	.22	486	.66	314	234	48	44	2.4	836	8.1

a Sum of determined constituents.

Apr. 1-15, 1954 ..	854	22		56	15	79	3.3	191	68	107	.3	2.0	0.20	460	.63	1,060	201	44	46	2.4	781	8.1
Apr. 16, 24-28 ...	830	15		70	12	119	--	153	112	175	.4	1.2	.18	607	.83	1,360	224	98	54	3.4	1,040	8.1
Apr. 17-23, 29-30	786	15		86	16	162	--	173	140	252	.4	1.2	.21	797	1.08	1,690	280	138	55	4.2	1,350	8.1
May 1-6, 15, 20..	5,002	18		76	16	141	5.6	152	121	228	.5	3.2	.10	699	.95	9,440	256	131	54	3.8	1,220	8.1
May 7-14, 16.....	3,610	18		57	9.1	78	5.7	135	81	115	.5	4.0	.15	444	.60	4,330	180	69	48	2.5	767	8.1
May 17-19	11,910	17		38	5.0	37	--	114	34	48	.6	4.2	--	240	.33	7,720	116	22	41	1.5	420	7.8
May 21-31	10,100	16		85	14	181	--	127	145	292	.4	2.8	.18	840	1.14	22,910	270	166	59	4.8	1,430	8.1
June 1-10	5,141	15		96	14	206	--	130	177	340	.2	2.8	.19	965	1.31	13,390	297	190	60	5.2	1,630	7.7
June 11-20	2,279	12		104	17	225	--	133	193	365	.3	1.5	.24	1,020	1.39	6,280	330	220	60	5.4	1,730	7.8
June 21-30	1,240	13		102	17	217	--	146	186	355	.2	1.8	.26	994	1.35	3,330	324	205	59	5.2	1,690	7.7
July 1-10	1,144	17		102	18	229	--	138	196	375	.2	1.8	.19	a1,010	1.37	3,120	328	216	60	5.5	1,740	8.0
July 11-20	554	16		96	18	215	--	141	182	350	.2	2.0	.20	993	1.35	1,490	314	198	60	5.3	1,660	8.0
July 21-31	898	16		94	19	224	--	131	186	365	.2	2.2	.22	1,010	1.37	2,450	312	205	61	5.5	1,690	8.0
Aug. 1-3, 7-11, 15-20	924	15		96	18	216	6.5	141	177	338	.2	2.0	.11	992	1.35	2,470	314	198	59	5.3	1,650	7.9
Aug. 4-6, 12-14 ..	1,162	16		84	14	172	6.0	142	139	268	.2	2.0	.08	812	1.10	2,550	267	150	58	4.6	1,370	7.9
Aug. 21-31	800	13		100	19	240	6.7	143	194	372	.2	1.8	.11	a1,020	1.39	2,200	328	210	61	5.7	1,810	7.8
Sept. 1-10	538	14		98	20	241	6.6	148	189	370	.2	2.0	.15	a1,010	1.37	1,470	326	205	61	5.8	1,760	7.9
Sept. 11-20	316	17		89	21	199	6.1	167	157	308	.2	1.8	.12	921	1.25	786	308	172	58	4.9	1,550	8.0
Sept. 21-30	389	15		85	21	192	6.0	179	152	290	.2	1.5	.20	879	1.20	923	298	152	58	4.8	1,500	8.0
Weighted average	2,727	17		55	9.1	83	4.1	124	72	127	0.5	2.5	0.14	453	0.62	3,340	174	73	50	2.7	754	--

a Sum of determined constituents.

BRAZOS RIVER BASIN--Continued

BRAZOS RIVER AT RICHMOND, TEX.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

MISCELLANEOUS ANALYSES OF STREAMS IN BRAZOS RIVER BASIN IN TEXAS

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chlorids (Cl)	Fluorids (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
DOUBLE MOUNTAIN FORK BRAZOS RIVER NEAR LUBBOCK SEWAGE PLANT																							
Nov. 30, 1953	0.08	49		--	--	--	--	--	--	563	440		28		--	--		--	--	--	--	2,960	--
Jan. 21, 1954	.05	33		75	180	303	418	16	556	430		38		1,840	2.50		927	558	42	4.3	2,960	8.4
Mar. 18	.11	36		82	187	303	453	21	561	440		28		1,880	2.56		974	568	40	4.2	2,960	8.5
DOUBLE MOUNTAIN FORK BRAZOS RIVER ON STATE HIGHWAY 835, 4.3 MILES SOUTHEAST OF LUBBOCK																							
Nov. 30, 1953	2.17	59		--	--	--	--	--	--	563	450		59		--	--		--	--	--	--	3,060	--
Jan. 21, 1954	1.83	42		89	160	333	448	16	545	422		58		1,880	2.56		880	486	45	4.9	2,970	8.4
Mar. 18	2.16	52		82	173	319	446	16	535	440		50		1,890	2.57		916	524	43	4.6	2,980	8.5
DOUBLE MOUNTAIN FORK BRAZOS RIVER ON STATE HIGHWAY 835, 7.8 MILES SOUTHEAST OF LUBBOCK																							
Nov. 30, 1953	2.84	24		54	158	288	396	15	509	372		8.2		1,620	2.20		784	434	44	4.5	2,690	8.4
Jan. 21, 1954	2.72	26		54	160	284	405	15	501	368		16		1,620	2.20		796	436	44	4.4	2,670	8.4
Mar. 18	3.62	36		77	168	321	478	26	539	400		26		1,830	2.49		883	448	44	4.7	2,880	8.5
DOUBLE MOUNTAIN FORK BRAZOS RIVER 7.5 MILES NORTHWEST OF SLATON																							
Nov. 30, 1953	1.96	14		--	--	--	--	--	--	324	238		1.5		--	--		--	--	--	--	1,850	--
Jan. 21, 1954	1.83	8.6		47	114	227	327	14	372	282		4.8		1,230	1.67		586	294	46	4.1	2,050	8.4
Mar. 18	1.88	6.8		49	138	279	371	17	483	325		3.5		1,480	2.01		690	358	47	4.6	2,350	8.5
DOUBLE MOUNTAIN FORK BRAZOS RIVER ½ MILE BELOW LOWER BUFFALO LAKES DAM, NEAR SLATON																							
Nov. 30, 1953	2.82	18		47	88	168	304	0	281	215		1.2		967	1.32		480	230	43	3.3	1,710	8.2
Jan. 21, 1954	4.60	19		60	103	203	380	13	314	250		3.0		1,150	1.56		573	240	44	3.7	1,940	8.4
Mar. 18	.05	32		78	130	222	516	26	349	270		1.5		1,360	1.85		729	262	40	3.6	2,200	8.5

BRAZOS RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN BRAZOS RIVER BASIN IN TEXAS--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
DOUBLE MOUNTAIN FORK BRAZOS RIVER ON STATE HIGHWAY 400, 5.5 MILES NORTH OF SLATON																							
Nov. 30, 1953	2.45	24		--	--	--		--	--	279	228		0.5		--	--		--	--	--	--	1,840	--
Jan. 21, 1954	.21	18		62	108	212		405	30	307	252		1.8		1,190	1.62		598	216	44	3.8	1,990	8.6
Mar. 18	.36	26		42	136	267		475	26	365	305		2.0		1,400	1.90		664	232	47	4.4	2,350	8.5
DOUBLE MOUNTAIN FORK BRAZOS RIVER 4.2 MILES NORTHEAST OF SLATON																							
Nov. 30, 1953	1.28	22		--	--	--		--	--	305	238		0.5		--	--		--	--	--	--	1,950	--
Jan. 21, 1954	.03	20		62	119	287		453	27	417	295		3.0		1,450	1.97		644	228	49	4.9	2,340	8.5
Mar. 18	.03	24		48	226	976		680	44	1,490	700		2.5		3,840	5.22		1,050	419	67	13	5,460	8.6
WHITE RIVER AT COUNTY ROAD CROSSING 4½ MILES EAST OF CROSBYTON																							
Jan. 20, 1954	2.17	46								63	28		0.5									879	
WHITE RIVER AT U. S. HIGHWAY 82, 4½ MILES EAST OF CROSBYTON																							
Jan. 20, 1954	1.84	44								70	27		0.5									853	
LAKE STAMFORD NEAR HASKELL																							
Oct. 2, 1953		9.4		33	9.5	10	5.2	157	0	9.4	7.2	0.4	1.5		163	0.22		121	0	15	0.4	297	7.9
LAMPASAS RIVER AT FORT HOOD																							
May 25, 1954		7.4		49	15	55		188	0	9.3	98	0.4	0.2		326	0.44		184	30	39	1.7	612	7.8

BULL CREEK NEAR IRA, TEX.

LOCATION.--At gaging station (discontinued) 267 feet upstream from highway crossing, 1.5 miles upstream from Colorado River, 5.5 miles upstream from Chimney Creek, 5.8 miles west of Ira, Scurry County, and 6.9 miles northwest of Cuthbert.
DRAINAGE AREA.--388 square miles, approximately (contributing area).
RECORDS AVAILABLE.--Chemical analyses: April 1950 to January 1954.
Water temperatures: April 1950 to September 1951.
REMARKS.--Values reported for dissolved solids concentrations less than 1,000 ppm are residues on evaporation and for concentrations more than 1,000 ppm are sums of determined constituents. Records of specific conductance of daily samples available in district office at Austin, Tex. Gaging station discontinued Sept. 30, 1953. No discharge records available.

Chemical analyses, in parts per million, October 1953 to January 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1, 1953		--		--	--	--		230	--	80		--		--	--		157	0	--	--	731	8.2
Oct. 5-6, 11-14, 20, 28, 30-31		16		51	10	106		160	91	120		3.8		479	0.65		168	37	58	3.5	831	8.1
Oct. 7, 23-25		12		29	3.8	26		120	19	17		4.0		174	.24		88	0	39	1.2	302	7.7
Oct. 8-10		14		32	6.3	58		124	46	56		4.2		278	.38		106	4	54	2.4	489	7.8
Nov. 11, 14, 19		13		72	17	166		196	136	210		15		735	1.00		250	89	59	4.6	1,280	7.8
Dec. 1, 5, 8, 12, 15, 19, 23, 26, 28, 31		13		136	52	348		291	379	480		.5		1,550	2.11		554	315	58	6.4	2,580	7.9
Jan. 4, 9, 1954		30		--	--	--		--	393	500		.5		--	--		--	--	--	--	2,670	--

COLORADO RIVER BASIN--Continued

DEEP CREEK NEAR DUNN, TEX.

LOCATION.--At gaging station at bridge on State Farm to Market Highway 1606, 2.0 miles Northwest of Dunn, Scurry County, 3.0 miles upstream from Sulphur Draw, and 8.0 miles upstream from mouth.
DRAINAGE AREA.--178 square miles.
RECORDS AVAILABLE.--Chemical analyses: March 1953 to September 1954 (discontinued).
Water temperatures: March 1953 to September 1954 (discontinued).
REMARKS.--Values reported for dissolved solids are residues on evaporation. Records of specific conductance and temperatures of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1953 to September 1954 given in WSP 1342.

Chemical analyses, in parts per million, October 1953 to June 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 21-31, Nov. 1, 1953	28.2	7.4		29	5.1	16		96	10	25		3.8		168	0.23	12.8	93	15	27	0.7	260	7.8
Jan. 25-26, 29-31, 1954, Feb. 1-10	.17	14		72	11	42		265	51	31		2.5		371	.50	.17	224	8	29	1.2	590	8.2
Apr. 12 (12 m.-4 p.m.)	554	22		55	4.2	125		243	31	135		4.5		502	.68	751	154	0	64	4.4	859	8.2
Apr. 12 (12 p.m.-12 m., 4 p.m.-12 p.m.), 13-31 May 1-2	32.1	14		33	3.0	14		124	9.1	7.5		4.5		155	.21	13.4	95	0	24	.6	251	8.1
May 11-13	662	8.8		29	1.3	19		102	8.1	18		3.0		143	.19	256	78	0	35	1.0	244	7.7
May 14-31, June 1	3.5	22		37	4.5	19		137	15	14		5.0		196	.27	1.9	111	0	27	.8	310	8.1
Weighted average	a8.96	10		31	2.2	21		111	9.4	20		3.5		160	0.22	3.9	86	0	34	1.0	267	--

a Represents 90 percent of runoff for water year.

COLORADO RIVER AT COLORADO CITY, TEX.

LOCATION.--At gaging station at Colorado City, Mitchell County, 3,517 feet upstream from bridge on U. S. Highway 80, 4,100 feet upstream from Texas and Pacific Railway bridge, 1.6 miles upstream from Lone Wolf Creek, and at mile 796.
DRAINAGE AREA.--,4,082 square miles, approximately, of which 2,590 square miles is probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: May 1946 to September 1954 (discontinued).
Water temperatures: November 1952 to September 1954 (discontinued).
EXTREMES, 1953-54.--Dissolved solids: Maximum, 24,400 ppm Mar. 8-19; minimum, 289 ppm May 12-13, 15, 19.
Hardness: Maximum, 3,020 ppm Mar. 8-19; minimum, 110 ppm Apr. 14-15.
Specific conductance: Maximum daily, 38,500 micromhos Mar. 19; minimum daily, 390 micromhos May 13.
EXTREMES, 1946-54.--Dissolved solids: Maximum, 32,800 ppm Apr. 1-10, 1952; minimum, 176 ppm Oct. 26, 1947.
Hardness: Maximum, 4,500 ppm Aug. 9-12, 1946; minimum, 65 ppm Sept. 15-20, 1949.
Specific conductance: Maximum, 45,800 micromhos Apr. 1-10, 1952; minimum daily, 272 micromhos Oct. 26, 1947.
REMARKS.--Values reported for dissolved solids concentrations less than 1,000 ppm are residues on evaporation and for concentrations more than 1,000 ppm are sums of determined constituents unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex.
Records of discharge for water year October 1953 to September 1954 given in WSP 1342.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-3, 18-20, 1953	a1.63	3.5		193	66	1,960		83	487	3,150		--		5,900	8.02	26.0	753	685	85	31	9,940	7.4
Oct. 4, 8-10, 29-31	40.7	9.6		74	19	513		113	135	810		2.8		1,620	2.20	178	262	170	81	14	2,960	7.8
Oct. 5-7, 23-28	824	7.9		36	5.9	107		126	41	142		3.2		420	.57	934	114	12	67	4.4	743	7.7
Oct. 11-17, 21-22	16.8	7.6		128	42	1,220		95	293	1,950		1.5		3,690	5.02	167	492	414	84	24	6,420	7.6
Nov. 1-5	11.5	6.1		103	35	825		108	207	1,340		1.0		2,570	3.50	79.8	401	312	82	18	4,570	7.5
Nov. 6-13	4.75	4.4		165	56	1,590		111	390	2,550		--		4,810	6.54	61.7	642	551	84	27	8,410	7.6
Nov. 14-20	1.83	5.2		221	80	2,230		118	553	3,590		--		6,740	9.17	33.3	880	784	85	33	11,400	7.0
Nov. 21-30	.67	5.6		301	108	3,050		134	759	4,910		--		9,200	12.5	16.6	1,200	1,080	85	38	15,100	7.4
Dec. 1-10	1.30	4.7		350	137	3,670		134	927	5,920		--		11,100	15.1	39.0	1,440	1,320	85	42	18,100	7.3
Dec. 11-20	.85	7.1		393	165	4,120		141	1,030	6,680		--		12,500	17.0	28.7	1,660	1,540	84	44	20,000	7.2
Dec. 21-31	1.13	5.3		412	166	4,200		155	1,070	6,810		--		12,800	17.4	39.1	1,710	1,580	84	44	20,400	7.7
Jan. 1-31, 1954	1.29	6.4		461	173	4,670		150	1,200	7,550		--		14,100	19.2	49.1	1,860	1,740	85	47	21,800	7.8
Feb. 1-20	.76	4.3		529	205	5,700		139	1,470	9,160		--		17,100	23.3	35.1	2,160	2,050	85	53	25,400	7.6
Feb. 21-28	a.04	3.5		648	255	7,230		132	1,840	11,600		--		21,600	29.4	2.33	2,670	2,560	85	61	31,400	7.9
Mar. 1-7	a.01	4.4		703	274	7,650		134	1,980	12,300		--		23,000	31.3	.62	2,880	2,770	85	62	33,200	7.9
Mar. 8-19	a.01	3.9		735	288	8,150		127	2,070	13,100		--		24,400	33.2	.66	3,020	2,910	85	64	34,800	7.7
Apr. 12	413	10		238	75	1,710		115	553	2,800		--		5,440	7.40	6,070	902	808	80	25	9,220	8.0
Apr. 13, 16	2,206	6.8		60	15	269		132	88	420		4.8		959	1.30	5,710	211	103	73	8.1	1,710	7.7
Apr. 14-15	1,617	7.0		36	4.8	88		129	33	112		2.2		b346	.47	1,510	110	4	64	3.6	609	7.6
Apr. 17-20	28.2	8.7		133	37	933		121	256	1,520		3.0		2,950	4.01	225	484	385	81	18	5,230	7.5

a Less than 0.05 second-foot flow Oct. 1-2, Feb. 25-28, Mar. 1-6, 11-31, Apr. 1-10, June 13-28, July 11 to Sept. 30.
b Sum of determined constituents.

COLORADO RIVER BASIN--Continued

COLORADO RIVER AT COLORADO CITY, TEX.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Apr. 21-26, 1954...	10.6	6.2		164	52	1,320		108	348	2,160		--		4,100	5.58	117	623	534	82	23	7,130	7.4
Apr. 27-30	62.2	6.4		97	22	551		103	167	900		2.8		1,800	2.45	302	332	248	78	13	3,320	7.3
May 1-10	2.24	3.4		170	56	1,420		111	355	2,330		--		4,390	5.97	26.6	654	564	83	24	7,640	7.5
May 11, 16, 21-23, 25-27, 31	480	10		84	24	490		120	153	790		1.8		1,610	2.19	2,090	308	210	78	12	2,910	7.8
May 12-13, 15, 19..	1,338	9.6		36	5.5	62		119	28	83		2.8		289	.39	1,040	112	14	54	2.5	528	7.5
May 14, 17-18	218	11		54	12	179		119	77	278		4.0		705	.96	415	184	86	68	5.7	1,260	7.8
May 20, 24, 28-30..	21.8	8.8		116	32	818		123	226	1,320		1.5		2,580	3.51	152	421	320	81	17	4,610	8.0
June 1-12.....	a.80	7.8		160	50	1,340		119	365	2,160		--		4,140	5.63	8.94	604	507	83	24	7,250	7.6
June 29-30.....	162	15		268	80	2,060		118	636	3,350		5.0		6,470	8.80	2,830	998	901	82	28	10,500	7.9
July 1	225	14		38	8.1	129		116	37	193		4.5		532	.72	323	128	34	69	4.9	969	8.0
July 2-5	25.6	13		76	19	484		120	142	760		1.0		1,550	2.11	107	268	169	80	13	2,940	7.6
July 6-10	1.66	10		127	42	1,200		88	311	1,920		3.0		3,660	4.98	16.4	490	418	84	24	6,500	7.0
July 11	a0	15		136	52	1,450		68	368	2,320		--		4,370	5.94	--	554	498	85	27	7,530	7.7
Weighted average..	75.8	8.5		58	14	277		124	90	430		3.1		954	1.30	195	202	100	75	8.5	1,670	--

a Less than 0.05 second-foot flow Oct. 1-2, Feb. 25-28, Mar. 1-6, 11-31, Apr. 1-10, June 13-28, July 11 to Sept. 30.

COLORADO RIVER BASIN--Continued

COLORADO RIVER AT COLORADO CITY, TEX.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

COLORADO RIVER BASIN--Continued

COLORADO RIVER NEAR SAN SABA, TEX.

LOCATION.--At gaging station at bridge on U. S. Highway 190, 5.2 miles downstream from San Saba River, 9.2 miles east of San Saba, San Saba County, and at mile 474.
DRAINAGE AREA.--30,600 square miles, approximately, of which 11,900 square miles is probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: September 1947 to September 1954.
Water temperatures: September 1947 to September 1954.
Sediment records: December 1950 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 633 ppm Mar. 27-31; minimum, 190 ppm Oct. 5-12.
Hardness: Maximum, 274 ppm Feb. 20-28; minimum, 118 ppm Oct. 5-12.
Specific conductance: Maximum daily, 1,230 micromhos Oct. 31; minimum daily, 225 micromhos Oct. 6.
Water temperatures: Maximum observed, 92°F July 12; minimum observed, 38°F Jan. 11, 22.
Sediment concentration: Maximum daily, 7,570 ppm Apr. 30; minimum, no flow Aug. 27-31.
Sediment loads: Maximum daily, 260,000 tons Apr. 14; minimum daily, 0 tons Aug. 27-31.
EXTREMES, 1947-54.--Dissolved solids: Maximum, 1,530 ppm Oct. 15-19, 1947; minimum, 127 ppm Sept. 11-13, 1952.
Hardness: Maximum, 522 ppm Oct. 15-19, 1947; minimum, 71 ppm June 25-30, 1949.
Specific conductance: Maximum daily, 3,420 micromhos Sept. 20, 1947; minimum daily, 161 micromhos Sept. 11, 1952
Water temperatures: Maximum observed, 93°F June 14, 1953; minimum observed, freezing point Jan. 29, 1948, Jan. 30, 1951.
Sediment concentration (1950-54): Maximum daily, 10,200 ppm May 24, 1951; minimum daily, no flow Aug. 27-31, 1954.
Sediment loads (1950-54): Maximum daily, 394,000 tons Sept. 11, 1952; minimum daily, 0 tons Aug. 27-31, 1954.
REMARKS.--Values reported for dissolved solids are residues on evaporation unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1953 to September 1954 given in WSP 1342.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-4, 13-15, 1953	946	16		49	14	43		181	35	61		2.2		314	0.43	802	180	32	34	1.4	533	8.2
Oct. 5-12	7,264	12		38	5.6	20		127	17	25		4.2		190	.26	3,730	118	14	27	.8	317	7.9
Oct. 16, 21-26, 29-30	472	13		52	11	74		169	41	108		2.5		394	.54	502	174	36	48	2.4	685	8.0
Oct. 17-20, 27-28, 31	894	12		59	10	131		155	64	197		2.5		564	.77	1,360	188	61	60	4.2	989	8.0
Nov. 1, 7-10	334	11		49	11	107		147	50	160		2.8		474	.64	427	168	47	58	3.6	840	7.8
Nov. 2-6, 11-20	221	12		50	13	68		177	41	97		2.8		376	.51	224	178	34	45	2.2	660	8.0
Nov. 21-30	86.4	13		59	21	54		249	32	79		2.2		385	.52	89.8	234	30	33	1.5	689	8.2
Dec. 1-10	82.4	14		61	22	58		270	32	80		1.8		412	.56	91.7	242	22	34	1.6	702	8.2
Dec. 11-20	68.4	12		63	25	53		289	29	76		2.0		413	.56	76.3	260	23	31	1.4	709	8.1
Dec. 21-31	66.7	10		62	27	56		291	28	84		2.2		425	.58	76.5	266	27	32	1.5	732	8.1
Jan. 1-10, 1954	68.0	16		61	27	62		294	28	89		2.5		a430	.58	78.9	263	22	34	1.7	793	8.2
Jan. 11-20	70.2	17		62	27	65		300	29	91		2.2		a441	.60	83.6	266	20	35	1.7	804	8.2
Jan. 21-31	74.8	18		64	26	66		293	34	94		2.0		a448	.61	90.5	266	26	35	1.8	809	8.1

a Sum of determined constituents.

Feb. 1-10, 1954..	59.9	14		62	27	60	296	30	85		1.8		437	.59	70.7	266	23	33	1.6	758	8.0
Feb. 11-19.....	46.4	14		62	27	66	292	29	98		1.8		451	.61	56.5	266	26	35	1.8	795	8.0
Feb. 20-28.....	37.9	14		62	29	60	309	26	87		1.8		441	.60	45.1	274	20	32	1.6	779	8.0
Mar. 1-12.....	45.1	13		50	31	62	268	29	96		2.2		426	.58	51.9	252	33	35	1.7	744	8.2
Mar. 13-26.....	40.7	16		51	30	67	274	27	101		1.5		430	.58	47.3	250	26	37	1.8	760	8.2
Mar. 27-31.....	180	12		74	21	132	258	57	202		2.0		633	.86	308	271	60	51	3.5	1,130	8.2
Apr. 1-9, 17-18..	1,294	13		60	22	108	244	55	154		1.2		a 533	.72	1,860	240	40	50	3.0	945	8.1
Apr. 10-13, 19-28	719	13		47	12	67	181	36	88		2.8		a 355	.48	689	167	18	47	2.3	631	7.9
Apr. 14-16, 29-30	10,820	12		42	5.8	35	137	28	43		2.2		238	.32	6,950	129	16	37	1.3	415	7.7
May 1, 3-10.....	1,441	13		39	8.2	26	147	19	32		3.8		226	.31	879	131	11	30	1.0	375	7.7
May 2, 14-20.....	5,391	16		45	6.1	58	141	36	76		4.0		314	.43	4,570	137	22	48	2.1	564	7.9
May 11-13, 21-31.	5,839	17		40	5.2	28	142	20	30		3.5		a 214	.29	3,370	121	5	33	1.1	372	7.8
June 1-10, 25-26..	1,037	16		58	13	76	155	70	114		2.0		464	.63	1,300	198	71	45	2.3	767	7.9
June 11-20	421	14		42	8.3	37	127	39	52		2.8		282	.38	321	139	35	37	1.4	456	7.7
June 21-24, 27-30.	179	15		48	9.4	38	168	30	50		1.2		295	.40	143	158	21	34	1.3	482	7.9
July 1-10.....	577	14		48	9.2	36	169	30	45		3.0		294	.40	458	158	19	33	1.2	480	7.9
July 11-20.....	53.7	13		34	11	30	139	24	39		1.8		228	.31	33.1	130	16	33	1.1	402	8.0
July 21-31.....	5.22	15		39	12	31	152	26	43		1.2		251	.34	3.54	147	22	31	1.1	432	7.9
Aug. 1-10.....	64.2	12		47	12	40	180	29	53		1.0		292	.40	50.6	167	19	34	1.3	506	7.9
Aug. 11-20.....	3.62	14		51	14	47	190	32	68		1.0		332	.45	3.24	184	29	35	1.5	581	7.9
Aug. 21-31.....	.08	13		48	15	50	188	35	70		1.0		339	.46	.07	182	28	37	1.6	590	7.7
Sept. 1-2, 9-17...	12.3	13		52	17	75	172	54	116		1.2		428	.58	14.2	200	58	45	2.3	754	8.1
Sept. 3-8, 18-20..	22.5	13		59	20	91	181	71	144		1.0		508	.69	30.9	229	80	46	2.6	893	8.2
Sept. 21-30.....	2.04	12		56	23	105	187	67	169		1.0		538	.73	2.96	234	81	49	3.0	962	8.1
Weighted average	906	14		44	8.0	43	151	29	56		3.2		278	0.38	680	143	20	40	1.6	481	--

a Sum of determined constituents.

COLORADO RIVER BASIN--Continued

COLORADO RIVER NEAR SAN SABA, TEX.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

COLORADO RIVER BASIN--Continued

COLORADO RIVER NEAR SAN SABA, TEX.--Continued

Suspended sediment, water year October 1953 to September 1954

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	45	58	7.0	535	750	1,080	74		
2	44			420	510	578	78		
3	42			364	400	393	74		
4	4,480	3,570	s86,700	332	300	269	80		
5	22,600	2,900	177,000	355	350	335	85	42	9.3
6	19,200	2,960	s149,000	505	350	477	110		
7	7,100	2,410	s43,300	386	300	313	96		
8	2,410	1,800	11,700	302	200	163	82		
9	2,790	1,450	10,900	246	197	131	74		
10	1,790	1,100	5,320	202	160	87	71		
11	1,280	790	2,730	180	144	70	71		
12	940	610	1,550	162	138	60	69		
13	704	384	730	149	90	36	69		
14	655	264	467	134	124	45	67		
15	650	352	618	128	108	37	67	30	5.5
16	585	268	423	122	88	29	65		
17	550	196	291	118	92	29	65		
18	530	186	266	118	90	29	67		
19	500	162	219	112			71		
20	490	170	a220	110			73		
21	400	182	197	105	40	11	71		
22	238	166	107	100			69		
23	183	144	71	98			67		
24	162	130	57	93			65		
25	158	124	53	93			64	24	4.3
26	158	126	54	82			65		
27	1,950	721	3,800	74	52	11	65		
28	1,520	1,270	s5,060	73			65		
29	1,320	2,900	10,300	73			65		
30	1,040	2,650	7,440	73			67	36	6.6
31	716	950	1,840	--	--	--	71		
Total	75,230	--	520,434	5,844	--	4,293	2,242	--	202.2

Day	January			February			March		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	76			67			33		
2	74			67			36		
3	71			67			33		
4	67			65			33		
5	65	58	11	63	100	16	36	80	9.7
6	63			56			46		
7	65			54			59		
8	67			54			56		
9	67			54			56		
10	65			52			59		
11	63			46			52		
12	61			48			42		
13	61			52			33		
14	63			50			27		
15	74	58	11	46	88	11	31	102	9.7
16	74			44			31		
17	74			44			31		
18	76			46			33		
19	78			42			33		
20	78			38			38		
21	78			38			40		
22	76			40			40		
23	76			38			42		
24	76			36			44		
25	74	54	11	36	66	6.7	46	99	29
26	74			40			101		
27	74			40			415		
28	74			35			196		
29	76			--	--	--	126		
30	74			--	--	--	89		
31	72			--	--	--	74		
Total	2,205	--	341	1,358	--	323.6	2,011	--	513.0

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

COLORADO RIVER BASIN--Continued

COLORADO RIVER NEAR SAN SABA, TEX.--Continued

Suspended sediment, water year October 1953 to September 1954--Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	61			6,760	4,970	s 92,800	759	330	676
2	48			4,660	6,060	s 77,800	568	200	307
3	40			2,460	5,500	36,500	436	151	178
4	36	88	10	1,210	3,050	9,960	343	126	117
5	36			752	1,050	2,130	284	112	86
6	31			518	500	699	251	92	62
7	27			390	300	316	221	68	48
8	23			310	200	167	203		
9	308			260	190	133	1,780	1,400	s a 19,000
10	518	116	69	310	165	138	7,210	4,190	s 82,600
11	280			1,370	1,080	s 4,560	1,550	2,800	11,700
12	168			4,830	4,690	s 66,800	704	1,250	2,380
13	1,200	1,090	s 15,000	7,210	4,840	s 94,700	442	350	418
14	14,900	6,900	s260,000	10,900	5,100	150,000	316	300	256
15	17,800	2,600	125,000	12,000	5,050	164,000	232		
16	11,700	3,700	117,000	4,070	4,740	s 50,900	193	136	72
17	10,200	3,800	105,000	2,220	3,200	19,200	193		
18	3,420	4,900	45,200	1,470	2,650	10,500	193		
19	1,920	3,200	16,600	1,010	1,900	5,180	165		
20	1,270	2,100	7,200	6,800	4,780	s 103,000	224		
21	898	1,200	2,910	12,300	4,650	154,000	221	95	56
22	724	600	1,170	10,900	3,200	94,200	217		
23	546	400	590	2,400	4,700	30,500	213		
24	790	600	1,280	1,720	3,450	16,000	213		
25	692	350	654	8,580	5,210	s 135,000	196		
26	343	300	278	16,800	2,400	109,000	196		
27	239	170	110	7,410	2,600	52,000	200	76	33
28	481	833	s 3,570	2,780	1,800	13,500	165		
29	2,250	4,150	s 26,300	2,520	1,450	9,870	115		
30	7,450	7,570	152,000	1,770	750	3,580	87		
31	--	--	--	1,160	500	1,570	--	--	--
Total	78,399	--	880,336	137,850	--	1,508,703	18,090	--	118,714

Day	July			August			September		
1	781	188	s 596	0.6	48	a 0.1	12		
2	1,840	165	820	.5			82		
3	738	385	767	85			52		
4	405	270	295	162			40		
5	662	210	375	102			40		
6	458	195	241	87			31	62	5.1
7	324	165	144	80			21		
8	236	140	89	56	72	11	14		
9	184	60	a 30	40			8.6		
10	143			29			5.6		
11	112			16			4.5		
12	92			8.6			4.5		
13	78			4.5			4.5		
14	67	42	7.5	2.6			4.0		
15	50			1.6			3.6	50	.4
16	40			1.0			3.2		
17	35			.7			2.6		
18	27			.5			2.0		
19	18			.4	60	.1	1.6		
20	18			.3			1.3		
21	14			.2			1.3		
22	12			.2			1.3		
23	8.6			.2			2.2		
24	6.2			.1			2.9		
25	5.0	48	.8	.1	88	(t)	2.6	42	.2
26	4.0			.1			2.0		
27	2.9			0	--	0	1.4		
28	1.8			0	--	0	1.3		
29	1.3			0	--	0	1.8		
30	.9			0	--	0	3.6		
31	.7			0	--	0	--	--	--
Total	6,365.4	--	3,441.6	679.2	--	133.3	358.4	--	57

Total discharge for year (cfs-days) 330,632.0
Total load for year (tons) 3,037,491.7

s Computed by subdividing day.
t Less than 0.05 ton.
a Computed from estimated concentration graph.

COLORADO RIVER NEAR SAN SABA, TEX.--Continued

Particle-size analyses of suspended sediment, water year October 1953 to September 1954
(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 (cfs)	Water temperature (°F)	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. 4, 1953	7:35 p.m.	10,900	--	7,990	3,450	4	12	56	88	96	99	100					SPN
Oct. 4	7:35 p.m.	10,900	--	7,990	3,520	52	66	77	88	93	99	100					SPCW
Oct. 5	12:45 p.m.	24,900	--	2,560	2,110	--	74	85	95	98	99	100					SPCW
Oct. 6	2:55 p.m.	17,800	--	4,600	3,550	--	72	86	97	99	100	--					SPCW
Oct. 6	10:45 p.m.	15,200	--	2,800	2,080	--	75	84	94	96	100	--					SPCW
Oct. 7	6:00 p.m.	3,810	70	2,880	2,310	--	66	79	93	99	100	--					SPCW
Oct. 30	8:00 a.m.	1,060	65	3,400	2,210	69	85	92	99	100	--	--					BCW
Apr. 14, 1954	2:05 a.m.	10,500	--	14,200	7,300	--	1	15	98	99	100	--					SPN
Apr. 14	2:05 a.m.	10,500	--	14,200	6,060	47	67	81	93	99	100	--					SPCW
Apr. 14	11:10 a.m.	14,900	--	5,630	1,850	0	12	39	97	99	100	--					BN
Apr. 14	11:10 a.m.	14,900	--	5,630	2,690	68	77	90	97	99	100	--					BCW
Apr. 15	6:45 a.m.	20,400	67	2,540	2,250	--	72	87	89	99	100	--					SPCW
Apr. 16	1:10 a.m.	12,300	--	3,390	2,310	--	69	85	94	99	100	--					SPCW
Apr. 16	11:10 p.m.	12,000	--	5,740	3,920	--	74	86	93	99	100	--					SPCW
Apr. 30	8:30 a.m.	9,100	68	7,830	3,430	0	6	54	84	95	99	100					SPN
Apr. 30	8:30 a.m.	9,100	68	7,830	3,000	47	62	75	87	94	99	100					SPCW
May 2	6:00 p.m.	4,660	69	7,280	4,310	--	72	85	98	99	100	--					SPCW
May 12	7:30 p.m.	6,380	--	4,680	3,560	--	79	88	90	99	100	--					SPCW
May 14	7:00 p.m.	11,700	--	5,660	5,160	--	67	80	91	98	100	--					SPCW
May 20	10:25 p.m.	10,400	--	5,330	5,080	--	68	80	90	97	100	--					SPCW
May 25	2:40 p.m.	12,000	75	6,660	4,230	--	55	65	77	90	99	100					SPCW
May 26	11:40 p.m.	15,300	--	1,920	1,190	71	79	89	97	100	--	--					BCW
June 10	11:30 a.m.	8,940	78	3,300	2,920	--	59	69	81	94	100	--					SPCW

COLORADO RIVER BASIN--Continued

COLORADO RIVER AT AUSTIN, TEX.

LOCATION.--At raw-water intake of Austin City Water Plant, 4½ miles upstream from gaging station which is at Montopolis bridge on U. S. Highway 183, at southeast edge of Austin, Travis County, 2.8 miles upstream from Walnut Creek, 3.8 miles downstream from Waller Creek, 5 miles downstream from Barton Creek and at mile 290.
DRAINAGE AREA.--38,400 square miles (revised), approximately, of which 11,900 square miles is probably noncontributing (at gaging station).
RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1954.
Water temperatures: October 1947 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 272 ppm Jan. 1-31; minimum, 224 ppm May 1-31.
Hardness: Maximum, 214 ppm Jan. 1-31; minimum, 146 ppm May 1-31, June 1-30.
Specific conductance: Maximum daily, 520 micromhos Jan. 27; minimum daily, 243 micromhos Dec. 2.
Water temperatures: Maximum observed, 80°F July 22, Sept. 2; minimum observed, 52°F Dec. 24, Jan. 22.
EXTREMES, 1947-54.--Dissolved solids: Maximum, 346 ppm Nov. 1-30, 1951; minimum, 214 ppm July 1-31, 1953.
Hardness: Maximum, 214 ppm Jan. 1-31, 1954; minimum, 144 ppm June 1-30, 1953.
Specific conductance: Maximum daily, 591 micromhos July 1, 1948; minimum daily, 243 micromhos Dec. 2, 1953.
Water temperatures: Maximum observed 87°F on several days during summer months; minimum observed, 43°F Jan. 28, 1948, Feb. 4, 1949.
REMARKS.--Values reported for dissolved solids are residues on evaporation unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1953 to September 1954 given in WSP 1342. No appreciable inflow between sampling point and gaging station except during periods of heavy local rains.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-31, 1953	334	12		47	12	17		182	16	25	0.5	2.2		228	0.31	206	167	18	18	0.6	388	8.2
Nov. 1-30	271	14		53	14	15		203	15	26	.3	2.8		a240	.33	176	190	23	15	.5	414	8.0
Dec. 1-31	505	12		56	14	17		218	17	24	.2	3.8		259	.35	353	197	18	16	.5	448	8.2
Jan. 1-31, 1954	487	12		58	17	17		230	20	28	--	3.5		272	.37	358	214	26	15	.5	477	8.2
Feb. 1-28	223	11		46	17	21		199	23	29	.2	3.5		256	.35	154	185	22	20	.7	452	8.2
Mar. 1-31	405	8.8		49	14	21		197	21	28	.2	1.8		248	.34	271	180	18	20	.7	440	8.2
Apr. 1-30	954	9.5		45	12	22		182	18	28	.5	1.5		227	.31	585	162	13	23	.7	400	7.5
May 1-31	1,952	16		42	10	25		174	16	27	.4	2.0		a224	.30	1,180	146	4	27	.9	389	8.2
June 1-30	1,963	13		42	10	24		167	17	28	.3	2.8		231	.31	1,220	146	9	26	.8	389	7.8
July 1-31	2,138	11		43	13	20		177	17	28	.2	1.0		234	.32	1,350	161	16	21	.7	407	7.8
Aug. 1-31	1,527	8.6		46	12	22		181	17	32	.3	1.2		234	.32	965	164	16	23	.8	410	7.6
Sept. 1-30	512	9.6		43	13	22		177	18	32	.2	.8		233	.32	322	161	16	23	.8	418	7.9
Weighted average	945	12		45	12	22		182	17	28	0.3	1.9		235	0.32	600	162	13	23	0.8	408	--

a Sum of determined constituents.

COLORADO RIVER BASIN--Continued

COLORADO RIVER AT AUSTIN, TEX.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

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COLORADO RIVER AT WHARTON, TEX.

LOCATION.--At gaging station at bridge on U. S. Highway 59 in Wharton County, 1,000 feet downstream from Texas and New Orleans Railroad bridge, 12 miles downstream from Jones Creek and at mile 67.
DRAINAGE AREA.--41,380 square miles (revised), approximately, of which 11,900 square miles is probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: April 1944 to September 1954.
Water temperatures: October 1945 to September 1948, March 1950 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 306 ppm Feb. 1-28; minimum, 167 ppm Oct. 27-31, Nov. 1-6.
Hardness: Maximum, 203 ppm Feb. 1-28; minimum, 110 ppm Oct. 27-31, Nov. 1-6.
Specific conductance: Maximum daily, 569 micromhos Mar. 15; minimum daily, 179 micromhos Oct. 30.
Water temperatures: Maximum observed, 95°F July 26; minimum observed, 42°F Dec. 26.
EXTREMES, 1944-54.--Dissolved solids: Maximum, 386 ppm Apr. 1-10, 1948; minimum, 87 ppm Feb. 24-28, 1949.
Hardness: Maximum, 231 ppm Feb. 1-10, 1947; minimum, 87 ppm Feb. 24-28, 1949.
Specific conductance: Maximum daily, 721 micromhos Oct. 3, 1952; minimum daily, 179 micromhos Oct. 30, 1953.
Water temperatures (1945-48 1950-54): Maximum observed, 95°F July 26, 1954; minimum observed, 42°F Dec. 26, 1953.
REMARKS.--Values reported for dissolved solids are residues on evaporation unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1953 to September 1954 given in WSP 1342.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-26, 1953...	674	22		50	13	28	4.1	a 210	21	36	0.3	1.2	0.09	b 279	0.38	508	178	6	25	0.9	470	8.4
Oct. 27-31, Nov. 1-6	3,050	17		36	5.0	10	3.6	118	21	12	.4	2.5	.09	167	.23	1,380	110	14	16	.4	270	8.0
Nov. 7-30	672	14		50	10	21	3.9	180	25	28	.4	1.5	.08	b 243	.33	441	166	18	21	.7	410	8.1
Dec. 1-4, 13-31...	1,051	17		56	11	20	3.6	193	30	27	.3	3.5	.12	275	.37	780	184	26	19	.6	437	7.7
Dec. 5-12	3,232	14		44	5.4	11	3.8	130	35	10	.5	4.2	.07	201	.27	1,750	132	26	15	.4	318	7.7
Jan. 1-31, 1954 ..	784	13		50	13	24	3.6	183	30	34	.3	1.8	.06	270	.37	572	178	28	22	.8	454	7.9
Feb. 1-28	390	9.0		55	16	30	3.6	216	34	41	.3	1.0	.16	306	.42	322	203	26	24	.9	532	8.0
Mar. 1-31.....	357	12		44	17	34	--	193	35	43	.3	2.2	.16	285	.39	275	180	22	29	1.1	504	8.2
Apr. 1-30	749	14		44	12	24	3.5	182	24	34	.3	1.8	.12	250	.34	508	160	10	24	.8	435	8.2
May 1-31.....	1,287	20		42	9.6	20	5.2	166	19	28	.3	2.5	.14	230	.31	799	144	8	22	.7	391	7.9
June 1-30	902	13		43	12	20	3.7	175	19	30	.3	2.2	.18	234	.32	570	157	14	21	.7	404	8.1
July 1-31.....	876	11		44	12	20	3.8	176	18	31	.3	1.2	.12	231	.31	546	160	16	21	.7	401	8.2
Aug. 1-31	910	9.6		44	12	24	4.2	172	20	39	.3	1.0	.13	b 239	.33	587	160	18	24	.8	430	8.2
Sept. 1-30	436	14		46	13	25	4.4	190	19	36	.2	1.0	.08	b 252	.34	297	168	13	24	.8	451	7.9
Weighted average.	880	15		45	11	21	4.0	171	24	29	0.3	2.1	0.11	239	0.33	568	158	18	22	0.7	406	--

a Includes equivalent of 4 parts per million of carbonate (CO_3).
b Sum of determined constituents.

COLORADO RIVER BASIN--Continued

COLORADO RIVER AT WHARTON, TEX.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

MISCELLANEOUS ANALYSES OF STREAMS IN COLORADO RIVER BASIN IN TEXAS

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
LAKE J. B. THOMAS NEAR IRA																						
Nov. 11, 1953		8.4	0.00	16	3.6	46	2.2	103	40	18	0.5	1.0	0.22	203	0.28		55	0	63	2.7	313	7.2
July 21, 1954		8.2	.01	17	4.6	41	1.3	104	37	18	.7	3.0	.02	189	.26		61	0	59	2.3	324	7.9
OAK CREEK RESERVOIR NEAR BLACKWELL																						
Oct. 16, 1953		3.6	0.03	34	4.6	1.7	4.5	125	8.4	1.5	0.1	1.0	0.06	127	0.17		104	1	3	0.1	222	7.8
SAN ANGELO RESERVOIR NEAR SAN ANGELO																						
Oct. 16, 1953		7.8	0.03	36	5.5	4.0	4.3	139	4.0	4.2	0.3	1.0	0.02	138	0.19		112	0	7	0.2	240	7.9
HORDES CREEK RESERVOIR NEAR COLEMAN																						
Jan. 14, 1954		6.4	0.06	38	5.8	3.4	5.4	146	3.4	3.8	0.3	0.5	0.08	146	0.20		119	0	6	0.1	242	8.1

GUADALUPE RIVER AT VICTORIA, TEX.

LOCATION.--At gaging station at bridge on U. S. Highway 59 in Victoria, Victoria County, 1,300 feet upstream from Texas and New Orleans Railroad bridge, 10 miles upstream from Coleto Creek, and at mile 51.
DRAINAGE AREA.--5,161 square miles (revised).
RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1946, October 1948 to September 1954.
Water temperatures: November 1950 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 650 ppm Sept. 13-20; minimum, 168 ppm Oct. 26-31, Nov. 1-2.
Hardness: Maximum, 278 ppm Apr. 25-29; minimum, 104 ppm Oct. 26-31, Nov. 1-2.
Specific conductance: Maximum daily, 1,260 micromhos Sept. 15; minimum daily, 224 micromhos Oct. 27.
Water temperatures: Maximum observed, 87°F Aug. 12, 14-15; minimum observed, 44°F Dec. 24.
EXTREMES, 1945-46, 1948-54.--Dissolved solids: Maximum, 1,040 ppm Jan. 11-17, 1946; minimum, 168 ppm Oct. 26-31, Nov. 1-2, 1953.
Hardness: Maximum, 428 ppm Jan. 11-17, 1946; minimum, 104 ppm Oct. 26-31, Nov. 1-2, 1953.
Specific conductance: Maximum daily, 1,950 micromhos Jan. 11-17, 1946; minimum daily, 201 micromhos Sept. 1, 1953.
Water temperatures (1950-54): Maximum observed, 90°F Aug. 4, 27, 1952; minimum observed, 40°F Feb. 1-2, 1951.
REMARKS.--Values reported for dissolved solids are residues on evaporation unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1953 to September 1954 given in WSP 1342.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-11, 1953	432	21		47	15	35	3.4	194	24	53	0.3	3.2	0.30	308	0.42	359	179	20	29	1.1	514	8.1
Oct. 12-25	775	18		46	16	34	2.9	195	25	52	.3	2.2	.21	304	.41	636	181	21	29	1.1	512	7.9
Oct. 26-31, Nov. 1-2	4,847	14		31	6.3	13	4.0	110	13	19	.3	3.5	.18	168	.23	2,200	104	14	21	.6	267	7.7
Nov. 3-9	902	16		46	8.8	26	4.3	158	20	42	.3	2.8	.25	255	.35	621	151	22	27	.9	421	7.9
Nov. 10-20	633	20		63	16	32	3.2	236	28	50	.2	3.8	.47	350	.48	598	223	30	23	.9	570	8.2
Nov. 21-30	533	20		52	18	34	2.5	214	30	54	.2	3.2	.26	329	.45	473	204	28	26	1.0	562	8.2
Dec. 1-7	1,508	16		66	16	36	2.9	244	29	54	.3	3.8	.34	351	.48	1,430	230	30	25	1.0	588	8.1
Dec. 8-16	784	15		56	12	25	3.5	204	27	34	.3	3.5	.29	286	.39	605	189	22	22	.8	471	8.0
Dec. 17-31	656	17		74	18	36	2.6	278	30	53	.2	4.5	.33	386	.52	684	258	30	23	1.0	625	8.2
Jan. 1-4, 10, 15, 22-24, 30, 1954	574	22		39	19	52	3.1	158	35	85	.3	4.0	.16	344	.47	533	176	46	39	1.7	592	8.0
Jan. 5-6, 21, 25-29, 31	583	19		32	19	42	2.8	147	32	67	.3	4.0	.09	a290	.39	456	158	38	36	1.5	510	8.0
Jan. 7-9, 11-14, 16-20	587	21		32	17	36	2.7	148	28	55	.3	3.5	.08	a269	.37	426	150	28	34	1.3	464	8.1
Feb. 1-10	527	18		34	19	43	2.8	158	33	66	.3	3.5	.09	a298	.41	424	163	34	36	1.5	527	8.1
Feb. 11-19	508	16		36	20	42	2.8	162	33	66	.3	2.8	.11	a299	.41	410	172	40	34	1.4	534	8.0
Feb. 20-28	477	16		42	19	44	3.2	173	32	72	.3	2.5	.14	339	.46	437	183	41	34	1.4	576	7.5
Mar. 1-10	437	18		46	20	48	2.9	195	35	75	.3	2.5	.17	a344	.47	406	197	37	34	1.5	609	8.1
Mar. 11-20, 22, 24	416	15		44	20	50	--	193	35	74	.3	2.2	.19	340	.46	382	192	34	36	1.6	604	8.0
Mar. 21, 23, 25-31	380	16		52	21	57	--	208	38	92	.3	3.0	.23	391	.53	401	216	46	36	1.7	678	8.1

a Sum of determined constituents.

GUADALUPE RIVER BASIN--Continued

GUADALUPE RIVER AT VICTORIA, TEX.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Apr. 1-13, 1954	571	19		54	20	59	--	212	37	94	0.3	3.5	0.18	404	0.55	623	216	42	37	1.8	709	8.2
Apr. 14-19	514	18		44	9.2	29	--	156	28	38	.3	3.5	.18	269	.37	373	148	20	30	1.0	434	8.0
Apr. 20-24, 30	389	23		60	17	50	--	224	33	80	.3	2.5	.21	a376	.51	395	220	36	33	1.5	661	8.2
Apr. 25-29	332	19		70	2.5	97	--	218	45	183	.2	1.2	.28	582	.79	522	278	99	43	2.5	994	8.1
May 1-10	557	29		42	17	48	--	181	31	74	.4	2.5	.23	a333	.45	501	175	26	37	1.6	583	8.2
May 11-15, 29-31	1,164	30		48	14	41	--	187	29	63	.4	4.5	.22	328	.45	1,030	178	24	33	1.3	554	8.2
May 16-28	530	23		39	6.7	29	4.4	138	17	40	.5	3.5	.20	236	.32	338	125	12	33	1.1	389	8.2
June 1-10	323	21		56	19	52	--	220	34	85	.3	1.8	.36	388	.53	338	218	37	34	1.5	663	8.1
June 11-20	199	21		49	18	51	--	201	34	80	.3	1.8	.26	360	.49	193	196	32	36	1.6	622	8.0
June 21-30	217	18		52	19	59	--	206	36	95	.4	2.0	.26	390	.53	229	208	38	38	1.8	680	8.0
July 1-10	181	19		40	19	61	3.2	181	35	94	.5	.8	.27	a362	.49	177	178	30	42	2.0	656	8.2
July 11-20	160	18		47	19	68	3.4	193	37	112	.4	.8	.29	a401	.55	173	196	38	43	2.1	725	8.1
July 21-31	103	19		52	22	112	4.7	176	46	200	.4	.8	.26	553	.75	154	220	76	52	3.3	997	7.7
Aug. 1-10	123	22		51	19	74	3.8	214	36	116	.5	.8	.28	a428	.58	142	205	30	43	2.2	761	8.0
Aug. 11-20	99.8	22		52	19	70	3.5	221	35	108	.4	.8	.25	420	.57	113	208	26	42	2.1	743	8.2
Aug. 21-31	102	21		54	20	80	3.7	215	42	128	.4	.5	.30	a456	.62	126	216	40	44	2.4	807	8.1
Sept. 1-12	111	26		50	21	81	3.9	209	39	124	.3	.5	.12	456	.62	137	212	40	45	2.4	805	8.2
Sept. 13-20	101	24		58	24	103	4.8	207	44	225	.3	.8	.19	650	.88	177	243	74	54	3.7	1,130	8.2
Sept. 21-30	108	23		50	18	71	3.8	224	33	98	.2	.5	.05	408	.55	119	199	16	43	2.2	728	8.1
Weighted average	548	19		46	14	37	3.4	179	27	58	0.3	3.2	0.22	304	0.41	450	172	26	31	1.2	516	--

a Sum of determined constituents.

GUADALUPE RIVER BASIN--Continued

GUADALUPE RIVER AT VICTORIA, TEX.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	--	64	65	51	62	60	65	--	82	83	84	84
2	81	66	--	54	62	61	66	--	83	82	83	85
3	79	68	--	62	63	59	70	--	84	84	85	84
4	--	67	64	58	61	--	73	--	80	82	86	82
5	--	66	66	57	61	54	74	--	79	84	86	81
6	74	65	63	56	62	53	75	--	82	85	85	80
7	70	66	58	54	--	58	--	--	82	85	86	84
8	70	62	62	56	59	59	76	--	83	86	84	83
9	--	59	54	58	56	60	--	--	89	85	84	83
10	74	59	56	57	62	62	73	--	83	85	86	84
11	72	56	--	50	63	66	75	--	84	84	86	82
12	73	58	52	52	58	70	74	--	84	86	87	80
13	73	64	--	51	58	68	74	--	83	86	86	80
14	72	68	55	56	62	--	76	--	85	86	87	82
15	74	62	56	61	65	58	76	--	83	85	87	83
16	72	64	54	57	65	59	72	--	--	86	86	80
17	73	--	54	--	63	59	69	--	84	85	85	83
18	74	--	55	57	63	62	72	--	83	86	86	82
19	75	69	53	--	66	67	71	--	83	86	85	84
20	75	66	--	61	63	65	73	--	84	85	86	84
21	76	75	55	56	61	67	74	79	84	84	85	83
22	76	63	55	51	62	68	--	78	83	84	85	80
23	--	60	--	54	64	69	74	78	82	--	86	78
24	--	62	44	57	62	63	75	75	82	86	84	76
25	73	58	46	59	60	70	76	76	84	86	83	78
26	73	57	--	64	63	68	76	77	82	86	--	80
27	69	59	50	63	67	67	76	78	83	86	85	80
28	68	62	--	60	61	70	72	79	83	86	85	82
29	--	62	50	60	--	72	77	80	84	87	82	81
30	67	64	50	63	--	74	78	82	84	85	83	83
31	--	--	50	64	--	74	--	80	--	86	82	--
Average	--	63	--	57	62	64	73	--	83	85	85	82

GUADALUPE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN GUADALUPE RIVER BASIN IN TEXAS

Chemical analyses, in parts per million, water October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
VERDE CREEK AT CAMP VERDE																						
May 14, 1954		12		69	19	8.6	289	9.2	16		0.0		276	0.38		250	13	7	0.2	498	7.9
HELOTES CREEK 1½ MILES NORTH OF HELOTES																						
Apr. 8, 1954		13		68	19	13	292	11	18		0.0		294	0.40		248	8	10	0.4	501	7.8
MEDINA LAKE NEAR SAN ANTONIO																						
Apr. 8, 1954		7.0		66	15	10	209	57	12		2.0		303	0.41		226	55	9	0.3	462	8.1

NUECES RIVER NEAR MATHIS, TEX.

LOCATION.--At intake tower at Lake Corpus Christi, 0.8 mile upstream from gaging station, which is at bridge on U.S. Highway 59, 200 feet downstream from Texas and New Orleans Railroad bridge, 0.8 mile downstream from Mathis Dam, 4 miles southwest of Mathis, San Patricio County, and at mile 47.
DRAINAGE AREA.--16,600 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1954.
Water temperatures: October 1947 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 478 ppm May 1-31; minimum, 211 ppm Nov. 1-30.
Hardness: Maximum, 172 ppm Apr. 1-30; minimum, 108 ppm Nov. 1-30.
Specific conductance: Maximum daily, 879 micromhos May 19; minimum daily, 315 micromhos Nov. 7.
Water temperatures: Maximum observed, 85°F July 21, 30; minimum observed, 46°F Dec. 14, 23.
EXTREMES, 1947-54.--Dissolved solids: Maximum, 548 ppm June 1-30, 1948; minimum, 175 ppm Apr. 27-30, 1949.
Hardness: Maximum, 201 ppm May 1-24, 1951; minimum, 85 ppm Apr. 27-30, 1949.
Specific conductance: Maximum daily, 1,040 micromhos July 1, 1948; minimum daily, 233 micromhos July 30, 1949.
Water temperatures: Maximum observed 94°F July 27, 1948; minimum observed, 38°F Jan. 31, 1948.
REMARKS.--Values reported for dissolved solids are residues on evaporation unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1953 to September 1954 given in WSP 1342.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-31, 1953...	1,068	31		45	3.7	32	6.1	170	30	24	0.5	2.5	0.18	a 259	0.35	747	128	0	34	1.2	401	8.1
Nov. 1-30.....	687	23		38	3.1	27	5.1	143	25	18	.5	1.0	.11	a 211	.29	391	108	0	34	1.1	335	8.0
Dec. 1-31.....	44.1	19		44	4.4	26	5.2	164	25	19	.4	1.0	.23	242	.33	29	128	0	30	1.0	368	8.0
Jan. 1-31, 1954 ..	44.4	19		47	4.5	27	5.5	176	25	19	.4	1.2	.18	247	.34	30	136	0	29	1.0	395	8.1
Feb. 1-28.....	58.8	19		51	4.7	32	6.2	189	28	25	.4	1.2	.19	274	.37	44	146	0	31	1.1	437	7.8
Mar. 1-31.....	60.4	19		55	4.6	42	--	211	30	32	.4	1.8	.21	298	.41	49	156	0	37	1.5	489	8.2
Apr. 1-30.....	52.5	36		60	5.4	73	6.7	b 245	40	68	.4	1.2	.25	a 411	.56	58	172	0	47	2.4	670	8.4
May 1-31.....	60.4	32		59	5.2	100	--	c 254	50	96	.5	3.5	.47	478	.65	78	168	0	56	3.4	801	8.5
June 1-10.....	995	29		49	5.7	89	--	220	50	82	.5	2.5	.42	428	.58	1,150	146	0	57	3.2	696	8.2
June 11-30.....	896	25		48	5.9	48	6.4	195	32	42	.5	2.5	.34	314	.43	760	140	0	41	1.8	514	8.0
July 1-31.....	2,362	24		46	4.4	32	6.9	176	25	26	.5	1.8	.15	263	.36	1,680	133	0	33	1.2	414	8.0
Aug. 1-31	86.6	23		55	4.3	28	7.3	206	23	23	.5	2.8	.18	276	.38	65	154	0	27	1.0	444	8.1
Sept. 1-30.....	77.8	24		53	4.6	33	7.8	205	23	28	.2	2.2	.18	282	.38	59	151	0	31	1.2	465	8.1
Weighted average	465	26		46	4.3	38	6.4	178	29	31	0.4	2.0	0.20	275	0.37	345	132	0	37	1.4	437	--

a Sum of determined constituents.
b Includes equivalent of 7 parts per million of carbonate (CO_3).
c Includes equivaleut of 8 parts per million of carbonate (CO_3).

NUECES RIVER BASIN--Continued

NUECES RIVER NEAR MATHIS, TEX.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

RIO GRANDE ABOVE CULEBRA CREEK NEAR LOBATOS, COLO.

LOCATION.--Half a mile southeast of La Sauses, 7 miles upstream from Culebra Creek, and 15 miles upstream from gaging station near Lobatos, Conejos County.
DRAINAGE AREA.--7,700 square miles, approximately, above gaging station (includes 2,940 square miles in closed basin in northern part of San Luis Valley,, Colo.).
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 359 ppm Oct. 17-19, Aug. 1-10; minimum, 177 ppm Feb. 1-10.
Hardness: Maximum, 165 ppm Oct. 17-19; minimum, 86 ppm May 11-20.
Specific conductance: Maximum observed, 585 micromhos Oct. 19; minimum observed, 206 micromhos May 12.
EXTREMES, 1946-54.--Dissolved solids: Maximum, 691 ppm July 21-31, 1948; minimum, 104 ppm May 2-10, 1947.
Hardness: Maximum, 346 ppm June 9-14, 1953; minimum, 52 ppm May 1-10, 1952.
Specific conductance: Maximum observed,1,070 micromhos July 26, 1948; minimum observed, 122 micromhos June 1, 1949.
REMARKS.--Values reported for dissolved solids are residues on evaporation. Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge for gaging station near Lobatos, Colo. for water year October 1953 to September 1954 given in WSP 1342. Culebra Creek which enters Rio Grande between the sampling point and the gaging station is usually dry at its mouth. Inflow from this and other sources between sampling point and gaging station occurs only after heavy local rainfall.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-10, 1953..	45.5	42	0.01	38	8.3	42	7.0	174	65	13	0.8	1.0	0.18	305	0.41	37.5	129	0	40	1.6	438	7.2
Oct. 11-16	65.2	--	--	36	7.5	27	--	--	--	--	--	--	--	257	.35	45.2	121	--	33	1.1	359	--
Oct. 17-19	52.0	--	--	48	11	46	--	--	--	--	--	--	--	359	.49	50.4	165	--	38	1.6	513	--
Oct. 20-31	79.7	--	--	35	8.5	28	--	--	--	--	--	--	--	264	.36	56.8	122	--	33	1.1	364	--
Nov. 1-10	77.6	--	--	35	7.6	20	--	--	--	--	--	--	--	273	.37	57.2	118	--	27	.8	332	--
Nov. 11-20	84.8	--	--	33	7.0	22	--	--	--	--	--	--	--	242	.33	55.4	116	--	30	.9	306	--
Nov. 21-30	214	--	--	33	7.3	23	--	--	--	--	--	--	---	203	.28	117	112	--	31	.9	317	--
Dec. 1-10	258	--	--	33	7.9	23	--	--	--	--	--	--	--	216	.29	150	115	--	30	.9	314	--
Dec. 11-20	250	--	--	36	7.3	23	--	--	--	--	--	--	--	223	.30	151	120	--	29	.9	329	--
Dec. 21-31	208	--	--	34	7.3	21	--	--	--	--	--	--	--	212	.29	119	115	--	28	.8	312	--
Jan. 1-10, 1954..	176	39	.03	31	5.7	21	4.5	132	35	6.0	.4	1.0	.06	211	.29	100	101	0	30	.9	299	7.4
Jan. 11-20.....	180	--	--	32	6.1	19	--	--	--	--	--	--	--	204	.28	99.1	105	--	28	.8	282	--
Jan. 21-31	213	--	--	31	5.9	18	--	--	--	--	--	--	--	189	.26	109	102	--	28	.8	268	--
Feb. 1-10	272	--	--	28	5.5	16	--	---	--	--	--	--	--	177	.24	130	92	--	27	.7	250	--
Feb. 11-20	306	--	--	33	6.7	20	--	--	--	--	--	--	--	224	.30	185	110	--	28	.8	295	--
Feb. 21-28	196	--	--	38	7.6	26	--	--	--	--	--	--	--	248	.31	131	126	--	31	1.0	357	--
Mar. 1-10.....	139	--	--	37	7.8	28	--	--	--	--	--	--	--	246	.33	92.3	124	--	33	1.1	358	--
Mar. 11-20.....	126	--	--	35	7.4	24	--	--	--	--	--	--	--	242	.33	82.3	118	--	31	1.0	333	--
Mar. 21-31.....	101	--	--	35	6.9	24	--	--	--	--	--	--	--	234	.32	63.8	116	--	31	1.0	325	--
Apr. 1-10	75.2	37	.06	37	6.6	30	6.2	148	58	4.0	.5	.4	.12	266	.36	54.0	120	0	34	1.2	381	7.5
Apr. 11-20	57.7	--	--	39	8.2	32	--	--	--	--	--	--	--	275	.37	42.8	131	--	35	1.2	395	--
Apr. 21-30	47.4	--	--	33	5.0	25	--	--	--	--	--	--	--	216	.29	27.6	103	--	35	1.1	317	--

RIO GRANDE BASIN--Continued

RIO GRANDE ABOVE CULEBRA CREEK NEAR LOBATOS, COLO.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
May 1-10, 1954 ..	32.3	--	--	32	4.5	23	--	--	--	--	--	--	--	208	0.28	18.1	98	--	34	1.0	298	--
May 11-20.....	71.2	--	--	26	5.0	15	--	--	--	--	--	--	--	186	.25	35.8	86	--	28	.7	243	--
May 21-31.....	52.0	--	--	27	4.9	16	--	--	--	--	--	--	--	197	.27	27.7	88	--	29	.7	248	--
June 1-10	29.4	--	--	33	5.9	28	--	--	--	--	--	--	--	213	.29	16.9	107	--	36	1.2	336	--
June 11-20	19.3	--	--	37	6.2	30	--	--	--	--	--	--	--	255	.35	13.3	118	--	36	1.2	364	--
June 21-30	10.8	--	--	40	7.8	46	--	--	--	--	--	--	--	320	.44	9.33	132	--	43	1.7	459	--
July 1-10	10.4	36	0.03	40	10	49	7.0	198	71	13	0.9	0.6	0.24	318	.43	8.93	141	0	42	1.8	482	7.5
July 11-20.....	12.2	--	--	39	9.7	45	--	--	--	--	--	--	--	312	.42	10.3	138	--	42	1.7	456	--
July 21-31.....	14.9	--	--	40	10	51	--	--	--	--	--	--	--	337	.46	13.6	141	--	44	1.9	488	--
Aug. 1-10	12.4	--	--	34	10	65	--	--	--	--	--	--	--	359	.49	12.0	126	--	53	2.5	520	--
Aug. 11-20	20.9	--	--	36	9.0	44	--	--	--	--	--	--	--	300	.41	16.9	127	--	43	1.7	439	--
Aug. 21-31.....	6.62	--	--	35	9.5	49	--	--	--	--	--	--	--	311	.42	5.56	126	--	46	1.9	456	--
Sept. 1-10.....	44.2	--	--	36	7.6	36	--	--	--	--	--	--	--	268	.36	32.0	121	--	39	1.4	391	--
Sept. 11-20.....	30.5	--	--	32	7.8	27	--	--	--	--	--	--	--	236	.32	19.4	112	--	34	1.1	336	--
Sept. 21-30.....	43.5	--	--	29	7.2	26	--	--	--	--	--	--	--	226	.31	26.5	102	--	36	1.1	318	--
Weighted average	98.9	--	--	33	6.9	23	--	--	--	--	--	--	--	252	0.34	67.3	111	--	31	0.9	318	--

RIO GRANDE BASIN--*Continued*

RIO GRANDE AT EMBUDO, N. MEX.

LOCATION.--At gaging station a quarter of a mile downstream from bridge at Embudo, Rio Arriba County and 2½ miles downstream from Embudo Creek.
DRAINAGE AREA.--10,400 square miles, approximately (includes 2,940 square miles in closed basin in northern part of San Luis Valley, Colo.).
RECORDS AVAILABLE.--Water temperatures: October 1948 to September 1954.
Sediment records: January 1948 to September 1954.
EXTREMES, 1953-54.--Water temperatures: Maximum observed, 75°F June 28, July 2; minimum, freezing point on several days during December and January.
Sediment concentrations: Maximum daily, 7,270 ppm Aug. 7; minimum daily, 4 ppm June 4.
Sediment loads: Maximum daily, 18,100 tons Aug. 7; minimum daily, 4 tons June 4.
EXTREMES, 1948-54.--Water temperatures: Maximum observed, 78°F Aug. 4, 1953; minimum, freezing point on many days during winter months.
Sediment concentrations: Maximum daily, 10,200 ppm Aug. 5, 1948; minimum daily, 4 ppm June 4, 1954.
Sediment loads: Maximum daily, 51,000 tons May 25, 1948; minimum daily, 4 tons June 4, 1954.
REMARKS.--Maximum observed sediment concentration during water year 40,600 ppm Aug. 7. Records of discharge for water year October 1953 to September 1954 given in WSP 1342. Stage-discharge relation affected by ice Dec. 8-12.

Temperature (°F) of water, water year October 1953 to September 1954
/Once-daily measurement generally taken after 6 p.m./

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

a Measurement made before 11 a.m.
b Measurement between 11 a.m. and 6 p.m.

RIO GRANDE BASIN--Continued

RIO GRANDE AT EMBUDO, N. MEX.--Continued

Suspended sediment, water year October 1953 to September 1954

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	205			282	20	15	525		
2.....	211			279	20	15	550		
3.....	214			276	31	23	587		
4.....	214			272	41	30	525		
5.....	217			296	448	358	475		
		35	21					35	44
6.....	220			505	2,320	s 3,840	371		
7.....	229			335	37	33	355		
8.....	229			318	46	39	410		
9.....	229			310	36	30	420		
10.....	229			314	24	20	410		
11.....	232	38	24	324			440		
12.....	235	33	21	321			420		
13.....	244	56	37	321			416		
14.....	250	30	20	321			470		
15.....	250	23	16	324			456		
					24	21		17	21
16.....	262	30	21	324			465		
17.....	259	19	13	324			480		
18.....	259	20	14	332			490		
19.....	259	38	27	343			490		
20.....	272	145	106	343			500		
21.....	279	120	90	321			500		
22.....	279	33	25	293			490		
23.....	296	56	a 45	324			452		
24.....	380	510	523	335			442		
25.....	324	250	219	367			447		
					53	56		21	28
26.....	304	80	66	393			447		
27.....	300	34	28	424			442		
28.....	296	28	22	460			424		
29.....	286	25	19	510			416		
30.....	286	50	39	515			416		
31.....	282	42	32	--	--	--	411		
Total.	8,031	--	1,617	10,406	--	5,173	14,142	--	958

Day	January			February			March		
1.....	393			510			420		
2.....	398			510			393		
3.....	402			515			388		
4.....	406			520			335		
5.....	406			540			406		
		14	16		23	33		17	18
6.....	411			545			447		
7.....	416			540			406		
8.....	429			545			393		
9.....	434			550			388		
10.....	442			565			384		
11.....	429			576	26	40	388		
12.....	438			592			380		
13.....	438			609			363		
14.....	447			631			351		
15.....	434			604	--	b 50	332		
		12	14					16	16
16.....	438			587			393		
17.....	438			582	62	97	375		
18.....	438			570	23	35	351		
19.....	447			565	28	43	332		
20.....	452			515	26	36	343		
21.....	465			490			347	28	26
22.....	447			510			355	27	26
23.....	442			500			460	110	137
24.....	456			500			550	150	a 220
25.....	465			490	25	33	480	118	153
26.....	470	18	23	480			429	71	82
27.....	470			456			420	38	43
28.....	470			429			411	35	39
29.....	480			--	--	--	411	25	28
30.....	490			--	--	--	406	27	30
31.....	505			--	--	--	398	23	25
Total.	13,696	--	553	15,026	--	1,095	12,235	--	1,149

s Computed by subdividing day.
a Computed from estimated concentration graph.
b Computed from water-sediment discharge curve.

RIO GRANDE BASIN--Continued

RIO GRANDE AT EMBUDO, N. MEX.--Continued

Suspended sediment, water year October 1953 to September 1954--Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	384			434	75	88	420	14	16
2	371			452	77	94	384	14	15
3	367			420	42	48	363	10	a10
4	375			411	31	34	343	4	4
5	402			398	43	46	335		
		35	39						
6	424			384	35	36	335	--	b5
7	456			384	37	38	328		
8	456			380	45	a46	314		
9	470			375	53	54	304		
10	465			420	65	74	296	9	7
11	456	57	70	555	229	343	293		
12	456	51	63	565	210	320	300		
13	460	55	68	582	200	314	300		
14	500	83	112	604	233	380	304		
15	510	68	94	598	198	320	296		
								17	13
16	480	56	73	598	205	331	286		
17	470	57	72	626	188	318	272		
18	480	72	93	620	231	387	268		
19	510	106	146	592	148	237	268		
20	505	93	127	587	138	219	268		
21	490	80	106	560	85	129	268		
22	495	85	114	576	133	207	259		
23	500	63	85	702	285	540	262		
24	495	58	78	692	244	456	262		
25	490	64	85	658	170	302	256		
								34	24
26	485	64	84	614	95	157	262		
27	465	61	77	565	58	88	262		
28	442	74	88	535	64	92	256		
29	406	73	80	515	63	88	247		
30	398	60	64	495	27	36	241		
31	--	--	--	447	24	29	--	--	--
Total	13,663	--	2,169	16,344	--	5,851	8,852	--	447

Day	July			August			September		
1	238			217	45	26	208	35	20
2	235			211	60	34	202	47	26
3	241			211	57	32	202	67	37
4	253			208	57	32	220	72	43
5	253			211	49	28	262	67	47
		29	19						
6	241			241	58	38	244	104	69
7	223			377	3,220	sc8,660	235	63	40
8	241			384	3,000	3,110	232	70	44
9	265			259	270	189	235	80	51
10	262			253	260	178	232		
11	259			279	270	203	232		
12	256			265	250	179	235		
13	247			293	1,030	815	244	--	b50
14	232			293	600	a470	241		
15	229			290	200	a160	238		
		17	11						
16	229			282	141	107	235		
17	226			265	137	98	229	48	30
18	232			256	135	93	223	51	31
19	229			238	99	64	223	52	31
20	225			229	106	66	235	57	36
21	220	12	7	226	115	70	223	58	35
22	220	281	167	229	124	77	220	66	39
23	300	294	238	226	118	72	223	60	a36
24	351	290	275	223	80	48	232	50	a31
25	328	294	260	235	70	44	238	44	28
26	293	150	119	259	390	273	244	50	a33
27	276	110	82	226	99	60	247	50	a33
28	262	100	a71	217	98	57	244	53	35
29	282	1,320	1,010	214	76	44	247	50	a33
30	241	430	280	208	73	41	247	50	a33
31	229	50	31	208	44	25	--	--	--
Total	7,818	--	2,840	7,733	--	15,393	6,972	--	1,191

Total discharge for year (cfs-days) 134,918

Total load for year (tons) 38,436

s Computed by subdividing day.

a Computed from estimated concentration graph.

b Computed from water-sediment discharge curve.

c Computed from partly estimated concentration trace.

RIO GRANDE BASIN--Continued

RIO GRANDE AT EMBUDO, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1953 to September 1954
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N_n, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (cfs)	Water temperature (°F)	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 22, 1954.....	7:15 p.m.	217	68	326	2,320		45		63		91	93	96		98	100	SPWCM
Aug. 8.....	4:00 p.m.	293	68	1,080	3,520		73		88		96	99	100				SPWCM

RIO GRANDE BASIN--Continued

RIO CHAMA NEAR ABIQUIU, N. MEX.

LOCATION.--At gaging station at bridge on State Highway 96, 1¾ miles upstream from El Rito Creek, 5 miles downstream from Abiquiu, Rio Arriba County, and 13.5 miles downstream from Abiquiu dam site.
DRAINAGE AREA.--2,170 square miles, approximately.
RECORDS AVAILABLE.--Sediment records: January 1948 to September 1954.
EXTREMES, 1953-54.--Sediment concentrations: Maximum daily, 29,100 ppm Mar. 24; minimum daily, 11 ppm Jan. 2.
Sediment loads: Maximum daily, 50,600 tons Sept. 13; minimum daily, less than 0.50 ton on many days.
EXTREMES, 1948-54.--Sediment concentrations: Maximum daily, 53,000 ppm July 30, 1953; minimum daily, 3 ppm Mar. 30, 1951.
Sediment loads: Maximum daily, 113,000 tons July 28, 1952; minimum daily, less than 0.50 ton on many days.
REMARKS.--Maximum observed sediment concentration during water year, 53,900 ppm Sept. 4. Records of discharge for water year October 1953 to September 1954 given in WSP 1342. Stage-discharge relation affected by ice Dec. 4-16, 18-31, Jan. 1-6, 11-19, 23-28.

Suspended sediment, water year October 1953 to September 1954

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	4.1			44	226	27	22	130	a 8
2.....	5.0			41	209	23	21	116	7
3.....	4.4			42	209	24	20	96	5
4.....	4.1			45	198	24	8	93	2
5.....	5.0			54	247	36	7	87	2
6.....	4.6			100	1,670	451	7	71	1
7.....	5.3			110	1,690	502	7	66	1
8.....	4.4	30	(t)	90	3,920	953	6	87	1
9.....	4.6			75	1,920	389	6	31	1
10.....	5.7			60	772	125	6	41	1
11.....	5.7			50	395	53	7	28	1
12.....	3.7			50	453	61	8	30	a 1
13.....	8.5			52	423	59	8	28	1
14.....	9.5			53	270	39	8	37	1
15.....	16			54	269	39	8	87	2
16.....	22			56	215	33	9	20	(t)
17.....	12	50	3	60	206	33	10	26	1
18.....	16			65	326	57	11	30	1
19.....	34			70	166	31	12	31	1
20.....	45	296	36	70	159	30	10	25	1
21.....	75	800	162	55	247	37	7	55	1
22.....	90	5,040	1,220	55	182	27	7	40	a 1
23.....	80	6,160	1,330	62	386	65	7	30	1
24.....	70	1,000	189	69	215	40	8	27	1
25.....	60	2,820	457	57	177	27	9	19	(t)
26.....	60	1,810	293	71	218	42	10	41	1
27.....	50	520	70	69	185	34	9	28	1
28.....	45	263	32	69	222	41	9	36	1
29.....	45	270	33	59	196	31	9	34	1
30.....	45	304	37	28	156	12	8	16	(t)
31.....	47	272	35	--	--	--	8	20	(t)
Total.	888.6	--	3,915	1,835	--	3,345	292	--	49

t Less than 0.50 ton.
a Computed from estimated concentration graph.

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RIO GRANDE BASIN--Continued

RIO CHAMA NEAR ABIQUIU, N. MEX.--Continued

Suspended sediment, water year October 1953 to September 1954--Continued

Day	January			February			March		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	8	13	(t)	17	19	1	44	170	20
2	8	11	(t)	17	18	1	35	64	6
3	8	14	(t)	17	28	1	31	102	9
4	8	21	(t)	17	31	1	34	54	5
5	8	34	1	17	25	1	32	42	4
6	8	19	(t)	17	22	1	32	78	7
7	10	30	1	17	40	2	29	62	5
8	11	42	1	26	54	4	29	380	30
9	12	12	(t)	27	36	3	28	93	7
10	11	16	(t)	27	42	3	307	2,380	s4,020
11	10	30	1	25	47	3	684	3,800	7,020
12	10	28	1	28	49	4	665	2,170	3,900
13	10	28	1	274	5,250	s4,760	352	708	s821
14	8	28	1	255	2,500	1,720	86	120	28
15	13	31	1	241	1,450	944	47	96	12
16	14	27	1	213	1,500	863	38	118	12
17	10	25	1	213	740	426	35	75	7
18	17	17	1	142	220	84	31	148	12
19	14	44	2	132	260	93	32	148	13
20	16	30	1	132	480	171	31	41	3
21	14	51	2	136	323	119	32	89	8
22	12	46	1	132	352	125	35	84	8
23	12	27	1	132	260	93	102	2,080	s1,450
24	12	27	1	136	295	108	457	29,100	s41,400
25	12	24	1	302	3,550	s3,940	477	11,700	15,100
26	16	46	2	297	1,780	s1,640	455	2,600	3,190
27	11	33	1	81	420	92	314	1,500	1,270
28	12	38	1	45	200	24	179	2,320	1,120
29	17	41	2	--	--	--	146	2,860	1,130
30	19	42	2	--	--	--	394	3,950	s4,990
31	18	26	1	--	--	--	665	2,100	3,770
Total	369	--	32	3,115	--	15,227	5,858	--	89,377

Day	April			May			June		
1	500	1,610	2,170	1,240	3,400	11,400	695	610	1,140
2	241	1,160	755	1,220	1,690	5,570	695	520	976
3	167	1,040	469	874	1,600	a3,800	675	440	802
4	167	990	446	637	1,410	2,430	675	500	911
5	179	1,200	580	637	1,160	2,000	675	500	911
6	208	1,550	870	646	1,300	2,270	675	500	911
7	241	2,360	1,540	637	1,240	2,130	675	500	911
8	425	3,910	4,490	637	960	1,650	675	510	a930
9	705	4,300	8,190	646	1,410	2,460	675	480	875
10	758	5,150	10,500	684	1,620	2,990	675	410	747
11	850	5,660	13,000	737	1,910	3,800	665	480	862
12	823	6,100	a15,000	726	1,940	3,800	665	510	916
13	910	5,900	a14,000	726	1,680	3,290	675	480	875
14	936	5,100	12,900	737	1,990	3,960	646	410	715
15	668	2,690	s5,560	1,260	3,260	11,100	646	500	872
16	227	640	392	1,280	2,260	7,810	637	490	843
17	132	500	178	1,270	2,220	7,610	253	250	171
18	120	320	104	1,280	2,350	8,120	65	50	9
19	126	770	262	1,240	2,120	7,100	38	17	2
20	132	970	346	1,270	2,070	7,100	32	19	2
21	126	910	310	1,240	2,030	6,800	22	18	1
22	112	1,150	348	1,280	2,160	7,460	11	12	(t)
23	101	660	180	1,270	2,010	6,890	9.5	90	2
24	98	1,200	318	1,260	1,990	6,770	7.0	28	.5
25	98	800	212	1,240	1,930	6,460	6.0	29	.5
26	81	570	125	1,220	1,350	4,450	8.5	26	.6
27	75	770	156	898	1,030	2,500	8.0	40	.9
28	63	790	134	716	800	1,550	57	68	10
29	47	680	86	705	660	1,260	54	79	12
30	1,010	6,040	s20,000	705	640	1,220	71	2,160	s550
31	--	--	--	695	600	1,130	--	--	--
Total	10,426	--	113,621	29,613	--	146,880	11,366.0	--	14,959

s Computed by subdividing day.
t Less than 0.50 ton.
a Computed from estimated concentration graph.

RIO GRANDE BASIN--Continued

RIO CHAMA NEAR ABIQUIU, N. MEX.--Continued

Suspended sediment, water year October 1953 to September 1954--Continued

Day	July			August			September		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	52	1,250	176	20	100	a 5	56	21,100	s 4,320
2.....	56	1,400	212	16	80	3	24	2,000	130
3.....	49	1,000	132	13	77	3	18	900	44
4.....	47	600	76	10	69	2	400	18,100	s 38,600
5.....	54	700	102	12	76	2	769	7,000	14,500
6.....	56	800	121	54	1,620	s 543	507	5,000	6,840
7.....	54	400	58	140	12,200	s 4,800	470	2,500	3,170
8.....	550	2,980	s 7,160	75	6,000	1,220	463	1,000	1,250
9.....	1,140	11,800	s 33,300	124	10,300	s 6,490	448	1,400	1,690
10.....	1,040	7,200	20,200	93	5,820	s 2,900	468	2,750	s 4,060
11.....	705	800	1,520	86	6,800	1,580	463	6,100	7,630
12.....	748	12,000	s 27,100	50	4,600	a 620	463	1,500	1,880
13.....	705	1,800	3,430	96	19,200	s 5,460	846	20,400	s 50,600
14.....	665	850	1,530	52	6,600	927	380	12,500	12,800
15.....	665	380	682	34	2,800	257	355	900	863
16.....	737	1,880	s 4,980	41	2,300	255	297	600	481
17.....	628	1,600	2,710	78	6,970	s 2,660	142	198	76
18.....	665	11,200	20,100	54	1,600	233	56	138	21
19.....	609	2,400	3,950	42	650	74	41	108	12
20.....	590	500	796	84	7,770	s 3,910	32	100	a 9
21.....	573	380	588	56	5,650	854	29	96	8
22.....	573	300	464	50	2,400	324	29	84	7
23.....	716	4,800	9,280	28	2,150	163	26	118	8
24.....	372	5,000	5,020	25	1,350	91	26	118	8
25.....	123	800	266	25	600	40	29	72	6
26.....	89	600	a 140	42	6,000	680	59	583	93
27.....	50	500	68	23	4,100	255	67	653	118
28.....	35	146	14	19	2,000	a 100	75	588	119
29.....	29	170	13	19	1,000	a 51	59	3,570	569
30.....	23	125	8	17	431	20	41	2,010	223
31.....	25	292	20	23	1,050	65	--	--	--
Total.	12,423	--	144,216	1,501	--	34,587	7,138	--	150,135

Total discharge for year (cfs-days) 84,824.6
Total load for year (tons) 716,343

s Computed by subdividing day.
t Less than 0.50 ton.
a Computed from estimated concentration graph.

RIO CHAMA NEAR ABIQUIU, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1953 to September 1954
(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; V, visual accumulation tube)

Date of collection	Time	Discharge (cfs)	Water temperature (°F)	Suspended sediment											Methods of analysis
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters									
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
Mar. 11, 1954 ...	3:45 p.m.	675	44	3,550	4,600		34		55		86	96	99		100		VPWCM
Mar. 24	4:10 p.m.	455	46	36,400	3,960		64		91		100	--	--		--		VPWCM
Apr. 1	2:55 p.m.	380	53	1,560	4,840		34		55		96	99	100		--		VPWCM
Apr. 8	2:25 p.m.	485	57	3,980	3,800		39		60		93	98	100		--		VPWCM
Apr. 21	2:20 p.m.	123	60	867	3,490		88		98		100	--	--		--		SPWCM
May 12	3:05 p.m.	748	63	1,700	4,240		34		47		72	90	98		100		VPWCM
May 19	3:20 p.m.	1,240	63	1,820	6,100		12		19		43	77	92		99	100	VPWCM
July 8	11:45 a.m.	e 900	75	13,100	4,670		43		59		96	100	--		--		VPWCM
Aug. 7	10:20 a.m.	146	--	13,000	3,560		82		99		100	--	--		--		SPWCM
Sept. 1	1:45 p.m.	38	80	32,800	4,420		73		99		100	00	--		--		SPWCM
Sept. 4	5:55 a.m.	17	63	583	1,440		90		99		100	--	--		--		SPWCM
Sept. 4	1:00 p.m.	949	71	45,800	3,820		44		79		98	100	--		--		VPWCM
Sept. 30	3:15 p.m.	38	67	1,360	3,790		96		100		--	--	--		--		SPWCM

e Estimated.

RIO GRANDE BASIN--Continued

RIO CHAMA NEAR CHAMITA, N. MEX.

LOCATION.--At gaging station 200 feet downstream from bridge on U. S. Highway 285, 2½ miles upstream from mouth, and 2½ miles northwest of Chamita, Rio Arriba County.
DRAINAGE AREA.--3,200 square miles, approximately.
RECORDS AVAILABLE.--Water temperatures: October 1950 to September 1954.
Sediment records: October 1947 to September 1954.
EXTREMES, 1953-54.--Water temperatures: Maximum observed, 88°F June 28, July 28; minimum, freezing point on many days during December and January.
Sediment concentrations: Maximum daily, 36,000 ppm Aug. 6; minimum daily, 12 ppm June 21.
Sediment loads: Maximum daily, 46,600 tons Sept. 13; minimum daily, less than 0.50 ton, on many days.
EXTREMES, 1947-54.--Water temperatures (1950-54): Maximum observed, 89°F July 19, 1951; minimum, freezing point on many days during winter months.
Sediment concentrations: Maximum daily, 40,100 ppm Aug. 3, 1950; minimum, no flow on many days.
Sediment loads: Maximum daily, 139,000 tons May 17, 1952; minimum daily, 0 tons on many days.
REMARKS.--Maximum observed sediment concentration during water year 62,700 ppm Sept. 4. Records of discharge for water year October 1953 to September 1954 given in WSP 1342. Stage-discharge relation affected by ice Dec. 4 to Jan. 28.

Temperature (°F) of water, water year October 1953 to September 1954
(Once-daily measurement generally between 11 a.m. and 6 p.m.)

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	70	55	43	32	50	48	53	62	69	75	80	86
2	71	57	a 42	a 32	47	48	a 44	a 50	66	82	81	81
3	a 53	56	42	32	48	41	a 44	61	67	a 65	80	77
4	a 60	55	32	a 32	a 34	51	a 46	62	69	75	--	75
5	a 62	46	--	32	51	50	62	a 55	b 66	--	b 75	73
6	69	48	a 32	32	46	50	65	68	a 67	--	a 72	75
7	71	49	35	33	51	55	61	a 59	66	82	--	a 65
8	73	49	a 32	33	50	55	56	a 55	67	80	a 63	72
9	71	49	34	32	48	52	63	b 61	a 64	b 71	a 68	72
10	70	47	34	32	47	60	b 56	57	70	a 69	b 69	69
11	69	a 38	a 32	32	51	44	a 56	b 51	71	a 64	b 73	--
12	70	a 38	32	32	--	40	58	65	a 60	--	a 63	b 65
13	a 60	51	33	32	--	a 32	59	63	65	77	b 73	b 68
14	70	b 49	35	33	--	49	58	68	b 63	a 71	a 63	71
15	68	51	33	34	--	44	61	a 63	71	75	--	b 68
16	63	53	33	33	--	45	a 45	--	74	72	a 63	71
17	a 61	49	32	32	a 37	48	a 65	a 52	--	a 76	a 65	75
18	64	49	a 32	34	43	50	57	a 53	b 74	--	a 63	a 66
19	64	42	a 32	--	43	41	61	68	72	76	a 58	a 58
20	57	42	a 34	39	45	48	63	67	--	80	--	75
21	a 49	42	40	40	46	a 39	61	69	82	79	--	72
22	55	a 32	33	41	48	52	62	63	b 74	73	--	a 60
23	57	43	32	40	48	48	61	a 56	83	a 76	a 63	71
24	a 49	44	32	40	43	48	a 52	61	b 77	a 71	a 59	--
25	53	40	--	37	52	45	a 57	63	85	a 76	a 63	67
26	56	45	a 32	39	50	50	65	66	b 70	82	a 62	a 58
27	58	43	32	42	a 36	a 40	67	66	83	80	--	a 58
28	57	a 40	32	43	44	49	67	63	88	88	--	70
29	58	a 40	32	48	--	53	61	66	87	86	a 70	65
30	58	45	32	49	--	53	54	63	82	78	82	67
31	58	--	32	50	--	52	--	a 59	--	b 76	82	--
Average	62	46	34	36	46	48	58	61	72	76	--	70

a Measurement before 11 a.m.
b Measurement after 6 p.m.

RIO GRANDE BASIN--Continued

RIO CHAMA NEAR CHAMITA, N. MEX.--Continued

Suspended sediment, water year October 1953 to September 1954

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Tons per day	Mean discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Tons per day	Mean discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Tons per day
1	0.4			48	316	41	45	200	24
2	.4			46	272	34	46	155	19
3	.4			46	229	28	48	130	17
4	.4			45	238	29			
5	.5			46	900	112			
		25	(t)				40	182	20
6	.5			154	7,400	3,080			
7	.4			144	9,250	3,600			
8	.4			105	3,300	936			
9	.4			92	3,100	770			
10	.7			77	2,000	416			
11	.4			66	777	138			
12	.4			59	506	81			
13	.6			55	319	47			
14	.6			55	361	54			
15	.6			57	333	51			
		30	(t)						
16	.6			57	260	40			
17	.7			59	237	38			
18	.7			61	237	39			
19	.8			66	280	50	30	165	13
20	72	18,700	s 4,870	72	360	70			
21	52	2,900	407	81	340	74			
22	66	1,900	339	68	320	59			
23	54	6,000	875	66	390	69			
24	68	4,700	863	81	400	87			
25	55	1,000	148	77	400	83			
26	54	1,000	146	79	470	100			
27	55	937	139	84	460	104			
28	57	644	99	92	600	149			
29	54	474	69	89	480	115			
30	48	392	51	61	325	54			
31	48	348	45	--	--	--			
Total	692.9	--	8,052	2,188	--	10,548	1,019	--	452

Day	January			February			March		
1				50	180	24	63	209	36
2				52	150	21	55	139	21
3				50	167	23	55	109	16
4				50	136	18	57	182	28
5				52	128	18	55	166	25
	30	143	12						
6				54	100	15	54	150	22
7				52	193	27	54	151	22
8				50	134	18	48	107	14
9				59	148	24	41	90	10
10				57	176	27	114	2,450	s 2,420
11				57	199	31	472	7,500	9,560
12				59	183	29	472	4,700	5,990
13				157	5,520	s 3,050	340	3,050	2,800
14				203	4,350	2,380	111	1,050	315
15				182	2,450	1,200	57	280	43
	40	261	28						
16				186	1,550	778	34	95	9
17				189	1,450	740	26	336	24
18				154	900	374	28	549	42
19				150	500	202	24	227	15
20				147	451	179	25	148	10
21				158	413	176	26	129	9
22				158	338	144	18	86	4
23				154	384	160	30	790	64
24				150	340	138	415	29,300	s 37,100
25	50	235	32	214	4,340	s 3,430	454	17,400	21,300
26				262	3,600	2,550	450	5,700	6,930
27				124	600	201	385	2,250	2,340
28				74	297	59	192	3,350	1,740
29	50	214	29	--	--	--	144	4,300	1,670
30	50	187	25	--	--	--	316	8,300	s a 9,900
31	50	156	21	--	--	--	630	6,400	10,900
Total	1,250	--	731	3,304	--	16,036	5,245	--	113,379

s Computed by subdividing day.
t Less than 0.50 ton.
a Computed from estimated concentration graph.

RIO GRANDE BASIN--Continued

RIO CHAMA NEAR CHAMITA, N. MEX.--Continued

Suspended sediment, water year October 1953 to September 1954--Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	546	3,200	4,720	1,250	7,200	24,300	654	1,180	2,080
2.....	312	1,200	1,010	1,210	5,650	18,500	654	940	1,660
3.....	189	600	306	1,090	4,450	13,100	630	881	1,500
4.....	196	480	254	900	2,900	7,050	638	826	1,420
5.....	206	450	250	702	2,000	3,790	616	827	1,380
6.....	286	1,150	888	654	1,850	3,270	623	949	1,600
7.....	358	2,800	2,710	646	2,000	3,490	616	802	1,330
8.....	518	5,200	7,270	630	2,200	3,740	616	674	1,120
9.....	820	6,750	14,900	595	2,150	3,450	623	838	1,410
10.....	860	6,800	15,800	581	2,450	3,840	616	1,130	1,880
11.....	1,020	6,550	18,000	678	3,550	6,500	623	705	1,190
12.....	1,110	6,400	19,200	702	3,350	6,350	609	744	1,220
13.....	1,130	5,550	16,900	719	2,750	5,340	609	898	1,480
14.....	1,270	5,800	19,900	710	2,150	4,120	602	625	1,020
15.....	1,140	4,100	12,600	1,080	6,100	17,800	588	744	1,180
16.....	595	2,050	3,290	1,270	6,450	22,100	574	230	356
17.....	466	3,100	3,900	1,420	5,650	21,700	335	115	104
18.....	472	2,050	2,610	1,400	4,750	18,000	63	52	9
19.....	448	1,200	1,450	1,340	4,350	15,700	26	26	2
20.....	405	1,650	1,800	1,340	3,650	13,200	13	.23	1
21.....	348	800	752	1,270	2,740	9,400	7.5	12	(t)
22.....	290	563	441	1,270	2,770	9,500	5.7	22	(t)
23.....	262	557	394	1,290	2,820	9,820	5.7	15	(t)
24.....	230	511	317	1,220	2,760	9,090	5.7	28	(t)
25.....	206	629	350	1,180	2,220	7,070	12	157	5
26.....	189	331	169	1,200	2,230	7,230	10	220	6
27.....	172	314	146	977	1,640	4,330	8	82	2
28.....	140	302	114	773	1,600	3,340	6	90	1
29.....	121	229	75	737	1,330	2,650	4	99	1
30.....	818	8,750	s 26,800	719	1,240	2,410	5.6	970	s a 230
31.....	--	--	--	686	1,510	2,800	--	--	--
Total.	15,123	--	177,316	30,239	--	282,980	10,398.2	--	22,188

Day	July			August			September		
1.....	52	15,200	2,130	4.3	54	1	22	10,800	s 1,380
2.....	31	6,600	552	2.9	57	(t)	16	10,600	458
3.....	38	800	82	2.0	58	(t)	12	3,100	100
4.....	28	350	26	1.0	45	(t)	200	13,400	7,240
5.....	31	400	33	115	7,560	s 24,800	750	19,900	40,300
6.....	15	900	36	141	36,000	s 22,400	586	7,450	s 12,500
7.....	8.0	1,050	23	114	13,800	4,250	448	3,200	3,870
8.....	230	3,150	s 7,290	52	7,000	983	466	2,700	3,400
9.....	1,090	6,500	19,100	47	18,700	s 3,550	460	2,050	2,550
10.....	1,070	8,000	23,100	98	22,600	s 7,690	460	2,100	2,610
11.....	737	2,050	4,080	94	23,000	s 6,120	472	10,200	13,000
12.....	686	10,300	19,100	52	6,500	913	454	4,100	5,030
13.....	638	2,720	4,690	134	16,400	s 7,130	783	18,700	s 46,600
14.....	602	990	1,610	57	14,100	2,170	410	29,800	33,000
15.....	595	750	1,200	35	4,500	425	376	4,600	4,670
16.....	595	2,080	3,340	20	1,000	54	344	1,700	1,580
17.....	623	11,800	19,800	45	5,960	s 1,560	176	840	399
18.....	616	15,500	25,800	23	5,900	366	41	360	40
19.....	567	7,000	10,700	12	700	23	25	200	14
20.....	532	1,000	1,440	9.5	300	8	19	130	7
21.....	532	600	862	53	10,700	s 2,210	14	100	4
22.....	525	650	921	35	3,700	350	14	65	2
23.....	764	4,000	8,250	15	1,700	69	11	70	2
24.....	553	6,500	9,710	10	1,300	35	28	679	s 123
25.....	168	1,100	499	7	2,600	49	16	865	37
26.....	89	420	101	26	10,000	702	43	580	67
27.....	57	598	92	7.1	1,100	21	50	755	102
28.....	24	290	19	4.8	597	8	52	720	101
29.....	14	187	7	3.9	231	2	59	1,000	159
30.....	8.0	107	2	3.9	153	2	38	1,760	181
31.....	6.2	83	1	3.4	197	2	--	--	--
Total.	11,524.2	--	164,596	1,227.8	--	85,894	6,845	--	179,526

Total discharge for year (cfs-days)..... 89,056.1
Total load for year (tons)..... 1,061,698

s Computed by subdividing day.
a Computed from estimated concentration graph.
t Less than 0.50 ton.

RIO GRANDE BASIN--Continued

RIO CHAMA NEAR CHAMITA, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1953 to September 1954
(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; V, visual accumulation tube)

Date of collection	Time	Discharge (cfs)	Water temperature (°F)	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. 20, 1953	8:30 a.m.	84	51	24,700	3,560		58		86		99	99	100		--	--	VPWCM
Nov. 6	3:05 p.m.	186	48	6,100	5,080		60		79		89	95	98		100	--	VPWCM
Dec. 3	11:20 a.m.	48	36	141	--		--		--		61	72	100		--	--	S
Feb. 14, 1954	4:15 p.m.	214	--	3,410	5,110		45		68		83	91	99		100	--	VPWCM
Feb. 24	12:00 m.	150	43	338	1,340		29		37		46	60	85		100	--	SPWCM
Feb. 26	2:25 p.m.	270	50	2,700	3,700		39		60		81	93	98		100	--	VPWCM
Mar. 11	5:20 p.m.	472	44	6,450	3,970		28		43		62	76	84		93	100	VPWCM
Apr. 10	6:40 p.m.	850	56	6,260	4,100		29		41		65	80	89		96	100	VPWCM
May 10	3:40 p.m.	567	57	2,290	2,800		9		12		29	61	94		99	100	VPWCM
July 1	1:30 p.m.	38	75	22,900	3,380		82		100		--	--	--		--	--	SPWCM
July 10	9:50 a.m.	1,060	69	5,110	3,580		35		47		64	73	84		93	99	VPWCM
Aug. 6	10:35 a.m.	57	72	33,300	4,900		81		98		100	--	--		--	--	SPWCM
Aug. 8	7:30 a.m.	84	63	11,400	3,680		89		98		100	--	--		--	--	SPWCM
Sept. 1	2:50 p.m.	72	86	7,230	3,640		81		98		100	--	--		--	--	SPWCM
Sept. 5	10:45 a.m.	728	--	16,300	4,240		47		69		90	97	99		100	--	VPWCM
Sept. 10	3:00 p.m.	454	69	2,330	4,380		23		36		65	89	98		100	--	VPWCM
Sept. 13	6:15 p.m.	719	68	13,400	3,560		47		69		92	98	100		--	--	VPWCM
Sept. 27	8:40 a.m.	55	58	689	1,920		82		97		99	100	--		--	--	SPWCM

RIO GRANDE AT OTOWI BRIDGE NEAR SAN ILDEFONSO, N. MEX.

LOCATION.--At gaging station on downstream side of pier of former railway bridge (now removed), 400 feet downstream from bridge on State Highway 4, 1¾ miles southwest of San Ildefonso Pueblo, San Ildefonso Pueblo Grant, 2½ miles downstream from Rio Pojoaque, and 7 miles west of Pojoaque, Santa Fe County.
DRAINAGE AREA.--14,300 square miles, approximately (includes 2,940 square miles in closed basin in northern part of San Luis Valley, Colo.).
RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1954.
Water temperatures: October 1948 to September 1954. Seven-day mercury actuated thermograph installed Apr. 2, 1954.
Sediment records: October 1947 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 536 ppm Mar. 11; minimum, 157 ppm June 1-10.
Hardness: Maximum, 292 ppm Mar. 11; minimum, 100 ppm June 1-10.
Specific conductance: Maximum observed, 852 micromhos Sept. 14; minimum observed, 234 micromhos June 9.
Water temperatures: Maximum, 88°F Aug. 4, 5; minimum, freezing point on several days in December and January.
Sediment concentrations: Maximum daily, 34,400 ppm Aug. 6; minimum daily, 21 ppm Oct. 2.
Sediment loads: Maximum daily, 73,700 tons Aug. 10; minimum daily, 11 tons Oct. 2.
EXTREMES, 1946-54.--Dissolved solids: Maximum, 884 ppm Aug. 26, 1951; minimum, 137 ppm June 11-20, 1952.
Hardness: Maximum, 572 ppm Aug. 26, 1951; minimum, 85 ppm June 21-30, 1949.
Specific conductance: Maximum observed, 1,230 micromhos Aug. 26, 1951; minimum observed, 165 micromhos June 13, 1952.
Water temperatures (1948-54): Maximum observed, 88°F Aug. 4, 5, 1954; minimum, freezing point on many days during winter months.
Sediment concentrations (1947-54): Maximum daily, 34,400 ppm Aug. 6, 1954; minimum daily, 18 ppm Sept. 24, 26, 1953.
Sediment loads (1947-54): Maximum daily, 184,000 tons July 14, 1950; minimum daily, 9 tons Sept. 22, 24, 26, 1953.
REMARKS.--Maximum observed sediment concentration during water year, 149,000 ppm Aug. 10. Values reported for dissolved solids are sums of determined constituents. Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge for water year October 1953 to September 1954 given in WSP 1342.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-10, 1953	205	30		38	8.1	27	--	176	0	38	10		0.5		239	0.33	132	128	0	31	1.0	368	7.4
Oct. 11-20	257	30		39	8.0	30	--	175	0	46	12		.6		252	.34	175	133	0	33	1.1	389	7.5
Oct. 21-31	381	32		52	10	37	--	188	0	75	14		1.0		313	.43	322	170	16	32	1.2	491	7.8
Nov. 1-10	462	33		49	10	35	--	186	0	73	12		.6		304	.41	379	164	11	32	1.2	462	8.0
Nov. 11-20	434	29		48	10	34	--	183	0	75	13		.6		300	.41	352	161	11	31	1.2	459	7.7
Nov. 21-30	498	29		47	10	33	--	180	0	72	14		.4		294	.40	395	158	11	31	1.1	447	7.7
Dec. 1-10	528	28		39	8.3	25	--	158	0	50	11		1.0		240	.33	342	132	2	29	1.0	370	7.8
Dec. 11-20	523	30		41	8.5	26	--	162	0	46	10		.6		242	.33	342	138	5	29	1.0	380	7.7
Dec. 21-31	498	29		38	8.0	24	--	158	0	44	9.5		.6		230	.31	309	128	0	29	.9	356	7.7
Jan. 1-10, 1954	472	29		38	8.2	25	--	160	0	44	10		.4		234	.32	298	128	0	30	.9	363	7.7
Jan. 11-20	494	30		37	7.1	25	3.4	154	0	41	9.5		.6		230	.31	307	122	0	30	1.0	349	7.4
Jan. 21-31	526	38		34	7.6	28	3.3	148	0	42	9.5		.6		236	.32	335	116	0	34	1.1	338	7.6
Feb. 1-10	595	45		32	8.3	28	3.0	148	0	43	9.0		.5		242	.33	389	114	0	34	1.1	335	8.0
Feb. 11-20	776	27		44	8.8	28	3.5	151	0	71	9.5		.9		267	.36	559	146	22	29	1.0	401	7.4
Feb. 21-28	698	27		44	9.3	26	--	153	0	71	8.5		.8		262	.36	494	148	22	28	.9	411	7.3
Mar. 1-10	475	30		41	8.6	28	--	163	0	57	9.5		.3		254	.35	326	138	4	31	1.0	398	7.4
Mar. 11	994	20		84	20	61		134	20	249	16		.1		536	.73	1,440	292	149	31	1.6	789	8.5

RIO GRANDE AT OTOWI BRIDGE NEAR SAN ILDEFONSO, N. MEX.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Mar. 12-20, 1954	575	27		45	9.3	27	--	166	0	65	8.5		0.4		264	0.36	410	150	14	28	1.0	412	7.7
Mar. 21-31	692	23		53	11	38	--	177	0	101	9.0		.5		322	.44	602	177	32	32	1.2	511	7.7
Apr. 1-10	784	23		54	10	26	--	169	0	80	7.5		.8		284	.39	601	176	37	24	.9	456	7.6
Apr. 11-20	1,322	19		44	6.9	15	--	152	0	44	5.0		1.9		211	.29	753	138	14	19	.6	340	7.6
Apr. 21-30	683	23		39	6.2	20	3.0	144	0	42	7.2		.4		212	.29	391	123	5	26	.8	327	7.5
May 1-10	1,287	17		44	4.2	12	2.8	150	0	29	4.8		.9		189	.26	657	128	4	17	.5	307	7.4
May 11-20	1,686	18		40	4.5	12	2.5	138	0	30	4.5		.7		180	.24	820	118	6	18	.5	289	7.6
May 21-31	1,669	18		37	4.0	10	2.6	125	0	27	3.8		.4		164	.22	739	109	6	16	.4	261	7.5
June 1-10	988	18		33	4.2	11	2.7	114	0	28	4.2		.2		157	.21	419	100	6	19	.5	246	7.3
June 11-20	665	20		35	5.5	15	--	128	0	36	4.5		.3		179	.24	321	110	5	23	.6	281	7.2
June 21-30	226	24		39	7.4	25	--	160	0	45	7.0		.4		227	.31	139	128	0	30	1.0	352	7.4
July 1-9	337	29		43	8.3	25	--	174	0	48	8.0		.7		248	.34	226	142	0	28	.9	372	7.5
July 10	1,310	23		75	11	30	--	164	0	154	2.0		1.5		378	.51	1,340	232	98	22	.9	542	7.2
July 11-18, 20	805	24		45	4.9	14	--	150	0	39	3.5		.7		205	.28	446	132	10	19	.5	325	7.4
July 19	743	20		61	8.5	26	--	194	0	85	3.0		.2		299	.41	600	187	28	23	.8	467	7.0
July 21-31	559	26		42	6.4	22	--	153	0	45	6.5		.7		224	.30	338	132	6	27	.8	364	7.4
Aug. 1-10	290	33		59	8.5	25	--	218	0	44	7.0		1.2		285	.39	223	182	4	23	.8	440	7.5
Aug. 11-20	316	29		60	8.5	31	--	206	0	67	10		1.9		308	.42	263	184	16	27	1.0	476	7.6
Aug. 21-31	217	31		54	8.5	30	--	197	0	56	9.5		1.3		287	.39	168	170	8	28	1.0	442	7.6
Sept. 1-10	528	25		64	9.0	26	--	203	0	76	7.5		.8		308	.42	439	196	30	22	.8	476	7.4
Sept. 11-12, 16-20	457	25		56	10	28	--	181	0	81	7.5		1.0		298	.41	368	180	32	25	.9	458	7.6
Sept. 13-15	758	21		83	16	49	--	201	0	194	9.0		1.4		472	.64	966	273	108	28	1.3	682	7.7
Sept. 21-30	266	29		48	10	31	--	182	0	64	11		.7		283	.38	203	161	12	30	1.1	437	7.5
Weighted average	622	25		44	7.4	22	--	157	0	53	7.5		0.7		237	0.32	400	140	12	25	0.8	369	--

RIO GRANDE AT OTOWI BRIDGE NEAR SAN ILDEFONSO, N. MEX.--Continued

Temperature (°F) of water, water year October 1953 to September 1954
/Once-daily measurement before 11 a.m. October 1 to April 2; seven-day
mercury actuated thermograph April 3 to September 30/

Day	October	November	December	January	February	March	April		May		June		July		August		September	
							max	min	max	min	max	min	max	min	max	min	max	min
1	58	a 55	40	a 32	40	39	47		50	47	68	58	79	67	83	67	84	66
2	56	48	a 43	a 33	39	36	a 56		56	46	--	59	76	65	83	65	80	68
3	55	50	a 42	a 34	38	38	60	47	60	48	67	56	79	66	84	66	76	67
4	a 60	50	35	32	40	a 42	60	50	65	52	69	58	80	66	88	66	79	64
5	a 63	48	32	a 38	40	38	62	50	67	57	67	60	79	67	88	69	72	64
6	55	48	32	a 39	41	41	62	51	66	57	66	59	84	67	77	66	72	62
7	54	a 47	a 36	a 39	a 46	42	61	52	66	56	65	55	83	70	75	65	72	64
8	55	a 49	32	35	39	42	58	48	66	57	68	56	78	67	73	65	70	65
9	54	42	a 34	35	41	44	59	49	66	58	70	59	73	69	77	65	68	64
10	58	41	a 35	a 35	39	50	56	50	62	58	70	60	75	64	73	66	66	62
11	a 61	42	a 33	a 33	39	37	56	50	60	52	69	60	75	68	75	63	--	--
12	56	44	32	a 32	42	38	57	50	66	54	71	60	78	67	76	65	--	--
13	59	43	a 37	a 35	a 47	34	58	51	62	58	67	60	78	66	77	66	69	--
14	a 56	46	a 33	a 40	--	37	58	52	67	56	66	59	78	69	76	66	69	61
15	a 61	a 50	32	a 35	--	44	58	49	66	59	72	58	75	68	77	66	68	62
16	a 61	44	a 35	33	--	40	59	49	64	57	72	61	75	69	79	66	70	61
17	53	43	a 37	a 37	a 45	42	62	51	61	54	74	63	74	66	80	66	71	62
18	a 60	45	35	a 35	40	a 46	62	52	65	52	78	64	76	67	77	67	74	61
19	a 58	a 43	34	36	a 41	a 44	61	53	68	57	80	66	78	68	79	64	73	58
20	55	a 42	35	36	a 43	42	61	53	68	58	79	64	80	70	79	66	72	57
21	52	a 42	a 38	35	38	43	62	53	65	58	82	64	79	72	76	64	68	57
22	50	35	a 35	a 36	37	45	61	52	64	57	78	69	75	70	77	64	70	56
23	52	34	a 32	a 35	41	49	62	54	63	56	85	66	75	67	74	66	72	59
24	51	38	a 35	a 42	a 41	48	66	55	64	55	83	65	77	66	74	64	70	60
25	a 50	40	--	35	a 50	42	66	58	64	54	82	67	72	70	76	63	67	62
26	48	a 45	a 36	a 44	43	42	64	56	67	--	76	67	81	70	78	65	71	59
27	50	a 42	a 34	a 41	41	a 47	66	56	68	57	81	67	80	70	79	64	69	58
28	50	a 43	a 33	a 37	a 40	47	66	55	68	58	81	66	84	70	78	62	69	57
29	a 52	40	a 34	39	--	48	63	54	67	57	82	65	83	70	80	66	66	56
30	a 55	a 43	a 33	a 45	--	47	58	52	68	58	80	84	85	70	80	66	66	56
31	a 53	--	a 34	42	--	a 53	--	--	69	58	--	--	84	68	81	66	--	--
Average	55	44	35	37	41	43	61	52	64	55	74	62	79	68	78	65	71	61

a Measurement between 11 a.m. and 6 p.m.

RIO GRANDE BASIN--Continued

RIO GRANDE AT OTOWI BRIDGE NEAR SAN ILDEFONSO, N. MEX.--Continued

Suspended sediment, water year October 1953 to September 1954

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	196	27	14	360	119	116	591	223	356
2	194	21	11	360	114	111	630	300	510
3	194	28	15	360	125	122	665	260	467
4	203	26	14	355	94	90	635	140	240
5	206	24	13	350	97	92	549	148	219
6	206	25	14	781	3,350	s 7,830	478	95	123
7	216	29	17	635	1,160	1,990	397	76	81
8	211	53	30	491	500	663	418	57	64
9	216	40	23	473	770	983	456	60	74
10	211	35	20	451	600	731	464	117	147
11	221	43	26	434	290	340	496	162	217
12	229	40	25	434	175	205	496	134	179
13	237	43	28	430	157	182	460	107	133
14	251	43	29	426	121	139	501	99	134
15	256	55	38	426	112	129	510	109	150
16	254	43	29	422	127	145	524	61	86
17	254	60	41	422	99	113	549	58	86
18	254	45	31	430	99	115	560	78	118
19	248	37	25	460	137	170	565	118	180
20	369	8,280	s 10,400	451	113	138	570	85	131
21	359	3,750	3,630	456	123	151	580	88	138
22	350	600	567	418	77	87	560	84	127
23	360	400	389	405	114	125	510	130	179
24	422	2,800	3,190	456	153	188	456	109	134
25	442	1,500	1,790	464	110	138	487	120	a 160
26	389	345	362	496	117	157	510	144	198
27	386	256	267	520	181	254	491	88	117
28	386	223	232	565	196	299	491	92	122
29	382	164	169	608	225	369	473	100	128
30	360	131	127	596	196	315	464	63	79
31	360	120	117	--	--	--	460	79	98
Total	8,822	--	21,683	13,935	--	16,487	15,996	--	5,175

Day	January			February			March		
1	434	112	131	579	98	153	515	134	186
2	447	97	117	584	121	191	478	145	187
3	462	94	117	574	131	203	474	120	154
4	466	96	121	574	114	177	447	90	109
5	466	82	103	589	108	172	447	125	151
6	470	81	103	603	117	190	507	110	151
7	482	80	104	603	103	168	486	100	131
8	503	100	136	598	95	153	470	80	102
9	499	81	109	613	84	139	466	90	113
10	495	71	95	629	90	153	462	100	125
11	482	67	87	634	144	246	994	3,580	s 10,200
12	474	74	95	645	160	279	1,110	2,180	6,530
13	478	89	115	764	921	s 2,270	938	1,410	3,570
14	515	76	106	946	1,620	4,140	533	470	676
15	495	105	140	914	1,020	2,520	451	140	170
16	482	84	109	848	730	1,670	440	100	119
17	490	73	97	821	590	1,310	466	120	151
18	490	67	89	762	430	885	432	120	140
19	511	89	123	724	345	674	418	89	100
20	520	103	145	701	280	530	389	99	104
21	511	80	110	684	195	360	407	135	148
22	503	77	105	666	170	306	407	100	110
23	482	93	121	678	190	348	462	120	150
24	490	110	146	672	160	290	808	3,590	7,830
25	529	114	163	684	432	798	1,020	11,600	31,900
26	551	98	146	969	1,550	4,060	930	4,190	10,500
27	533	75	108	678	520	952	848	1,380	3,160
28	533	89	128	555	160	240	608	700	1,150
29	542	111	162	--	--	--	579	2,700	4,220
30	551	112	167	--	--	--	533	1,300	1,870
31	565	81	124	--	--	--	1,010	5,900	16,100
Total	15,451	--	3,722	19,291	--	23,577	18,535	--	100,307

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

RIO GRANDE BASIN--Continued

RIO GRANDE AT OTOWI BRIDGE NEAR SAN ILDEFONSO, N. MEX.--Continued

Suspended sediment, water year October 1953 to September 1954--Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	969	2,040	5,340	1,790	4,730	22,900	1,150	780	2,420
2.....	706	920	1,750	1,850	4,650	23,200	1,090	570	1,680
3.....	533	310	446	1,550	2,630	11,000	1,010	665	1,810
4.....	524	240	340	1,270	1,650	5,660	993	740	1,980
5.....	537	260	377	1,110	1,300	3,900	997	725	1,950
6.....	579	400	625	1,080	1,080	3,150	961	700	1,820
7.....	672	540	980	1,070	1,000	2,890	954	610	748
8.....	794	1,100	2,360	1,040	1,000	2,810	946	610	1,560
9.....	1,170	2,600	8,210	1,040	920	2,580	930	615	1,540
10.....	1,360	3,120	11,500	1,070	900	2,600	870	615	1,440
11.....	1,470	3,500	13,900	1,420	2,100	8,050	863	505	1,180
12.....	1,560	4,000	16,800	1,430	1,960	7,570	848	405	927
13.....	1,620	4,080	17,800	1,370	1,890	6,990	885	445	1,060
14.....	1,780	4,880	23,500	1,360	1,320	4,850	878	370	877
15.....	1,770	3,580	17,100	1,670	2,750	12,400	834	490	1,100
16.....	1,150	1,480	4,600	1,910	3,300	17,000	814	500	1,100
17.....	993	1,200	3,220	2,030	2,940	16,100	666	330	593
18.....	993	1,200	3,220	1,970	2,950	15,700	348	150	141
19.....	993	1,100	2,950	1,850	2,190	10,900	271	95	70
20.....	892	790	1,900	1,850	2,130	10,600	246	80	53
21.....	781	410	865	1,790	2,530	12,200	246	85	56
22.....	737	330	657	1,850	2,000	9,990	220	54	32
23.....	731	400	789	2,030	2,240	12,300	211	70	40
24.....	689	495	921	2,030	2,440	13,400	206	53	29
25.....	655	610	1,080	1,970	2,000	10,600	209	48	27
26.....	655	320	566	1,970	2,030	10,800	261	480	338
27.....	593	285	456	1,700	1,660	7,620	251	190	129
28.....	560	200	302	1,330	1,100	3,950	225	77	47
29.....	503	190	258	1,230	1,000	3,320	213	73	42
30.....	925	3,600	s 14, 900	1,240	1,130	3,780	213	650	374
31.....	--	--	--	1,220	940	3,100	--	--	--
Total.	27,894	--	157,712	48,090	--	281,910	18,789	--	25,163

Day	July			August			September		
1.....	255	970	589	184	570	283	178	1,190	572
2.....	225	1,410	857	174	233	109	197	2,370	1,260
3.....	234	290	183	172	175	81	184	2,800	1,390
4.....	237	240	154	165	166	74	206	3,200	1,780
5.....	251	185	125	165	200	89	890	23,400	s 57,900
6.....	225	105	64	348	34,400	s 43,600	872	8,000	18,800
7.....	206	170	95	411	29,500	s 37,000	688	4,300	7,990
8.....	206	100	56	490	14,000	18,500	694	2,600	4,870
9.....	1,220	5,200	17,100	304	10,800	8,860	694	2,000	3,750
10.....	1,310	4,800	17,000	492	28,900	s 73,700	682	1,800	3,310
11.....	1,040	1,820	5,110	376	25,100	s 30,300	676	2,000	3,650
12.....	863	4,680	10,900	250	9,000	6,080	657	2,100	3,730
13.....	794	2,400	5,150	404	8,450	s 9,630	898	13,400	s 39,200
14.....	768	920	1,910	382	7,000	7,220	726	20,100	39,400
15.....	755	800	1,630	446	12,700	s 37,400	651	5,400	9,490
16.....	743	940	1,890	329	9,000	7,990	581	1,740	2,730
17.....	787	1,800	3,820	265	3,600	2,580	460	1,250	1,550
18.....	781	6,500	a 14,000	273	8,300	6,120	330	640	570
19.....	743	7,180	14,400	226	2,100	1,280	250	346	234
20.....	718	1,350	2,620	213	2,000	1,150	247	370	247
21.....	701	600	1,140	244	10,200	6,720	230	352	219
22.....	684	880	1,630	240	3,000	1,940	222	221	132
23.....	870	3,200	7,520	258	12,800	s 12,700	216	243	142
24.....	1,400	10,600	s 44,800	222	4,200	2,520	226	269	164
25.....	560	1,700	2,570	213	2,000	1,150	262	938	664
26.....	428	760	878	236	9,100	5,800	262	452	320
27.....	363	555	544	233	2,600	1,640	304	1,180	969
28.....	318	395	339	193	1,900	990	321	693	601
29.....	287	500	387	190	4,000	2,050	321	492	426
30.....	244	400	264	175	1,620	765	300	396	321
31.....	291	762	s 743	184	1,190	591	--	--	--
Total.	18,477	--	158,468	8,457	--	328,912	13,425	--	206,381

Total discharge for year (cfs-days) 227,162
Total load for year (tons) 1,329,497

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

RIO GRANDE BASIN--Continued

RIO GRANDE AT OTOWI BRIDGE NEAR SAN ILDEFONSO, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1953 to September 1954
(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, V, visual accumulation tube)

Date of collection	Time	Discharge (cfs)	Water temperature (°F)	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. 20, 1953	1:55 p.m.	393	57	18,400	3,830		57		86		98	99	99		99	100	VPWCM
Nov. 6	4:05 p.m.	900	50	4,270	3,720		46		65		83	87	90		95	100	VPWCM
Dec. 3	4:50 p.m.	671	--	312	--		--		--		34	44	84		100	--	VWCM
Feb. 15, 1954	9:45 a.m.	899	--	1,090	5,050		29		44		56	64	72		82	100	VPWCM
Mar. 11	2:15 p.m.	993	48	4,020	6,440		44		71		92	96	99		100	--	VPWCM
Apr. 1	10:05 a.m.	1,060	47	2,010	4,940		29		50		78	89	96		100	--	VPWCM
Apr. 10	10:05 a.m.	1,320	52	2,640	3,760		33		48		74	89	96		100	--	VPWCM
May 1	3:40 p.m.	1,790	50	4,240	4,470		24		36		69	87	96		99	100	VPWCM
May 20	9:20 a.m.	1,850	60	2,040	2,850		12		19		39	74	93		99	100	VPWCM
July 1	11:20 a.m.	266	72	798	3,160		24		40		92	96	100		--	--	VPWCM
July 10	8:00 a.m.	1,320	66	9,780	3,670		59		84		93	96	99		100	--	VPWCM
Aug. 6	2:10 p.m.	271	75	31,500	3,360		77		94		99	99	100		--	--	VPWCM
Aug. 10	5:15 p.m.	2,540	67	131,000	4,400		35		51		85	98	100		--	--	SPWCM
Aug. 23	5:25 p.m.	570	71	67,900	4,110		42		61		90	97	100		--	--	SPWCM
Sept. 4	11:15 p.m.	197	70	1,100	2,940		31		37		56	92	100		--	--	VPWCM
Sept. 5	2:15 a.m.	745	67	14,800	3,680		34		47		78	94	99		100	--	VPWCM
Sept. 5	5:30 p.m.	949	71	16,800	3,640		43		62		81	93	99		100	--	VPWCM
Sept. 10	8:50 a.m.	694	64	2,080	4,960		24		35		58	82	97		100	--	VPWCM
Sept. 27	9:45 a.m.	304	61	1,240	2,450		51		60		67	76	91		100	--	VPWCM

RIO GRANDE BASIN--Continued

GALISTEO CREEK AT DOMINGO, N. MEX.

LOCATION.--At gaging station in Santo Domingo Pueblo Grant, at highway bridge 0.3 mile northeast of Domingo, Sandoval County, 2¼ miles east of Santo Domingo Pueblo, and 4 miles upstream from mouth.
DRAINAGE AREA.--640 square miles, approximately.
RECORDS AVAILABLE.--Sediment records: January 1948 to September 1954.
EXTREMES, 1953-54.--Sediment concentrations: Maximum daily, 59,000 ppm May 11; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 252,000 tons Aug. 10; minimum daily, 0 tons on many days.
EXTREMES, 1948-54.--Sediment concentrations: Maximum daily, 88,800 ppm July 4, 1952; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 360,000 tons Aug. 11, 1952; minimum daily, 0 tons on many days.
REMARKS.--Maximum observed sediment concentration during year, 153,000 ppm Aug. 10. Records of discharge for water year October 1953 to September 1954 given in WSP 1342. Stage discharge relation affected by ice Dec. 16-29, Jan. 6-7, 10-11, 13-19, 21-26.

Suspended sediment, water year October 1953 to September 1954

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	0			0	--	0	0	--	.0
2.....	0			.1	--	--	.8	--	--
3.....	0			.1	--	--	.2	--	--
4.....	0			0	--	0	.2	--	--
5.....	0			1	--	--	6	--	--
6.....	0			17	--	--	0		
7.....	0			1	--	--	0		
8.....	0			.8	--	--	0		
9.....	0			.5	--	--	0		
10.....	0	--	0	.2	924		0	--	0
11.....	0			.2	--		0		
12.....	0			.3	--		0		
13.....	0			.2	--		0		
14.....	0			.2	--		0		
15.....	0			.2	--		0		
16.....	0			.2	--		.3	996	
17.....	0			.2	1,200	1	.3	--	
18.....	0			.4	--		.3	--	
19.....	0			.3	--		.4	--	
20.....	.4	667	s 2	.4	--		.5	--	
21.....	0			.4	--		.5	--	
22.....	0	--	0	.5	--		.4	--	
23.....	0			.3	--		.1	--	
24.....	.3	--	b 1	0			.2	--	1
25.....	.1	--	(b)(t)	0			.2	--	
26.....	0	--		0			.2	--	
27.....	.1	--		0	--	0	.2	--	
28.....	.1	--		0			.2	--	
29.....	.1	348	(t)	0			.2	--	
30.....	.1	--		0			.2	--	
31.....	.1	--		--			.2	--	
Total.	1.3	--	5	24.5	--	b 420	11.6	--	b 56

s Computed by subdividing day.
t Less than 0.50 ton.
b Computed from water-sediment discharge curve.

RIO GRANDE BASIN--Continued

GALISTEO CREEK AT DOMINGO, N. MEX.--Continued

Suspended sediment, water year October 1953 to September 1954--Continued

Day	January			February			March		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	0.1						0		
2	.1						0		
3	.2						0		
4	.4						0		
5	.5						0		
6	.5	1,850	2				0		
7	.5						0		
8	.7						0		
9	.4						0		
10	.4						0		
11	.2						0	--	0
12	.2						0		
13	.2						0		
14	.3						0		
15	.3						0		
16	.3						0		
17	.4						0		
18	.4						0		
19	.5						0		
20	.3						0		
21	.2						0		
22	.2						.5	--	b 2
23	.2						.1	648	(t)
24	.2						0		
25	.3						0		
26	.2						0		
27	0						0	--	0
28	0						0		
29	0						0		
30	0						0		
31	0						0		
Total	8.2	--	b 25	0	--	0	0.6	--	2

Day	April			May			June		
1				0.2	--	(bt)	0	--	0
2				.2	--	(bt)	0	--	0
3				0	--	0	0	--	0
4				0	--	0	0	--	0
5				0	--	0	0	--	0
6				0	--	0	0	--	0
7				0	--	0	0	--	0
8				0	--	0	0	--	0
9				0	--	0	0	--	0
10				7	--	b 500	0	--	0
11				209	59,000	a 56,000	0	--	0
12				6	8,500	138	0	--	0
13				.1	--	b 1	0	--	0
14				.1	--	b 1	0	--	0
15				0	--	0	0	--	0
16				0	--	0	0	--	0
17				496	40,900	s 154,900	0	--	0
18				79	23,200	s 9,670	0	--	0
19				1	1,000	a 3	0	--	0
20				0	--	0	0	--	0
21				0	--	0	0	--	0
22				0	--	0	0	--	0
23				1	--	b 1	0	--	0
24				1	--	b 1	0	--	0
25				1	--	b 1	0	--	0
26				0	--	0	0	--	0
27				0	--	0	6	35,000	a 1,400
28				0	--	0	.6	6,000	10
29				0	--	0	0	--	0
30				0	--	0	0	--	0
31				0	--	0	--	--	--
Total	0	--	0	801.6	--	220,315	6.6	--	1,410

s Computed by subdividing day.
t Less than 0.50 ton.
a Computed from estimated concentration graph.
b Computed from water-sediment discharge curve.

RIO GRANDE BASIN--Continued

GALISTEO CREEK AT DOMINGO, N. MEX.--Continued

Suspended sediment, water year October 1953 to September 1954--Continued

Day	July			August			September		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	0	--	0	0	--	0	40	33,200	s4,880
2	0	--	0	0	--	0	18	10,000	a490
3	0.2	--	b2	0	--	0	9	--	b50
4	28	44,200	s4,730	0	--	0	4	--	b6
5	3	6,000	a50	66	--	b16,000	2	--	b1
6	1	1,000	a3	4	--	b500	1	--	--
7	2	9,000	a50	182	39,000	s66,700	1	--	--
8	1	1,000	3	57	39,200	s9,770	1	--	(b)(t)
9	11	--	b1,000	1	6,000	16	1	--	--
10	4	--	b200	860	37,600	s252,000	11	10,600	s708
11	0	--	0	133	45,100	s21,300	55	33,000	sa9,400
12	0	--	0	58	34,700	s7,370	77	34,800	s14,900
13	0	--	0	32	37,200	s4,100	1	5,000	14
14	0	--	0	6	--	b500	1	3,000	8
15	0	--	0	45	--	b7,000	0	--	0
16	0	--	0	8	--	b600	0	--	0
17	0	--	0	78	38,600	s19,900	0	--	0
18	0	--	0	33	22,000	a2,000	0	--	0
19	1	--	b5	8	4,000	a90	0	--	0
20	3	--	b100	3	960	8	0	--	0
21	18	13,100	4,990	71	--	b9,000	0	--	0
22	19	39,600	s3,210	27	--	b3,000	0	--	0
23	14	16,900	s1,610	197	13,000	sa36,000	0	--	0
24	43	29,900	s10,600	328	36,200	s50,300	4	22,000	238
25	2	--	b3	52	10,000	1,400	2	6,000	32
26	1	--	b1	10	--	b60	2	3,000	a16
27	.1	335	(t)	5	--	b15	6	--	b320
28	82	--	b14,000	2	--	b10	3	--	b45
29	8	--	b150	1	--	b5	2	--	b14
30	12	34,000	1,140	58	40,000	a6,500	1	--	b2
31	1	3,000	8	64	37,400	s10,900	--	--	--
Total	254.3	--	41,855	2,389	--	525,044	242	--	31,124

Total discharge for year (cfs-days) 3,739.7
Total load for year (tons) 820,256

s Computed by subdividing day.
t Less than 0.50 ton.
a Computed from estimated concentration graph.
b Computed from water-sediment discharge curve.

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RIO GRANDE BASIN--Continued

GALISTEO CREEK AT DOMINGO, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1953 to September 1954
(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 V, visual accumulation tube)

Date of collection	Time	Discharge (cfs)	Water temperature (°F)	Suspended sediment												Methods of analysis
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000
Jan. 6, 1954	1:20 p.m.	5.6	38	2,140	2,960		43		64		90	96	100		--		VPWCM
May 17	2:30 p.m.	4,110	--	111,000	3,320		31		46		73	87	96		100		SPWCM
May 18.....	12:35 a.m.	520	--	54,700	4,140		47		64		88	96	99		100		SPWCM
July 4.....	2:45 a.m.	93.3	--	75,700	3,330		65		91		97	99	100		--		VPWCM
July 4.....	8:00 a.m.	39.4	--	51,700	3,920		81		99		100	--	--		--		VPWCM
July 22.....	9:35 p.m.	22.6	68	46,900	4,070		55		80		98	99	100		--		SPWCM
July 22.....	10:45 p.m.	236	68	120,000	3,840		49		74		92	96	99		100		SPWCM
July 24.....	10:45 a.m.	1.5	86	17,100	4,640		89		99		100	--	--		--		SPWCM
Aug. 10	4:10 p.m.	692	72	126,000	3,650		35		54		83	93	98		100		SPWCM
Aug. 10	6:45 p.m.	11,400	71	134,000	4,710		30		43		76	91	99		100		SPWCM
Aug. 12	5:15 p.m.	39.4	76	42,100	3,120		64		86		95	97	99		100		VPWCM
Aug. 31	10:15 a.m.	158	72	64,000	3,620		65		88		96	98	100		--		VPWCM
Sept. 13.....	11:10 a.m.	.05	80	4,640	4,460		91		99		99	100	--		--		SPWCM
Sept. 24.....	11:40 a.m.	25	68	44,800	3,390		73		93		99	100	--		--		VPWCM

RIO GRANDE BASIN--Continued

JEMEZ RIVER BELOW JEMEZ CANYON DAM, N. MEX.
(Formerly published as Jemez River near Bernalillo)

LOCATION.--At gaging station three-quarters of a mile downstream from Jemez Canyon Dam, 1½ miles upstream from mouth, and 6 miles north of Bernalillo, Sandoval County.
DRAINAGE AREA.--1,040 square miles, approximately.
RECORDS AVAILABLE.--Water temperatures: October 1950 to September 1954.
Sediment records: April 1948 to September 1954.
EXTREMES, 1953-54.--Water temperatures: Maximum observed, 92°F July 3, 27; minimum, freezing on several days in December and January.
Sediment concentrations: Maximum daily, 52,000 ppm July 23; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 150,000 tons (estimated) Sept. 26; minimum daily, 0 tons on many days.
EXTREMES, 1948-54.--Water temperatures (1950-54): Maximum observed, 93°F July 19,1953; minimum, freezing point on many days during winter months.
Sediment concentrations: Maximum daily 66,700 ppm Sept. 20, 1950; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 167,000 tons July 25, 1951; minimum daily, 0 tons on many days.
REMARKS.--Maximum observed sediment concentration during water year, 92,400 ppm July 23, Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge for water year October 1953 to September 1954 given in WSP 1342. Stage-discharge relation affected by ice Dec. 5-14, 22-31, Jan. 1-5.

Temperature (°F) of water, water year October 1953 to September 1954
/Once-daily measurement generally between 11 a. m. and 6 p. m.
No flow on many days/

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	--	--	50	--	55	55	58	--		--	--	--
2	--	--	--	--	55	50	55	--		--	--	--
3	--	64	38	36	60	--	77	76		92	--	--
4	--	--	32	34	58	53	--	a 68		--	--	--
5	--	--	--	35	59	64	65	84		--	--	--
6	--	a 56	--	34	--	58	70	78		--	--	--
7	--	42	--	36	--	--	68	85		--	--	--
8	--	--	--	45	57	62	70	84		--	--	--
9	--	57	--	--	57	64	71	--		--	--	--
10	--	--	32	--	55	61	--	a 74		--	--	--
11	--	--	32	34	58	58	--	66		--	a 71	--
12	--	--	--	31	61	40	71	84		--	--	--
13	--	60	--	31	--	39	74	68		--	--	--
14	--	--	--	33	--	--	64	84		--	--	--
15	--	--	--	32	51	52	65	65		--	--	--
16	--	--	--	36	60	55	72	--		--	84	--
17	--	--	--	--	60	56	75	79		--	a 68	--
18	--	50	39	35	60	51	--	77		--	--	--
19	--	37	--	36	40	56	75	66		--	--	--
20	--	49	--	35	42	47	75	79		--	--	--
21	--	42	42	37	--	--	79	70		--	--	--
22	--	--	32	36	55	58	79	--		--	--	--
23	--	--	34	--	61	56	78	--		85	--	--
24	69	--	32	--	52	45	82	65		73	a 72	--
25	--	50	--	35	58	55	--	84		89	--	--
26	--	--	32	52	52	65	a 61	70		88	--	--
27	64	49	--	41	42	--	80	75		92	--	68
28	--	--	34	52	--	--	75	72		--	--	69
29	--	--	35	51	--	62	71	--		--	--	73
30	--	--	32	--	--	57	a 54	--		--	--	75
31	--	--	32	--	--	51	--	--		--	--	--
Average	--	--	--	--	--	55	71	--		--	--	--

a Measurement prior to 11 a. m.

RIO GRANDE BASIN--Continued

JEMEZ RIVER BELOW JEMEZ CANYON DAM, N. MEX.--Continued

Suspended sediment, water year October 1953 to September 1954

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Tons per day	Mean discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Tons per day	Mean discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Tons per day
1	0	--	0	0.4	1,000	a 1	16	8,060	s 352
2	0	--	0	.2	800	(a)(t)	18	6,400	a 310
3	0	--	0	.8	2,200	5	16	7,000	s 333
4	0	--	0	1.2	2,300	a 7	3.1	1,850	s 25
5	0	--	0	3.3	4,500	a 40	2	2,800	a 15
6	0	--	0	65	32,600	s 8,480	2	2,200	a 12
7	0	--	0	12	16,400	531	.5	1,800	a 2
8	0	--	0	8.8	14,000	a 330	5	5,200	a 70
9	0	--	0	6.0	7,500	122	3	5,800	a 47
10	0	--	0	5.0	5,100	69	2	5,120	28
11	0	--	0	6.4	7,300	a 130	4	3,700	40
12	0	--	0	7.9	9,400	a 200	5	1,400	a 19
13	0	--	0	6.0	7,300	118	6	1,100	a 18
14	0	--	0	5.5	6,900	a 100	9	2,000	a 49
15	0	--	0	6.5	8,800	a 150	24	3,900	a 250
16	0	--	0	7.6	9,000	a 180	28	4,200	a 320
17	0	--	0	4.7	4,400	a 60	44	9,820	s 1,640
18	0	--	0	3.7	4,800	s 64	36	7,780	s 806
19	0	--	0	5.3	6,400	92	29	5,000	a 390
20	0	--	0	8.3	5,700	128	23	3,500	a 220
21	0	--	0	7.2	6,000	117	14	4,020	s 195
22	0	--	0	3.0	3,500	a 28	4.2	2,750	s 52
23	0	--	0	9.9	7,800	sa 310	.5	800	1
24	21	33,300	s 2,090	12	8,700	sa 290	.7	580	1
25	2.3	26,000	sa 200	13	8,690	s 337	.5	570	a 1
26	.3	7,050	s 10	15	8,100	sa 370	4	1,390	15
27	.6	1,570	s 2	14	7,150	s 296	8	1,500	a 32
28	1.0	800	a 2	17	8,200	a 380	10	800	22
29	.4	400	(a)(t)	15	7,300	sa 320	12	860	28
30	.1	900	(a)(t)	14	8,000	sa 320	15	990	40
31	.4	1,400	a 2	--	--	--	10	880	24
Total	26.1	--	2,[illegible]	284.7	--	13,575	354.5	--	5,357

Day	January			February			March		
	Mean discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Tons per day	Mean discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Tons per day	Mean discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Tons per day
1	12	1,000	a 32	16	5,200	225	32	8,510	s 807
2	15	1,600	a 65	16	4,770	206	28	6,840	s 599
3	18	1,520	74	17	4,900	225	31	5,490	s 670
4	20	2,100	113	17	4,700	216	25	7,920	s 572
5	25	1,590	107	18	4,300	209	28	7,750	586
6	33	2,020	s 247	16	4,400	a 190	34	8,080	s 831
7	45	3,200	s 529	18	4,600	a 220	23	6,600	sa 460
8	32	5,480	473	18	3,750	182	33	7,300	s 705
9	15	2,300	a 93	19	4,230	217	38	7,500	s 768
10	2	1,200	a 27	19	5,050	259	62	16,200	s 3,030
11	.4	1,820	6	18	5,100	248	46	13,500	s 1,800
12	.3	1,100	1	20	5,500	297	24	8,000	s 644
13	.5	1,150	2	22	6,000	a 360	27	12,200	s 1,090
14	15	2,280	s 209	21	5,300	a 300	22	12,700	a 750
15	38	2,530	260	34	6,800	624	25	8,770	s 813
16	40	2,100	227	17	4,400	202	14	4,810	182
17	28	1,530	a 120	13	3,920	138	10	3,470	94
18	23	2,180	s 250	5	3,900	53	4.5	1,190	14
19	28	4,990	s 454	2.5	3,550	24	7.7	3,400	s 88
20	22	5,600	333	15	5,670	s 350	7.5	1,570	32
21	36	5,610	s 648	15	6,400	sa 320	7.8	1,500	a 32
22	20	4,500	243	14	7,780	294	19	4,250	218
23	18	4,000	sa 230	6.6	3,950	70	67	15,800	s 3,550
24	18	4,400	sa 270	6.6	3,950	70	313	16,600	s 12,700
25	20	5,880	318	7.8	4,800	101	95	17,200	s 4,530
26	26	9,200	646	30	9,250	s 871	45	10,200	1,240
27	18	6,850	333	51	10,200	s 1,460	30	7,900	a 640
28	15	5,200	211	44	8,500	sa 1,200	32	9,800	a 850
29	18	6,200	301	--	--	--	45	8,420	s 1,050
30	16	5,600	a 240	--	--	--	49	13,200	1,750
31	17	5,600	a 260	--	--	--	44	10,000	1,190
Total	634.2	--	7,322	516.5	--	9,131	1,268.5	--	42,285

s Computed by subdividing day.
t Less than 0.50 ton.
a Computed from estimated concentration graph.

RIO GRANDE BASIN--Continued

JEMEZ RIVER BELOW JEMEZ CANYON DAM, N. MEX.--Continued

Suspended sediment, water year October 1953 to September 1954--Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	40	6,250	675	40	3,400	a 370			
2.....	32	6,100	527	44	4,000	a 480			
3.....	33	4,700	419	32	4,420	382			
4.....	43	6,200	a 720	37	4,100	410			
5.....	158	9,280	s 4,460	49	4,000	529			
6.....	48	8,400	1,090	43	4,000	464			
7.....	46	6,600	820	30	3,500	284			
8.....	56	7,200	1,090	24	3,300	a 210			
9.....	64	7,900	1,370	20	3,100	a 170			
10.....	58	8,400	a 1,300	53	6,060	s 3,730			
11.....	58	8,100	a 1,300	353	31,900	s 37,200			
12.....	59	8,000	1,270	143	19,800	7,640			
13.....	101	8,400	2,290	98	12,800	s 3,420			
14.....	111	10,000	3,000	67	8,810	1,590			
15.....	120	9,000	2,920	53	6,400	916			
16.....	116	9,000	2,820	42	5,300	a 600			
17.....	126	8,600	2,930	39	4,500	474			
18.....	152	9,600	sa 4,100	163	23,400	s 14,200			
19.....	166	8,450	s 3,830	32	11,000	950			
20.....	118	8,820	2,810	20	7,300	394			
21.....	100	6,750	1,820	12	5,300	172			
22.....	88	6,200	1,470	16	5,900	a 250			
23.....	67	4,800	868	24	7,000	a 450			
24.....	67	5,000	904	50	13,700	s 2,020			
25.....	60	4,800	a 780	25	6,800	459			
26.....	64	3,600	622	12	4,600	149			
27.....	57	4,300	662	5.4	2,450	36			
28.....	43	5,000	580	.9	725	s 3			
29.....	32	3,600	311	0	--	0			
30.....	28	2,800	212	0	--	0			
31.....	--	--	--	0	--	0			
Total.	2,311	--	47,970	1,527.3	--	77,952	0	--	0

	July			August			September		
1.....	1.4	--	e 70	154	45,000	sa 28,000	0	--	0
2.....	1.4	--	e 40	2	--	e 40	0	--	0
3.....	40	35,800	s 4,860	0	--	0	0	--	0
4.....	3	14,300	116	0	--	0	0	--	0
5.....	0	--	0	0	--	0	0	--	0
6.....	0	--	0	0	--	0	0	--	0
7.....	0	--	0	0	--	0	0	--	0
8.....	0	--	0	0	--	0	0	--	0
9.....	0	--	0	0	--	0	0	--	0
10.....	0	--	0	0	--	0	0	--	0
11.....	0	--	0	3	28,000	227	.1	--	e 5
12.....	0	--	0	0	--	0	1.8	--	e 40
13.....	0	--	0	0	--	0	0	--	0
14.....	0	--	0	0	--	0	0	--	0
15.....	0	--	0	0	--	0	0	--	0
16.....	0	--	0	450	46,600	s 77,100	0	--	0
17.....	0	--	0	10	14,600	394	0	--	0
18.....	0	--	0	1	2,800	a 8	0	--	0
19.....	0	--	0	0	--	0	0	--	0
20.....	0	--	0	0	--	0	0	--	0
21.....	0	--	0	96	37,200	s 13,900	0	--	0
22.....	0	--	0	6	11,000	a 180	0	--	0
23.....	416	52,000	s 67,400	28	18,000	sa 6,200	0	--	0
24.....	1,110	33,700	s 128,000	3.0	32,000	s 377	0	--	0
25.....	66	13,200	2,350	0	--	0	0	--	0
26.....	24	7,800	505	0	--	0	726	49,000	sa 150,000
27.....	9.7	3,700	97	0	--	0	68	17,600	s 3,820
28.....	.8	1,900	a 4	0	--	0	19	16,900	867
29.....	.6	12,000	sa 30	0	--	0	7.2	12,000	233
30.....	.3	9,000	sa 15	0	--	0	4	8,600	93
31.....	3.2	12,000	a 100	0	--	0	--	--	--
Total.	1,676.4	--	203,587	753.0	--	126,426	826.1	--	155,058

Total discharge for year (cfs-days) 10,178.3
Total load for year (tons) 690,970

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

RIO GRANDE BASIN--Continued

JEMEZ RIVER BELOW JEMEZ CANYON DAM, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1953 to September 1954
(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; V, visual accumulation tube)

Date of collection	Time	Discharge (cfs)	Water temperature (°F)	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. 24, 1953	1:20 p.m.	48	69	77,900	4,200		89		98		99	100	--		--		VPWCM
Nov. 6	11:00 a.m.	79	55	40,900	3,670		84		96		100	--	--		--		SPWCM
Nov. 9	11:25 a.m.	7.6	57	6,760	4,860		92		99		100	--	--		--		SPWCM
Nov. 27	9:20 a.m.	11	34	4,370	3,460		79		89		96	98	100		--		VPWCM
Jan. 22, 1954	8:45 a.m.	11	32	2,770	3,050		40		52		97	100	--		--		SPWCM
Feb. 20	1:15 p.m.	18	42	6,070	3,630		57		83		97	99	100		--		VPWCM
Mar. 6	1:30 p.m.	22	60	6,800	3,860		57		77		96	100	--		--		VPWCM
Mar. 24	12 m.	480	44	9,770	3,470		52		78		85	89	98		100		VPWCM
Mar. 24	1:55 p.m.	510	44	10,000	4,220		64		88		93	93	98		100		VPWCM
Apr. 3	12:20 p.m.	48	74	5,380	4,560		48		63		88	99	100		--		VPWCM
May 11	10:30 a.m.	272	57	32,100	4,890		62		77		94	99	100		--		VPWCM
May 15	11:00 a.m.	77	65	5,570	4,700		45		55		73	92	100		--		VPWCM
July 23	9:30 a.m.	708	62	83,600	3,480		70		88		93	96	99		100		VPWCM
July 23	3:10 p.m.	570	85	48,000	5,420		74		91		96	98	100		--		VPWCM
July 24	12:30 p.m.	1,440	73	36,800	5,190		71		86		92	93	98		100		VPWCM
July 25	11:50 a.m.	67	89	13,600	3,860		71		91		100	--	--		--		SPWCM
Sept. 27	9:30 a.m.	158	64	22,400	4,050		63		83		96	100	--		--		VPWCM

RIO GRANDE BASIN--Continued

RIO GRANDE NEAR BERNALILLO, N. MEX.

LOCATION.--At gaging station 2 miles northwest of Sandia Pueblo, 3 miles southwest of Bernalillo, Sandoval County, 3.5 miles downstream from State Highway 44, and 8.5 miles downstream from Jemez River.
DRAINAGE AREA.--17,300 square miles, approximately (includes 2,940 square miles in closed basin in northern part of San Luis Valley, Colo.).
RECORDS AVAILABLE.--Water temperatures: October 1948 to September 1954.
Sediment records: November 1947 to September 1954.
EXTREMES, 1953-54.--Water temperatures: Maximum observed, 87°F Aug. 5; minimum observed, freezing point on many days in December and January.
Sediment concentrations: Maximum daily, 49,600 ppm Aug. 11; minimum daily, 40 ppm June 23.
Sediment loads: Maximum daily, 145,000 tons July 24; minimum daily, 1 ton on several days.
EXTREMES, 1947-54.--Water temperatures (1948-54): Maximum observed, 93°F Aug. 18, 1951; minimum observed, freezing point on many days during winter months.
Sediment concentrations: Maximum daily, 50,300 ppm Aug. 2, 1950; minimum daily, 18 ppm May 13, 17, 1950.
Sediment loads: Maximum daily, 320,000 tons July 24, 1949; minimum daily, less than 0.50 ton Sept. 25, 1953.
REMARKS.--Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge for water year October 1953 to September 1954 given in WSP 1342. Stage-discharge relation affected by ice Dec. 23, 29, Jan. 1-5.

Temperature (°F) of water, water year October 1953 to September 1954
/Once-daily measurement, generally before 11 a.m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jnne	July	Aug.	Sept.
1	a70	49	38	31	40	39	43	46	60	65	72	74
2	48	46	41	31	a46	39	44	46	65	66	61	74
3	58	48	b39	31	39	32	47	a61	b67	64	64	73
4	55	48	b36	31	39	37	50	54	62	75	--	74
5	47	48	34	31	39	39	51	58	63	69	b87	67
6	49	45	b31	31	a46	37	49	59	62	67	65	64
7	45	42	--	32	39	37	49	59	56	67	66	69
8	45	42	31	36	39	43	47	63	66	65	61	71
9	45	40	b31	38	39	42	51	62	58	62	62	69
10	53	40	31	32	38	49	52	64	56	69	68	69
11	51	39	b31	31	38	45	55	54	58	70	64	62
12	48	40	b31	32	40	35	53	58	60	69	59	67
13	53	40	b31	31	41	35	53	61	63	68	66	67
14	46	43	a34	b40	42	36	54	61	60	68	b84	67
15	47	44	31	31	42	38	53	65	60	68	73	67
16	47	43	31	32	38	38	50	63	61	68	65	66
17	49	42	34	33	40	39	53	63	63	68	65	67
18	52	43	33	32	39	37	b66	56	60	70	65	60
19	48	39	35	34	33	39	54	62	63	70	63	61
20	54	33	37	35	b45	43	55	64	66	70	72	63
21	45	b38	33	33	39	45	53	64	61	72	64	62
22	b59	33	32	32	40	48	53	64	70	69	67	61
23	48	32	31	32	40	50	--	62	63	62	69	60
24	51	36	31	34	41	46	--	59	62	73	65	64
25	46	37	31	35	43	39	--	a65	61	75	65	b63
26	45	38	31	b46	43	42	--	a66	60	73	63	61
27	43	39	31	35	39	43	a68	a67	63	72	65	56
28	43	40	31	36	37	47	54	a69	62	69	68	57
29	45	39	31	37	--	48	55	60	65	70	67	55
30	44	37	31	40	--	43	52	62	61	70	72	53
31	46	--	31	37	--	42	--	60	--	64	70	--
Average	49	41	33	34	40	41	52	61	62	69	67	65

a Measurement after 6 p.m.
b Measurement between 11 a.m. and 6 p.m.

RIO GRANDE BASIN--Continued

RIO GRANDE NEAR BERNALILLO, N. MEX.--Continued

Suspended sediment, water year October 1953 to September 1954

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	3	58	s1	280	1,020	s845	588	1,320	2,100
2	5	108	s2	336	900	816	600	1,340	2,170
3	4	106	1	100	550	s183	612	1,320	2,180
4	3	75	1	145	600	235	600	1,630	2,640
5	13	131	5	169	450	205	572	1,100	1,700
6	14	112	4	284	1,430	1,100	509	895	1,230
7	16	110	5	412	3,710	s4,590	448	360	435
8	18	100	5	505	4,930	6,720	406	460	504
9	20	140	8	448	2,370	2,870	418	670	756
10	14	90	3	430	1,530	1,780	460	590	733
11	15	97	4	420	1,700	1,930	488	940	1,240
12	18	96	5	407	1,390	1,530	495	920	1,230
13	23	141	9	394	1,180	1,260	488	1,030	1,360
14	24	150	10	384	1,030	1,070	481	740	961
15	32	228	20	389	970	1,020	495	735	982
16	32	176	15	398	880	946	509	840	1,150
17	34	147	13	407	830	912	530	955	1,370
18	39	144	15	412	830	923	544	1,170	1,720
19	32	127	11	420	780	884	558	1,080	1,630
20	52	350	49	425	860	987	558	1,160	1,750
21	42	530	60	443	850	1,020	551	1,090	1,620
22	72	2,790	542	434	910	1,070	558	1,000	1,510
23	55	4,300	639	420	860	975	540	840	1,180
24	57	1,150	177	416	1,000	1,120	470	1,100	1,400
25	334	3,760	s3,360	448	1,010	1,220	450	780	948
26	380	2,500	2,560	470	950	1,210	480	270	350
27	75	1,100	s282	490	1,000	1,320	500	390	526
28	50	620	84	510	1,360	1,870	510	900	1,240
29	66	480	86	540	1,370	2,000	520	520	730
30	35	340	32	588	1,140	1,810	495	470	628
31	34	230	21	--	--	--	448	570	689
Total	1,611	--	8,029	11,924	--	44,421	15,421	--	38,662
	January			February			March		
1	440	520	618	558	810	1,220	424	990	1,130
2	430	690	801	558	770	1,160	325	970	851
3	440	630	748	572	930	1,440	275	700	520
4	450	900	1,090	565	920	1,400	247	1,040	694
5	450	860	1,040	579	910	1,420	231	1,000	624
6	460	820	1,020	593	910	1,460	188	800	406
7	460	990	1,230	600	870	1,410	426	610	702
8	495	1,270	1,700	586	780	1,230	438	800	946
9	502	1,000	1,360	579	740	1,160	215	1,060	615
10	502	840	1,140	579	670	1,360	227	1,150	705
11	502	630	854	624	750	1,260	267	2,080	1,500
12	502	820	1,110	664	800	1,430	618	2,810	4,690
13	502	900	1,220	680	1,010	1,850	688	2,490	4,630
14	502	650	881	858	1,150	2,660	730	2,460	4,850
15	537	780	1,130	932	3,200	8,050	528	1,500	2,140
16	518	1,040	1,450	858	2,430	5,630	255	825	568
17	509	960	1,320	825	1,880	4,190	215	708	s566
18	502	860	1,170	761	1,410	2,900	310	879	s845
19	509	780	1,070	689	1,260	2,340	199	420	226
20	530	930	1,330	664	970	1,740	178	400	192
21	530	910	1,300	656	1,020	1,810	375	590	597
22	523	1,030	1,450	656	910	1,610	390	530	558
23	502	960	1,300	648	940	1,640	188	950	482
24	495	830	1,110	648	800	1,400	380	4,080	4,190
25	509	1,040	1,430	664	860	1,540	540	5,620	8,190
26	523	1,180	1,670	715	870	1,680	600	11,900	19,300
27	530	940	1,350	880	2,040	4,850	528	7,050	10,000
28	523	890	1,260	656	1,600	2,830	695	3,820	7,170
29	537	780	1,130	--	--	--	570	2,050	3,150
30	544	900	1,320	--	--	--	325	1,840	1,610
31	551	790	1,180	--	--	--	293	3,540	2,800
Total	15,507	--	36,782	18,848	--	62,670	11,868	--	85,447

s Computed by subdividing day.

RIO GRANDE BASIN--Continued

RIO GRANDE NEAR BERNALILLO, N. MEX.--Continued

Suspended sediment, water year October 1953 to September 1954--Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	570	4,000	6,160	522	1,700	s4,230	588	750	1,190
2.....	600	2,500	4,050	1,420	5,320	20,400	522	830	1,170
3.....	456	1,340	1,650	1,620	3,300	14,400	516	1,300	1,810
4.....	522	1,350	1,900	1,100	2,000	5,940	480	570	739
5.....	522	2,090	2,950	920	1,320	3,280	462	510	636
6.....	306	1,400	1,160	840	1,200	2,720	779	1,350	2,840
7.....	302	1,020	832	765	950	1,960	737	1,050	
8.....	370	950	949	723	860	1,680	438	450	532
9.....	540	1,550	2,260	1,000	1,750	4,720	432	450	525
10.....	730	2,720	5,360	944	1,120	2,850	444	430	515
11.....	1,030	5,400	15,000	1,070	13,800	s43,600	415	300	336
12.....	1,100	4,320	12,800	944	4,500	11,500	410	228	252
13.....	1,150	4,300	13,400	944	2,900	7,390	450	1,210	1,470
14.....	1,250	4,100	13,800	920	1,950	4,840	700	624	1,180
15.....	1,270	4,700	16,100	944	1,530	3,900	614	490	812
16.....	1,200	3,950	12,800	1,620	3,400	14,900	350	300	283
17.....	944	2,300	5,860	1,680	3,000	13,600	340	250	229
18.....	1,050	2,800	7,940	1,830	16,600	s86,300	280	220	166
19.....	987	2,230	5,940	1,490	4,200	16,900	96	140	36
20.....	723	1,940	3,790	1,420	2,000	7,670	207	220	123
21.....	642	1,300	2,250	1,360	1,420	5,210	231	190	118
22.....	528	1,200	1,710	1,340	2,100	7,600	34	130	12
23.....	468	1,100	1,390	1,920	3,010	15,600	11	40	1
24.....	420	820	930	1,900	3,100	15,900	7	100	2
25.....	618	1,340	2,240	1,470	2,380	9,450	5	80	1
26.....	582	990	1,560	1,420	1,880	7,210	10	180	5
27.....	311	620	521	1,390	1,430	5,370	194	3,110	s1,880
28.....	235	940	596	1,090	1,100	3,240	211	1,780	1,010
29.....	188	600	305	765	1,020	2,110	24	738	s98
30.....	150	330	134	1,060	740	2,120	11	1,200	36
31.....	--	--	--	969	795	2,080	--	--	--
Total	19,764	--	146,337	37,400	--	348,670	9,998	--	20,097

	July			August			September		
1.....	4	380	4	225	15,100	s11,400	26	14,000	983
2.....	2	220	1	215	6,150	3,570	20	9,150	494
3.....	18	15,700	s1,340	123	6,100	2,030	17	3,600	165
4.....	134	4,000	1,450	90	1,000	a240	18	2,700	131
5.....	188	3,750	1,900	78	800	168	101	5,700	1,550
6.....	23	500	31	87	10,700	s3,000	600	26,000	42,100
7.....	17	500	23	223	11,700	s6,320	400	12,000	13,000
8.....	17	700	32	420	37,600	s48,000	255	5,000	3,440
9.....	8	550	12	420	27,400	31,100	298	3,800	3,060
10.....	532	5,720	s10,100	345	15,000	14,000	320	3,700	3,200
11.....	978	5,250	13,900	760	49,600	s130,000	382	7,730	s7,860
12.....	779	3,250	6,840	59	30,000	4,780	593	14,900	23,900
13.....	588	1,500	2,380	36	18,000	1,750	570	10,500	16,200
14.....	415	2,600	2,910	23	9,900	615	614	11,700	s20,100
15.....	410	1,700	1,880	40	7,900	853	345	10,100	9,410
16.....	375	900	911	473	38,000	s67,600	231	14,900	9,290
17.....	360	900	875	130	23,200	s7,520	192	4,950	2,570
18.....	642	1,750	3,030	51	14,000	1,930	134	1,600	579
19.....	648	2,700	4,720	17	5,300	243	259	2,000	1,400
20.....	492	1,500	1,990	12	1,800	58	219	1,500	887
21.....	385	3,500	3,640	50	26,500	s5,630	203	1,100	603
22.....	512	19,000	s27,200	150	17,600	7,130	150	950	385
23.....	900	30,300	s79,100	231	6,920	s6,610	128	800	276
24.....	1,540	31,800	s145,000	495	46,900	s87,400	125	700	236
25.....	695	15,300	28,700	118	30,400	s10,200	138	3,100	1,160
26.....	415	5,800	6,500	36	9,300	904	570	35,800	s82,500
27.....	199	1,400	752	31	2,200	184	275	8,600	6,380
28.....	181	750	366	28	1,600	121	85	5,050	1,160
29.....	138	2,200	820	26	2,200	154	51	2,350	324
30.....	231	1,700	1,060	28	2,000	151	46	1,400	174
31.....	181	1,800	880	29	5,000	391	--	--	--
Total	12,007	--	348,347	5,049	--	454,052	7,365	--	253,517

Total discharge for year (cfs-days) 167,222
Total load for year (tons) 1,847,031

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

RIO GRANDE BASIN--Continued

RIO GRANDE NEAR BERNALILLO, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1953 to September 1954
(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; V, visual accumulation tube)

Date of collection	Time	Discharge (cfs)	Water temperature (°F)	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. 20, 1953	8:30 a.m.	47	54	219	--		--		--		89	92	98		100		SWCM
Nov. 1	10:15 a.m.	320	49	1,050	3,980		39		60		80	88	99		100		VPWCM
Nov. 7	7:45 a.m.	368	42	5,040	4,100		63		81		88	89	96		100		VPWCM
Dec. 1	8:40 a.m.	594	38	1,340	4,250		32		47		71	77	96		100		VPWCM
Dec. 20	9:45 a.m.	551	37	1,210	3,200		28		39		60	71	96		100		VPWCM
Jan. 10, 1954	5:10 p.m.	488	39	825	--		--		--		54	67	94		100		VPWCM
Feb. 18	1:20 p.m.	792	49	1,380	3,340		24		39		67	81	95		100		VPWCM
Mar. 6	12:25 p.m.	170	47	714	3,300		65		78		85	89	98		100		VPWCM
Mar. 28	9:30 a.m.	716	47	4,000	3,800		51		71		86	94	99		100		VPWCM
Apr. 10	9:35 a.m.	654	52	2,060	4,360		46		67		84	95	100		--		VPWCM
Apr. 15	8:10 a.m.	1,400	53	5,220	2,840		29		46		79	91	100		--		VPWCM
May 11	9:45 a.m.	1,400	54	18,700	3,750		68		84		97	98	100		--		VPWCM
May 17	11:55 p.m.	1,510	60	2,800	2,810		24		34		65	87	100		--		VPWCM
May 18	2:30 a.m.	2,650	59	20,300	3,340		41		61		90	96	99		100		VPWCM
May 22	9:20 a.m.	1,420	64	2,180	4,330		32		44		77	90	100		--		VPWCM
June 11	10:30 a.m.	426	69	416	--		--		--		38	58	92		100		VWCM
July 3	7:35 p.m.	20	71	31,700	3,560		94		99		100	--	--		--		SPWCM
July 10	11:15 a.m.	660	76	8,200	3,900		58		85		94	96	100		--		VPWCM
July 23	11:40 a.m.	1,470	71	25,200	3,640		60		77		94	97	100		--		VPWCM
Aug. 8	7:15 a.m.	540	61	63,800	4,000		63		89		98	97	100		--		VPWCM
Aug. 8	1:10 p.m.	444	80	42,900	4,900		67		92		98	99	100		--		VPWCM
Aug. 11	1:00 a.m.	1,700	58	72,000	4,720		44		70		93	97	100		--		SPWCM
Aug. 12	6:45 a.m.	63	54	36,500	4,960		83		99		100	--	--		--		SPWCM
Aug. 16	7:20 a.m.	888	65	82,600	4,170		62		85		94	96	99		100		SPWCM
Aug. 17	7:15 p.m.	53	72	24,700	3,400		86		98		100	--	--		--		SPWCM
Sept. 6	8:30 a.m.	654	67	29,600	3,900		51		80		96	98	100		--		VPWCM
Sept. 26	10:15 a.m.	1,100	61	63,800	1,970		63		82		96	98	100		--		VPWCM

RIO GRANDE BASIN--Continued

RIO GRANDE NEAR BERNARDO, N. MEX.

LOCATION.--At gaging station at bridge on U. S. Highway 60, 2 miles east of Bernardo, Socorro County, and 3½ miles upstream from Rio Puerco. Gage is on a conveyance channel, 5 miles downstream from heading, formerly San Francisco riverside drain.
DRAINAGE AREA.--19,230 square miles, approximately (includes 2,940 square miles in closed basin in northern part of San Luis Valley, Colo.).
RECORDS AVAILABLE.--Sediment records: October 1947 to September 1954.
EXTREMES, 1953-54.--Sediment concentrations: Maximum daily, 29,000 ppm Sept. 27; minimum daily, only flow from drain on many days.
Sediment loads: Maximum daily, 47,600 tons July 25; minimum daily, less than 0.50 ton on many days.
EXTREMES, 1947-54.--Sediment concentrations: Maximum daily, 42,400 ppm Aug. 3, 1950; minimum daily, no river flow on many days. Not determined in interior drain.
Sediment loads: Maximum daily, 240,000 tons July 24, 1949; minimum daily, 0 tons in river on many days. Less than 0.50 ton in interior drain and conveyance channel on many days.
REMARKS.--Maximum observed sediment concentration during water year, 64,200 ppm Sept. 27. Records are summation of water and sediment discharges in main channel, conveyance channel (formerly San Francisco riverside drain), and Bernardo interior drain. Daily sediment concentrations not listed because a composite concentration of more than one channel is meaningless. Tables for particle-size analyses for each channel are published separately and show water discharges and concentrations in those channels at the time of sampling. Records of discharge for water year October 1953 to September 1954 given in WSP 1342.

Suspended sediment, water year October 1953 to September 1954

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	1			8		2	364		3,100
2.....	1			10		3	424		3,730
3.....	1			11		3	476		5,290
4.....	1			11		3	528		5,630
5.....	1			15		9	584		5,720
6.....	1			16		12	584		5,110
7.....	1			13		8	564		5,530
8.....	2			13		6	524		4,750
9.....	1			19		10	480		3,430
10.....	1			50		178	424		2,720
			(t)						
11.....	1			61		277	464		3,370
12.....	1			52		193	496		3,790
13.....	1			52		172	500		3,640
14.....	1			52		132	512		3,590
15.....	1			56		142	525		3,820
16.....	1			60		152	525		3,790
17.....	1			55		100	533		4,080
18.....	1			52		79	545		5,160
19.....	1			67		138	557		5,530
20.....	2			104		439	565		4,780
21.....	4		2	139		841	565		4,450
22.....	4		2	150		722	553		3,860
23.....	4		1	185		1,260	545		3,920
24.....	4		1	211		1,330	553		4,360
25.....	5		2	214		1,240	561		4,370
26.....	5		1	205		1,300	525		3,480
27.....	6		2	201		1,330	495		2,840
28.....	6		2	246		1,760	495		2,980
29.....	9		4	276		2,120	509		2,910
30.....	8		3	318		2,710	525		2,950
31.....	8		3	--		--	497		3,070
Total.	85		24	2,922		16,671	15,997		125,750

t Less than 0.50 ton.

RIO GRANDE BASIN--Continued

RIO GRANDE NEAR BERNARDO, N. MEX.--Continued

Suspended sediment, water year October 1953 to September 1954--Continued

Day	January			February			March		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	497		3,080	556		2,450	836		5,400
2.....	505		2,960	556		2,390	556		2,930
3.....	494		2,770	568		2,320	481		2,180
4.....	489		2,630	581		2,750	373		1,340
5.....	485		2,660	594		2,780	351		1,120
6.....	480		2,820	594		3,000	287		615
7.....	505		2,700	594		2,520	251		595
8.....	543		2,880	594		2,680	211		393
9.....	556		3,240	606		2,660	213		453
10.....	556		3,270	606		2,580	219		518
11.....	544		3,360	621		2,510	185		362
12.....	531		2,880	621		2,540	202		426
13.....	544		3,780	621		2,570	204		553
14.....	544		2,960	661		2,510	422		s 2,810
15.....	531		2,820	676		2,730	518		3,440
16.....	518		2,280	806		4,580	381		2,270
17.....	544		2,700	926		7,950	222		755
18.....	556		2,960	837		6,500	227		591
19.....	531		2,640	762		a 5,480	205		430
20.....	531		2,280	749		a 4,610	181		236
21.....	544		2,640	704		a 3,490	155		93
22.....	568		2,850	691		3,630	125		65
23.....	581		3,230	691		3,530	151		150
24.....	568		3,490	661		3,150	160		226
25.....	556		2,900	648		2,790	116		87
26.....	556		2,820	648		2,960	141		158
27.....	556		2,640	648		2,910	263		979
28.....	568		2,810	691		3,590	342		1,730
29.....	581		2,810	--		--	377		3,720
30.....	568		2,760	--		--	417		4,340
31.....	556		2,550	--		--	326		1,600
Total.	16,686		89,170	18,511		94,160	9,098		40,565

	April			May			June		
1.....	230		547	101		42	429		1,840
2.....	185		333	150		221	248		397
3.....	237		717	611		a 6,190	131		97
4.....	359		1,720	745		7,230	103		57
5.....	295		835	761		a 5,730	97		53
6.....	209		384	430		1,740	91		43
7.....	225		420	330		965	86		45
8.....	196		413	240		533	70		13
9.....	151		237	249		417	67		14
10.....	133		145	219		348	61		12
11.....	190		305	369		1,100	53		6
12.....	450		s 4,200	484		2,550	51		11
13.....	662		5,980	714		9,580	42		14
14.....	807		8,060	659		7,980	36		6
15.....	837		6,450	689		6,180	41		11
16.....	902		a 7,000	689		3,770	47		9
17.....	1,030		a 8,660	992		s 12,100	79		76
18.....	720		a 5,020	1,420		s 26,200	45		10
19.....	506		2,690	1,700		s 44,000	40		8
20.....	506		2,520	980		17,300	38		7
21.....	375		1,180	1,030		13,200	33		6
22.....	308		810	1,110		7,500	29		4
23.....	258		533	1,130		12,500	28		4
24.....	216		336	1,470		s 18,900	28		3
25.....	252		667	1,360		13,400	30		3
26.....	168		260	1,260		s 11,800	34		7
27.....	155		159	1,140		7,420	35		14
28.....	159		149	1,140		6,960	40		9
29.....	110		60	955		5,080	38		10
30.....	100		47	660		2,760	27		7
31.....	--		--	482		1,150	--		--
Total.	10,931		60,837	24,269		254,846	2,177		2,796

s Computed by subdividing day.
a Partly estimated.

RIO GRANDE BASIN--Continued

RIO GRANDE NEAR BERNARDO, N. MEX.--Continued

Suspended sediment, water year October 1953 to September 1954--Continued

Day	July			August			September		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	26		7	30		33	14		8
2.....	24		3	23		14	12		7
3.....	28		7	22		11	17		11
4.....	25		4	25		16	14		6
5.....	27		5	26		11	14		7
6.....	45		13	30		12	14		7
7.....	23		5	34		165	12		7
8.....	20		5	36		97	12		5
9.....	23		4	71		s976	14		a11
10.....	25		4	39		337	12		10
11.....	23		7	69		708	83		s 4,140
12.....	23		5	111		s 8,080	39		s 3,170
13.....	23		4	48		855	18		73
14.....	21		4	31		48	18		24
15.....	20		2	26		20	19		28
16.....	19		2	25		15	27		219
17.....	19		2	24		10	20		54
18.....	19		2	23		11	18		22
19.....	18		3	21		8	14		10
20.....	20		2	20		5	16		9
21.....	18		3	26		161	17		9
22.....	19		2	22		131	15		8
23.....	26		98	17		23	15		5
24.....	127		s 7,140	26		s107	20		10
25.....	480		s 47,600	30		130	27		44
26.....	131		4,990	20		140	87		s 5,430
27.....	61		494	21		139	264		s 33,400
28.....	42		111	19		38	134		7,680
29.....	37		245	16		12	107		2,000
30.....	27		44	16		11	89		594
31.....	27		25	15		9	--		--
Total.	1,466		60,842	962		12,333	1,182		57,008

Total discharge for year (cfs-days)..... 104,286
Total load for year (tons)..... 815,002

s Computed by subdividing day.
a Partly estimated.

RIO GRANDE BASIN--Continued

RIO GRANDE NEAR BERNARDO, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1953 to September 1954

(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 V, visual accumulation tube)

Date of collection	Time	Discharge (cfs)	Water temperature (°F)	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	
CONVEYANCE CHANNEL (FORMERLY SAN FRANCISCO RIVERSIDE DRAIN)																	
Nov. 10, 1953	11:00 a.m.	56		1,600	4,280		71		92		99	100	--		--		SPWCM
Dec. 7	10:00 a.m.	580		3,150	5,060		36		50		70	82	97		100		VPWCM
Jan. 30, 1954	3:00 p.m.	550		1,760	2,710		29		41		58	71	95		100		VPWCM
Feb. 16	5:30 p.m.	890		2,330	4,460		30		53		77	86	99		100		VPWCM
Feb. 17	10:00 a.m.	920		3,270	6,270		29		49		68	78	94		99	100	VPWCM
Mar. 16	1:30 p.m.	349		1,800	3,730		48		62		73	84	98		100		VPWCM
Mar. 27	3:00 p.m.	297		1,680	3,560		51		65		82	88	99		100		VPWCM
Apr. 12	5:00 p.m.	725		5,780	4,460		37		52		70	82	98		100		VPWCM
Apr. 17	4:00 p.m.	1,010		3,260	3,160		49		68		82	91	99		100		VPWCM
Apr. 24	11:30 a.m.	213		646	1,510		65		78		89	91	99		100		SPWCM
May 3	2:30 p.m.	950		4,840	4,520		48		68		86	93	98		100		VPWCM
May 17	5:00 p.m.	1,230		5,920	3,330		41		71		88	93	99		100		VPWCM
May 24	2:30 p.m.	1,660		5,600	4,880		35		55		80	90	98		100		VPWCM
July 24	6:00 a.m.	175		32,900	3,820		59		93		99	99	100		--		VPWCM
July 25	9:00 a.m.	1,100		42,700	3,150		75		90		99	100	--		--		VPWCM
July 25	6:30 p.m.	450		32,000	2,920		76		91		97	99	100		--		VPWCM
July 26	3:00 p.m.	113		12,300	4,040		91		98		100	--	--		--		SPWCM
Aug. 12	6:30 a.m.	279		6,710	3,940		45		80		95	98	100		--		VPWCM
Aug. 12	3:00 p.m.	167		34,400	2,640		87		99		99	100	--		--		VPWCM
Sept. 11	8:00 a.m.	119		28,800	4,600		73		99		100	--	--		--		VPWCM
Sept. 12	10:00 a.m.	62		40,000	2,760		69		94		100	--	--		--		VPWCM
Sept. 27	12:30 p.m.	175		12,100	4,540		33		52		88	94	99		100		VPWCM
Sept. 27	4:30 p.m.	588		64,200	3,570		69		88		96	98	100		--		VPWCM
FLOODWAY NEAR BERNARDO, N. MEX.																	
May 21, 1954	2:30 p.m.	223		3,870	3,840		66		86		92	98	100				VPWCM
May 22	4:00 p.m.	835		2,000	4,640		55		75		85	96	100				VPWCM

RIO GRANDE BASIN--Continued

RIO PUERCO BELOW CABEZON, N. MEX.

LOCATION.--One-fourth mile upstream from mouth of Chico Arroyo, 4½ miles southwest of Cabezon, Sandoval County, and 1¼ miles downstream from gaging station above Chico Arroyo near Guadalupe.
DRAINAGE AREA.--420 square miles approximately, at gaging station above Chico Arroyo near Guadalupe.
RECORDS AVAILABLE.--Sediment records: April 1948 to September 1954.
EXTREMES, 1953-54.--Sediment concentrations: Maximum daily, 150,000 ppm July 23; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 198,000 tons July 23; minimum daily, 0 tons on many days.
EXTREMES, 1948-54.--Sediment concentrations: Maximum daily, 166,000 ppm July 31, 1953; minimum daily, no flow on many days.
Sediment loads: Maximum daily 219,000 tons Aug. 1, 1953; minimum daily 0 tons on many days.
REMARKS.--Maximum observed sediment concentration during water year, 331,000 ppm July 22. Records of discharge for Rio Puerco above Chico Arroyo near Guadalupe, N. Mex., for water year October 1953 to September 1954 given in WSP 1342. No appreciable inflow between sampling point and gaging station except during periods of heavy local runoff.

Suspended sediment, water year October 1953 to September 1954

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Tons per day	Mean discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Tons per day	Mean discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Tons per day
1.....	0	--	0	0	--	0	0.2		--
2.....	0	--	0	0	--	0	.3		--
3.....	0	--	0	0	--	0	.2		--
4.....	0	--	0	0	--	0	.3		--
5.....	0	--	0	34	32,000	sa10,000	.2		--
6.....	0	--	0	206	92,100	s 84,200	.1		--
7.....	0	--	0	7	40,000	a 780	0		0
8.....	0	--	0	2	--	b 90	0		0
9.....	0	--	0	1	--	b 30	0		0
10.....	0	--	0	.5	--	b 9	0		0
11.....	0	--	0	.3	--	b 4	0		0
12.....	0	--	0	.2	--	b 2	0		0
13.....	0	--	0	.1	--	b 1	0		0
14.....	0	--	0	.1	--	b 1	0		0
15.....	0	--	0	0	--	0	0		0
16.....	0	--	0	0	--	0	0		0
17.....	0	--	0	0	--	0	0		0
18.....	0	--	0	0	--	0	0		0
19.....	0	--	0	0	--	0	0		0
20.....	23	73,000	sa 7,400	0	--	0	0		0
21.....	34	97,800	s 11,100	0	--	0	0		0
22.....	10	69,000	a 1,900	0	--	0	0		0
23.....	16	60,000	sa 3,700	0	--	0	0		0
24.....	7	44,000	a 860	0	--	0	0		0
25.....	1	--	b 25	0	--	0	0		0
26.....	.5	--	b 7	0	--	0	0		0
27.....	.1	--	b 3	0	--	0	0		0
28.....	0	--	0	.3	--	e 3	0		0
29.....	0	--	0	.9	--	e 24	0		0
30.....	0	--	0	.6	--	e 12	0		0
31.....	0	--	0	--	--	--	0		0
Total.	91.6	--	24,995	253.0	--	95,156	1.3		e 15

e Estimated.
s Computed by subdividing day.
a Computed from estimated concentration graph.
b Computed from water-sediment discharge curve.

RIO GRANDE BASIN--Continued

RIO PUERCO BELOW CABEZON, N. MEX.--Continued

Suspended sediment, water year October 1953 to September 1954--Continued

Day	January			February			March		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1				10	--	e 800	0	--	0
2				20	--	e 1,800	.1	--	e 3
3				12	30,500	988	0	--	0
4				10	25,500	688	0	--	0
5				6	23,800	386	0	--	0
6				7	25,500	482	0	--	0
7				4	--	b 240	0	--	0
8				1	--	b 40	0	--	0
9				1	--	b 40	0	--	0
10				.7	--	b 26	0	--	0
11				.2	--	b 5	0	--	0
12				.2	--	b 5	.1	--	e 4
13				0	--	0	.1	--	e 3
14				0	--	0	.1	--	e 3
15				0	--	0	0	--	0
16				0	--	0	0	--	0
17				0	--	0	.1	--	e 4
18				0	--	0	.2	--	e 6
19				.1	--	e 3	.1	--	e 3
20				.1	--	e 2	.1	--	e 3
21				0	--	0	.1	--	e 3
22				0	--	0	.2	--	e 6
23				0	--	0	28	26,000	sa 6,800
24				0	--	0	103	89,000	sa 28,000
25				0	--	0	47	72,000	s 9,740
26				0	--	0	25	50,000	a 3,500
27				0	--	0	16	50,300	s 2,410
28				.1	--	e 3	7	36,000	a 710
29				--	--	--	4	--	b 350
30				--	--	--	2	--	b 130
31				--	--	--	1	--	b 50
Total	0		0	72.4	--	5,508	234.2	--	51,728

Day	April			May			June		
1	0.8	--	b 35	0	--	0	0	--	0
2	.5	--	b 19	.7	--	e 16	0	--	0
3	.2	--	b 5	5	--	e 290	0	--	0
4	.1	--	b 2	3	--	e 130	0	--	0
5	0	--	0	22	--	e 2,300	0	--	0
6	0	--	0	20	--	e 2,000	0	--	0
7	0	--	0	10	--	e 800	0	--	0
8	0	--	0	5	--	e 290	0	--	0
9	0	--	0	2	--	e 76	0	--	0
10	0	--	0	27	--	e 3,200	0	--	0
11	.6	--	b 9	34	--	e 4,400	0	--	0
12	5	--	b 260	53	55,800	s 8,880	0	--	0
13	9	--	b 680	41	48,000	a 5,500	0	--	0
14	16	--	b 1,700	25	35,500	2,480	0	--	0
15	21	--	b 2,600	19	--	b 1,600	0	--	0
16	19	--	b 2,200	14	--	b 1,000	0	--	0
17	24	--	b 3,200	23	--	e 2,300	0	--	0
18	38	--	b 6,600	20	--	e 1,800	0	--	0
19	50	--	b 10,000	12	--	e 760	0	--	0
20	37	58,200	s 6,120	26	--	e 2,800	0	--	0
21	26	43,000	s 3,340	10	--	e 570	0	--	0
22	13	33,000	s 1,360	7	--	e 300	0	--	0
23	10	28,000	a 760	12	--	e 760	0	--	0
24	9	32,000	s 815	25	--	e 2,500	0	--	0
25	5	--	b 260	14	--	e 1,000	0	--	0
26	2	--	b 60	7	--	e 300	14	--	--
27	4	--	b 180	2	--	e 38	.2	--	--
28	.8	--	b 14	.2	--	e 1	0	--	0
29	.2	--	b 2	.1	--	(e)(t)	0	--	0
30	.1	--	b 1	.1	--	(e)(t)	5	--	--
31	--	--	--	0	--	0	--	--	--
Total	291.3	--	40,222	439.1	--	46,091	19.2	--	e 1,500

e Estimated.
s Computed by subdividing day.
t Less than 0.50 ton.
a Computed from estimated concentration graph.
b Computed from water-sediment discharge curve.

RIO GRANDE BASIN--Continued

RIO PUERCO BELOW CABEZON, N. MEX.--Continued

Suspended sediment, water year October 1953 to September 1954--Continued

Day	July			August			September		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	0.5	--	e10	1	35,000	98	0.3	35,000	29
2.....	0	--	0	.1	10,000	a3	0	--	0
3.....	0	--	0	0	--	0	0	--	0
4.....	0	--	0	0	--	0	24	90,200	s15,500
5.....	0	--	0	0	--	0	7	118,000	2,400
6.....	0	--	0	0	--	0	3	83,000	697
7.....	11	--	b3,000	0	--	0	.3	53,000	45
8.....	16	90,600	s5,990	4	13,000	sa530	.1	33,000	a9
9.....	12	60,200	s3,630	2	22,500	s282	0	--	0
10.....	1	55,000	154	13	32,000	s5,280	0	--	0
11.....	.3	--	b40	49	98,000	s17,000	16	95,400	s8,760
12.....	0	--	0	3	65,000	546	25	98,500	s12,900
13.....	0	--	0	.7	55,000	108	282	140,000	s182,000
14.....	0	--	0	0	--	0	18	65,000	3,280
15.....	0	--	0	378	51,900	s160,000	4	48,000	a540
16.....	0	--	0	55	28,600	s5,240	1	32,000	a90
17.....	.2	--	e20	24	25,500	s2,110	.2	--	b14
18.....	0	--	0	10	21,000	567	.1	--	b6
19.....	0	--	0	5	6,000	81	.1	--	b5
20.....	0	--	0	30	30,500	s6,860	0	--	0
21.....	0	--	0	17	27,000	s1,960	0	--	0
22.....	170	105,000	s93,100	4	--	b56	0	--	0
23.....	442	150,000	s198,000	1	--	b5	4	26,400	s1,040
24.....	61	61,700	s13,800	1	--	b3	52	28,100	s23,100
25.....	12	25,000	810	26	92,200	s15,700	492	44,800	s121,000
26.....	3	--	b140	6	110,000	1,910	240	77,500	s64,700
27.....	2	--	b76	.4	41,000	a46	59	41,000	sa7,500
28.....	.9	--	b22	.1	15,000	a4	12	19,000	616
29.....	.5	--	b9	0	--	0	5	14,000	189
30.....	.1	--	b1	17	124,000	s11,100	3	4,000	32
31.....	3	19,000	s1,370	14	108,000	s6,540	--	--	--
Total.	735.5	--	320,172	661.3	--	236,029	1,248.1	--	443,552

e Estimated.
s Computed by subdividing day.
a Computed from estimated concentration graph.
b Computed from water-sediment discharge curve.

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RIO GRANDE BASIN--Continued

RIO PUERCO BELOW CABEZON, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1953 to September 1954
(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 V, visual accumulation tube)

Date of collection	Time	Discharge (cfs)	Water temperature (°F)	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. 21, 1953	8:00 a.m.	10	43	80,600	4,680		78		97		99	99	100		--		VPWCM
Oct. 21	12:15 p.m.	87	52	123,000	4,850		55		77		89	94	98		100		SPWCM
Feb. 3, 1954	12:40 p.m.	48	40	51,000	4,360		53		67		82	93	99		100		SPWCM
Feb. 5	1:40 p.m.	10	45	27,400	5,920		70		87		96	99	100		--		VPWCM
Feb. 5	3:35 p.m.	28	45	52,500	3,400		58		76		90	96	99		100		SPWCM
May 18	1:50 p.m.	24	76	31,300	6,400		56		76		91	98	100		--		VPWCM
May 27	2:05 p.m.	1.5	74	8,330	5,750		92		98		99	100	--		--		SPWCM
July 7	10:30 p.m.	178	61	236,000	3,220		41		54		79	91	98		100		SPWCM
July 22	5:45 a.m.	1,080	64	327,000	5,080		29		40		60	77	91		99	100	SPWCM
July 23	10:45 a.m.	403	67	172,000	3,920		40		53		75	90	99		100		SPWCM
July 24	10:10 a.m.	370	68	102,000	4,160		40		53		75	94	100		--		SPWCM
Aug. 10	9:20 p.m.	24	65	107,000	3,250		70		86		95	98	100		--		VPWCM
Aug. 11	7:30 p.m.	35	70	88,800	4,420		62		79		94	99	100		--		VPWCM
Aug. 25	12:50 p.m.	126	--	194,000	3,270		45		63		78	88	97		100		SPWCM
Aug. 30	11:40 p.m.	100	71	257,000	3,800		43		60		79	88	96		100		SPWCM
Sept. 4	1:30 p.m.	112	--	262,000	3,190		42		55		77	87	95		100		SPWCM
Sept. 13	6:00 a.m.	392	57	223,000	3,670		11		12		62	80	97		100		SPWCM
Sept. 26	7:30 a.m.	74	--	20,100	3,840		62		75		89	97	100		--		VPWCM

RIO GRANDE BASIN--Continued

CHICO ARROYO NEAR GUADALUPE, N. MEX.

LOCATION.--At gaging station a quarter of a mile upstream from mouth, 4½ miles northwest of Guadalupe, Sandoval County, and 5½ miles southwest of Cabezon.
DRAINAGE AREA.--1,390 square miles, approximately.
RECORDS AVAILABLE.--Sediment records: July 1948 to September 1954.
EXTREMES, 1953-54.--Sediment concentrations: Maximum daily, 87,500 ppm July 23; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 480,000 tons July 24; minimum daily, 0 tons on many days.
EXTREMES, 1948-54.--Sediment concentrations: Maximum daily, 113,000 ppm July 23, 1949; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 1,220,000 tons July 17, 1953; minimum daily, 0 tons on many days.
REMARKS.--Maximum observed sediment concentration during water year, 175,000 ppm Aug. 15. No flow during December, February, and April; tabulation omitted for these months. Records of discharge for water year October 1953 to September 1954 given in WSP 1342.

Suspended sediment, water year October 1953 to September 1954

Day	October			November			January		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	0	--	0	0	--	0	0		0
2.....	0	--	0	0	--	0	0		0
3.....	0	--	0	0	--	0	0		0
4.....	0	--	0	0	--	0	0		0
5.....	0	--	0	0	--	0	0		0
6.....	0	--	0	80	51,000	sa18,000	0		0
7.....	0	--	0	6	16,000	a 260	0		0
8.....	0	--	0	2	--	b 40	0		0
9.....	0	--	0	.5	--	b 4	0		0
10.....	0	--	0	0	--	0	0		0
11.....	0	--	0	0	--	0	0		0
12.....	0	--	0	0	--	0	0		0
13.....	0	--	0	0	--	0	0		0
14.....	0	--	0	0	--	0	0		0
15.....	0	--	0	0	--	0	0		0
16.....	0	--	0	0	--	0	0		0
17.....	0	--	0	0	--	0	0		0
18.....	0	--	0	0	--	0	0		0
19.....	.6	37,000	sa 110	0	--	0	0		0
20.....	56	44,000	sa 8,100	0	--	0	.1		
21.....	4	21,000	s 225	0	--	0	.1	--	(b)(t)
22.....	.1	11,000	3	0	--	0	.1		
23.....	8	--	b400	0	--	0	.1		
24.....	2	--	b 40	0	--	0	0		0
25.....	0	--	0	0	--	0	0		0
26.....	0	--	0	0	--	0	0		0
27.....	0	--	0	0	--	0	0		0
28.....	0	--	0	0	--	0	0		0
29.....	0	--	0	0	--	0	0		0
30.....	0	--	0	0	--	0	0		0
31.....	0	--	0	--	--	--	0		0
Total.	70.7	--	8,878	88.5	--	18,304	0.4	--	1.0

s Computed by subdividing day.
t Less than 0.50 ton.
a Computed from estimated concentration graph.
b Computed from water-sediment discharge curve.

RIO GRANDE BASIN--Continued

CHICO ARROYO NEAR GUADALUPE, N. MEX.--Continued

Suspended sediment, water year October 1953 to September 1954--Continued

Day	March			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	0	--	0	0	--	0	0		0
2	0	--	0	0	--	0	0		0
3	0	--	0	0	--	0	0		0
4	0	--	0	0	--	0	0		0
5	0	--	0	0	--	0	0		0
6	0	--	0	0	--	0	0		0
7	0	--	0	0	--	0	0		0
8	0	--	0	0	--	0	0		0
9	0	--	0	0	--	0	0		0
10	0	--	0	.5	--	b20	0		0
11	0	--	0	.1	--	(b)(t)	0		0
12	0	--	0	0	--	0	0		0
13	0	--	0	0	--	0	0		0
14	0	--	0	0	--	0	0		0
15	0	--	0	0	--	0	0		0
16	0	--	0	0	--	0	0		0
17	0	--	0	234	16,000	sa45,800	0		0
18	0	--	0	53	26,300	s5,200	0		0
19	0	--	0	2	--	b25	0		0
20	0	--	0	.3	--	b2	0		0
21	0	--	0	0	--	0	0		0
22	0	--	0	12	49,000	sa2,200	0		0
23	0	--	0	7	--	b1,300	0		0
24	12	43,000	sa2,400	3	--	b300	0		0
25	20	61,400	s3,360	.5	--	b20	0		0
26	7	78,000	a1,500	.2	--	b3	0		0
27	3	52,000	437	0	--	0	84		b14,000
28	1	29,000	a80	0	--	0	5		b600
29	.5	--	b5	0	--	0	1		b20
30	0	--	0	0	--	0	0		0
31	0	--	0	0	--	0	--		--
Total	43.5	--	7,802	312.6	--	54,870	90		14,620

Day	July			August			September		
1	72	47,000	sa13,000	0.6	48,000	81	3	38,000	319
2	43	77,100	s11,200	0	--	0	.4	8,000	9
3	7	52,000	1,020	0	--	0	83	13,600	s19,300
4	45	72,600	s15,000	0	--	0	69	45,400	s9,590
5	9	78,000	s1,890	0	--	0	40	37,000	s4,790
6	1	40,500	181	930	71,100	s210,000	100	54,600	s18,500
7	1	14,600	s107	64	33,500	s6,800	6	29,000	470
8	17	50,500	s3,600	15	19,400	s751	2	14,000	76
9	33	55,900	s6,420	10	12,900	s389	13	10,900	s1,860
10	30	39,100	s3,950	100	17,400	s20,300	59	39,000	s11,700
11	5	29,200	s443	390	69,700	s103,000	257	67,800	s72,600
12	.3	5,800	sa9	42	26,000	2,950	1,200	52,600	s246,000
13	0	--	0	94	43,500	11,400	1,460	75,600	s360,000
14	0	--	0	33	26,200	s2,790	90	27,000	s7,520
15	0	--	0	1,270	54,300	s433,000	17	13,000	a600
16	0	--	0	1,560	86,500	s437,000	7	7,500	142
17	0	--	0	645	54,200	s112,000	3	3,000	24
18	0	--	0	880	65,900	s192,000	2	507	3
19	0	--	0	45	25,500	3,100	.2	55	(t)
20	0	--	0	550	34,000	s155,000	0	--	0
21	0	--	0	312	50,000	s64,700	0	--	0
22	140	59,000	s28,400	19	18,800	964	0	--	0
23	1,420	87,500	s385,000	12	7,000	227	34	16,000	s4,530
24	1,950	86,300	s480,000	86	37,300	s10,300	203	31,200	s38,100
25	317	69,200	s68,700	73	35,600	s10,300	1,690	75,700	s419,000
26	14	29,500	1,120	5	12,000	162	1,460	83,100	s428,000
27	8	18,200	393	.8	7,000	15	74	33,500	6,940
28	4	8,000	86	.6	5,000	8	20	14,200	767
29	3	2,000	16	.2	3,000	2	7	8,000	151
30	2	4,510	24	.2	1,500	1	3	3,500	28
31	2	28,800	156	34	60,500	s8,850	--	--	--
Total	4,123.3	--	1,020,715	7,171.4	--	1,786,090	6,902.6	--	1,651,019

Total discharge for year (cfs-days) 18,803

Total load for year (tons) 4,562,299

s Computed by subdividing day.

t Less than 0.50 ton.

a Computed from estimated concentration graph.

b Computed from water-sediment discharge curve.

CHICO ARROYO NEAR GUADALUPE, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1953 to September 1954
(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; V, visual accumulation tube)

Date of collection	Time	Discharge (cfs)	Water temperature (°F)	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. 20, 1953	3:20 p.m.	38	--	40,200	7,850		73		86		90	91	96		100		VPWCM
May 22, 1954	2:00 p.m.	6.5	68	46,100	4,940		85		91		91	92	98		100		VPWCM
July 2	6:00 a.m.	108	55	114,000	3,780		59		74		83	87	97		100		SPWCM
July 4	11:50 a.m.	165	73	141,000	4,070		59		77		84	88	98		100		SPWCM
July 8	10:40 a.m.	62	--	83,000	3,340		66		90		94	97	100		--		VPWCM
July 22	2:50 a.m.	175	64	112,000	3,500		57		81		90	94	99		100		SPWCM
July 23	10:15 a.m.	1,430	68	116,000	3,900		41		58		76	86	98		100		SPWCM
Aug. 6	1:45 a.m.	1,430	63	126,000	3,280		32		48		67	82	97		100		SPWCM
Aug. 6	6:30 p.m.	372	72	62,300	3,080		51		65		73	81	97		100		SPWCM
Aug. 10	8:30 p.m.	534	66	83,100	3,430		46		59		76	86	98		100		SPWCM
Aug. 11	2:40 a.m.	1,120	64	112,000	4,290		37		54		72	85	98		100		SPWCM
Aug. 15	5:20 p.m.	5,300	58	92,100	2,640		39		48		77	93	99		100		SPWCM
Aug. 16	9:50 a.m.	260	65	68,500	4,170		35		44		52	65	92		100		SPWCM
Aug. 16	3:00 p.m.	1,780	57	95,900	3,280		27		35		56	80	98		100		SPWCM
Aug. 17	11:50 p.m.	820	--	81,600	3,540		39		53		75	89	99		100		SPWCM
Aug. 19	10:55 a.m.	60	72	23,200	3,560		72		85		92	97	100		--		VPWCM
Sept. 12	7:00 p.m.	1,520	60	128,000	2,880		33		43		74	91	99		100		SPWCM
Sept. 25	9:00 p.m.	6,000	58	72,900	3,310		45		61		90	98	100		--		VPWCM
Sept. 26	1:45 a.m.	3,200	55	121,000	3,650		22		32		47	72	97		100		SPWCM
Sept. 26	2:30 p.m.	1,220	--	72,400	4,500		29		42		59	81	99		100		SPWCM

RIO GRANDE BASIN--Continued

SAN JOSE RIVER AT CORREO, N. MEX.

LOCATION.--At gaging station 0.6 mile upstream from U. S. Highway 66, 0.7 mile northeast of Correo, Valencia County, and 13 miles upstream from mouth.
DRAINAGE AREA.--2,610 square miles, approximately.
RECORDS AVAILABLE.--Sediment records: July 1948 to September 1954.
EXTREMES, 1953-54.--Sediment concentrations: Maximum daily, 57,800 ppm July 3; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 250,000 tons Aug. 24; minimum daily, 0 tons on many days.
EXTREMES, 1948-54.--Sediment concentrations: Maximum daily, 58,800 ppm Aug. 29, 1952; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 250,000 tons Aug. 24, 1954; minimum daily, 0 tons on many days.
REMARKS.--Maximum observed sediment concentration during water year, 183,000 ppm July 24. No flow Oct. 1 to May 10, May 20 to June 30; tabulation omitted for these periods. Records of discharge for water year October 1953 to September 1954 given in WSP 1342.

Suspended sediment, water year October 1953 to September 1954

Day	May		
	Mean discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Tons per day
11	0.8	--	e200
12	.1	--	s 1
13	0	--	0
14	0	--	0
15	0	--	0
16	0	--	0
17	23	3,400	sa7,700
18	186	32,300	s45,900
19	.2	--	b 1
Total	210.1	--	53,802

Day	July			August			September		
	Mean discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Tons per day	Mean discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Tons per day	Mean discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Tons per day
1	104	53,300	s 31,300	350	30,400	s42,100	0	--	0
2	0	--	0	25	10,500	709	0	--	0
3	24	57,800	s 5,750	2	4,000	a 22	0	--	0
4	0	--	0	.2	1,000	a 1	15	--	e 1,600
5	17	31,200	s2,880	96	18,800	s 9,030	1	--	e 15
6	0	--	0	70	26,800	s 9,140	0	--	0
7	0	--	0	6	14,300	s 254	0	--	0
8	10	7,960	s 562	3	10,200	s 100	0	--	0
9	3	3,400	s 55	2	--	b 60	0	--	0
10	0	--	0	18	--	a 1,200	16	13,900	s 1,350
11	0	--	0	570	35,800	s 55,600	200	14,800	s37,200
12	0	--	0	223	18,400	s 18,500	1,140	23,500	s 93,800
13	0	--	0	40	3,000	324	485	18,200	s26,400
14	0	--	0	9	--	b 60	238	27,100	s 27,500
15	0	--	0	75	13,000	sa 30,000	28	3,000	227
16	0	--	0	640	41,400	s 100,000	11	--	b 40
17	0	--	0	447	21,500	s 35,700	6	--	b 20
18	0	--	0	215	15,300	s 9,620	3	--	b 8
19	0	--	0	135	6,730	s 2,800	1	--	b 2
20	0	--	0	58	10,200	s 2,180	0	--	0
21	0	--	0	217	31,800	s 21,200	0	--	0
22	1	45,100	s 293	126	18,600	a 7,330	0	--	0
23	83	38,300	s 8,810	44	12,600	s 12,200	0	--	0
24	660	50,600	s 97,000	960	42,000	sc 250,000	293	48,000	sc 53,000
25	132	13,400	s 7,210	142	16,800	s 7,060	210	14,200	s 10,200
26	225	9,000	5,470	37	9,000	a 900	743	39,200	s 104,000
27	105	4,500	a 1,300	11	--	b 110	272	10,000	7,340
28	25	2,000	135	10	--	b 100	60	3,000	486
29	4	--	b 10	6	--	b 40	35	2,700	255
30	.1	--	b 1	1	--	b 2	18	2,500	122
31	0	--	0	0	--	0	--	--	--
Total	1,393.1	--	160,776	4,538.2	--	616,342	3,775	--	363,565

Total discharge for year (cfs-days) 9,916.4
Total load for year (tons) 1,194,485

e Estimated.
s Computed by subdividing day.
a Computed from estimated conceatration graph.
b Computed from water-sediment discharge curve.
c Computed from partly estimated concentration graph.

SAN JOSE RIVER AT CORREO, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1953 to September 1954
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water; W, in distilled water; C, chemically disperzed; M, mechanically dispersed; V, visual accumulation tube)

Date of collection	Time	Discharge (cfs)	Water temperature (°F)	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	
May 18, 1954	11:00 a.m.	23	--	21,800	4,790		86		99		100	--	--		--		SPWCM
July 1	10:25 a.m.	14	69	50,000	3,140		88		98		100	--	--		--		SPWCM
July 22	2:10 p.m.	2.2	88	96,200	5,360		87		100		--	--	--		--		PWCM
July 23	12:45 p.m.	178	--	26,300	4,100		77		87		98	100	--		--		VPWCM
July 24	7:45 a.m.	810	64	62,700	4,510		55		69		86	94	99		100		SPWCM
July 24	8:15 p.m.	332	75	19,800	4,280		79		85		93	98	100		--		VPWCM
July 25	7:15 p.m.	384	--	34,200	3,800		44		50		73	91	99		100		SPWCM
July 26	10:20 a.m.	225	73	8,550	3,920		64		74		93	98	100		--		VPWCM
Aug. 1	5:00 p.m.	715	81	22,600	4,650		79		86		90	97	100		--		VPWCM
Aug. 2	7:10a.m.	31	70	10,900	3,730		93		98		100	--	--		--		SPWCM
Aug. 5	9:40 a.m.	332	68	22,900	3,460		79		89		93	98	100		--		VPWCM
Aug. 11	5:50 p.m.	580	74	19,200	3,400		51		62		80	96	100		--		VPWCM
Aug. 12	6:30 a.m.	288	--	27,100	3,770		49		66		89	98	100		--		VPWCM
Aug. 16	1:30 p.m.	420	--	29,700	3,520		73		88		93	98	100		--		VPWCM
Aug. 17	3:30 p.m.	294	76	11,000	3,230		59		70		85	97	100		--		VPWCM
Sept. 12	1:30 a.m.	825	59	30,000	3,960		53		67		87	95	99		100		VPWCM
Sept. 12	8:20 p.m.	3,140	57	37,300	4,220		49		60		79	92	99		100		SPWCM
Sept. 12	11:00 p.m.	1,330	58	33,300	4,380		57		71		92	98	98		100		SPWCM
Sept. 13	4:00 p.m.	264	74	11,800	4,540		67		77		87	95	100		--		VPWCM
Sept. 25	11:30 a.m.	201	62	9,230	3,480		65		74		87	94	98		100		VPWCM
Sept. 25	3:20 p.m.	356	64	27,600	3,000		71		86		91	98	100		--		VPWCM
Sept. 26	2:15 a.m.	1,870	59	92,900	3,830		43		57		79	94	100		--		SPWCM
Sept. 26	4:30 p.m.	660	67	19,700	4,140		51		60		74	96	100		--		VPWCM

RIO GRANDE BASIN--Continued

RIO PUERCO AT RIO PUERCO, N. MEX.

LOCATION.--At gaging station at Atchison, Topeka and Santa Fe Railway bridge, 7 miles downstream from San Jose River, and 15 miles west of Los Lunas, Valencia County.
DRAINAGE AREA.--5,160 square miles, approximately.
RECORDS AVAILABLE.--Water temperatures: October 1949 to September 1952.
Sediment records: July 1948 to September 1954.
EXTREMES, 1953-54.--Sediment concentrations: Maximum daily, 149,000 ppm Nov. 7; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 1,800,000 tons July 24; minimum daily, 0 tons on many days.
EXTREMES, 1948-54.--Sediment concentrations: Maximum daily, 195,000 ppm Aug. 8, 1949; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 1,800,000 tons July 24, 1954; minimum daily, 0 tons on many days.
REMARKS.--Maximum observed sediment concentrations during water year 351,000 ppm Aug. 7. Miscellaneous temperature measurements for water year October 1953 to September 1954 available in district office at Albuquerque, N. Mex. Records of discharge for water year October 1953 to September 1954 given in WSP 1342.

Suspended sediment, water year October 1953 to September 1954

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	0	--	0	0.1	--	e5	0.4	--	e35
2	0	--	0	0	--	0	.2	--	e15
3	0	--	0	0	--	0	.1	--	e7
4	0	--	0	0	--	0	0	--	0
5	0	--	0	0	--	0	0	--	0
6	0	--	0	.6	--	e50	0	--	0
7	0	--	0	212	149,000	s109,000	0	--	0
8	0	--	0	31	103,000	9,260	0	--	0
9	0	--	0	12	87,000	3,030	0	--	0
10	0	--	0	7	--	e1,400	0	--	0
11	0	--	0	4	--	e700	0	--	0
12	0	--	0	3	--	e500	0	--	0
13	0	--	0	3	--	e450	0	--	0
14	0	--	0	2	--	e250	0	--	0
15	0	--	0	2	--	e200	0	--	0
16	0	--	0	.3	--	e25	0	--	0
17	0	--	0	.2	--	e15	.5	--	e45
18	0	--	0	.2	--	e15	.2	--	e15
19	0	--	0	.3	--	e20	.2	--	e15
20	0	--	0	.1	--	e7	.2	--	e10
21	0	--	0	.3	--	e25	.1	--	e7
22	0	--	0	.1	--	e7	0	--	0
23	0	--	0	0	--	0	0	--	0
24	61	37,000	sa34,000	.6	--	e50	0	--	0
25	68	110,000	sa23,000	.3	--	e25	0	--	0
26	12	67,500	2,270	.2	--	e15	0	--	0
27	3	45,500	382	.4	--	e35	0	--	0
28	1	35,000	a100	.2	--	e15	0	--	0
29	.2	25,000	a15	0	--	0	0	--	0
30	.1	--	e7	0	--	0	0	--	0
31	.1	--	e6	--	--	--	0	--	0
Total	145.4	--	59,780	279.9	--	125,099	1.9	--	149

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

RIO GRANDE BASIN--Continued

RIO PUERCO AT RIO PUERCO, N. MEX.--Continued

Suspended sediment, water year October 1953 to September 1954--Continued

Day	January			February			March		
	Mean discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Tons per day	Mean discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Tons per day	Mean discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Tons per day
1	0	--	0				0	--	0
2	0	--	0				0	--	0
3	0	--	0				0	--	0
4	0	--	0				0	--	0
5	0	--	0				0	--	0
6	0	--	0				0	--	0
7	.5	--	e45				0	--	0
8	.8	--	e80				0	--	0
9	.7	--	e65				0	--	0
10	.2	--	e15				0	--	0
11	0	--	0				0	--	0
12	0	--	0				0	--	0
13	0	--	0				0	--	0
14	0	--	0				0	--	0
15	.2	--	e15				0	--	0
16	.2	--	e15				0	--	0
17	.1	--	e7				0	--	0
18	.1	--	e7				0	--	0
19	.5	--	e45				0	--	0
20	1	--	e100				0	--	0
21	.3	--	e25				0	--	0
22	.4	--	e35				0	--	0
23	.1	--	e10				0	--	0
24	0	--	0				0	--	0
25	.1	--	e7				0	--	0
26	.3	--	e25				0	--	0
27	.1	--	e7				22	139,000	9,170
28	0	--	0				13	110,000	a4,100
29	0	--	0				7	97,000	1,970
30	0	--	0				4	105,000	a1,200
31	0	--	0				3	82,000	689
Total	5.6	--	503	0	0	0	49	--	17,129

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Tons per day	Mean discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Tons per day	Mean discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Tons per day
1	1	58,000	a160	0.2	--	e15	0	--	0
2	.6	37,500	63	.2	--	e15	0	--	0
3	.4	24,000	a30	.2	--	e10	0	--	0
4	.4	--	e25	.1	--	e6	0	--	0
5	.2	--	e15	.1	--	e6	0	--	0
6	0	--	0	0	--	0	0	--	0
7	0	--	0	0	--	0	0	--	0
8	0	--	0	0	--	0	0	--	0
9	0	--	0	0	--	0	0	--	0
10	0	--	0	0	--	0	0	--	0
11	0	--	0	0	--	0	0	--	0
12	0	--	0	19	58,500	s5,600	0	--	0
13	0	--	0	13	74,000	2,690	0	--	0
14	0	--	0	21	96,000	sa6,300	0	--	0
15	0	--	0	20	83,000	a4,600	0	--	0
16	0	--	0	10	73,000	a2,000	0	--	0
17	0	--	0	6	70,000	1,180	0	--	0
18	0	--	0	135	71,400	s46,000	0	--	0
19	0	--	0	122	145,000	s61,700	0	--	0
20	0	--	0	24	92,000	a6,400	0	--	0
21	9	83,600	s3,790	8	77,500	1,740	0	--	0
22	12	100,000	s3,680	5	--	e1,000	0	--	0
23	6	95,000	1,650	2	--	400	0	--	0
24	5	98,000	a1,400	1	--	e150	0	--	0
25	2	77,000	a430	1	--	e150	0	--	0
26	1	37,500	105	4	--	e600	.6	--	e60
27	.7	23,500	44	5	--	e800	3	--	e500
28	.2	--	e15	2	--	e400	0	--	0
29	.1	--	e7	1	--	e150	0	--	0
30	.1	--	e7	.2	--	e20	.4	--	e35
31	--	--	--	0	--	0	--	--	--
Total	38.7	--	11,421	400.0	--	141,932	4.0	--	595

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

RIO GRANDE BASIN--Continued

RIO PUERCO AT RIO PUERCO, N. MEX.--Continued

Suspended sediment, water year October 1953 to September 1954--Continued

Day	July			August			September		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	377	82,600	s106,000	275	42,300	s 42,400	0	--	0
2.....	22	74,500	4,590	142	28,000	10,700	0	--	0
3.....	18	82,000	4,130	11	10,000	297	0	--	0
4.....	10	72,500	2,030	.8	1,500	3	0	--	0
5.....	9	86,900	s2,500	45	29,800	s13,100	81	106,000	s33,200
6.....	9	95,000	2,480	69	33,100	s7,240	30	70,000	5,880
7.....	1	76,000	a210	1,070	141,000	s577,000	79	66,000	sa18,000
8.....	1	--	e200	177	78,600	s49,600	20	41,000	a2,300
9.....	6	--	e1,700	45	53,100	7,820	14	51,000	sa3,400
10.....	3	--	e900	164	63,000	sa73,000	15	85,000	3,570
11.....	10	--	e3,000	677	87,300	s155,000	8	40,000	896
12.....	14	--	e4,000	1,000	110,000	s351,000	917	89,500	s225,000
13.....	2	--	e500	150	54,000	22,700	3,150	98,400	s987,000
14.....	.7	--	e130	36	--	e4,000	1,260	128,000	s498,000
15.....	.4	--	e60	42	--	e5,000	165	68,000	31,400
16.....	.2	--	e20	2,990	119,000	s1,300,000	28	47,500	3,720
17.....	0	--	0	2,300	122,000	s883,000	15	38,000	1,600
18.....	0	--	0	1,170	108,000	s388,000	6	--	e500
19.....	.6	--	e80	1,000	100,000	290,000	2	--	e150
20.....	3	--	e700	193	39,000	21,100	.6	--	e25
21.....	10	--	e3,000	2,060	118,000	s945,000	.1	--	e3
22.....	772	99,100	s250,000	460	77,000	99,200	0	--	0
23.....	2,330	145,000	s1,030,000	132	42,000	15,500	33	21,000	sa13,000
24.....	4,400	140,000	s1,800,000	1,510	81,700	s456,000	231	54,800	s37,800
25.....	1,110	114,000	s385,000	239	28,000	18,100	1,260	77,000	s602,000
26.....	590	74,000	122,000	90	--	e10,000	3,860	134,000	s1,470,000
27.....	200	48,000	a27,000	15	--	e1,000	1,680	94,100	s480,000
28.....	30	27,500	2,230	5	--	e700	250	59,000	41,300
29.....	17	17,000	780	1	--	e100	95	37,000	9,840
30.....	3	9,000	a70	.2	--	e15	30	25,000	2,020
31.....	35	27,000	sa10,000	0	--	0	--	--	--
Total	9,983.9	--	3,763,310	16,069.0	--	5,726,575	13,229.7	--	4,470,604

Total discharge for year (cfs-days) 40,207.1
Total load for year (tons) 14,317,097

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

RIO PUERCO AT RIO PUERCO, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1953 to September 1954
(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; V, visual accumulation tube)

Date of collection	Time	Discharge (cfs)	Water temperature (°F)	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	0.500	1.000	2.000	
Nov. 8, 1953	2:30 p.m.	28	48	98,800	5,240		81		100		--	--	--	--			SPWCM
Mar. 27, 1954	12:00 m.	42	50	136,000	4,180		83		100		--	--	--	--			SPWCM
May 18	12:50 p.m.	154	66	54,800	3,980		72		89		98	100	--	--			VPWCM
July 1	12:15 p.m.	524	68	77,800	3,990		61		79		93	98	100	--			VPWCM
July 22	5:30 a.m.	2,520	--	120,000	3,960		53		69		84	92	99	100			SPWCM
July 23	10:15 a.m.	3,540	--	197,000	3,660		38		49		70	82	96	100			SPWCM
July 24	12:15 p.m.	5,300	--	107,000	4,440		47		63		80	93	99	100			SPWCM
July 26	1:30 p.m.	662	--	74,200	4,050		57		75		88	97	100	--			SPWCM
Aug. 1	6:10 p.m.	710	76	54,500	3,690		56		70		88	98	100	--			SPWCM
Aug. 2	5:00 a.m.	219	71	34,300	4,020		72		82		91	98	100	--			VPWCM
Aug. 7	2:00 a.m.	2,670	69	262,000	3,970		30		40		57	73	97	100			SPWCM
Aug. 7	4:00 a.m.	1,780	69	179,000	3,540		45		55		70	86	99	100			SPWCM
Aug. 7	3:30 p.m.	546	--	105,000	3,780		59		77		88	96	100	--			SPWCM
Aug. 11	7:45 p.m.	1,040	--	41,500	3,240		52		62		83	96	100	--			SPWCM
Aug. 12	2:15 a.m.	1,950	--	133,000	4,070		41		54		75	89	99	100			SPWCM
Aug. 16	3:45 p.m.	6,280	--	104,000	3,960		52		68		85	93	99	100			SPWCM
Aug. 17	11:00 a.m.	6,140	--	132,000	4,710		35		46		69	88	99	100			SPWCM
Aug. 21	10:55 a.m.	2,280	--	147,000	3,880		35		45		71	90	99	100			SPWCM
Sept. 13	4:45 p.m.	5,720	68	131,000	3,770		45		57		77	91	99	100			SPWCM
Sept. 15	1:00 p.m.	148	70	63,000	4,220		78		89		95	98	100	--			SPWCM
Sept. 24	2:55 p.m.	590	68	47,400	5,340		55		65		87	98	100	--			SPWCM
Sept. 25	7:00 p.m.	2,940	--	162,000	3,500		28		37		61	79	92	100			SPWCM
Sept. 26	8:40 p.m.	5,750	60	107,000	4,420		34		45		71	89	98	100			SPWCM

RIO GRANDE BASIN--Continued

RIO PUERCO NEAR BERNARDO, N. MEX.

LOCATION.--At gaging station at bridge on U. S. Highway 85, 1.2 miles southwest of Bernardo, Socorro County, 3 miles upstream from mouth, and 16 miles south of Belen.
DRAINAGE AREA.--5,860 square miles, approximately.
RECORDS AVAILABLE.--Sediment records: October 1947 to September 1954.
EXTREMES, 1953-54.--Sediment concentrations: Maximum daily, 172,000 ppm Sept. 26; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 1,740,000 tons Sept. 26; minimum daily, 0 tons on many days.
EXTREMES, 1947-54.--Sediment concentrations: Maximum daily, 215,000 ppm July 22, 1949; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 1,740,000 tons Sept. 26, 1954; minimum daily, 0 tons on many days.
REMARKS.--Maximum observed sediment concentration during water year, 264,000 ppm Aug. 16. No flow during period January to March ; tabulation omitted for that period. Records of discharge for water year October 1953 to September 1954 given in WSP 1342.

Suspended sediment, water year October 1953 to September 1954

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	0	--	0	0	--	0			
2.....	0	--	0	0	--	0			
3.....	0	--	0	0	--	0			
4.....	0	--	0	0	--	0			
5.....	0	--	0	0	--	0			
6.....	0	--	0	0	--	0			
7.....	0	--	0	60	31,000	sa36,000			
8.....	0	--	0	113	135,000	s46,000			
9.....	0	--	0	32	118,000	11,000			
10.....	0	--	0	9	98,000	2,560			
11.....	0	--	0	6	87,000	1,510			
12.....	0	--	0	4	75,000	840			
13.....	0	--	0	1	54,000	151			
14.....	0	--	0	.5	34,000	a50			
15.....	0	--	0	.2	20,000	a10			
16.....	0	--	0	.1	12,000	3			
17.....	0	--	0	0	--	0			
18.....	0	--	0	0	--	0			
19.....	0	--	0	0	--	0			
20.....	0	--	0	0	--	0			
21.....	0	--	0	0	--	0			
22.....	0	--	0	0	--	0			
23.....	0	--	0	0	--	0			
24.....	0	--	0	0	--	0			
25.....	25	34,000	sa12,000	0	--	0			
26.....	38	117,000	s13,700	0	--	0			
27.....	8	98,000	2,270	0	--	0			
28.....	2	65,000	364	0	--	0			
29.....	.5	12,000	16	0	--	0			
30.....	.1	6,700	2	0	--	0			
31.....	0	--	0	-	--	-			
Total.	73.6	--	28,352	225.8	--	98,524	0		0

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

RIO GRANDE BASIN--Continued

RIO PUERCO NEAR BERNARDO, N. MEX.--Continued

Suspended sediment, water year October 1953 to September 1954--Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1				0	--	0	0		
2				0	--	0	0		
3				0	--	0	0		
4				0	--	0	0		
5				0	--	0	0		
6				0	--	0	0		
7				0	--	0	0		
8				0	--	0	0		
9				0	--	0	0		
10				0	--	0	0		
11				0	--	0	0		
12				0	--	0	0		
13				0	--	0	0		
14				0	--	0	0		
15				0	--	0	0		
16				10	92,500	s3,220	0		
17				5	92,500	1,340	0		
18				1	83,000	232	0		
19				188	121,000	s76,100	0		
20				82	156,000	38,400	0		
21				23	116,000	7,740	0		
22				8	93,000	2,160	0		
23				2	69,000	386	0		
24				2	52,000	291	0		
25				1	37,500	105	0		
26				.8	18,000	39	0		
27				.1	--	e3	0		
28				0	--	0	0		
29				0	--	0	0		
30				0	--	0	.2		
31				0	--	0	--		
Total	0		0	322.9	--	130,016	0.2		e8

Day	July			August			September		
1	127	15,000	sa39,000	1	14,000	a40	0	--	0
2	174	93,700	43,600	281	55,800	s57,400	0	--	0
3	20	94,000	5,450	26	40,000	2,910	.4	--	e10
4	9	79,000	1,990	12	30,300	982	.4	--	e10
5	8	73,000	1,640	4	13,000	140	0	--	0
6	2	61,200	343	12	32,000	s3,020	17	52,700	s8,220
7	3	23,000	186	584	149,000	s396,000	26	118,000	8,900
8	1	19,000	51	715	119,000	s298,000	69	118,000	s25,300
9	.1	11,000	a3	64	80,100	s14,300	27	118,000	9,240
10	0	--	0	43	71,000	8,550	8	108,000	2,510
11	0	--	0	432	88,400	s124,000	32	106,000	s10,400
12	0	--	0	1,060	119,000	s373,000	276	86,000	s90,400
13	0	--	0	278	100,000	80,600	1,530	111,000	s517,000
14	0	--	0	90	63,000	15,900	2,540	146,000	s1,120,000
15	0	--	0	35	52,500	5,140	350	102,000	104,000
16	0	--	0	1,330	92,300	s635,000	45	71,000	8,950
17	0	--	0	2,700	149,000	s1,190,000	34	65,000	6,190
18	0	--	0	1,430	141,000	s628,000	10	66,000	1,850
19	0	--	0	980	132,000	s409,000	2	52,000	291
20	0	--	0	358	53,000	a53,000	.4	--	e30
21	3	15,800	s397	1,380	88,000	sa630,000	.1	--	e5
22	485	61,000	s183,000	1,100	110,000	a350,000	0	--	0
23	944	128,000	s450,000	220	67,000	a41,000	198	30,900	s97,400
24	3,750	127,000	s1,350,000	1,100	97,600	s384,000	176	95,800	s52,200
25	2,740	123,000	s937,000	434	67,900	s94,100	508	95,400	s191,000
26	690	126,000	s252,000	178	46,000	22,900	3,370	172,000	s1,740,000
27	344	83,000	79,900	66	45,000	8,320	4,400	99,300	s1,150,000
28	120	53,000	17,800	36	34,000	3,430	563	86,500	136,000
29	35	37,500	3,680	12	47,500	1,600	172	59,000	28,400
30	14	32,500	1,270	3	--	e250	86	47,000	11,300
31	5	27,500	371	.4	--	e19	--	--	--
Total	9,474.1	--	3,367,681	14,964.4	--	5,834,592	14,440.3	--	5,319,606

Total discharge for year (cfs-days) 39,501.1
Total load for year (tons) 14,778,779

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

RIO GRANDE BASIN--Continued

RIO PUERCO NEAR BERNARDO, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1953 to September 1954
(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; V, visual accumulation tube)

Date of collection	Time	Discharge (cfs)	Water temperature (°F)	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	0.500	1.000	2.000	
Oct. 26, 1953....	8:00 a.m.	44	47	124,000	3,830		80		99		100	--	--	--			SPWCM
Nov. 8.....	10:30 a.m.	102	53	131,000	4,290		70		93		100	--	--	--			VPWCM
May 19, 1954....	12:15 a.m.	496	76	212,000	3,960		68		81		92	97	100	--			SPWCM
May 20.....	1:00 p.m.	80	--	156,000	4,790		70		95		100	--	--	--			VPWCM
May 24.....	5:00 p.m.	2	--	48,000	3,920		98		100		--	--	--	--			SPWCM
July 2.....	8:30 a.m.	176	--	87,400	3,310		67		92		99	100	--	--			VPWCM
July 2.....	7:00 p.m.	55	--	105,000	3,910		79		98		100	--	--	--			VPWCM
July 24.....	7:20 p.m.	4,610	--	127,000	3,990		52		68		86	95	100	--			SPWCM
July 25.....	7:00 a.m.	4,940	--	106,000	3,700		60		77		91	95	99	100			SPWCM
Aug. 8.....	6:30 a.m.	1,840	--	142,000	4,320		38		57		80	95	100	--			SPWCM
Aug. 12.....	10:00 a.m.	1,400	--	86,600	5,040		43		59		85	98	100	--			SPWCM
Aug. 17.....	2:30 a.m.	4,830	76	123,000	3,870		49		67		81	92	100	--			SPWCM
Aug. 17.....	7:00 p.m.	3,050	--	155,000	3,480		39		53		77	93	100	--			SPWCM
Aug. 24.....	7:00 p.m.	2,850	--	114,000	3,800		44		60		82	96	100	--			SPWCM
Aug. 25.....	10:30 a.m.	444	--	69,700	5,000		58		77		90	97	100	--			SPWCM
Sept. 13.....	2:00 p.m.	1,700	--	115,000	3,750		43		59		80	95	100	--			SPWCM
Sept. 14.....	5:00 a.m.	4,940	66	132,000	3,940		44		59		76	88	100	--			SPWCM
Sept. 14.....	2:00 p.m.	1,310	--	142,000	4,380		42		55		79	94	100	--			SPWCM
Sept. 26.....	10:50 p.m.	7,250	--	72,900	4,900		50		71		86	92	99	100			SPWCM
Sept. 27.....	12:30 a.m.	7,850	--	70,000	3,970		56		76		90	95	99	100			VPWCM
Sept. 27.....	9:00 a.m.	6,220	--	85,800	3,400		54		69		86	97	100	--			SPWCM
Sept. 28.....	8:00 a.m.	600	--	93,700	3,190		54		70		86	96	99	100			SPWCM

RIO GRANDE BASIN--Continued

RIO SALADO NEAR SAN ACACIA, N. MEX.

LOCATION.--At gaging station, 1 mile upstream from mouth, 2 miles northeast of San Acacia, Socorro County, 1.7 miles downstream from bridge on U. S. Highway 85, and 15 miles north of Socorro.
DRAINAGE AREA.--1,380 square miles, approximately.
RECORDS AVAILABLE.--Sediment records: July 1948 to September 1954.
EXTREMES, 1953-54.--Sediment concentrations: Maximum daily, 151,000 ppm July 24; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 776,000 tons Sept. 25; minimum daily, 0 tons on many days.
EXTREMES, 1948-54.--Sediment concentrations: Maximum daily, 182,000 ppm Aug. 13, 1953; minimum daily, no flow on many days each year.
Sediment loads: Maximum daily, 793,000 tons Aug. 13, 1953; minimum daily, 0 tons on many days each year.
REMARKS.--Maximum observed sediment concentrations during water year, 234,000 ppm July 24. No flow during period Oct. 1 to Apr. 12; tabulation omitted for that period. Records of specific conductance and some temperature observations for individual samples on file in the Albuquerque office. Records of discharge for water year October 1953 to September 1953 given in WSP 1342.

Suspended sediment, water year October 1953 to September 1954

Day	July			August			September		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	3	72,500	s1,170	16	52,500	s5,630	0	--	0
2.....	0	--	0	7	78,000	1,530	.8	13,500	s314
3.....	0	--	0	2	54,000	302	.2	--	e40
4.....	0	--	0	0	--	0	10	--	e 4,000
5.....	0	--	0	.4	17,400	s96	2	--	100
6.....	0	--	0	242	104,000	s76,000	10	--	e2,000
7.....	0	--	0	82	117,000	s34,000	8	--	e1,500
8.....	90	81,500	s35,700	11	72,400	s3,000	2	30,000	162
9.....	31	89,500	s10,800	10	39,000	s2,540	1	9,000	24
10.....	5	58,300	s 1,440	1,000	88,200	s711,000	40	59,000	6,610
11.....	1	38,000	a110	440	72,900	s136,000	140	91,900	s83,500
12.....	0	--	0	9	20,000	486	730	132,000	s344,000
13.....	0	--	0	1	12,000	32	400	96,100	131,000
14.....	0	--	0	0	--	0	90	75,000	s18,900
15.....	0	--	0	0	--	0	10	41,000	1,150
16.....	0	--	0	40	68,000	7,620	1	15,000	a40
17.....	0	--	0	5	76,000	1,060	0	--	0
18.....	0	--	0	157	91,800	s52,300	10	--	e3,000
19.....	0	--	0	32	63,000	s6,470	5	--	e1,000
20.....	0	--	0	47	98,900	s25,400	0	--	0
21.....	0	--	0	130	76,200	s54,500	0	--	0
22.....	9	92,200	s4,360	24	59,000	s6,460	0	--	0
23.....	144	110,000	85,700	12	70,000	2,350	240	9,580	sa170,000
24.....	1,110	151,000	s571,000	100	76,600	s41,600	710	74,100	s311,000
25.....	187	48,200	s32,300	275	96,300	s98,900	1,500	68,300	s776,000
26.....	1	--	e110	13	80,500	s3,170	1,470	103,000	s613,000
27.....	0	--	0	3	30,000	s275	480	58,300	s159,000
28.....	0	--	0	0	--	0	12	10,200	s 5,510
29.....	0	--	0	0	--	0	0	--	0
30.....	0	--	0	0	--	0	0	--	0
31.....	0	--	0	0	--	0	--	--	0
Total.	1,581	--	742,690	2,658.4	--	1,270,721	5,872.0	--	2,631,850

Total discharge for year (cfs-days)..... b10,112.4
Total load for year (tons)..... c4,645,461

e Estimated.
s Computed by subdividing day.
a Computed from estimated concentration graph.
b Includes mean discharge of 1 for Apr. 13.
c Includes estimated total of 200 tons for April

RIO GRANDE BASIN--Continued

RIO SALADO NEAR SAN ACACIA, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1953 to September 1954
(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, V, visual accumulation tube)

Date of collection	Time	Discharge (cfs)	Water temperature (°F)	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	0.500	1.000	2.000	
July 9, 1954	5:10 p.m.	23	78	29,800	3,980		73		98		99	100	--	--	--		VPWCM
July 22	7:00 a.m.	3.8	63	103,000	2,740		84		98		99	99	100	--	--		VPWCM
July 23	5:05 a.m.	160	68	167,000	4,690		62		92		98	98	99	100	--		VPWCM
July 24	7:50 a.m.	1,200	69	169,000	3,760		35		51		72	84	96	100	--		SPWCM
July 24	8:25 p.m.	3,220	73	234,000	3,670		28		39		62	77	94	99	100		SPWCM
July 25	8:45 a.m.	190	74	52,800	3,780		74		91		97	99	100	--	--		VPWCM
Aug. 2	5:45 p.m.	5	77	76,900	4,510		93		99		99	99	99	100	--		VPWCM
Aug. 6	7:10 a.m.	354	66	99,400	3,580		53		74		91	96	99	100	--		SPWCM
Aug. 7	10:55 a.m.	260	71	146,000	4,500		49		74		88	93	99	100	--		SPWCM
Aug. 18	9:25 a.m.	230	72	86,600	5,190		50		70		85	92	99	100	--		SPWCM
Aug. 25	4:00 p.m.	700	75	118,000	2,800		48		71		91	96	99	100	--		SPWCM
Sept. 11	7:30 p.m.	426	68	198,000	3,620		34		51		78	87	97	100	--		SPWCM
Sept. 25	10:30 p.m.	16,600	63	180,000	4,000		19		25		47	62	87	98	99	100	SPWCM
Sept. 26	9:10 a.m.	600	65	82,800	2,880		54		69		84	91	97	100	--		SPWCM

RIO GRANDE BASIN--Continued

SOCORRO MAIN CANAL NORTH AT SAN ACACIA, N. MEX.

LOCATION.--At San Acacia diversion dam, half a mile upstream from canal gaging station, and 0.7 mile east of San Acacia, Socorro County.
RECORDS AVAILABLE.--Sediment records: October 1947 to September 1954.
EXTREMES, 1953-54.--Sediment loads: Maximum daily, 43,200 tons Aug. 19; minimum daily, 0 tons on many days.
EXTREMES, 1947-54.--Sediment loads: Maximum daily, 47,900 tons Aug. 12, 1953; minimum daily, 0 tons on many days.
REMARKS.--Records of discharge for water year October 1953 to September 1954 given in WSP 1342.

Monthly and annual summary of suspended-sediment discharge, water year October 1953 to September 1954

Month	Discharge (cfs-days)	Suspended sediment (tons)
1953		
October	157	8,674
November	1,632	12,943
December	419	6,034
1954		
January	0	0
February	855	12,433
March	2,855	14,830
April	3,735	19,942
May	4,486	59,308
June	2,089	4,640
July	1,448	182,675
August	2,218	371,966
September	704	116,931
Total for year	20,598	a810,376

a Total suspended load for Rio Grande at San Acacia diversion dam is the sum of the load for Rio Grande at San Acacia and the load for Socorro main canal north, or 15,517,555 tons. Suspended sediment records for Rio Grande at San Acacia are given on page 427.

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RIO GRANDE BASIN--Continued

RIO GRANDE AT SAN ACACIA, N. MEX.

LOCATION.--At San Acacia diversion dam, 0.7 mile above gaging station, 0.7 mile east of San Acacia, Socorro County, and 1.8 miles downstream from Rio Salado.
DRAINAGE AREA.--26,770 square miles, approximately (includes 2,940 square miles in northern part of San Luis Valley, Colo.).
RECORDS AVAILABLE.--Chemical analyses: July to December 1937, March 1939 to September 1954.
Water temperatures: October 1947 to September 1954.
Sediment records: July 1946 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 2,950 ppm Oct. 26; minimum, 374 ppm May 21-31.
Hardness: Maximum, 1,420 ppm Oct. 26; minimum, 194 ppm May 21-31.
Specific conductance: Maximum observed, 3,590 micromhos Oct. 26; minimum observed, 509 micromhos May 22.
Water temperatures: Maximum observed, 88°F Aug. 8; minimum observed, 33°F Dec. 23.
Sediment concentrations: Maximum daily, 132,000 ppm Sept. 14; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 1,450,000 tons Sept. 26; minimum daily, 0 tons on many days.
EXTREMES, 1937, 1939-54.--Dissolved solids: Maximum, 2,950 ppm Oct. 26, 1953; minimum, 183 ppm June 1-10, 1942.
Hardness: Maximum, 1,420 ppm Oct. 26, 1953; minimum, 101 ppm June 11-20, 1942.
Specific conductance: Maximum observed, 3,700 micromhos July 14, 1940; minimum observed, 236 micromhos May 17, 1942.
Water temperatures (1947-54): Maximum observed, 88°F Aug. 8, 1954; minimum observed, freezing point on several days during winter months in most years.
Sediment concentrations (1946-54): Maximum daily, 196,000 ppm Aug. 11, 1946; minimum daily, no flow on many days.
Sediment loads (1946-54): Maximum daily, 1,570,000 tons Aug. 17, 1947; minimum daily, 0 tons on many days.
REMARKS.--Values reported for dissolved solids are sums of determined constituents. Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Socorro Main Canal heads at San Acacia diversion dam and by-passes gaging station. Data reported do not include flow in canal. Monthly sediment records for the canal are given on page 423. Records of discharge for water year October 1953 to September 1954 given in WSP 1342. No appreciable inflow between sampling point and gaging station except during periods of heavy local rains.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-5, 1953	a0.10	56		75	17	136	--	225	270	64		0.8		730	0.99	0.20	257	72	•53	3.7	1,070	7.5
Oct. 13-20	.15	50		67	16	112	--	205	229	54		.4		629	.86	.25	233	65	51	3.2	929	7.7
Oct. 21-25	.22	45		76	17	111	--	215	238	54		.6		648	.88	.38	260	84	48	3.0	958	7.7
Oct. 26	29.0	--		418	92	407		480	1,670	123		.5		2,950	4.01	231	1,420	1,030	38	4.7	3,590	--
Oct. 27	a8.0	19		184	37	193		242	701	72		1.1		1,330	1.81	28.7	611	412	41	3.4	1,840	--
Nov. 20	3.0	38		88	19	107	--	227	265	52		2.5		684	.93	5.54	298	112	44	2.7	1,000	7.7
Nov. 21-30	122	36		80	15	75	--	234	180	36		3.1		540	.73	178	261	70	38	2.0	810	7.5
Dec. 1-10	433	32		74	13	60	--	225	144	28		3.4		465	.63	544	238	54	35	1.7	707	7.4
Dec. 11-20	495	31		68	12	60	--	207	128	30		2.6		434	.59	580	219	50	37	1.8	665	7.5
Dec. 21-31	533	30		68	13	67	--	201	133	43		2.3		455	.52	655	223	58	39	1.9	705	7.6
Jan. 1-10, 1954	503	30		67	13	57	--	210	125	30		2.3		427	.58	580	220	48	36	1.7	656	7.5
Jan. 11-20	538	29		69	14	60	--	227	123	36		2.7		446	.61	648	230	44	36	1.7	697	7.5
Jan. 21-31	553	28		68	12	56	--	224	115	30		2.4		421	.57	629	219	36	36	1.6	658	7.4
Feb. 1-10	588	28		64	12	55	--	212	112	30		2.2		407	.55	646	209	36	36	1.6	643	7.5
Feb. 11-20	683	29		63	12	52	--	202	117	27		2.1		401	.55	739	206	41	35	1.6	623	7.7
Feb. 21-28	603	28		65	11	53	--	206	117	27		2.8		405	.55	659	207	38	36	1.6	633	7.5
Mar. 1-8	389	28		65	12	63	--	205	132	36		2.0		439	.60	461	212	44	39	1.9	684	7.6
Mar. 9-20	222	31		73	14	74	--	228	154	43		2.0		503	.68	301	240	52	40	2.1	791	7.7
Mar. 21-31	152	33		80	16	89	--	240	187	49		2.0		574	.78	236	266	69	42	2.4	888	7.6

a No flow Oct. 6-12, Oct. 28 to Nov. 7, Nov. 10-19, July 13, 16-17.

Apr. 1-10, 1954...	148	31		78	16	84	233		187	46		2.2		559	.76	223	260	70	41	2.3	863	7.7
Apr. 11-20.....	556	27		66	12	57	204		128	31		3.1		424	.58	637	214	47	37	1.7	669	7.7
Apr. 21-May 2	115	34		83	17	90	248		192	50		.7		589	.80	183	277	74	41	2.4	894	7.6
May 3-10	338	30		74	14	66	231		141	36		2.2		477	.65	435	242	52	37	1.9	732	7.7
May 11-12, 15-20..	845	30		70	14	65	215		142	34		2.5		464	.63	1,060	232	56	38	1.9	711	7.7
May 13-14	528	27		106	17	124	220		292	84		3.2		761	1.03	1,080	334	154	45	2.9	1,150	7.7
May 21-31	953	25		62	9.7	49	199		104	24		2.0		374	.51	962	194	32	35	1.5	577	7.6
June 1-10	71.6	33		83	14	94	243		201	50		1.1		595	.81	115	264	66	44	2.5	896	7.8
June 11-20	3.3	44		80	15	112	235		223	55		1.3		646	.88	5.76	261	68	48	3.0	971	7.6
June 21-24, 26-30..	3.3	40		82	16	114	239		238	57		1.2		666	.91	5.93	270	74	48	3.0	995	7.5
July 1, 3-5.....	4.5	31		93	45	161	263		437	62		4.5		962	1.31	11.7	417	202	46	3.4	1,390	7.5
July 6-10	27.2	31		90	18	122	246		259	64		2.5		708	.96	52.0	298	97	47	3.1	1,090	7.8
July 11-12, 14-15, 18-21	a.15	43		84	17	120	215		262	66		.6		699	.95	.28	280	104	48	3.1	1,010	7.8
July 22, 30-31	91.7	34		91	15	120	241		250	61		3.2		693	.94	172	288	91	47	3.1	1,000	7.4
July 23-29	1,349	23		157	26	177	263		562	61		4.8		1,140	1.55	4,150	498	283	44	3.4	1,560	7.9
Aug. 1, 8, 10.....	473	18		286	45	192	232		973	79		1.2		1,710	2.33	2,180	898	708	32	2.8	2,150	7.7
Aug. 2-7, 9	119	20		124	24	137	224		419	58		4.0		896	1.22	288	408	224	42	2.9	1,280	8.0
Aug. 11-20.....	838	17		179	34	173	262		642	59		1.9		1,230	1.67	2,780	586	372	39	3.1	1,670	7.7
Aug. 21-27.....	564	19		187	39	187	259		687	68		4.0		1,320	1.80	2,010	627	415	39	3.3	1,780	7.6
Aug. 28-Sept. 4 ...	4.0	31		111	21	138	275		312	86		2.4		836	1.14	9.03	364	138	45	3.1	1,250	7.5
Sept. 5-9	2.0	19		202	40	219	422		670	74		.4		1,430	1.94	7.72	668	322	42	3.7	1,930	7.6
Sept. 10-20.....	521	22		183	39	200	241		733	71		3.6		1,370	1.86	1,930	617	420	41	3.5	1,830	7.6
Sept. 21-23.....	2.7	30		96	21	114	250		294	54		1.7		734	1.00	5.35	326	121	43	2.8	1,080	7.5
Sept. 24-30.....	1,990	21		133	28	166	213		534	62		11		1,060	1.44	5,700	447	272	45	3.4	1,490	7.8
Weighted average	b401	26		100	19	99	223		291	43		3.5		692	0.94	740	328	145	40	2.4	999	--

a No flow Oct. 6-12, Oct. 28 to Nov. 7, Nov. 10-19, July 13, 16-17.
b Average for 330 days of flow which includes more than 99 percent of runoff for water year.

RIO GRANDE BASIN--Continued

RIO GRANDE AT SAN ACACIA, N. MEX.--Continued

Temperature (°F) of water, water year October 1953 to September 1954
(Once-daily measurement, usually between 11 a. m. and 6 p. m.)

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	73	--	50	--	51	55	61	52	a61	b77	--	a65
2	76	--	41	37	52	53	63	--	78	80	b80	b75
3	74	--	a34	38	53	58	63	b60	b78	79	80	75
4	a52	--	45	a33	54	55	a49	b69	75	--	74	76
5	72	--	40	40	55	55	b63	70	a61	80	a76	--
6	--	--	--	39	54	a41	66	a60	--	b79	b81	a64
7	--	--	--	42	a40	57	68	81	b63	78	--	b77
8	--	55	--	48	54	58	61	a61	78	81	a88	78
9	--	--	--	46	57	60	65	--	72	b81	78	b75
10	--	--	--	--	57	58	67	b67	75	81	b78	78
11	--	--	--	36	56	50	--	b75	75	a67	a67	76
12	--	--	--	35	56	a33	68	a56	b76	b81	80	--
13	65	--	--	36	57	50	68	79	--	--	a78	78
14	63	--	--	43	a45	--	67	a61	b76	84	a68	a71
15	66	--	--	45	52	49	b67	b79	a61	a69	78	76
16	64	--	--	40	53	50	a49	--	79	--	a68	71
17	65	--	--	45	57	50	a56	b78	b79	--	a65	a63
18	--	--	--	45	55	50	68	b68	b79	--	a65	b77
19	65	--	--	46	60	a46	69	71	a68	84	--	a64
20	64	50	46	45	58	60	69	75	--	a68	--	75
21	62	45	42	45	--	65	b69	70	80	--	--	75
22	66	45	35	46	53	57	b69	68	81	69	--	74
23	61	45	33	47	55	59	a56	--	80	80	--	--
24	64	49	36	45	55	a47	70	a59	b80	81	a65	70
25	59	48	--	43	58	55	--	69	73	80	75	70
26	51	--	35	48	57	a41	a56	b70	a65	83	a65	a65
27	55	48	35	50	55	60	71	75	b80	83	b74	67
28	--	51	36	51	--	--	a58	b76	81	--	a63	73
29	--	50	36	52	--	60	a55	76	a69	b83	--	--
30	--	49	38	50	--	a45	b60	--	b78	a66	b74	68
31	--	--	36	--	--	45	--	b74	--	83	77	--
Average	64	49	--	43	54	52	63	69	74	78	--	72

a Measurement before 11 a. m.
b Measurement after 6 p. m.

RIO GRANDE BASIN--Continued

RIO GRANDE AT SAN ACACIA, N. MEX.--Continued

Suspended sediment, water year October 1953 to September 1954

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	0.1	288	(t)	0	--	0	270	4,500	3,280
2	.1	425	(t)	0	--	0	285	4,960	3,820
3	.1	458	(t)	0	--	0	321	5,200	4,510
4	.1	150	(t)	0	--	0	371	5,800	5,810
5	.1	167	(t)	0	--	0	438	8,400	9,930
6	0	--	0	0	--	0	544	9,000	a13,000
7	0	--	0	0	--	0	569	11,400	17,500
8	0	--	0	33	--	b4,500	578	5,890	9,190
9	0	--	0	1	--	(b)(t)	512	5,580	7,710
10	0	--	0	0	--	0	438	6,000	7,100
11	0	--	0	0	--	0	417	6,600	7,430
12	0	--	0	0	--	0	431	7,400	8,610
13	.1	305	(t)	0	--	0	445	4,580	5,500
14	.1	180	(t)	0	--	0	473	1,900	2,430
15	.1	174	(t)	0	--	0	512	4,000	5,530
16	.1	195	(t)	0	--	0	520	3,400	4,770
17	.2	260	(t)	0	--	0	520	2,900	4,070
18	.2	350	(t)	0	--	0	520	3,460	4,860
19	.2	319	(t)	0	--	0	528	7,200	10,300
20	.2	331	(t)	3	2,620	21	587	13,100	20,800
21	.2	273	(t)	33	3,090	275	578	9,600	15,000
22	.3	271	(t)	65	19,900	s4,920	552	4,100	6,110
23	.2	230	(t)	67	5,000	904	560	6,180	9,340
24	.2	230	(t)	88	4,600	1,090	560	4,950	7,480
25	.2	249	(t)	138	4,250	1,580	569	2,500	a3,800
26	29	102,000	s11,300	190	2,800	a1,400	544	2,400	3,530
27	8	95,500	s2,670	126	3,500	1,190	480	2,600	3,370
28	0	--	0	124	3,800	1,270	488	7,290	9,610
29	0	--	0	172	4,100	1,900	512	5,780	7,990
30	0	--	0	215	4,200	2,440	528	6,200	8,840
31	0	--	0	--	--	--	488	2,700	3,560
Total	39.8	--	13,972	1,254.1	--	21,490	15,138	--	234,780

Day	January			February			March		
1	480	3,600	a4,700	578	3,580	5,590	810	6,700	14,700
2	488	4,600	6,060	560	4,300	6,500	560	4,000	6,050
3	488	2,200	2,900	569	3,570	5,480	416	3,000	3,370
4	488	7,550	9,950	578	4,800	7,490	340	2,730	2,510
5	480	9,600	12,400	596	6,700	10,800	295	2,070	1,650
6	473	4,830	6,170	605	6,800	11,100	280	1,290	976
7	480	1,900	2,460	623	6,900	11,600	240	1,300	842
8	544	2,930	4,300	605	5,970	9,750	170	1,580	725
9	552	2,900	4,320	578	4,350	6,790	160	1,610	696
10	560	1,500	a2,300	587	5,640	8,940	145	1,590	622
11	560	2,900	4,380	623	3,890	6,540	140	2,020	764
12	520	3,500	4,910	614	2,560	4,240	115	1,000	310
13	560	4,660	7,050	614	5,200	8,620	105	1,300	369
14	520	3,220	4,520	632	6,570	11,200	342	1,700	a1,600
15	528	3,200	4,560	650	7,520	13,200	496	2,160	2,890
16	520	2,650	3,720	623	4,460	7,500	400	2,410	2,600
17	544	4,300	6,320	810	5,100	11,200	240	2,550	1,650
18	569	4,500	6,910	790	7,550	16,100	240	1,320	855
19	552	5,420	8,080	760	5,000	a10,000	190	1,880	964
20	512	9,800	13,500	713	5,400	10,400	97	1,230	322
21	536	7,700	11,100	686	6,100	a11,000	85	1,110	255
22	560	2,400	3,630	605	5,500	8,980	66	1,100	196
23	578	2,520	3,930	614	5,800	9,620	52	690	97
24	544	2,400	3,530	605	7,600	12,400	66	690	123
25	536	4,210	6,090	560	5,220	7,890	60	930	151
26	544	4,100	6,020	560	3,400	5,140	56	740	112
27	552	3,160	4,710	569	5,280	8,110	105	1,660	471
28	552	4,210	6,280	623	8,700	a15,000	256	1,800	a1,200
29	560	4,600	6,960	--	--	--	310	2,950	2,470
30	552	6,400	9,540	--	--	--	325	3,790	3,330
31	569	3,200	a4,900	--	--	--	295	2,580	2,050
Total	16,501	--	186,200	17,530	--	261,180	7,451	--	54,920

s Computed by subdivided day method.
t Less than 0.50 ton.
a Computed from estimated concentration graph.
b Computed from water-sediment discharge curve.

RIO GRANDE BASIN--Continued

RIO GRANDE AT SAN ACACIA, N. MEX.--Continued

Suspended sediment, water year October 1953 to September 1954--Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	200	1,840	994	43	600	70	390	2,900	3,050
2.....	150	1,260	510	44	590	a 70	195	800	421
3.....	110	1,050	312	490	2,330	s 6,170	76	900	185
4.....	200	1,140	616	596	3,200	5,150	26	690	48
5.....	250	1,590	1,070	650	3,120	5,480	8	470	10
6.....	120	1,410	457	340	2,100	1,930	5	470	a 6
7.....	135	1,400	510	265	1,880	1,350	4	510	6
8.....	145	1,430	560	135	1,580	576	4	530	6
9.....	97	1,100	288	120	1,300	a 420	4	409	4
10.....	76	890	183	105	900	255	4	379	4
11.....	73	800	a 160	220	1,200	713	3	396	3
12.....	139	4,780	s 3,570	325	2,090	1,830	3	428	3
13.....	704	7,200	13,700	512	4,100	5,670	5	430	a 6
14.....	788	4,900	10,400	544	3,780	5,550	3	420	3
15.....	704	4,100	7,790	596	3,560	5,730	3	545	4
16.....	762	5,000	10,300	596	3,500	a 5,600	3	495	4
17.....	916	3,700	9,200	834	4,420	s 11,700	3	300	2
18.....	650	2,500	4,390	1,380	5,130	s 21,200	4	383	4
19.....	464	2,100	2,630	1,960	28,900	s 177,000	3	290	2
20.....	365	2,150	2,120	850	20,500	47,000	3	300	a 2
21.....	280	1,800	1,360	740	11,200	22,400	4	221	2
22.....	265	1,500	1,070	894	6,000	14,500	3	180	1
23.....	170	1,250	574	1,210	5,500	a 18,000	3	160	1
24.....	140	1,200	454	1,570	5,200	22,000	2	163	1
25.....	125	1,200	a 400	1,240	6,400	21,400	116	2,680	s 3,960
26.....	97	1,100	288	1,080	5,000	14,600	3	1,200	10
27.....	60	710	115	960	5,200	13,500	4	614	7
28.....	68	830	152	1,010	5,000	13,600	4	170	2
29.....	50	820	111	916	5,000	12,400	3	135	1
30.....	40	800	86	504	4,000	a 5,400	4	180	2
31.....	--	--	--	358	4,000	3,870	--	--	--
Total.	8,343	--	74,370	21,087	--	465,134	895	--	7,760

	July			August			September		
1.....	4	160	2	4	4,100	a 44	4	490	5
2.....	156	59,700	s36,900	135	46,200	s 24,500	4	500	5
3.....	8	30,500	s 934	9	32,500	s 1,080	3	5,200	42
4.....	3	7,100	a 58	10	17,100	s 418	3	3,500	28
5.....	3	16,000	130	15	3,250	s 168	3	3,200	a 26
6.....	3	6,000	49	136	40,700	s 23,400	3	46,000	386
7.....	2	1,800	10	430	103,000	s229,000	2	45,000	252
8.....	85	29,800	s 15,500	924	107,000	s351,000	1	78,000	218
9.....	28	31,500	s 3,660	100	68,700	s 30,600	1	90,000	261
10.....	18	15,100	s 2,170	490	84,300	s269,000	35	97,800	s 11,700
11.....	.2	2,900	2	950	91,600	s298,000	285	94,600	s 109,000
12.....	.2	308	(t)	900	66,800	s179,000	750	100,000	sa 230,000
13.....	0	--	0	400	61,500	s81,300	1,540	120,000	s 556,000
14.....	.1	299	(t)	35	20,500	s2,560	2,430	132,000	s 935,000
15.....	.1	278	(t)	1	3,000	8	580	82,000	s 148,000
16.....	0	--	0	235	52,500	s 104,000	90	55,100	s 13,500
17.....	0	--	0	2,890	118,000	s1,030,000	10	35,000	a 980
18.....	.1	200	(a) (t)	1,680	104,000	s556,000	6	23,000	373
19.....	.1	318	(t)	875	120,000	sa 330,000	6	19,000	308
20.....	.2	400	(t)	410	71,000	sa 94,000	4	5,000	54
21.....	.2	361	(t)	760	92,000	sa 250,000	4	1,100	12
22.....	267	37,900	s 115,000	1,220	86,000	sa 330,000	2	900	5
23.....	481	82,200	s 129,000	270	68,000	51,400	2	44,000	246
24.....	4,130	118,000	s1,400,000	760	78,800	s276,000	1,420	67,000	s 536,000
25.....	3,650	90,800	s 978,000	696	56,800	s124,000	840	82,200	s 344,000
26.....	795	83,000	185,000	210	38,000	22,300	4,540	102,000	s1,450,000
27.....	317	45,100	s43,300	31	29,000	2,430	5,770	80,800	1,310,000
28.....	67	25,000	a 4,500	6	23,000	373	910	43,100	s 131,000
29.....	6	23,000	373	4	6,000	a 65	308	29,000	24,100
30.....	4	8,000	86	4	10,000	108	143	27,000	10,400
31.....	4	1,900	21	4	2,000	22	--	--	--
Total.	10,032.2	--	2,914,696	14,594	--	4,660,776	19,699	--	5,811,901

Total discharge for year (cfs-days) 132,564.1

Total load for year (tons) 14,707,179

s Computed by subdivided day method.

t Less than 0.50 ton.

a Computed from estimated concentration graph.

RIO GRANDE AT SAN ACACIA, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1953 to September 1954
(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, V, visual accumulation tube)

Date of collection	Time	Discharge (cfs)	Water temperature (°F)	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. 26, 1953	9:00 a.m.	70	48	146,000	3,100		77		94		100	--	--		--		SPWCM
Nov. 8	11:00 a.m.	37	53	99,700	3,030		77		93		99	99	100		--		VPWCM
Nov. 22	4:00 p.m.	43	45	3,350	4,360		61		87		99	100	--		--		SPWCM
Dec. 26	4:00 p.m.	488	35	2,220	1,310		56		83		100	--	--		--		SPWCM
Jan. 7, 1954	1:00 p.m.	528	42	2,690	2,750		42		68		99	100	--		--		SPWCM
Jan. 15	9:00 a.m.	552		6,680	4,790		17		26		55	82	99		100		VPWCM
Feb. 26	11:00 a.m.	578	51	2,790	3,030		32		54		91	100	--		--		VPWCM
Feb. 26	11:30 a.m.	544	51	4,720	3,760		21		34		69	93	100		--		VPWCM
Mar. 6	8:30 a.m.	265	41	1,390	2,240		50		66		96	99	100		--		SPWCM
Mar. 12	8:30 a.m.	79	33	949	855		61		75		94	100	--		--		SPWCM
Mar. 15	8:15 a.m.	480	--	2,370	2,020		52		69		93	99	100		--		SPWCM
Mar. 29	11:00 a.m.	280	60	2,830	5,070		51		61		72	81	99		100		VPWCM
Apr. 17	8:00 a.m.	1,040	56	6,190	8,920		39		53		87	99	100		--		VPWCM
May 3	7:00 p.m	1,180	60	5,570	4,880		31		57		93	99	100		--		VPWCM
May 19	5:30 a.m.	3,460	61	15,500	4,730		29		49		92	100	--		--		VPWCM
July 2	9:00 a.m.	230	73	75,100	3,560		81		98		99	100	--		--		VPWCM
July 3	6:00 p.m.	1.8	79	11,200	4,040		90		99		100	--	--		--		SPWCM
July 8	11:00 a.m.	245	--	131,000	4,500		71		93		98	99	100		--		VPWCM
July 10	6:30 a.m.	1.8	68	17,700	3,420		80		96		99	99	100		--		SPWCM
July 24	5:30 p.m.	4,250	--	92,800	4,200		62		80		93	98	100		--		VPWCM
Aug. 15	5:00 p.m.	--	78	44,100	3,960		79		96		100	--	--		--		SPWCM
Sept. 14	11:30 a.m.	4,100	--	127,000	4,100		50		65		84	96	100		--		VPWCM
Sept. 26	4:30 a.m.	5,180	--	94,000	3,840		46		62		80	90	98		100		VPWCM
Sept. 27	10:30 a.m.	8,940	69	66,200	3,610		65		82		93	99	100		--		VPWCM
Sept. 27	4:00 p.m.	3,980	67	74,600	4,600		53		69		84	95	99		100		VPWCM

RIO GRANDE BASIN--Continued

RIO GRANDE AT SAN ANTONIO, N. MEX.

LOCATION.--At gaging station at bridge on U. S. Highway 380, about 0.9 mile east of San Antonio, Socorro County.
DRAINAGE AREA.--27,400 square miles, approximately (includes 2,940 square miles in closed basin in northern part of San Luis Valley, Colo.).
RECORDS AVAILABLE.--Water temperatures: August 1951 to September 1954.
Sediment records: August 1951 to September 1954.
EXTREMES, 1953-54.--Water temperatures: Maximum observed, 88°F July 3; minimum observed, freezing point Dec. 15, Jan. 2.
Sediment concentrations: Maximum daily, 122,000 ppm Sept. 14; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 1,200,000 tons Sept. 27; minimum daily, 0 tons on many days.
EXTREMES, 1951-54.--Water temperatures: Maximum observed, 95°F July 1, 1953; minimum observed, freezing point Feb. 2, Dec. 25, 1952, Dec. 15, 1953, Jan. 3, 1954.
Sediment concentrations: Maximum daily, 122,000 ppm Sept. 14, 1954; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 1,200,000 tons Sept. 27, 1954; minimum daily, 0 tons on many days.
REMARKS.--Maximum observed sediment concentration during water year, 142,000 ppm Sept. 14. Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge for water year October 1953 to September 1954 given in WSP 1342. Stage-discharge relation affected by ice Dec. 11-17, 24-31, Jan. 1-12.

Temperature (°F) of water, water year October 1953 to September 1954
/Once-daily measurement between 11 a.m. and 6 p.m.
No flow on many days./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	--	55	47	--	39	52	a 58	67	--	--	--	--
2	--	62	49	32	42	52	66	71	a 69	--	--	--
3	--	65	46	33	48	46	a 63	--	73	88	--	--
4	--	58	--	34	41	51	a 64	64	--	79	--	--
5	--	54	44	34	47	a 38	a 65	71	--	--	76	--
6	--	58	34	--	44	--	a 66	69	--	--	79	--
7	--	60	54	44	50	55	a 66	74	--	--	75	--
8	--	--	33	48	51	56	69	71	--	--	81	--
9	--	56	34	42	52	59	66	69	--	--	72	--
10	--	56	34	39	51	56	68	74	--	--	--	--
11	--	53	--	46	41	51	67	72	--	--	72	--
12	--	54	33	42	40	54	69	75	--	--	73	74
13	--	51	--	48	51	57	68	74	--	--	75	64
14	--	53	41	40	54	56	67	69	--	--	a 80	75
15	--	56	32	--	55	48	64	74	--	--	82	64
16	--	56	35	43	54	51	67	76	--	--	--	71
17	--	64	--	41	49	50	71	76	--	--	75	72
18	--	66	43	46	59	49	67	71	--	--	72	70
19	--	40	47	46	58	51	62	--	--	--	b 75	a 76
20	--	38	48	48	54	47	a 71	72	--	--	75	--
21	--	40	41	51	56	58	a 64	74	--	--	76	--
22	--	51	38	45	50	54	b 56	74	--	--	b 68	--
23	--	52	34	51	54	58	b 54	71	--	59	79	--
24	--	--	36	48	54	61	b 63	69	--	79	76	69
25	--	49	39	48	58	60	b 66	68	--	83	b 64	72
26	--	51	36	--	51	56	69	69	--	86	76	69
27	--	48	35	50	48	59	67	74	--	86	79	69
28	--	53	38	47	56	61	64	68	--	--	81	72
29	--	48	38	48	--	59	73	71	--	78	--	72
30	64	53	41	51	--	61	69	69	--	81	--	a 69
31	60	--	36	41	--	59	--	75	--	--	--	--
Average	--	54	39	44	50	54	66	71	--	80	--	--

a Measurement after 6 p.m.
b Measurement before 11 a.m.

RIO GRANDE BASIN--Continued

RIO GRANDE AT SAN ANTONIO, N. MEX.--Continued

Suspended sediment, water year October 1953 to September 1954

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	0	--	0	3	7,000	57	163	9,700	4,270
2	0	--	0	5	2,000	27	193	11,300	5,890
3	0	--	0	2	500	3	247	11,700	7,800
4	0	--	0	2	629	3	292	12,500	a9,900
5	0	--	0	2	290	2	350	13,700	12,900
6	0	--	0	2	447	2	422	10,000	11,400
7	0	--	0	1	474	1	498	11,200	15,100
8	0	--	0	2	--	e1	422	11,400	13,000
9	0	--	0	50	78,600	s14,000	370	8,300	8,290
10	0	--	0	15	69,000	2,900	382	8,000	8,250
11	0	--	0	13	39,000	1,420	390	7,900	a8,300
12	0	--	0	28	17,500	1,320	360	7,200	7,000
13	0	--	0	6	6,500	105	350	7,700	a7,300
14	0	--	0	5	3,000	40	370	9,700	9,690
15	0	--	0	8	4,000	a90	400	9,000	a9,700
16	0	--	0	8	3,000	a60	380	10,500	10,800
17	0	--	0	10	2,000	54	370	9,000	a9,000
18	0	--	0	7	2,500	47	370	7,600	7,590
19	0	--	0	6	3,500	57	382	7,800	8,040
20	0	--	0	10	5,500	148	415	7,800	8,740
21	0	--	0	20	6,000	324	445	8,700	10,500
22	0	--	0	50	7,150	965	445	5,800	6,970
23	0	--	0	60	7,290	1,180	402	5,400	5,860
24	0	--	0	77	6,900	a1,400	350	4,100	3,870
25	0	--	0	84	6,700	1,520	300	3,200	2,590
26	0	--	0	104	7,800	2,190	320	4,000	3,460
27	0	--	0	91	8,200	2,010	350	5,400	5,100
28	1	--	e3	75	6,300	1,280	400	4,900	5,290
29	.9	--	e2	113	7,000	2,140	450	4,500	5,470
30	2	2,300	12	133	7,200	2,590	470	5,800	7,360
31	3	8,100	66	--	--	--	450	4,600	5,590
Total	6.9	--	83	992	--	35,936	11,508	--	245,020

	January			February			March		
1	350	--	e3,800	475	5,300	6,800	650	10,300	18,100
2	300	--	e3,000	468	6,300	7,960	700	7,300	13,800
3	350	4,000	3,780	468	6,400	8,090	428	4,800	5,550
4	400	3,100	3,350	475	6,500	8,340	410	4,500	4,980
5	450	5,800	7,050	482	5,100	6,640	304	3,700	3,040
6	500	10,000	a14,000	490	5,200	6,880	255	2,900	a2,000
7	500	10,900	14,700	514	6,700	9,300	206	2,500	1,390
8	480	9,800	12,700	506	7,000	9,560	166	1,550	695
9	470	9,200	11,700	506	5,900	8,060	134	1,880	680
10	450	9,700	11,800	522	5,300	7,470	117	1,580	499
11	430	8,000	9,290	530	5,400	7,730	134	1,630	590
12	530	7,500	10,700	510	5,800	7,990	101	1,640	447
13	498	6,500	8,740	530	5,500	7,870	70	2,810	531
14	452	7,500	9,150	540	5,200	7,580	117	2,700	853
15	422	7,500	a8,500	550	5,000	7,420	346	4,000	3,740
16	415	7,500	8,400	600	7,700	12,500	410	4,400	4,870
17	415	7,300	8,180	670	7,200	13,000	310	2,700	2,260
18	475	7,600	9,750	780	6,300	13,300	245	2,550	1,690
19	460	9,200	11,400	710	7,800	15,000	184	2,640	1,310
20	460	9,000	11,200	700	6,200	11,700	170	1,780	817
21	445	7,500	9,010	680	5,700	10,500	98	838	222
22	430	7,400	8,590	640	5,800	10,000	66	804	143
23	452	8,000	9,760	630	5,000	8,500	40	906	98
24	468	5,500	6,950	610	4,400	7,250	38	700	72
25	475	7,300	9,360	570	5,000	7,700	32	709	61
26	468	6,700	a8,500	580	4,500	7,050	38	829	85
27	460	5,800	7,200	530	5,300	7,580	32	634	55
28	460	6,200	7,700	510	6,900	9,500	81	1,500	328
29	468	5,200	6,570	--	--	--	272	2,700	1,980
30	475	5,800	7,440	--	--	--	298	4,100	3,300
31	482	4,650	6,050	--	--	--	265	4,700	3,360
Total	13,890	--	268,300	15,776	--	241,270	6,717	--	77,546

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

RIO GRANDE BASIN--Continued

RIO GRANDE AT SAN ANTONIO, N. MEX.--Continued

Suspended sediment, water year October 1953 to September 1954--Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	206	3,300	1,840	0.3	750	1	278	2,500	1,880
2.....	101	1,760	480	6	721	12	206	1,600	890
3.....	72	1,500	292	11	800	a 24	97	1,000	262
4.....	93	2,520	633	373	4,750	s 7,260	8	--	e 15
5.....	138	2,480	924	500	4,000	5,400	0	--	0
6.....	166	2,240	1,000	370	3,700	3,700	0	--	0
7.....	95	1,470	377	179	2,200	1,060	0	--	0
8.....	62	1,420	238	130	1,600	562	0	--	0
9.....	57	1,480	228	90	1,200	292	0	--	0
10.....	34	1,220	112	85	1,300	298	0	--	0
11.....	17	867	40	72	2,000	389	0	--	0
12.....	25	800	54	210	2,500	1,420	0	--	0
13.....	236	5,340	s 7,720	317	3,600	3,080	0	--	0
14.....	620	9,800	16,400	473	5,500	7,020	0	--	0
15.....	680	6,600	12,100	482	4,700	6,120	0	--	0
16.....	600	6,300	10,200	520	6,100	8,560	0	--	0
17.....	700	7,200	13,600	530	5,100	7,300	0	--	0
18.....	770	8,100	16,800	1,000	9,300	s 26,200	0	--	0
19.....	455	5,000	6,140	1,520	16,000	sa 88,000	0	--	0
20.....	310	2,400	2,010	980	23,100	s 61,200	0	--	0
21.....	272	4,000	2,940	822	16,500	36,600	0	--	0
22.....	230	2,200	1,370	811	10,900	23,900	0	--	0
23.....	174	1,600	752	912	7,500	18,500	0	--	0
24.....	98	1,490	394	1,010	6,600	18,000	0	--	0
25.....	77	1,370	285	1,330	6,800	24,400	0	--	0
26.....	64	879	152	1,210	7,600	24,800	0	--	0
27.....	45	785	95	936	8,000	20,200	0	--	0
28.....	57	922	142	912	5,400	13,300	0	--	0
29.....	28	981	74	912	4,200	10,300	0	--	0
30.....	15	797	32	630	3,700	6,290	0	--	0
31.....	--	--	--	338	2,600	2,370	--	--	--
Total.	6,497	--	97,424	17,671.3	--	426,558	589	--	3,047

Day	July			August			September		
1.....	0	--	0	0	--	0	0	--	0
2.....	0	--	0	0	--	0	0	--	0
3.....	4	51,200	s 578	0	--	0	0	--	0
4.....	.2	7,500	s 6	8	3,120	s 910	0	--	0
5.....	0	--	0	42	24,200	s 2,820	0	--	0
6.....	0	--	0	290	38,900	s 82,200	0	--	0
7.....	0	--	0	139	66,000	s 33,000	0	--	0
8.....	0	--	0	790	85,500	s 199,000	0	--	0
9.....	0	--	0	278	61,000	s 56,100	0	--	0
10.....	0	--	0	151	42,500	s 21,200	0	--	0
11.....	0	--	0	1,310	61,600	s 301,000	0	--	0
12.....	0	--	0	555	66,300	s 107,000	360	89,000	sa 96,000
13.....	0	--	0	570	78,400	s 127,000	1,020	100,000	sa 310,000
14.....	0	--	0	135	63,600	s 25,200	2,050	122,000	s 738,000
15.....	0	--	0	22	41,500	s 2,590	830	94,100	s 239,000
16.....	0	--	0	5	18,000	243	164	86,100	s 39,600
17.....	0	--	0	1,580	81,200	s 557,000	51	48,000	s 7,270
18.....	0	--	0	1,780	88,000	s 457,000	17	34,500	1,640
19.....	0	--	0	865	78,800	s 195,000	3	9,500	77
20.....	0	--	0	646	90,500	s 176,000	2	--	e 50
21.....	0	--	0	350	77,900	s 78,100	1	--	e 20
22.....	0	--	0	1,380	92,100	s 487,000	.7	--	e 10
23.....	87	36,200	s 26,500	395	69,900	s 77,000	.4	--	e 5
24.....	1,200	96,600	s 404,000	111	66,100	s 20,700	565	40,900	s 127,000
25.....	4,000	92,000	1,070,000	1,110	92,200	s 337,000	153	38,700	s 17,000
26.....	1,050	75,400	s 219,000	290	66,400	s 55,500	3,070	90,100	s 813,000
27.....	440	70,900	s 90,700	99	29,900	s 8,900	4,700	88,000	s 1,200,000
28.....	110	23,000	6,830	20	24,500	1,320	1,860	68,600	s 409,000
29.....	25	2,500	169	5	--	e 240	340	55,500	s 53,700
30.....	1	702	2	6	--	e 290	156	42,800	s 18,900
31.....	0	--	0	.8	--	e 20	--	--	--
Total.	6,917.2	--	1,817,785	12,932.8	--	3,359,333	15,343.1	--	4,070,272

Total discharge for year (cfs-days)..... 108,840.3
Total load for year (tons)..... 10,642,594

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

RIO GRANDE AT SAN ANTONIO, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1953 to September 1954
(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; V, visual accumulation tube)

Date of collection	Time	Discharge (cfs)	Water temperature (°F)	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. 31, 1953	5:30 p.m.	4.4	60	15,000	3,640		92		98		99	100	--		--		VPWCM
Nov. 10	5:30 p.m.	21	56	59,100	3,690		92		96		100	--	--		--		VPWCM
Nov. 21	4:30 p.m.	31	40	5,930	3,420		84		98		100	--	--		--		SPWCM
Dec. 7	5:00 p.m.	438	54	11,500	4,100		58		87		99	100	--		--		SPWCM
Dec. 22	5:00 p.m.	438	38	5,010	4,930		49		70		92	97	98		100		VPWCM
Jan. 3, 1954	5:00 p.m.	a 350	33	4,130	6,900		60		81		94	98	100		--		VPWCM
Jan. 14	5:00 p.m.	452	40	7,820	7,470		39		63		89	99	100		--		VPWCM
Jan. 22	5:00 p.m.	430	45	7,790	3,610		35		55		86	97	100		--		VPWCM
Feb. 3	5:00 p.m.	452	48	6,190	3,760		35		57		94	99	100		--		VPWCM
Feb. 14	5:30 p.m.	570	54	5,220	4,120		41		64		93	99	100		--		VPWCM
Feb. 22	5:00 p.m.	680	50	5,810	3,410		40		63		97	100	--		--		VPWCM
Mar. 3	6:00 p.m.	378	46	4,650	3,800		39		57		82	94	100		--		VPWCM
Mar. 15	5:30 p.m.	455	48	4,970	3,900		41		64		94	99	100		--		VPWCM
Mar. 28	6:00 p.m.	117	61	1,610	3,260		58		77		95	99	99		100		SPWCM
Apr. 1	6:30 p.m.	170	58	2,670	5,550		64		81		96	99	100		--		SPWCM
Apr. 10	5:30 p.m.	38	68	1,190	2,770		77		90		99	100	--		--		SPWCM
Apr. 14	6:00 p.m.	670	67	8,290	3,260		35		48		81	95	100		--		VPWCM
Apr. 20	6:30 p.m.	284	71	2,670	6,330		58		77		96	100	--		--		SPWCM
May 5	6:00 p.m.	630	71	5,060	4,430		49		70		98	100	--		--		VPWCM
May 10	6:00 p.m.	80	74	1,220	2,280		74		91		100	--	--		--		SPWCM
May 20	5:00 p.m.	740	72	23,500	3,350		78		90		99	100	--		--		VPWCM
May 30	6:00 p.m.	550	69	3,260	3,850		53		74		95	100	--		--		SPWCM
July 24	4:00 p.m	2,500	79	122,000	4,480		72		94		97	98	100		--		VPWCM
July 25	12:00 m.	4,780	76	91,600	4,740		68		86		95	98	100		--		VPWCM
Aug. 17	12:30 p.m.	3,270	76	128,000	4,050		57		73		86	91	99		100		SPWCM
Aug. 22	10:00 a.m.	2,500	68	118,000	3,850		59		74		95	99	100		--		SPWCM
Aug. 25	7:00 a.m.	2,030	64	98,300	4,240		60		76		97	99	100		--		SPWCM
Sept. 14	9:30 p.m.	2,660	66	129,000	4,090		49		62		82	92	100		--		SPWCM
Sept. 15	7:30 a.m.	1,030	54	103,000	3,410		61		78		94	97	100		--		SPWCM
Sept. 26	1:25 p.m.	4,290	69	88,300	4,410		56		73		90	95	100		--		SPWCM
Sept. 26	7:30 p.m.	5,020	71	85,100	4,050		60		73		86	93	100		--		SPWCM

RIO GRANDE CONVEYANCE CHANNEL BELOW HEADING NEAR SAN MARCIAL, N. MEX.

LOCATION.--At heading structure 1,250 feet upstream from gaging station, 6 miles upstream from former site of San Marcial, Socorro County, and 13.4 miles southwest of San Antonio.
RECORDS AVAILABLE.--Water temperatures: March to September 1954.
Sediment records: March to September 1954.
EXTREMES, March to September 1954.--Water temperatures: Maximum observed, 85°F July 27, Aug. 6, Sept. 1; minimum observed, 37°F Mar. 13, 14.
Sediment concentrations: Maximum daily, 95,000 ppm Aug. 22; minimum daily, 32 ppm Sept. 23.
Sediment loads: Maximum daily, 271,000 tons July 25; minimum daily, less than 0.50 tons Sept. 23.
REMARKS.--Records of specific conductance of daily samples available in district office at Albuquerque, N.Mex. Records of discharge for period March to September 1954 given in WSP 1342.

Temperature (°F) of water, March to September 1954
(Once-daily measurement, generally between 11 a.m. and 6 p.m.)

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

a Measurement prior to 11 a.m. b Measurement after 6 p.m.

Suspended sediment, March to September 1954

Day	March		
	Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day
11	41	3,280	s 470
12	83	1,700	381
13	55	840	125
14	49	620	82
15	117	2,190	s 788
16	334	3,400	3,070
17	282	2,810	s 2,200
18	185	2,060	1,030
19	138	1,670	622
20	129	1,350	470
21	79	980	209
22	58	960	150
23	27	650	47
24	16	440	19
25	13	380	13
26	13	360	13
27	14	360	14
28	12	350	11
29	98	1,870	s 513
30	167	2,250	1,010
31	206	2,670	1,490
Total	2,116	--	12,727

RIO GRANDE BASIN--Continued

RIO GRANDE CONVEYANCE CHANNEL BELOW HEADING NEAR SAN MARCIAL, N. MEX.--Continued

Suspended sediment, March to September 1954--Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	182	2,440	1,200	12	450	15	55	2,390	355
2.....	95	1,460	374	10	200	5	49	2,400	318
3.....	57	1,080	166	9	150	4	24	1,400	91
4.....	48	1,050	136	58	1,160	s 469	19	838	s 46
5.....	77	1,500	312	278	1,650	1,240	10	520	14
6.....	107	1,820	526	422	720	820	8	300	6
7.....	77	1,260	262	342	760	702	7	250	a 5
8.....	39	1,070	113	163	2,750	1,210	7	245	5
9.....	34	890	82	76	1,480	304	6	116	2
10.....	26	740	52	56	1,840	278	6	110	2
11.....	13	480	17	46	1,140	142	5	110	a 1
12.....	4	280	3	87	1,480	s 414	5	149	2
13.....	12	333	s 12	170	1,680	771	5	120	2
14.....	333	3,240	s 3,130	275	1,600	1,190	5	110	1
15.....	557	4,630	6,960	370	460	460	4	114	1
16.....	534	4,200	6,060	394	780	830	4	77	1
17.....	566	3,300	5,040	406	1,900	2,080	4	83	1
18.....	696	3,430	6,450	450	915	1,110	4	105	1
19.....	520	3,100	4,350	835	1,950	4,400	4	92	1
20.....	275	2,640	1,960	919	3,480	s 8,870	4	78	1
21.....	246	2,320	1,540	770	1,120	2,330	4	110	1
22.....	158	1,930	823	924	1,830	s 5,570	4	124	1
23.....	119	1,920	617	980	1,750	4,630	4	126	1
24.....	80	1,920	415	904	1,500	3,660	4	122	1
25.....	53	1,310	187	968	1,730	4,520	3	102	1
26.....	40	900	97	1,080	1,150	3,350	4	170	2
27.....	40	930	100	940	825	s 2,020	3	184	1
28.....	34	750	69	386	3,500	sa 3,700	3	153	1
29.....	23	550	34	330	4,870	4,340	3	157	1
30.....	16	410	18	235	4,500	a 2,900	3	165	1
31.....	--	--	--	104	3,380	949	--	--	--
Total.	5,061	--	41,105	12,999	--	63,283	270	--	867

	July			August			September		
1.....	3	115	1	7	--	e10	5	212	3
2.....	3	133	1	7	341	6	5	132	2
3.....	3	137	1	21	83	5	5	104	1
4.....	3	96	1	27	--	e2,000	5	48	1
5.....	3	170	a 1	29	30,000	2,350	5	87	1
6.....	3	200	2	54	13,000	1,900	4	1,860	20
7.....	3	150	1	150	--	e30,000	4	802	9
8.....	3	113	1	156	--	e31,000	4	793	9
9.....	3	104	1	224	--	e46,000	3	773	6
10.....	3	110	1	72	--	e11,000	3	326	3
11.....	3	106	1	288	59,900	s66,000	4	360	a 4
12.....	3	130	1	245	56,900	s35,900	60	50,800	8,530
13.....	3	146	1	333	62,300	s59,200	170	80,500	38,300
14.....	3	130	a 1	98	66,900	s18,200	617	70,700	s124,000
15.....	3	125	1	46	--	e 6,000	707	68,400	135,000
16.....	3	111	1	30	--	e 3,300	115	76,000	sa25,000
17.....	3	130	a 1	260	--	e52,000	33	63,000	5,820
18.....	3	95	1	946	76,000	201,000	15	49,500	2,080
19.....	3	113	1	465	65,400	s86,900	9	36,500	920
20.....	3	105	1	309	63,800	s60,300	7	3,010	57
21.....	2	99	1	137	60,100	s25,700	5	221	3
22.....	2	125	1	430	95,000	s134,000	4	109	1
23.....	3	178	1	216	64,600	s42,300	4	32	(t)
24.....	118	66,900	s 29,900	63	63,000	s11,300	143	30,500	s 31,500
25.....	1,060	93,400	s271,000	212	62,000	sa45,000	120	45,000	15,100
26.....	1,230	64,100	s224,000	154	42,400	s18,500	547	59,600	s 89,100
27.....	353	76,100	s 77,200	70	44,500	8,720	934	46,800	s123,000
28.....	82	55,900	s 13,100	27	19,000	a 1,400	1,380	43,500	168,000
29.....	40	39,500	4,420	13	5,000	176	439	43,000	52,900
30.....	27	25,500	1,860	6	498	8	65	38,500	s 7,100
31.....	12	2,000	65	6	884	14	--	--	--
Total.	2,989	--	621,569	5,101	--	1,000,189	5,421	--	826,470

Total discharge for period (cfs-days) Mar. 11 to Sept. 30 33,957
Total load for period (tons) Mar. 11 to Sept. 30 2,566,210

e Estimated.
s Computed by subdividing day.
t Less than 0.50 ton.
a Computed from estimated concentration graph.

RIO GRANDE BASIN--Continued

RIO GRANDE CONVEYANCE CHANNEL BELOW HEADING NEAR SAN MARCIAL, N. MEX.--Continued

Particle-size analyses of suspended sediment, March to September 1954

(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, V, visual accumulation tube)

Date of collection	Time	Discharge (cfs)	Water temperature (°F)	Suspended sediment											Methods of analysis
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters									
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
Mar. 12, 1954	11:00 a.m.	85	40	1,310	4,880		55		72		88	97	100		--		VPWCM
Mar. 15	2:35 p.m.	127	47	3,300	5,840		37		59		80	92	100		--		VPWCM
Mar. 16	9:00 a.m.	354	43	3,070	10,700		41		60		78	88	97		100		VPWCM
Mar. 19	9:00 a.m.	140	40	1,540	7,070		73		90		97	98	99		99	100	SPWCM
Apr. 1	4:25 p.m.	185	64	2,410	8,330		81		96		99	100	--		--		SPWCM
Apr. 10	2:50 p.m.	24	70	619	2,150		86		94		99	99	100		--		SPWCM
Apr. 20	9:00 a.m.	269	62	2,600	6,100		66		87		98	100	--		--		VPWCM
May 1	11:25 a.m.	13	48	495	2,340		87		93		98	99	100		--		SPWCM
May 10	2:45 p.m.	56	63	2,630	5,730		76		96		99	99	100		--		VPWCM
June 4	5:30 p.m.	23	75	960	4,470		82		97		100	--	--		--		SPWCM
July 25	4:00 1.m.	1,300	79	72,100	4,680		82		99		100	--	--		--		SPWCM
July 26	8:00 a.m.	1,490	79	67,300	3,900		84		98		100	--	--		--		SPWCM
July 27	6:00 p.m.	199	83	68,100	4,660		86		97		100	--	--		--		SPWCM
Aug. 20	9:55 a.m.	409	75	79,400	3,480		79		93		98	100	--		--		VPWCM
Sept. 15	12:50 a.m.	890	69	77,200	3,920		76		94		99	100	--		--		VPWCM
Sept. 15	6:30 a.m.	970	67	70,400	3,780		83		98		100	--	--		--		SPWCM
Sept. 26	1:45 1.m.	723	--	62,900	3,560		67		87		96	99	100		--		VPWCM

RIO GRANDE TIFFANY CHANNEL AT SAN MARCIAL, N. MEX.

LOCATION.--At water-stage recorder on pier of Atchison, Topeka, and Santa Fe Railway bridge over Tiffany channel, 3 miles northeast of former site of San Marcial, Socorro County. Tiffany channel is a bypass channel carrying water around the main channel gaging station at San Marcial.
RECORDS AVAILABLE.--Chemical analyses: April 1950 to April 1954 (discontinued).
Water temperatures: October 1950 to April 1954 (discontinued).
Sediment records: April 1950 to April 1954 (discontinued).
EXTREMES, October 1953 to April 1954.--Dissolved solids: Maximum, 1,430 ppm Feb. 11-20; minimum, 514 ppm Apr. 15-22.
Hardness: Maximum, 442 ppm Jan. 1-10; minimum, 222 ppm Apr. 15-22.
Specific conductance: Maximum observed, 2,400 micromhos Feb. 14; minimum observed, 675 micromhos Apr. 19.
Water temperatures: Maximum observed, 69°F Apr. 22; minimum observed, 32°F Dec. 24.
Sediment concentrations: Maximum daily, 7,340 ppm Dec. 4; minimum daily, 70 ppm Nov. 21.
Sediment loads: Maximum daily, 7,450 tons Apr. 15; minimum daily, 2 tons Nov. 9, 21.
EXTREMES, 1950-54.--Dissolved solids: Maximum, 1,730 ppm Aug. 23, 24, 1951: minimum, 220 ppm June 9, 10, 1952.
Hardness:--Maximum, 849 ppm Aug. 23, 24, 1951; minimum, 120 ppm June 9, 10, 1952.
Specific conductance: Maximum observed, 2,990 micromhos June 19, 1953; minimum observed 294 micromhos June 12, 1952.
Water temperatures: Maximum observed, 94°F July 10, 18, 29, 1951; minimum observed, 32°F Dec. 24, 1953.
Sediment concentrations: Maximum daily, 41,700 ppm Sept. 22, 1950; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 40,600 tons Aug. 24, 1952; minimum daily, 0 tons on many days.
REMARKS.--Values reported for dissolved solids are residues on evaporation. Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Extremes and weighted-average analysis for period October 1953 to April 1954 probably related to conveyance channel construction and operation. Weighted-average analysis not included in this years record. Records of discharge for period October 1953 to April 14, 1954 furnished by Santa Fe District of Surface Water Branch. Records of discharge for period April 15-30 are sum of discharges at San Antonio Riverside drain and Rio Grande conveyance channel below heading near San Marcial. Records for composite discharge of Tiffany channel and Main channel given under Rio Grande at San Marcial in WSP 1342. Quality of Water records for Rio Grande floodway at San Marcial given on page 447.

Chemical analyses, in parts per million, October 1953 to April 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-10, 1953.	7.60	38	0.01	90	20	175	7.1	284	259	138	0.6	0.6	0.25	864	1.18	17.7	306	74	55	4.4	1,320	7.7
Oct. 11-20	7.30	--	--	90	20	166	--	--	--	--	--	--	--	819	1.11	16.1	306	--	54	4.1	1,270	--
Oct. 21-31.....	8.20	--	--	96	22	192	--	--	--	--	--	--	--	915	1.24	20.3	330	--	56	4.6	1,410	--
Nov. 1-10	6.60	--	--	96	22	196	--	--	--	--	--	--	--	917	1.25	16.3	330	--	56	4.7	1,430	--
Nov. 11-20	12.1	--	--	124	28	216	--	--	--	--	--	--	--	1,110	1.51	36.3	424	--	53	4.6	1,650	--
Nov. 21-30	6.35	--	--	88	18	100	--	--	--	--	--	--	--	628	.85	10.8	294	--	43	2.5	938	--
Dec. 1-4	172	--	--	75	14	92	--	--	--	--	--	--	--	529	.72	246	244	--	45	2.6	809	--
Dec. 5-10	24.8	--	--	103	24	205	--	--	--	--	--	--	--	948	1.29	63.5	356	--	56	4.7	1,490	--
Dec. 11-20	29.6	--	--	102	25	196	--	--	--	--	--	--	--	994	1.35	79.4	358	--	54	4.5	1,550	--
Dec. 21-31	27.5	--	--	118	32	250	--	--	--	--	--	--	--	1,130	1.54	83.9	426	--	56	5.3	1,830	--
Jan. 1-10, 1954 .	23.9	33	01	131	28	274	9.5	272	428	282	.5	3.2	.31	1,350	1.84	87.1	442	219	57	5.7	2,040	7.6
Jan. 11-20.....	40.6	--	--	111	31	277	--	--	--	--	--	--	--	1,280	1.74	140	404	--	60	6.0	1,950	--
Jan. 21-31.....	37.7	--	--	103	29	265	--	--	--	--	--	--	--	1,190	1.62	121	376	--	61	5.9	1,840	--

RIO GRANDE BASIN--Continued

RIO GRANDE TIFFANY CHANNEL AT SAN MARCIAL, N. MEX.--Continued

Chemical analyses, in parts per million, October 1953 to April 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Feb. 1-10, 1954..	42.3	--	--	102	29	288	--	--	--	--	--	--	--	1,260	1.71	144	374	--	63	6.5	1,950	--
Feb. 11-20.....	79.5	--	--	114	31	332	--	--	--	--	--	--	--	1,430	1.94	307	412	--	64	7.1	2,220	--
Feb. 21-28.....	79.9	--	--	111	28	271	---	--	--	--	--	--	--	1,230	1.67	265	392	--	60	6.0	1,900	--
Mar. 1-10.....	72.5	--	--	100	24	203	--	--	--	--	--	--	--	1,000	1.36	196	348	--	56	4.7	1,530	--
Mar. 11-20.....	219	--	--	88	18	126	--	--	--	--	--	--	--	716	.97	423	294	--	48	3.2	1,090	--
Mar. 21-31.....	140	--	--	90	20	150	--	--	--	--	--	--	--	800	1.09	302	306	--	52	3.7	1,220	--
Apr. 1-10.....	126	28	0.01	87	15	127	7.5	240	218	96	0.6	0.7	0.05	722	.98	246	278	82	49	3.3	1,100	7.8
Apr. 11-14.....	128	--	--	92	22	177	--	--	--	--	--	--	--	887	1.21	307	320	--	55	4.3	1,360	--
Apr. 15-22.....	500	--	--	66	14	82	--	--	--	--	--	--	--	514	.70	694	222	--	45	2.4	789	--
Apr. 23-30.....	138	--	--	88	21	148	--	--	--	--	--	--	--	801	1.09	298	306	--	51	3.7	1,220	--
Weighted average	79.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	173	--	--	--	--	--	--

RIO GRANDE TIFFANY CHANNEL AT SAN MARCIAL, N. MEX.--Continued

Temperature (°F) of water, October 1953 to April 1954
(Once-daily measurement, generally between 11 a. m. and 6 p. m.)

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

a Measurement before 11 a. m.

Suspended sediment for period October 1953 to April 1954

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	9	295	7	7	192	4	122	5,400	a 1,800
2.....	9	275	7	7	190	a 4	151	5,900	a 2,400
3.....	9	260	a 6	7	180	3	187	6,900	a 3,500
4.....	6	293	5	7	200	4	228	7,340	4,520
5.....	8	270	6	7	226	4	40	2,900	sa 430
6.....	10	263	7	7	205	4	18	390	19
7.....	7	230	a 4	6	190	a 3	19	150	8
8.....	6	200	3	6	170	a 3	28	300	23
9.....	6	200	a 3	6	150	a 2	22	350	21
10.....	6	200	a 3	6	166	3	22	141	8
11.....	6	208	3	13	350	12	22	227	13
12.....	6	240	a 4	11	340	10	23	122	8
13.....	6	285	5	21	290	a 16	22	144	9
14.....	6	240	a 4	17	302	14	22	89	5
15.....	7	180	a 3	10	250	7	22	89	5
16.....	9	210	5	9	225	5	23	110	7
17.....	8	240	5	9	197	5	56	140	a 21
18.....	8	263	6	10	245	7	46	110	14
19.....	8	223	5	11	218	6	33	81	7
20.....	9	265	6	10	133	4	27	100	7
21.....	9	250	a 6	8	70	a 2	26	122	9
22.....	9	232	6	11	105	3	25	120	a 8
23.....	8	220	a 5	30	1,200	sa 120	23	112	7
24.....	8	210	a 5	58	1,800	a 280	24	91	6
25.....	8	200	a 4	65	815	143	26	--	e 8
26.....	8	206	4	71	2,840	544	27	135	10
27.....	8	180	a 4	81	3,070	671	30	130	11
28.....	8	162	3	117	4,200	sa 1,600	30	66	5
29.....	8	180	a 4	90	4,800	a 1,200	30	113	9
30.....	8	207	4	104	4,900	1,380	31	430	36
31.....	8	192	4	--	--	--	30	480	39
Total.	239	--	146	822	--	6,063	1,435	--	12,973

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

RIO GRANDE BASIN--Continued

RIO GRANDE TIFFANY CHANNEL AT SAN MARCIAL, N. MEX.--Continued

Suspended sediment for period October 1953 to April 1954--Continued

Day	January			February			March		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	30	300	24	38	200	21	64	120	21
2	10	230	6	38	250	26	63	110	19
3	7	312	s 7	39	190	20	65	105	18
4	12	458	s 19	40	173	19	69	120	a 22
5	22	621	s 38	44	170	20	75	130	26
6	24	500	32	44	172	20	80	140	a 30
7	24	390	25	43	187	22	81	160	35
8	36	320	31	42	157	18	79	290	62
9	26	170	12	46	150	19	75	200	40
10	48	200	s 31	49	192	25	74	200	40
11	39	200	21	47	173	22	105	688	s 221
12	34	108	10	44	198	24	153	900	372
13	32	160	14	60	225	36	127	550	189
14	53	183	s 27	74	271	54	125	365	123
15	51	160	a 20	80	480	104	192	717	s 405
16	48	260	34	108	310	90	413	2,400	2,680
17	40	520	a 55	96	360	a 95	380	2,200	s 2,290
18	36	410	a 40	90	240	58	272	1,650	1,210
19	36	315	31	92	190	47	219	1,120	662
20	37	308	31	104	175	49	208	910	511
21	38	400	a 40	96	170	44	156	650	274
22	37	400	40	84	152	34	130	570	200
23	36	180	17	77	207	43	100	420	113
24	37	155	15	78	159	33	88	320	76
25	38	197	20	86	143	33	87	220	52
26	38	183	19	83	165	37	88	180	43
27	39	250	26	71	182	35	95	200	51
28	38	185	19	64	135	23	95	200	51
29	39	185	19	--	--	--	170	700	321
30	38	161	17	--	--	--	242	1,430	934
31	37	155	15	--	--	--	285	2,020	1,550
Total	1,060	--	755	1,857	--	1,071	4,455	--	12,641
				April					
1				250	1,920	1,300			
2				158	1,170	499			
3				112	690	209			
4				102	620	171			
5				128	875	302			
6				157	1,220	517			
7				129	1,060	369			
8				82	760	168			
9				72	530	103			
10				69	520	97			
11				57	390	60			
12				46	300	37			
13				49	405	54			
14				358	3,180	s 3,670			
15				601	4,590	7,450			
16				580	3,600	5,640			
17				617	2,960	4,930			
18				753	3,450	7,010			
19				580	2,770	4,340			
20				335	2,000	1,810			
21				310	1,800	1,510			
22				224	1,620	980			
23				185	1,170	584			
24				144	935	364			
25				114	810	249			
26				110	560	166			
27				147	540	214			
28				150	500	202			
29				135	490	179			
30				122	525	173			
31				--	--	--			
Total				6,876	--	43,357			

Total discharge for period (cfs-days) 16,744
Total load for period (tons) 77,006

s Computed by subdividing day.

a Computed from estimated concentration graph.

RIO GRANDE TIFFANY CHANNEL AT SAN MARCIAL, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1943 to September 1954
(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; V, visual accumulation tube)

Date of collection	Time	Discharge (cfs)	Water temperature (°F)	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	
Nov. 27, 1953	1:10 p.m.	81	43	3,100	3,900		90		96			100	--				SPWCM
Dec. 4	12:15 p.m.	221	33	7,120	3,460		81		99		100	--	--				SPWCM
Jan. 1, 1954	1:30 p.m.	31	35	264	--		--		--		99	99	100				S
Jan. 6	12:40 p.m.	39	35	684	975		71		94		97	99	100				SPWCM
Mar. 11	1:00 p.m.	121	--	855	2,200		69		90		98	100	--				SPWCM
Mar. 16	9:30 a.m.	409	45	2,560	2,870		60		85		97	99	100				SPWCM
Mar. 20	12:30 p.m.	211	48	844	1,000		84		97		99	100	--				SPWCM
Apr. 1	5:50 p.m.	245	61	2,040	4,180		85		98		99	100	--				SPWCM
Apr. 10	2:20 p.m.	69	65	474	1,270		83		94		99	100	--				SPWCM
Apr. 14	11:20 a.m.	375	59	3,560	3,780		71		94		99	100	--				SPWCM
Apr. 15	10:15 a.m.	728	53	4,740	4,250		56		74		86	96	100				VPWCM
Apr. 24	1:00 p.m.	137	66	971	1,300		79		98		99	100	--				SPWCM

RIO GRANDE BASIN--Continued

RIO GRANDE CONVEYANCE CHANNEL AT SAN MARCIAL, N. MEX.

LOCATION.--At gaging station 440 feet downstream from grade control at outlet of San Marcial Lake, 150 feet downstream from mouth of drain entering from left side, 1,800 feet west of San Marcial gage on railway bridge, about 18½ miles eouthwest of San Antonio, and about 1 mile south of the site of the former village of San Marcial, Socorro County.
RECORDS AVAILABLE.--Chemical analyses: March to September 1954.
Water temperatures: March to September 1954.
Sediment records: March to September 1954.
EXTREMES, March to September 1954.--Dissolved solids: Maximum, 1,520 ppm June 21-30; minimum, 528 ppm Sept. 26.
Hardness: Maximum, 656 ppm Aug. 11-31; minimum, 222 ppm Sept. 26.
Specific conductance: Maximum observed, 2,320 micromhos June 24; minimum observed, 622 micromhos May 28.
Water temperatures: Maximum observed, 88°F Sept. 3, 4; minimum observed, 41°F Mar. 19.
Sediment concentrations: Maximum daily, 56,000 ppm Aug. 23; minimum daily, 70 ppm Apr. 4.
Sediment loads: Maximum daily, 105,000 tons Sept. 28; minimum daily, less than 0.50 ton on several days.
REMARKS.--Maximum observed sediment concentration during period March to September 1954, 72,900 ppm Aug. 25. Values reported for dissolved solids are residues on evaporation. Records of specific conductance of daily samples available in district office at Albuquerque, N.Mex. Gaging station established February 22, 1954. Records of discharge for period March to September 1954 furnished by Santa Fe district office of Surface Water Branch. Records of composite discharge for Rio Grande conveyance channel at San Marcial, and Rio Grande floodway at San Marcial given under Rio Grande at San Marcial in WSP 1342. Quality of Water records for Rio Grande floodway given on page 447.

Chemical analyses, in parts per million, March to September 1954

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chlorids (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Mar. 11-18, 1954...	200	--	--	113	20	242	--	--	--	--	--	--	--	1,150	1.56	621	364	--	59	5.5	1,720	--
Mar. 19-31.....	156	--	--	85	17	138	--	--	--	--	--	--	--	728	.99	307	282	--	52	3.6	1,130	--
Apr. 1-10	150	27	0.01	84	17	135	7.5	237	244	102	0.7	0.3	0.06	747	1.02	303	280	86	50	3.5	1,160	8.0
Apr. 11-20	369	--	--	75	17	119	--	--	--	--	--	--	--	674	.92	672	257	--	50	3.2	1,010	--
Apr. 21-30	191	--	--	66	16	93	--	--	--	--	--	--	--	570	.78	294	230	--	47	2.7	857	--
May 1-10	222	--	--	80	18	141	--	--	--	--	--	--	--	768	1.04	460	274	--	53	3.7	1,150	--
May 11-20	471	--	--	79	18	136	--	--	--	--	--	--	--	751	1.02	955	271	--	52	3.6	1,120	--
May 21-June 2.....	764	--	--	67	15	83	--	--	--	--	--	--	--	534	.73	1,100	228	--	44	2.4	788	--
June 3-10.....	85.4	--	--	76	17	118	--	--	--	--	--	--	--	678	.92	156	260	--	50	3.2	1,010	--
June 11-20.....	16.7	--	--	129	42	237	--	--	--	--	--	--	--	1,410	1.92	63.6	494	--	51	4.6	1,870	--
June 21-30.....	1.34	--	--	148	52	277	--	--	--	--	--	--	--	1,520	2.07	5.50	584	--	51	5.0	2,160	--
July 1-10	1.57	26	09	147	46	268	9.3	386	537	186	.8	2.4	.38	1,450	1.97	6.15	556	240	51	4.9	2,050	7.7
July 11-20	1.33	--	--	123	48	268	--	--	--	--	--	--	--	1,380	1.88	4.96	504	--	54	5.2	1,980	--
July 21-31	234	--	--	166	38	236	--	--	--	--	--	--	--	1,420	1.93	897	570	--	47	4.3	1,960	--
Aug. 1-10	66.7	--	--	187	33	215	--	--	--	--	--	--	--	1,450	1.97	261	602	--	44	3.8	1,900	--
Aug. 11-20.....	285	--	--	210	32	197	--	--	--	--	--	--	--	1,500	2.04	1,150	656	--	40	3.3	1,920	--
Aug. 21-31	153	--	--	202	37	215	--	--	--	--	--	--	--	1,500	2.04	620	656	--	40	3.3	1,950	--

Sept. 1-10, 1954 ..	15.6	--	--	176	41	250	--	--	--	--	--	--	--	1,510	2.05	63.6	608	--	47	4.4	2,030	--
Sept. 11-20	162	--	--	186	38	227	--	--	--	--	--	--	--	1,500	2.04	656	620	--	44	4.0	1,980	--
Sept. 21-25, 27-30.	353	--	--	179	32	185	--	--	--	--	--	--	--	1,330	1.81	1,270	578	--	41	3.3	1,760	--
Sept. 26	287	--	--	71	11	79	--	--	--	--	--	--	--	528	.72	409	222	--	44	2.3	787	--
Weighted average.	204	--	--	111	22	147	--	--	--	--	--	--	--	911	1.24	502	368	--	47	3.3	1,280	--

RIO GRANDE BASIN--Continued

RIO GRANDE CONVEYANCE CHANNEL AT SAN MARCIAL, N. MEX.--Continued

Temperature (°F) of water March to September 1954
(Once-daily measurement, generally between 10 a. m. and 6 p. m.)

Day	Mar.	Apr.	May	June	July	Aug.	Sept.
1	--	58	59	--	78	--	81
2	--	58	61	b80	81	85	--
3	--	61	64	77	77	86	88
4	--	--	68	75	78	79	88
5	--	64	69	72	--	78	84
6	--	b61	73	70	85	80	84
7	--	65	70	--	82	--	78
8	--	50	69	72	82	76	85
9	--	61	69	71	83	79	84
10	--	65	60	b66	85	b77	73
11	53	65	64	68	84	81	77
12	49	58	72	75	79	77	78
13	46	61	70	71	84	77	73
14	48	64	65	--	--	81	73
15	48	54	72	67	83	81	71
16	46	57	71	73	81	77	68
17	48	61	62	76	--	79	67
18	47	a62	67	82	75	75	76
19	41	60	a67	80	84	75	a63
20	50	59	a66	a74	78	83	68
21	54	61	70	--	78	78	60
22	51	66	71	75	84	74	64
23	54	66	70	76	75	80	65
24	53	67	62	73	--	--	63
25	51	a65	a63	78	81	74	67
26	47	65	65	a74	85	80	67
27	56	a62	a66	76	85	a71	70
28	54	64	63	83	80	--	65
29	55	58	--	86	84	a72	65
30	52	a60	--	77	81	75	65
31	a51	--	72	--	--	a69	--
Average	--	61	67	75	81	78	73

a Measurement prior to 10 a. m.
b Measurement after 6 p. m.

Suspended sediment, March to September 1954

Day	March		
	Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day
11.....	65	254	s46
12.....	116	222	70
13.....	131	168	59
14.....	126	120	41
15.....	143	145	56
16.....	270	317	s222
17.....	392	175	185
18.....	355	209	200
19.....	284	152	117
20.....	242	110	72
21.....	207	153	86
22.....	160	190	82
23.....	126	173	59
24.....	110	180	53
25.....	96	280	73
26.....	94	147	37
27.....	91	141	35
28.....	92	125	31
29.....	106	153	44
30.....	170	182	84
31.....	250	182	123
Total.	3,626	--	1,775

RIO GRANDE BASIN--Continued

RIO GRANDE CONVEYANCE CHANNEL AT SAN MARCIAL, N. MEX.--Continued

Suspended sediment, March to September 1954--Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	276	134	100	113	258	s78	198	165	88
2	234	112	71	112	178	54	161	178	77
3	165	87	39	106	163	47	134	233	84
4	130	70	a25	103	190	53	112	261	79
5	120	110	36	192	168	87	96	308	80
6	134	148	54	360	98	95	83	407	91
7	147	198	79	456	134	165	77	310	a64
8	121	190	62	350	110	104	69	263	49
9	92	196	49	244	140	92	59	325	52
10	81	203	44	185	265	132	53	231	33
11	76	335	69	174	246	116	47	230	a29
12	56	322	49	177	172	82	44	273	32
13	49	222	29	244	163	107	41	237	26
14	111	300	s106	310	167	140	28	254	s16
15	409	525	s574	445	134	161	1.2	215	1
16	570	370	569	512	135	187	1.1	157	(t)
17	600	138	224	534	180	260	1.2	150	(t)
18	660	210	374	546	170	251	1.2	123	(t)
19	680	318	584	731	292	s592	1.2	120	(t)
20	480	194	251	1,040	258	s719	1.2	123	(t)
21	364	110	108	935	208	525	1.2	130	(t)
22	302	130	106	910	162	s398	1.1	180	1
23	250	235	159	1,160	212	664	1.0	187	1
24	192	184	95	1,110	344	1,030	1.1	173	1
25	153	182	75	1,080	222	647	1.6	127	1
26	129	214	75	1,210	209	683	1.4	201	1
27	124	176	59	1,210	215	702	1.5	188	1
28	132	164	58	733	196	s396	1.5	200	1
29	140	165	62	489	143	189	1.5	183	1
30	125	161	54	423	200	a230	1.5	207	1
31	--	--	--	310	188	157	--	--	--
Total	7,102	--	4,239	16,504	--	9,143	1,222.5	--	813

	July			August			September		
1	1.5	120	(t)	38	450	a46	27	900	66
2	1.5	115	(t)	24	400	26	21	860	a49
3	1.6	125	1	19	360	18	22	750	45
4	1.6	135	1	18	305	15	18	586	28
5	1.6	160	a1	17	282	13	18	545	26
6	1.7	208	1	19	258	13	16	450	19
7	1.6	150	1	67	360	sa70	13	575	20
8	1.6	122	1	105	312	88	10	475	13
9	1.5	183	1	205	223	123	9.0	345	8
10	1.5	177	1	155	222	93	2.0	475	3
11	1.4	180	1	133	229	s85	1.9	500	3
12	1.4	182	1	320	200	173	2.7	485	4
13	1.4	180	1	288	220	171	43	925	s100
14	1.3	190	a1	216	205	120	324	2,570	s3,000
15	1.3	195	1	111	209	63	699	40,600	s80,300
16	1.3	193	1	70	268	51	330	29,200	s27,600
17	1.3	190	a1	59	2,130	339	100	26,100	s6,990
18	1.3	187	1	554	40,500	s63,300	55	15,500	2,300
19	1.3	187	1	701	33,000	s64,900	39	5,800	611
20	1.3	184	1	401	46,300	52,000	30	1,700	138
21	1.4	203	1	221	37,600	s22,800	23	1,040	s66
22	1.4	199	1	207	36,500	s22,600	18	685	33
23	1.4	234	1	417	56,000	sa66,000	17	650	30
24	1.3	230	a1	158	39,800	s17,900	25	692	s49
25	192	165	86	125	51,500	s18,700	136	2,870	s1,060
26	1,090	1,820	s5,650	246	24,500	16,300	287	2,620	s2,710
27	753	1,560	s3,380	132	31,400	11,200	786	24,300	s52,300
28	280	810	612	67	21,000	a3,800	1,050	35,400	s105,000
29	128	690	238	44	7,500	891	912	21,600	s57,100
30	78	765	161	32	1,430	124	214	27,800	16,100
31	53	570	a82	34	1,300	119	--	--	--
Total	2,608.5	--	10,232	5,203	--	362,141	5,248.6	--	355,771

Total discharge for period (cfs-days) Mar. 11 to Sept. 30, 1954 ..... 41,514.6
Total load for period (tons) Mar. 11 to Sept. 30, 1954 744,114

s Computed by subdividing day.
t Less than 0.50 ton.
a Computed from estimated concentration graph.

RIO GRANDE BASIN--Continued

RIO GRANDE CONVEYANCE CHANNEL AT SAN MARCIAL, N. MEX.--Continued

Particle-size analyses of suspended sediment, March to September 1954
(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; V, visual accumulation tube)

Date of collection	Time	Discharge (cfs)	Water temperature (°F)	Suspended sediment												Methods of analysis
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
Apr. 15, 1954	11:20 a.m.	401	54	517	985		44		48		75	95	100				VPWCM
May 1	12:50 p.m.	115	59	263	970		90		98		100	--					SPWCM
May 10	1:15 p.m.	171	60	239	--		--		--		100	--					S
July 26	11:30 a.m.	1,180	85	2,060	2,730		86		98		99	100					SPWCM
July 26	5:00 p.m.	1,160	85	3,260	3,050		88		100		--	--					SPWCM
Aug. 20	11:45 a.m.	390	78	48,900	4,780		85		99		100	--					SPWCM
Sept. 1	12:05 p.m.	268	81	919	1,660		85		97		100	--					SPWCM
Sept. 14	11:05 p.m.	558	73	8,210	3,470		86		99		100	--					SPWCM
Sept. 20	11:00 a.m.	304	68	1,650	4,320		91		99		100	--					SPWCM

RIO GRANDE FLOODWAY AT SAN MARCIAL, N. MEX.
(Formerly published as Rio Grande at San Marcial, N. Mex.)

LOCATION.--At gaging station at Atchison, Topeka, and Santa Fe Railway bridge, 1.1 miles downstream from former site of San Marcial, Socorro County, and 18½ miles (revised) southwest of San Antonio.
DRAINAGE AREA.--27,700 square miles, approximately (includes 2,940 square miles in closed basin in northern part of San Luis Valley, Colo.).
RECORDS AVAILABLE.--Chemical analyses: July 1946 to September 1954.
Water temperatures: January 1949 to September 1954.
Sediment records: July 1946 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 1,950 ppm Aug. 3-10; minimum, 392 ppm May 27-31.
Hardness: Maximum, 1,010 ppm Aug. 3-10; minimum, 194 ppm May 27-31.
Specific conductance: Maximum observed, 2,690 micromhos Oct. 17; minimum observed; 581 micromhos May 28.
Water temperatures: Maximum observed, 92 °F Sept. 1; minimum observed, freezing point on several days.
Sediment concentrations: Maximum daily, 95,200 ppm Sept. 13; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 301,000 tons Sept. 28; minimum daily, 0 tons on many days.
EXTREMES, 1946-54.--Dissolved solids: Maximum, 1,950 ppm Aug. 3-10, 1954; minimum, 233 ppm June 11-20, 1952.
Hardness: Maximum, 1,010 ppm Aug. 3-10, 1954; minimum, 138 ppm June 11-20, 1952.
Specific conductance: Maximum observed, 2,730 micromhos Apr. 8, 1953; minimum observed, 311 micromhos June 14, 1952.
Water temperatures (1949-54): Maximum observed, 97 °F Aug. 11, 1951; minimum observed, freezing point on many days.
Sediment concentrations: Maximum daily, 95,200 ppm Sept. 13, 1954; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 366,000 tons July 25, 1949; minimum daily, 0 tons on many days.
REMARKS.--Values reported for dissolved solids are residues on evaporation. Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of chemical analyses and sediment loads for years prior to 1946 have been published in Water Bulletins of International Boundary and Water Commission. Records of discharge for water year October 1953 to September 1954 furnished by Santa Fe district office of Surface Water Branch. Records of discharge for Rio Grande at San Marcial for water year October 1953 to September 1954 given in WSP 1342 are a composite of floodway, formerly named main channel, and Tiffany channel through February 1954. Thereafter they are a composite of floodway and conveyance channel at San Marcial. Quality of Water records for Tiffany channel given on page 437 and for conveyance channel at San Marcial on page 442.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180 °C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 4-5, 1953.....	a0.43			170	87	298								1,570	2.14	1.82	782		45	4.6	2,380	
Oct. 14-15, 17-19..	a.33			200	80	356								1,870	2.54	1.67	828		48	5.4	2,680	
Oct. 27-Nov. 1, 6-8	a.41			126	75	338								1,640	2.23	1.82	623		54	5.9	2,370	
Dec. 5-10.....	188			84	18	94								579	.79	294	284		42	2.4	901	
Dec. 11-20.....	267			78	15	73								496	.67	358	256		38	2.0	762	
Dec. 21-31.....	257			74	14	71								469	.64	325	242		39	2.0	710	
Jan. 1-10, 1954....	325	27	0.02	73	12	66	4.6	220	145	32	0.7	1.8	0.16	476	.65	418	232	51	38	1.9	719	7.5
Jan. 11-20	398			70	12	63								475	.65	510	224		38	1.8	707	
Jan. 21-31	407			73	12	63								473	.64	520	232		37	1.8	712	
Feb. 1-10.....	423			69	11	62								469	.64	536	217		38	1.8	695	
Feb. 11-20.....	512			71	12	60								466	.63	644	226		37	1.7	698	
Feb. 21-28.....	558			67	13	59								447	.61	673	220		37	1.7	671	

a No flow Oct. 1-3, 7-13, 16, 20-26, Nov. 2-5, Nov. 9 to Dec. 4, 1953, Mar. 20 to Apr. 18, Apr. 22 to May 26, June 6 to July 25, Aug. 1-2, Sept. 2-11, 23.

RIO GRANDE BASIN--Continued

RIO GRANDE FLOODWAY AT SAN MARCIAL, N. MEX.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residues at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Mar. 1-10, 1954...	321			74	15	71								527	0.72	457	246		39	2.0	779	
Mar. 11-19.....	a2.82			85	14	104								682	.93	5.20	270		46	2.8	1,010	
May 27-31.....	336			60	11	50								392	.53	356	194		36	1.6	597	
June 1-5	a 87.2			77	15	59								484	.66	114	254		34	1.6	726	
July 26-31.....	a250			204	49	220								1,550	2.11	1,050	710		40	3.6	2,000	
Aug. 3-10.....	101			300	63	209								1,950	2.65	532	1,010		31	2.9	2,360	
Aug. 11-20.....	306			238	44	200								1,620	2.20	1,340	775		36	3.1	2,020	
Aug. 21-31.....	180			208	48	195								1,520	2.07	739	716		37	3.2	1,910	
Sept. 1.....	a .20			159	40	203								1,330	1.81	.72	561		44	3.7	1,790	
Sept. 12-13.....	200			118	29	115								817	1.11	441	414		38	2.5	1,160	
Sept. 14-20.....	216			222	52	226								1,680	2.28	980	768		39	3.5	2,100	
Sept. 21-22, 24, 26-30.....	a603			204	45	200								1,520	2.07	2,470	694		39	3.3	1,940	
Sept. 25.....	205			96	22	117								724	.98	401	330		44	2.8	1,070	
Weighted average.	b277	--	--	112	22	103	--	--	--	--	--	--	--	781	1.06	584	370	--	38	2.3	1,070	--

a No flow Oct. 1-3, 7-13, 16, 20-26, Nov. 2-5, Nov. 9 to Dec. 4, 1953, Mar. 20 to Apr. 18, Apr. 22 to May 26, June 6 to July 25, Aug. 1-2, Sept. 2-11, 23.
b Average for 189 days of flow which includes more than 99 percent of runoff for water year.

RIO GRANDE BASIN--Continued

RIO GRANDE FLOODWAY AT SAN MARCIAL, N. MEX.--Continued

Temperature (°F) of water, water year October 1953 to September 1954
/Once-daily measurement, generally between 11 a. m. and 6 p. m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	--		--	33	44	a 42		--	--	--	--	92
2	--		--	--	a 43	43		--	80	--	--	--
3	--		--	33	a 43	a 42		--	77	--	--	--
4	--		--	33	a 43	44		--	--	--	--	--
5	--		--	35	46	49		--	--	--	--	--
6	a 53		34	a 32	44	--		--	--	--	--	--
7	--		--	a 32	42	a 45		--	--	--	--	--
8	--		35	35	a 40	a 46		--	--	--	76	--
9	--		33	38	a 40	48		--	--	--	78	--
10	--		32	a 33	49	a 55		--	--	--	b 78	--
11	--		33	a 32	49	--		--	--	--	80	--
12	--		32	a 32	a 45	48		--	--	--	76	--
13	--		35	33	51	41		--	--	--	76	b 67
14	--		34	35	a 44	49		--	--	--	77	69
15	--		33	--	a 46	53		--	--	--	81	78
16	--		32	32	a 41	49		--	--	--	a 77	a 63
17	a 57		34	a 34	a 45	49		--	--	--	80	a 67
18	a 55		37	35	a 48	51		--	--	--	76	72
19	--		a 33	39	43	a 50		--	--	--	80	a 71
20	--		35	a 41	46	56		--	--	--	77	a 77
21	--		36	41	a 45	69		--	--	--	73	a 66
22	--		--	a 39	a 44	--		--	--	--	a 70	a 66
23	--		32	37	--	--		--	--	--	--	--
24	--		a 32	--	a 43	--		--	--	--	71	a 65
25	--		--	a 38	a 47	--		--	--	--	73	65
26	--		a 32	a 42	47	--		--	--	85	a 71	66
27	--		32	a 42	a 47	--		--	--	85	71	a 69
28	--		33	38	a 38	--		62	--	79	--	a 64
29	--		a 32	a 43	--	--		--	--	86	78	a 65
30	60		a 33	48	--	--		--	--	88	77	a 62
31	60		33	a 41	--	--		64	--	--	a 80	--
Average	--		--	37	45	--		--	--	85	--	65

a Measurement before 11 a. m.
b Measurement after 6 p. m.

RIO GRANDE BASIN--Continued

RIO GRANDE FLOODWAY AT SAN MARCIAL, N. MEX.--Continued

Suspended sediment, water year October 1953 to September 1954

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	0	--	0	0.2	183	(t)	0	--	0
2	0	--	0	0	--	0	0	--	0
3	0	--	0	0	--	0	0	--	0
4	.5	--	b1	0	--	0	0	--	0
5	.6	890	a1	0	--	0	169	6,000	a2,700
6	.2	470	(t)	.1	--	(b)(t)	193	5,770	3,010
7	0	--	0	1	--	b4	205	5,000	a2,800
8	0	--	0	.1	--	(b)(t)	212	4,350	2,490
9	0	--	0	0	--	0	179	2,860	s1,400
10	0	--	0	0	--	0	173	2,300	1,070
11	0	--	0	0	--	0	181	2,350	1,150
12	0	--	0	0	--	0	170	1,760	808
13	0	--	0	0	--	0	155	1,200	502
14	1	--	b4	0	--	0	190	1,830	s992
15	.1	--	(b)(t)	0	--	0	215	1,870	1,090
16	0	--	0	0	--	0	218	1,880	s1,120
17	.6	--	b2	0	--	0	384	4,100	s4,360
18	.2	--	(b)(t)	0	--	0	425	5,200	5,970
19	.1	--	(b)(t)	0	--	0	388	4,820	5,050
20	0	--	0	0	--	0	342	5,600	5,170
21	0	--	0	0	--	0	352	4,750	4,510
22	0	--	0	0	--	0	350	4,600	a4,300
23	0	--	0	0	--	0	250	4,100	2,770
24	0	--	0	0	--	0	160	1,800	778
25	0	--	0	0	--	0	100	800	a220
26	0	--	0	0	--	0	190	1,150	590
27	.7	--	b3	0	--	0	250	1,310	884
28	.6	--	b2	0	--	0	290	1,480	1,160
29	.2	--	(b)(t)	0	--	0	270	1,500	1,090
30	.4	216	(t)	0	--	0	260	1,520	1,070
31	.4	274	(t)	--	--	--	350	1,610	1,520
Total	5.6	--	15	1.4	--	4	6,621	--	58,574
	January			February			March		
1	170	1,360	624	425	2,920	3,350	450	2,480	3,010
2	180	1,190	578	425	3,500	4,020	495	2,690	3,600
3	190	1,280	657	412	3,850	4,280	555	2,070	3,100
4	225	1,400	850	400	2,910	3,140	438	2,420	2,860
5	262	1,620	1,150	388	2,900	3,040	388	2,950	3,090
6	365	2,000	1,970	412	2,880	3,200	278	2,640	1,980
7	495	3,000	4,010	438	2,510	2,970	212	2,350	1,350
8	525	4,000	5,670	450	2,400	2,920	166	2,010	901
9	438	4,270	5,050	438	2,450	2,900	127	1,560	535
10	400	4,520	4,880	438	2,900	3,430	104	1,410	396
11	375	3,990	4,040	450	2,600	3,160	12	750	24
12	390	3,530	3,720	450	2,410	2,930	5	310	4
13	400	2,900	3,130	450	2,420	2,940	3	135	1
14	450	3,730	4,530	450	2,400	2,920	2	90	(t)
15	425	4,200	a4,800	465	2,780	3,490	1	72	(t)
16	370	3,910	3,910	480	2,560	3,320	1	96	(t)
17	375	3,750	3,800	495	2,480	3,310	1	96	(t)
18	370	3,740	3,740	555	2,580	3,870	.2	115	(t)
19	412	3,590	3,990	660	1,900	3,390	.2	74	(t)
20	412	3,800	a4,200	660	1,800	3,210	0	--	0
21	412	3,750	4,170	640	1,600	2,760	0	--	0
22	400	3,700	4,000	640	1,710	2,950	0	--	0
23	388	3,600	3,770	600	1,990	3,220	0	--	0
24	412	3,500	a3,900	570	2,220	3,420	0	--	0
25	425	3,530	4,050	540	2,140	3,120	0	--	0
26	412	3,090	3,440	510	2,190	3,020	0	--	0
27	412	2,900	3,230	495	2,420	3,230	0	--	0
28	388	3,080	3,230	465	2,360	2,960	0	--	0
29	388	3,130	3,280	--	--	--	0	--	0
30	412	3,250	3,620	--	--	--	0	--	0
31	425	3,170	3,640	--	--	--	0	--	0
Total	11,703	--	105,629	13,801	--	90,470	3,238.4	--	20,852

s Computed by subdividing day.
t Less than 0.50 tons.
a Computed from estimated concentration graph.
b Computed from water-sediment discharge curve.

RIO GRANDE BASIN--Continued

RIO GRANDE FLOODWAY AT SAN MARCIAL, N. MEX.--Continued

Suspended sediment, water year October 1953 to September 1954--Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	0			0	--	0	164	3,100	1,370
2	0			0	--	0	164	2,850	1,260
3	0			0	--	0	83	2,050	459
4	0			0	--	0	25	1,300	a90
5	0			0	--	0	.2	650	(a)(t)
6	0			0	--	0	0	--	0
7	0			0	--	0	0	--	0
8	0			0	--	0	0	--	0
9	0			0	--	0	0	--	0
10	0			0	--	0	0	--	0
11	0			0	--	0	0	--	0
12	0			0	--	0	0	--	0
13	0			0	--	0	0	--	0
14	0			0	--	0	0	--	0
15	0			0	--	0	0	--	0
16	0			0	--	0	0	--	0
17	0			0	--	0	0	--	0
18	0			0	--	0	0	--	0
19	34			0	--	0	0	--	0
20	13			0	--	0	0	--	0
21	2			0	--	0	0	--	0
22	0			0	--	0	0	--	0
23	0			0	--	0	0	--	0
24	0			0	--	0	0	--	0
25	0			0	--	0	0	--	0
26	0			0	--	0	0	--	0
27	0			27	858	s 505	0	--	0
28	0			466	4,420	s 5,310	0	--	0
29	0			465	3,720	4,670	0	--	0
30	0			438	3,750	4,430	0	--	0
31	--			282	3,580	2,730	--	--	--
Total	49		b 140	1,678	--	17,645	436.2	--	3,179

	July			August			September		
1	0	--	0	0	--	0	0.2	300	(a)(t)
2	0	--	0	0	--	0	0	--	0
3	0	--	0	3	--	b200	0	--	0
4	0	--	0	8	--	b700	0	--	0
5	0	--	0	6	--	b500	0	--	0
6	0	--	0	11	--	b400	0	--	0
7	0	--	0	150	--	b 25,000	0	--	0
8	0	--	0	198	49,800	s 40,800	0	--	0
9	0	--	0	341	54,200	s 56,900	0	--	0
10	0	--	0	90	41,200	s 11,600	0	--	0
11	0	--	0	212	61,900	s 53,200	0	--	0
12	0	--	0	379	60,200	s 77,900	96	42,000	sa 21,000
13	0	--	0	401	53,000	59,500	304	95,200	s 84,600
14	0	--	0	140	74,600	s 29,600	540	82,000	124,000
15	0	--	0	26	57,400	4,180	710	72,000	143,000
16	0	--	0	6	31,000	502	171	76,000	s 35,200
17	0	--	0	147	42,000	sa 42,000	56	71,500	11,200
18	0	--	0	730	75,000	153,000	21	57,500	3,380
19	0	--	0	619	71,100	s 127,000	9	35,000	882
20	0	--	0	398	67,800	s 77,300	2	4,000	22
21	0	--	0	243	59,100	s 42,100	2	232	1
22	0	--	0	382	84,500	s 106,000	.2	157	(t)
23	0	--	0	439	74,000	a 91,000	0	--	0
24	0	--	0	113	66,000	20,900	122	21,000	sa 24,000
25	0	--	0	382	73,300	s 87,400	205	45,900	s 26,100
26	440	54,500	s 154,000	278	56,500	44,000	422	70,200	s 81,600
27	896	79,300	s 215,000	110	48,000	s 15,700	1,090	51,600	157,000
28	134	56,300	s 22,800	30	12,000	a 970	2,500	43,000	301,000
29	26	17,900	s 1,560	2	100	a 1	1,120	40,000	125,000
30	2	--	b 10	.3	121	(t)	170	42,500	20,200
31	.2	--	b 1	2	8,100	sa 140	--	--	--
Total	1,498.2	--	393,371	5,846.3	--	1,168,493	7,540.4	--	1,158,185

Total discharge for year (cfs-days) 52,418.5
Total load for year (tons) 3,016,557

s Computed by subdividing day.
t Less than 0.50 tons.
a Computed from estimated concentration graph.
b Computed from water-sediment discharge curve.

RIO GRANDE BASIN--Continued

RIO GRANDE FLOODWAY AT SAN MARCIAL, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1953 to September 1954
(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; V, visual accumulation tube)

Date of collection	Time	Discharge (cfs)	Water temperature (°F)	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	0.500	1.000	2.000	
Dec. 6, 1953	12:05 p.m.	151	34	5,770	4,620		78		92		94	97	100				VPWCM
Dec. 17	11:00 a.m.	412	34	3,230	3,550		60		70		84	94	100				VPWCM
Dec. 21	2:30 p.m.	352	36	4,390	4,640		68		88		94	96	100				VPWCM
Jan. 8, 1954	12:05 p.m.	525	35	4,020	4,530		82		98		100	--	--				SPWCM
Jan. 25	9:35 a.m.	425	38	3,630	3,620		74		89		93	97	100				VPWCM
Feb. 11	12:35 p.m.	450	49	2,430	3,420		76		87		90	94	100				VPWCM
Feb. 21	10:05 a.m.	640	45	1,540	3,140		82		93		95	97	100				SPWCM
Mar. 10	10:40 a.m.	116	55	1,470	3,940		71		93		100	--	--				SPWCM
May 29	12:20 p.m.	438	--	3,650	3,570		74		89		94	98	100				VPWCM
June 3	6:00 p.m.	72	77	1,800	4,880		81		97		100	--	--				SPWCM
Aug. 10	6:55 p.m.	118	78	56,100	3,500		82		97		100	--	--				SPWCM
Aug. 20	1:30 p.m.	495	77	82,200	3,240		74		94		99	100	--				SPWCM
Sept. 14	11:30 p.m.	652	69	75,300	3,600		77		94		99	99	99	100			SPWCM
Sept. 20	10:30 a.m.	2.2	--	2,400	3,440		85		88		93	95	100				VPWCM

PECOS RIVER AT PUERTO DE LUNA, N. MEX.

LOCATION.--At bridge at Puerto de Luna, Guadalupe County, 17½ miles upstream from gaging station near Puerto de Luna which is 17½ miles upstream from Alamogordo Dam (revised).
DRAINAGE AREA.--3,970 square miles, approximately, above gaging station (contributing area).
RECORDS AVAILABLE.--Chemical analyses: July 1939 to September 1941, November 1946 to September 1954.
Water temperatures: June 1949 to September 1954.
Sediment records: January 1949 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 2,690 ppm Apr. 21-30; minimum, 355 ppm May 18.
Hardness: Maximum, 1,910 ppm Apr. 21-30; minimum, 264 ppm May 18.
Specific conductance: Maximum observed, 3,310 micromhos May 12; minimum observed, 583 micromhos May 18.
Water temperatures: Maximum observed, 98°F July 25; minimum observed, 38°F on several days during December and January.
Sediment concentratione: Maximum daily, 48,600 ppm Aug. 23; minimum daily, 43 ppm Apr. 25-30.
Sediment loads: Maximum daily, 766,000 tons Sept. 27; minimum daily, 7 tons Apr. 25-30.
EXTREMES, 1939-41, 1946-54.--Dissolved solids: Maximum, 2,690 ppm Apr. 21-30, 1954; minimum, 287 ppm May 11-16, 18-20, 1941.
Hardness: Maximum, 1,910 ppm Apr. 21-30, 1954; minimum, 200 ppm May 11-16, 18-20, 1941.
Specific conductance: Maximum observed, 3,810 micromhos Dec. 14, 1951; minimum observed, 344 micromhos Sept. 21, 1941.
Water temperatures (1949-54): Maximum observed, 98°F July 5, 19, 1949, July 25, 1954; minimum observed, freezing point Jan. 5, 1950; Nov. 11, 18, 1952.
Sediment concentrations, 1949-54.--Maximum daily, 48,600 ppm Aug. 23, 1954; minimum daily, 24 ppm May 22, 1950.
Sediment loads (1949-54): Maximum daily, 766,000 tons Sept. 27, 1954; minimum daily, 5 tons Sept. 21-30, 1951.
REMARKS.--Values reported for diesolved solids are sums of determined constituents. Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge for gaging station near Puerto de Luna for water year October 1953 to September 1954 given in WSP 1342. No appreciable inflow between sampling point and gaging station except during periods of heavy local runoff.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-10, 1953...	79.2	20		570	77	106	--	152	1,560	154		0.3		2,560	3.48	547	1,740	1,610	12	1.1	2,870	--
Oct. 11-20.....	89.3	19		574	77	101	--	164	1,580	145		.3		2,580	3.51	622	1,750	1,610	11	1.0	2,870	7.7
Oct. 21-31.....	103	17		556	73	96	--	172	1,510	135		.6		2,470	3.36	687	1,690	1,550	11	1.0	2,760	7.8
Nov. 1-10.....	105	19		556	74	99	--	167	1,500	141		.4		2,470	3.36	700	1,690	1,550	11	1.0	2,800	7.9
Nov. 11-20.....	94.6	20		552	77	97	--	148	1,530	141		.3		2,490	3.39	636	1,690	1,570	11	1.0	2,770	7.8
Nov. 21-30.....	96.0	22		556	64	102	--	124	1,540	134		.5		2,480	3.37	643	1,650	1,550	12	1.1	2,820	7.7
Dec. 1-10.....	99.6	19		564	66	106	--	172	1,520	142		.3		2,500	3.40	672	1,680	1,540	12	1.1	2,840	7.8
Dec. 11-20.....	96.9	19		560	66	106	--	163	1,530	143		.4		2,500	3.40	654	1,670	1,540	12	1.1	2,850	7.7
Dec. 21-31.....	90.6	20		572	62	105	--	165	1,520	143		.4		2,500	3.40	612	1,680	1,550	12	1.1	2,840	7.6
Jan. 1-10, 1954...	94.8	22		560	66	110	--	172	1,490	150		.2		2,480	3.37	635	1,670	1,530	13	1.2	2,870	7.7
Jan. 11-20.....	101	16		548	76	115	3.2	171	1,510	166		.8		2,520	3.43	687	1,680	1,540	13	1.2	2,920	7.5
Jan. 21-31.....	106	17		564	72	99	--	168	1,550	137		.6		2,520	3.43	721	1,700	1,570	11	1.0	2,870	7.7
Feb. 1-10.....	99.4	17		572	70	99	--	170	1,560	135		.3		2,540	3.45	682	1,720	1,580	11	1.0	2,890	7.8
Feb. 11-20.....	101	17		584	77	101	3.3	174	1,580	140		.1		2,590	3.52	706	1,770	1,630	11	1.0	2,920	7.6
Feb. 21-28.....	98.2	18		572	78	100	--	170	1,580	143		.2		2,580	3.51	684	1,750	1,610	11	1.0	2,930	7.7

RIO GRANDE BASIN--Continued

PECOS RIVER AT PUERTO DE LUNA, N. MEX.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Mar. 1-10, 1954...	96.8	17		560	83	98	--	163	1,590	133		0.1		2,560	3.48	669	1,740	1,600	11	1.0	2,930	7.8
Mar. 11-20.....	80.4	17		596	66	98	--	177	1,590	136		.0		2,590	3.52	562	1,760	1,610	11	1.0	2,920	7.8
Mar. 21-31.....	78.5	18		612	81	82	--	178	1,640	133		1.1		2,660	3.62	564	1,860	1,710	9	.8	2,950	7.3
Apr. 1-10.....	69.9	18		616	80	91	--	181	1,650	137		1.4		2,680	3.64	506	1,870	1,720	10	.9	2,980	7.6
Apr. 11-20.....	80.5	18		602	80	81	--	169	1,620	140		1.3		2,630	3.58	572	1,830	1,690	9	.8	2,940	7.7
Apr. 21-30.....	64.4	21		628	83	81	--	172	1,650	143		.9		2,690	3.66	468	1,910	1,770	8	.8	2,980	7.6
May 1-10.....	58.4	19		622	80	81	--	168	1,630	150		.8		2,670	3.63	421	1,880	1,740	9	.8	3,010	7.5
May 11-17.....	96.4	20		584	69	104	--	176	1,590	146		.4		2,600	3.54	677	1,740	1,600	11	1.1	2,950	6.9
May 18.....	1,290	25		90	9.5	27		347	19	10		3.8		355	.48	1,240	264	0	18	.7	583	7.9
May 19.....	370	23		195	20	38	--	250	382	45		.3		826	1.12	825	568	364	13	.7	1,170	7.6
May 20-31.....	141	21		445	47	76	--	167	1,150	101		1.1		1,920	2.61	731	1,300	1,170	11	.9	2,300	7.3
June 1-10.....	66.1	21		607	62	99	--	177	1,600	135		.1		2,610	3.55	466	1,770	1,620	11	1.0	2,950	7.2
June 11-20.....	56.9	22		611	71	101	--	167	1,650	141		.1		2,680	3.64	412	1,820	1,680	11	1.0	3,010	7.2
June 21-30.....	56.1	20		607	69	104	--	167	1,620	142		.1		2,640	3.59	400	1,800	1,660	11	1.1	2,980	7.2
July 1-6, 8, 10....	185	20		328	33	58	--	208	800	66		1.6		1,420	1.93	709	954	784	12	.8	1,810	7.0
July 7, 9.....	156	20		498	53	78	--	173	1,290	105		2.0		2,130	2.90	897	1,460	1,320	10	.9	2,500	7.3
July 11-13.....	165	18		343	37	54	--	197	856	73		.5		1,480	2.01	659	1,010	846	10	.7	1,860	7.0
July 14-20.....	69.3	22		588	59	97	--	180	1,550	134		.9		2,540	3.45	475	1,710	1,560	11	1.0	2,870	6.8
July 21-22, 27-31..	79.9	20		584	59	93	--	177	1,540	127		.5		2,510	3.41	541	1,700	1,550	11	1.0	2,840	7.3
July 23-26.....	171	20		379	40	64	--	198	956	83		1.6		1,640	2.23	757	1,110	948	11	.8	2,020	7.0
Aug. 1-6.....	96.5	26		580	92	99	--	173	1,630	127		1.2		2,640	3.59	688	1,830	1,680	11	1.0	2,880	7.7
Aug. 7-13.....	293	20		248	36	42	--	228	584	47		3.1		1,090	1.48	862	767	580	11	.7	1,410	7.4
Aug. 14-22.....	124	21		512	64	86	--	150	1,400	111		1.7		2,270	3.09	760	1,540	1,420	11	1.0	2,550	7.6
Aug. 23-25.....	1,144	18		200	26	30	--	183	454	29		6.9		854	1.16	2,640	606	456	10	.5	1,130	7.7
Aug. 26-31.....	134	21		504	52	93	--	182	1,330	118		1.8		2,210	3.01	800	1,470	1,320	12	1.1	2,550	7.5
Sept. 1-10.....	70.8	21		576	64	100	--	178	1,560	130		2.4		2,540	3.45	486	1,700	1,550	11	1.1	2,840	7.5
Sept. 11-12.....	1,260	20		198	21	22	--	213	407	27		2.7		803	1.09	2,730	580	406	8	.4	1,090	7.6
Sept. 13-14.....	215	16		377	45	64	--	181	984	83		1.5		1,660	2.26	964	1,130	977	11	.8	2,010	7.3
Sept. 15-26.....	93.8	19		568	62	99	--	162	1,530	129		5.3		2,490	3.39	631	1,670	1,540	11	1.1	2,790	7.7
Sept. 27-28.....	4,460	16		204	15	22	--	155	444	24		4.0		805	1.09	9,690	570	444	8	.4	1,090	7.7
Sept. 29-30.....	224	15		397	45	80	--	163	1,050	109		1.5		1,780	2.42	1,080	1,180	1,040	13	1.0	2,140	7.4
Weighted average.	142	19		420	50	69	--	178	1,090	93		2.1		1,830	2.49	702	1,250	1,110	11	0.8	2,150	--

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RIO GRANDE BASIN--Continued

PECOS RIVER AT PUERTO DE LUNA, N. MEX.--Continued

Temperature (°F) of water, water year October 1953 to September 1954
/Once-daily measurement, generally between 11 a.m. and 6 p.m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	70	--	50	48	50	50	70	60	a78	68	a80	80
2	--	--	50	50	45	40	70	62	78	79	90	80
3	--	--	50	50	50	40	70	60	b72	79	80	80
4	--	--	48	50	60	50	70	70	80	b79	80	80
5	--	--	48	50	60	50	70	72	80	79	90	80
6	--	--	38	50	60	50	70	65	79	b75	90	80
7		--	38	50	60	60	60	68	70	78	70	80
8	60	--	40	50	60	60	60	70	b86	78	--	80
9	75	--	38	50	60	60	50	70	79	79	80	80
10	60	--	--	50	60	60	50	70	78	70	80	80
11	62	--	40	50	60	60	60	60	80	b70	80	65
12	64	--	40	50	60	62	60	70	--	69	80	80
13	65	--	50	50	62	50	65	65	80	80	80	b80
14	60	--	50	45	60	50	60	65	80	78	80	80
15	--	--	40	45	60	60	60	55	80	90	80	80
16	--	--	48	40	60	60	60	60	80	60	90	80
17	--	--	40	a48	60	60	60	70	85	80	80	80
18	--	--	40	48	60	50	60	60	82	80	80	80
19	--	--	40	48	60	65	60	70	b78	80	80	80
20	--	50	50	43	60	50	50	80	87	90	80	70
21	--	42	50	38	60	50	60	70	85	80	80	70
22	--	40	40	38	60	60	60	70	85	80	80	70
23	--	50	38	60	50	50	50	65	80	78	70	70
24	--	48	40	60	50	50	50	60	b79	80	70	a60
25	--	60	40	58	50	50	50	a62	80	98	80	a68
26	--	58	40	60	50	50	60	75	85	90	b80	70
27	--	58	40	--	50	50	60	b70	78	90	b80	60
28	--	b60	40	60	50	50	70	b68	78	90	80	70
29	--	b58	40	60	--	50	68	75	80	90	80	70
30	--	60	40	60	--	a60	66	b72	78	80	80	70
31	--	--	40	60	--	60	--	75	--	80	a78	--
Average	--	--	43	51	57	54	61	67	80	80	80	75

a Measurement before 11 a.m.
b Measurement after 6 p.m.

RIO GRANDE BASIN--Continued

PECOS RIVER AT PUERTO DE LUNA, N. MEX.--Continued

Suspended sediment, water year October 1953 to September 1954

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	63			98	283	75	103	187	52
2	68			100	190	51	105	178	50
3	72			93	200	50	112	184	56
4	78			89	245	59	100	164	44
5	85	399	84	112	243	73	93	128	32
6	85			115	340	106	95	216	55
7	82			105	559	158	89	241	58
8	85			103	715	199	93	226	57
9	85			125	680	230	103	206	57
10	89			110	508	151	103	176	49
11	85			85	627	144	100		
12	89			103	566	157	85		
13	87			103	563	157	87		
14	82	387	92	103	290	81	98		
15	89			95	230	59	95	114	29
16	98			89	216	52	103		
17	87			93	402	101	93		
18	85			91	118	29	98		
19	91	361	89	93	288	72	103		
20	100	381	103	91	672	165	107		
21	89	271	65	95	696	179	98	142	36
22	91	135	33	95	744	191	91		
23	103	78	22	95	393	101	80		
24	105	273	77	93	345	87	82		
25	145	318	124	91	394	97	93		
26	107	179	52	98	417	110	91		
27	100	339	91	95	323	83	91		
28	105	357	101	98	723	191	91	--	b35
29	98	368	97	100	732	198	89		
30	93	153	38	100	632	171	98		
31	93	444	111	--	--	--	93		
Total	2,814	--	2,587	2,956	--	3,577	2,962	--	1,204

Day	January			February			March		
1	95			98			100		
2	91			98	264	71	95		
3	95			103			107		
4	95	--	b50	103			98		
5	95			105			103		
6	98			98			103	172	45
7	100			98	324	87	95		
8	95			98			93		
9	91	124	32	98			98		
10	93			95			76		
11	93			95			70		
12	95			103			78	446	93
13	100			107			78		
14	103			95			82		
15	110	290	80	93			85		
16	107			98	265	73	80		
17	100			110			85		
18	100			110			87		
19	100			110			74		
20	103			100			85		
21	112	323	93	98			85	192	42
22	112			98			85		
23	110			103			85		
24	112			95			80		
25	105			103	169	45	82		
26	95			103			78		
27	103	169	47	93			78		
28	100			91			68		
29	103			100			74	145	29
30	107			--	--	--	74	119	24
31	107			--	--	--	74	153	31
Total	3,125	--	1,920	2,789	--	1,957	2,635	--	1,494

b Computed from water-sediment discharge curve.

RIO GRANDE BASIN--Continued

PECOS RIVER AT PUERTO DE LUNA, N. MEX.--Continued

Suspended sediment, water year October 1953 to September 1954--Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Tons per day	Mean discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Tons per day	Mean discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Tons per day
1	70			58			85	245	56
2	68			65			80	224	48
3	65			58			75	190	37
4	67			60			70		
5	76			56			60	284	46
		147	28		110	17			
6	67			60			58	181	28
7	68			65			56		
8	70			60			56	185	28
9	70			51			58		
10	78			51			63	180	29
11	65			93			58		
12	87			80			60	145	24
13	91			75			61		
14	85			77	158	35	67	141	24
15	82			82			60		
		77	17						
16	70			82			56	134	20
17	82			186	3,100	sa 4,700	55		
18	88			1,290	27,800	s 140,000	56	76	11
19	80			370	12,200	12,600	47		
20	75			222	7,800	4,680	49	100	13
21	67			177	792	378	49		
22	70	246	45	155	2,430	1,020	56	100	15
23	63			142	433	166	58		
24	70			128	438	151	54	142	21
25	67			131	1,410	499	51	126	17
26	65			166	1,040	466	49	117	15
27	63	43	7	142	724	278	49	101	13
28	63			125	339	114	63	186	32
29	58			110	328	97	65	184	32
30	58			104	198	56	67	96	17
31	--	--	--	88	121	29	--	--	--
Total	2,148	--	672	4,609	--	165,614	1,791	--	755

	July			August			September		
1	244	19,100	s 17,300	174	8,540	s 12,900	80	--	b 34
2	165	13,400	s 6,120	158	9,080	s 6,440	82	--	b 35
3	101	6,000	a 1,640	72	254	49	93	145	36
4	120	10,400	s 5,650	70	415	78	75	521	106
5	166	19,000	8,520	54	153	22	65	241	42
6	240	13,600	s 11,900	51	148	20	67	220	40
7	151	2,980	s 3,070	466	20,900	s 39,500	58	259	41
8	308	17,000	s 15,400	258	8,920	s 8,770	60	205	33
9	162	6,300	a 2,760	277	20,000	s 15,200	63	180	31
10	133	3,380	s 1,380	314	12,300	s 14,500	65	239	42
11	240	7,750	s 5,360	272	13,900	s 11,800	2,080	39,000	s 324,000
12	148	3,800	1,520	268	16,100	s 13,700	437	19,700	s 25,500
13	107	1,500	433	196	11,000	5,820	249	4,700	3,160
14	88	460	109	148	3,500	1,400	181	3,200	1,560
15	77	501	104	119	759	244	122	584	192
16	72	571	111	98	454	120	93	320	80
17	58	267	42	82	700	155	80	314	68
18	70	258	49	141	6,500	s 2,630	72	185	36
19	60	466	75	128	3,020	s 1,070	70	159	30
20	60	215	35	82	900	199	72	165	32
21	123	7,230	s 3,130	164	3,480	s 3,560	65	116	20
22	80	400	a 86	157	6,700	s 8,130	63	143	24
23	234	12,000	s 9,110	2,340	48,600	s 394,000	65	105	18
24	195	9,280	s 5,030	534	22,600	s 38,600	158	4,500	s 3,620
25	145	4,000	1,570	577	12,800	s 28,300	152	1,100	s 459
26	110	2,240	665	222	3,800	2,280	113	225	69
27	85	514	118	155	1,700	711	8,090	30,100	s 766,000
28	63	340	58	125	985	332	828	12,500	s 35,100
29	78	476	100	110	407	121	285	1,300	1,000
30	67	273	49	98	386	102	162	308	135
31	63	197	34	93	316	79	--	--	--
Total	4,013	--	101,528	7,983	--	610,832	14,145	--	1,161,543

Total discharge for year (cfs-days) 51,970
Total load for year (tons) 2,053,683

s Computed by subdividing day.
a Computed from estimated concentration graph.
b Computed from water-sediment discharge curve.

RIO GRANDE BASIN--Continued

PECOS RIVER AT PUERTO DE LUNA, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1953 to September 1954
(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 [a] (cfs)	Water temperature (°F)	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 18, 1954	7:00 a.m.		--	38,700	3,860		18		54		78	87	97		99	100	SPWCM
May 18	3:00 p.m.		60	37,800	4,100		34		49		76	82	92		99	100	SPWCM
May 18	5:20 p.m.		60	24,900	4,670		43		74		95	98	99		100	--	SPWCM
May 18	5:20 p.m.		60	24,900	4,780		15		81		95	98	99		100	--	SPN
May 20	1:00 p.m.		80	5,670	4,280		75		87		92	94	96		100	--	SPWCM
July 1	2:00 p.m.		68	30,500	4,100		66		90		97	98	100		--	--	SPWCM
July 1	2:00 p.m.		68	30,500	4,380		7		92		97	98	100		--	--	SPN
July 5	8:35 p.m.		72	36,300	4,680		45		77		95	98	99		100	--	SPWCM
July 5	8:35 p.m.		72	36,300	4,690		7		79		95	98	99		100	--	SPN
July 10	5:00 p.m.		70	1,860	4,810		68		75		98	99	100		--	--	SPWCM
July 23	1:15 p.m.		78	26,200	4,080		44		64		75	76	83		97	100	SPWCM
July 23	8:30 p.m.		76	10,900	4,460		63		86		94	96	99		100	--	SPWCM
July 24	9:00 a.m.		73	9,910	4,050		50		80		95	98	100		--	--	SPWCM
July 24	9:00 a.m.		73	9,910	4,280		0		79		95	98	100		--	--	SPN
Aug. 10	10:08 a.m.		80	7,150	3,860		70		89		97	99	100		--	--	SPWCM
Aug. 11	5:00 p.m.		80	5,540	2,860		61		77		87	91	96		98	100	SPWCM
Aug. 11	5:00 p.m.		80	5,540	2,950		1		65		87	91	96		98	100	SPN
Aug. 23	7:48 a.m.		60	36,200	4,180		39		58		80	91	99		100	--	SPWCM
Aug. 23	11:15 a.m.		65	35,700	4,200		42		62		85	93	98		100	--	SPWCM
Aug. 24	1:00 p.m.		--	11,100	3,600		58		73		95	98	100		--	--	SPWCM
Aug. 24	1:00 p.m.		--	11,100	3,350		1		82		95	98	100		--	--	SPN
Sept. 11	3:00 a.m.		58	57,500	4,400		35		51		83	94	98		100	--	SPWCM
Sept. 11	10:30 a.m.		60	41,400	4,320		38		56		85	95	99		100	--	SPWCM
Sept. 11	10:30 a.m.		60	41,400	4,180		2		52		85	95	99		100	--	SPN
Sept. 12	7:30 a.m.		78	19,200	4,140		55		80		98	100	--		--	--	SPWCM
Sept. 27	7:38 a.m.		56	23,600	4,150		38		59		82	89	96		99	100	SPWCM
Sept. 27	7:38 a.m.		56	23,600	3,810		4		49		82	89	96		99	100	SPN
Sept. 27	8:28 a.m.		56	20,300	5,390		41		65		89	94	98		100	--	SPWCM
Sept. 27	2:43 p.m.		60	36,500	4,280		34		53		85	96	99		100	--	SPWCM
Sept. 27	3:15 p.m.		60	20,100	4,840		31		50		77	96	100		--	--	SPWCM
Sept. 27	3:15 p.m.		60	20,100	4,940		1		45		77	96	100		--	--	SPN
Sept. 28	11:30 a.m.		65	6,620	4,210		54		68		85	96	100		--	--	SPWCM

a Discharges omitted because of lack of correlation of discharges at sampling point and at gaging station.

PECOS RIVER BELOW ALAMOGORDO DAM, N. MEX.

LOCATION.--At gaging station, 1,200 feet downstream from Alamogordo Dam, 1½ miles downstream from Alamogordo Creek, and 4½ miles northeast of Guadalupe, DeBaca County.
DRAINAGE AREA.--4,390 square miles, approximately (contributing area).
RECORDS AVAILABLE.--Chemical analyses: June 1937 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 2,730 ppm May 11-20; minimum, 1,240 ppm Sept. 1-10.
Hardness: Maximum, 1,910 ppm May 1-10; minimum, 871 ppm Sept. 1-10.
Specific conductance: Maximum observed, 3,160 micromhos May 12; minimum observed, 1,500 micromhos Sept. 10.
EXTREMES, 1937-54.--Dissolved solids: Maximum, 2,730 ppm May 11-20, 1954; minimum, 435 ppm Oct. 1-8, 1941.
Hardness: Maximum, 1,910 ppm May 1-10, 1954; minimum, 294 ppm Oct. 1-8, 12-20, 1941.
Specific conductance: Maximum observed, 3,200 micromhos Jan. 14, 1948; minimum observed, 513 micromhos July 22, 1937.
REMARKS.--Values reported for dissolved solids are sums of determined constituents. Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge for water year October 1953 to September 1954 given in WSP 1342.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-10, 1953 ..	67.5	17		466	62	69		164	1,250	96		1.1		2,040	2.77	372	1,420	1,280	10	0.8	2,360	7.5
Oct. 11-20	66.6	14		492	64	76		166	1,320	103		.9		2,150	2.92	387	1,490	1,350	10	.9	2,460	7.5
Oct. 21-31	65.6	16		516	69	84		152	1,410	116		.6		2,290	3.11	406	1,570	1,450	10	.9	2,600	7.7
Nov. 1-5.....	a.10	14		438	73	87		143	1,250	108		.6		2,040	2.77	.55	1,390	1,280	12	1.0	2,390	7.6
Nov. 12-20.....	.21	17		438	74	89		164	1,240	111		.6		2,050	2.79	1.16	1,400	1,260	12	1.0	2,400	7.6
Nov. 21-30.....	.48	17		449	69	90		155	1,300	102		.9		2,100	2.86	2.72	1,400	1,280	12	1.0	2,480	7.5
Dec. 1, 5-10	a.20	17		449	69	92		155	1,280	112		.7		2,100	2.86	1.13	1,400	1,280	12	1.1	2,470	7.5
Dec. 11-20.....	.45	19		429	66	93		172	1,230	108		.6		2,030	2.76	2.47	1,340	1,200	13	1.1	2,410	7.5
Dec. 21-31.....	.55	20		445	69	97		160	1,280	116		.7		2,110	2.87	3.13	1,390	1,260	13	1.1	2,490	7.5
Jan. 1-10, 1954 ..	.20	19		433	74	100		155	1,260	117		.5		2,080	2.83	1.12	1,380	1,260	14	1.2	2,480	7.5
Jan. 11-20.....	.22	16		449	75	99		178	1,290	120		.4		2,140	2.91	1.27	1,430	1,280	13	1.1	2,550	7.6
Jan. 21-31	.19	18		421	74	98		172	1,210	116		.2		2,020	2.75	1.04	1,360	1,210	14	1.2	2,450	7.4
Feb. 1-10.....	.15	18		425	80	97		167	1,240	119		.6		2,060	2.80	.83	1,390	1,250	13	1.1	2,460	7.4
Feb. 11-20.....	.28	17		415	86	98		171	1,230	120		.4		2,050	2.79	1.55	1,390	1,250	13	1.1	2,460	7.6
Feb. 21-28.....	.24	18		445	71	98		173	1,280	122		.3		2,120	2.88	1.37	1,400	1,260	13	1.1	2,550	7.3
Mar. 1-10	3.85	17		445	69	98		174	1,270	122		.4		2,110	2.87	21.9	1,390	1,250	13	1.1	2,520	7.7
Mar. 11-20	96.0	15		592	59	100		146	1,580	140		.2		2,560	3.48	664	1,720	1,600	11	1.0	2,900	7.7
Mar. 21-31	75.4	18		596	80	78		153	1,610	144		1.3		2,600	3.54	529	1,820	1,690	9	.8	2,930	7.4
Apr. 1-10.....	803	18		606	81	78		153	1,640	144		1.5		2,640	3.59	5,720	1,840	1,720	8	.8	2,950	7.6
Apr. 11-20.....	388	17		620	82	81		160	1,660	151		1.4		2,690	3.66	2,820	1,880	1,750	9	.8	3,000	7.4
Apr. 21-30.....	67.6	19		614	84	84		146	1,640	152		1.0		2,670	3.63	487	1,880	1,760	9	.8	3,020	7.4

a No flow Nov. 6-11, Dec. 2-4.

RIO GRANDE BASIN--Continued

PECOS RIVER BELOW ALAMOGORDO DAM, N. MEX.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
May 1-10, 1954..	62.6	19		619	89	91		147	1,670	159		1.3		2,720	3.70	460	1,910	1,790	9	0.9	3,110	7.4
May 11-21.....	63.8	23		627	78	100		156	1,670	155		.1		2,730	3.71	470	1,880	1,760	10	1.0	3,050	7.4
May 21-31.....	93.5	19		417	43	73		129	1,080	96		1.0		1,790	2.43	452	1,220	1,110	12	.9	2,190	7.0
June 1-10.....	92.5	19		393	47	69		142	1,030	91		.9		1,720	2.34	430	1,170	1,060	11	.9	2,130	7.1
June 11-20.....	54.4	23		429	54	77		148	1,160	101		.6		1,920	2.61	282	1,290	1,170	11	.9	2,300	7.2
June 21-30.....	51.8	20		453	54	83		144	1,190	111		.9		1,980	2.69	277	1,350	1,230	12	1.0	2,450	7.2
July 1-10.....	61.9	22		504	52	91		143	1,360	117		.9		2,220	3.02	371	1,470	1,350	12	1.0	2,580	6.8
July 11-20.....	93.6	19		461	54	84		144	1,250	110		1.2		2,050	2.79	518	1,370	1,250	12	1.0	2,450	7.0
July 21-31.....	96.5	19		449	52	82		139	1,220	104		.6		1,990	2.71	519	1,330	1,220	12	.9	2,360	7.2
Aug. 1-10.....	113	17		441	54	80		141	1,210	105		.7		1,980	2.69	604	1,320	1,210	12	1.0	2,350	6.8
Aug. 11-20.....	544	19		389	62	73		160	1,060	94		3.4		1,780	2.42	2,610	1,230	1,090	11	.9	2,150	7.5
Aug. 21-31.....	100	17		296	44	38		171	782	33		4.3		1,300	1.77	351	920	780	8	.5	1,610	7.3
Sept. 1-10.....	98.6	14		280	39	43		127	760	44		2.8		1,240	1.69	330	871	767	10	.6	1,570	7.3
Sept. 11-20.....	82.9	16		302	37	41		126	815	45		2.6		1,320	1.80	295	906	802	9	.6	1,620	7.5
Sept. 21-30.....	64.8	13		288	38	41		138	751	49		1.8		1,250	1.70	219	870	758	9	.6	1,580	7.2
Weighted average	b94.2	18		498	66	75		151	1,340	116		1.7		2,190	2.98	557	1,510	1,390	10	0.8	2,530	--

b Average for 356 days of flow.

PECOS RIVER NEAR ACME, N. MEX.

LOCATION.--At gaging station, 1 mile southeast of Melena railroad station, 3½ miles downstream from Salt Creek, 5 miles southwest of Acme, Chaves County, and 13 miles northeast of Roswell.
DRAINAGE AREA.--11,380 square miles, approximately (contributing area).
RECORDS AVAILABLE.--Chemical analyses: July 1937 to September 1954.
Water temperatures: May 1952 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 6,970 ppm Feb. 1-2; minimum, 1,030 ppm Aug. 23-27, 31.
Hardness: Maximum, 2,990 ppm June 1-9; minimum, 634 ppm Aug. 23-27, 31.
Specific conductance: Maximum observed, 10,800 micromhos Feb. 2; minimum observed, 1,210 micromhos Aug. 25.
Water temperatures: Maximum observed, 87°F Aug. 14; minimum not determined.
EXTREMES, 1937-54.--Dissolved solids: Maximum, 19,870 ppm May 23 to June 2, 1938; minimum, 806 ppm May 24, 1941.
Hardness: Maximum, 5,320 ppm May 23 to June 2, 1938; minimum, 528 ppm May 24, 1941.
Specific conductance: Maximum observed, 39,300 micromhos Aug. 9, 1945; minimum observed, 955 micromhos Aug. 21, 1941.
Water temperatures (1952-54): Maximum observed, 89°F July 21-22, 26, Aug. 5, 1953; minimum observed, 33°F Jan. 4, 1953.
REMARKS.--Values reported for dissolved solids are sums of determined constituents. Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge for water year October 1953 to September 1954 given in WSP 1342.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 27-31, 1953..	a6.6	15		470	92	203		111	1,460	270		0.9		2,570	3.50	45.8	1,550	1,460	22	2.2	3,140	7.5
Nov. 1-10.....	11.8	15		510	101	247		110	1,590	340		.7		2,860	3.89	91.1	1,690	1,600	24	2.6	3,520	7.5
Nov. 11-23.....	a2.9	14		556	134	469		125	1,820	680		1.4		3,740	5.09	29.3	1,940	1,840	34	4.6	4,830	7.5
Dec. 8.....	a1.0	12		604	151	682		147	1,930	1,050		2.0		4,500	6.12	12.2	2,130	2,010	41	4.6	6,000	7.5
Dec. 19-23.....	a1.0	12		632	162	728		151	2,040	1,120		.2		4,770	6.49	12.9	2,240	2,120	41	6.7	6,330	7.6
Jan. 6-10, 1954 ..	1.4	13		604	150	676		144	1,930	1,040		.5		4,480	6.09	16.9	2,120	2,010	41	6.4	5,970	7.8
Jan. 11-20.....	1.3	14		622	174	842		146	1,950	1,380		2.3		5,060	6.88	17.8	2,270	2,150	45	7.7	6,950	7.8
Jan. 21-31.....	1.6	11		620	167	724		119	1,950	1,190		2.3		4,720	6.42	20.4	2,230	2,140	41	6.7	6,340	7.9
Feb. 1-2.....	a1.0	10		750	231	1,340		145	2,250	2,320		--		6,970	9.48	18.8	2,820	2,700	51	11	9,770	7.7
Mar. 19, 23.....	a2.5	36		676	146	308		121	2,040	520		1.2		3,790	5.15	25.6	2,290	2,190	23	2.8	4,610	7.3
Apr. 7-10.....	924	16		618	105	145		163	1,750	235		2.2		2,950	4.01	7,360	1,970	1,840	14	1.4	3,440	7.1
Apr. 11-20.....	562	17		634	100	109		126	1,770	200		1.6		2,890	3.93	4,390	1,990	1,890	11	1.1	3,300	7.5
Apr. 21-30.....	31.6	16		586	106	190		106	1,680	335		3.1		2,970	4.04	253	1,900	1,810	18	1.9	3,630	7.2
May 1-5	a4.6	15		586	118	343		112	1,780	530		.7		3,430	4.66	42.6	1,950	1,860	28	3.4	4,320	7.1
May 12-20	851	16		345	75	150		108	1,010	250		4.4		1,900	2.58	4,370	1,170	1,080	22	1.9	2,610	7.5
May 21-31	36.8	17		568	124	502		143	1,620	860		2.0		3,760	5.11	374	1,930	1,810	36	5.0	5,080	7.3
June 1-9	a2.1	19		842	216	1,070		145	2,490	1,850		1.5		6,560	8.92	37.2	2,990	2,870	44	8.5	8,770	7.5
June 14-20.....	a48.9	15		373	78	525		134	1,080	820		2.1		2,960	4.03	391	1,250	1,140	48	6.5	4,330	7.5

a No flow Oct. 1-26, Nov. 24 to Dec. 7, 9-18, Dec. 24 to Jan. 5, Feb. 3 to Mar. 18, 20-22, Mar. 24 to Apr. 6, May 6-11, June 10-13, June 21 to July 2, 4-31, Aug. 2-6, Sept. 6-12, 15-30.

RIO GRANDE BASIN--Continued

PECOS RIVER NEAR ACME, N. MEX.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Aug. 7-10, 1954 ..	398	15		381	36	122		94	1,000	172		3.2		1,780	2.42	1,910	1,100	1,020	19	1.6	2,270	7.6
Aug. 11-20	317	18		439	68	105		118	1,260	138		.9		2,090	2.84	1,790	1,380	1,280	14	1.2	2,440	7.6
Aug. 21-22, 28-30.	64.8	23		365	69	206		152	1,080	270		4.1		2,090	2.84	366	1,190	1,070	27	2.6	2,680	7.6
Aug. 23-27, 31....	334	19		200	33	81		176	538	75		1.1		1,030	1.40	929	634	490	22	1.4	1,410	7.6
Sept. 1-3	39.3	18		220	40	181		134	685	198		4.9		1,410	1.92	150	714	604	35	2.9	1,960	7.7
Sept. 4-5	a 8.0	18		480	104	266		103	1,570	342		2.4		2,830	3.85	61.1	1,620	1,540	26	2.9	3,440	7.5
Sept. 13-14.....	a 4.5	20		488	112	187		90	1,610	236		3.1		2,700	3.67	32.8	1,680	1,600	20	2.0	3,160	8.0
Weighted average	b 159	17		460	80	143		127	1,300	227		2.6		2,290	3.11	983	1,480	1,370	17	1.6	2,840	--

a No flow Oct. 1-26, Nov. 24 to Dec. 7, 9-18, Dec. 24 to Jan. 5, Feb. 3 to Mar. 18, 20-22, Mar. 24 to Apr. 6, May 6-11, June 10-13, June 21 to July 2, 4-31, Aug. 2-6, Sept. 6-12, 15-30.
b Mean discharge for 161 days of flow which includes more than 99 percent of runoff for water year.

RIO GRANDE BASIN--Continued

PECOS RIVER NEAR ACME, N. MEX.--Continued

Temperature (°F) of water, water year October 1953 to September 1954
(Once-daily measurement usually during daylight hours)

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	--	--					--	69	82		--	82
2	--	46					--	68	75		--	83
3	--	47					--	--	73		--	80
4	--	41					--	--	70		--	81
5	--	38					--	70	77		--	75
6	--	40					--	--	80		--	--
7	--	38					--	--	70		--	--
8	--	--					--	--	79		80	--
9	--	39					--	--	--		80	--
10	--	--					--	--	--		83	--
11	--	38					--	--	--		84	--
12	--	44					55	--	--		82	--
13	--	40					63	73	--		75	83
14	--	41					67	74	--		87	83
15	--	38					69	77	75		80	--
16	--	37					69	70	70		85	--
17	--	--					70	82	86		85	--
18	--	36					73	67	85		83	--
19	--	--					74	77	--		78	--
20	--	--					70	80	78		80	--
21	--	--					69	75	--		78	--
22	--	--					71	70	--		76	--
23	--	--					68	74	--		79	--
24	--	--					73	65	--		80	--
25	--	--					75	74	--		80	--
26	--	--					70	76	--		80	--
27	45	--					73	80	--		82	--
28	46	--					75	82	--		82	--
29	44	--					70	75	--		81	--
30	44	--					67	80	--		82	--
31	36	--					--	77	--		76	--
Average	43	--					70	74	77		81	81

RIO GRANDE BASIN--Continued

RIO HONDO AT DIAMOND A RANCH, NEAR ROSWELL, N. MEX.

LOCATION.--At gaging station on downstream side of road bridge at Diamond A Ranch, 8 miles upstream from Rocky Arroyo, and 18 miles west of Roswell, Chaves County.
DRAINAGE AREA.--960 squares miles (contributing area).
RECORDS AVAILABLE.--Water temperatures: September 1951 to September 1954.
Sediment records: September 1951 to September 1954.
EXTREMES, 1953-54.--Water temperatures: Maximum observed, 85 °F June 28; minimum, not determined.
Sediment concentrations: Maximum daily, 60,000 ppm July 22; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 68,000 tons Sept. 24; minimum daily, 0 tons on many days.
EXTREMES, 1951-54.--Water temperatures: Maximum observed, 86 °F July 24, 25, 1952; minimum, not determined.
Sediment concentrations: Maximum daily, not determined; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 160,000 tons (estimated) July 13, 1953; minimum daily, 0 tons on many days.
REMARKS.--Maximum observed, sediment concentration during water year, 119,000 ppm July 23. No flow during January to March; tabulation omitted for this period. Records of discharge for water year October 1953 to September 1954 given in WSP 1342.

Temperature (°F) of water, water year October 1953 to September 1954
(Once-daily measurement, generally between 11 a.m. and 6 p.m. No flow on many days)

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1									--	82	--	78
2									--	a74	--	b78
3									--	--	--	80
4									--	--	--	--
5									--	--	--	b75
6									--	--	76	b76
7									--	83	76	78
8									--	84	78	80
9									--	84	80	80
10									--	--	69	--
11									--	--	80	78
12									--	--	--	76
13									--	--	--	78
14									--	--	80	77
15									--	--	--	a69
16									--	--	--	a69
17									--	--	--	--
18								72	--	--	--	--
19									--	--	82	--
20									--	--	--	--
21									--	--	--	--
22									--	79	66	--
23									--	78	78	--
24									--	a78	72	--
25									--	82	74	67
26									--	--	78	--
27									--	--	78	--
28									85	--	80	--
29									82	--	80	--
30									84	--	80	--
31									--	--	79	--
Average								--	84	--	77	--

a Measurement before 11 a.m.
b Measurement after 6 p.m.

RIO GRANDE BASIN--Continued

RIO HONDO AT DIAMOND A RANCH NEAR ROSWELL, N. MEX.--Continued

Suspended sediment, water year October 1953 to September 1954

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1				0	--	0	3	--	b 3
2				0	--	0	1	--	(b)(t)
3				0	--	0	3	--	b 3
4				0	--	0	4	--	b 4
5				0	--	0	4	--	b 4
6				0	--	0	6	--	b 9
7				0	--	0	7	--	b 10
8				0	--	0	4	--	b 4
9				0	--	0	4	--	b 4
10				0	--	0	5	--	b 6
11				0	--	0	6	--	b 9
12				0	--	0	5	--	b 6
13				0	--	0	0	--	0
14				0	--	0	0	--	0
15				0	--	0	0	--	0
16				0	--	0	0	--	0
17				0	--	0	0	--	0
18				0	--	0	0	--	0
19				0	--	0	0	--	0
20				0	--	0	0	--	0
21				0	--	0	0	--	0
22				0	--	0	0	--	0
23				0	--	0	0	--	0
24				7	--	b 10	0	--	0
25				10	--	b 19	0	--	0
26				11	--	b 22	2	--	b 2
27				9	--	b 16	4	--	b 4
28				4	--	b 4	2	--	b 2
29				5	--	b 6	2	--	b 2
30				7	--	b 10	1	--	(b)(t)
31				--	--	--	0	--	0
Total	0		0	53	--	87	63	--	73

Day	April			May			June		
1				0	--	0	0	--	0
2				0	--	0	0	--	0
3				0	--	0	0	--	0
4				0	--	0	0	--	0
5				0	--	0	0	--	0
6				0	--	0	0	--	0
7				0	--	0	0	--	0
8				0	--	0	0	--	0
9				0	--	0	0	--	0
10				0	--	0	0	--	0
11				0	--	0	0	--	0
12				0	--	0	0	--	0
13				0	--	0	0	--	0
14				0	--	0	0	--	0
15				0	--	0	0	--	0
16				0	--	0	0	--	0
17				78	3,060	sa 12,500	0	--	0
18				215	17,600	s 16,600	0	--	0
19				22	2,800	sa 170	0	--	0
20				8	1,400	sa 35	0	--	0
21				246	13,000	sa 36,000	0	--	0
22				51	13,000	sa 2,600	0	--	0
23				3	8,000	a 65	0	--	0
24				330	18,000	sa 30,000	0	--	0
25				51	14,000	sa 2,000	0	--	0
26				16	9,200	a 400	0	--	0
27				12	8,300	a 270	0	--	0
28				7	7,300	a 140	43	8,190	s 1,850
29				0	--	0	13	3,690	s 134
30				5	--	e 110	89	21,300	s 9,100
31				1	--	e 10	--	--	--
Total	0		0	1,045	--	100,900	145	--	11,084

e Estimated.
s Computed by subdividing day.
t Less than 0.50 ton.
a Computed from estimated concentration graph.
b Computed from water-sediment discharge relation.

RIO GRANDE BASIN--Continued

RIO HONDO AT DIAMOND A RANCH NEAR ROSWELL, N. MEX.--Continued

Suspended sediment, water year October 1953 to September 1954--Continued

Day	July			August			September		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	7	10,000	189	0	--	0	9	860	21
2	7	1,950	37	0	--	0	28	3,520	s401
3	2	700	a4	0	--	0	32	900	s97
4	0	--	0	0	--	0	19	340	a17
5	0	--	0	0	--	0	19	490	25
6	0	--	0	5	2,250	s100	5	50	1
7	19	7,070	s724	39	9,820	s1,710	5	50	a1
8	8	5,600	s130	7	6,500	123	2	40	(t)
9	5	5,890	sa136	64	2,300	397	2	30	(t)
10	4	5,500	sa92	371	46,700	s65,000	0	--	0
11	0	--	0	29	11,400	893	8	92	s5
12	0	--	0	11	3,200	95	7	310	6
13	0	--	0	3	1,200	10	36	5,930	s520
14	0	--	0	10	1,150	s49	3	1,000	8
15	0	--	0	0	--	0	3	380	3
16	0	--	0	0	--	0	2	80	(t)
17	0	--	0	0	--	0	1	70	(a)(t)
18	0	--	0	0	--	0	1	60	(a)(t)
19	0	--	0	3	570	sa13	1	50	(a)(t)
20	0	--	0	0	--	0	1	40	(a)(t)
21	0	--	0	0	--	0	1	30	(a)(t)
22	87	60,000	s25,000	61	6,250	s849	1	30	(a)(t)
23	76	34,500	s 8,510	133	18,900	s9,910	1	30	(a)(t)
24	11	5,700	169	408	23,000	s39,600	315	10,900	sa68,000
25	2	3,100	17	124	9,500	3,180	171	23,400	s25,100
26	0	--	0	56	5,000	s802	35	2,000	a190
27	0	--	0	12	4,480	145	27	200	a15
28	0	--	0	6	3,210	52	20	100	a 5
29	0	--	0	5	2,320	31	14	80	a3
30	0	--	0	7	2,330	44	10	50	a1
31	0	--	0	12	1,690	55	--	--	--
Total	228	--	35,008	1,366	--	123,058	779	--	94,421
Total discharge for year (cfs-days)									3,679
Total load for year (tons)									364,631

s Computed by subdividing day.
t Less than 0.50 ton.
a Computed from estimated concentration graph.

RIO HONDO AT DIAMOND A RANCH NEAR ROSWELL, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1953 to September 1954
(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 (cfs)	Water temperature (°F)	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	0.500	1.000	2.000	
May 18, 1954	7:00 a.m.	440	58	25,700	4,320		23		43		78	93	100	--			SPWCM
Aug. 7	10:00 a.m.	103	--	23,900	3,920		37		68		94	98	99	100			SPWCM
Aug. 7	10:00 a.m.	103	--	23,900	4,240		2		57		94	98	99	100			SPN
Aug. 7	1:00 p.m.	74	--	15,700	3,620		47		81		96	98	99	100			SPWCM
Aug. 10	12:30 a.m.	2,530	--	69,600	4,460		49		70		93	97	99	100			SPWCM
Aug. 10	2:30 a.m.	1,040	65	70,000	3,780		45		68		91	96	99	100			SPWCM
Aug. 10	5:35 a.m.	428	--	67,500	4,050		48		71		90	94	97	100			SPWCM
Aug. 10	11:00 a.m.	169	69	45,700	3,180		56		77		95	98	99	100			SPWCM
Aug. 22	10:45 p.m.	465	66	23,300	4,280		38		63		90	98	99	100			SPWCM
Aug. 24	7:30 a.m.	1,490	--	49,600	3,570		24		39		80	92	97	99	100		SPWCM
Aug. 24	10:30 a.m.	1,050	--	34,900	3,380		55		77		80	92	97	100			SPWCM
Aug. 24	10:30 a.m.	1,050	--	34,900	4,780		6		42		80	92	97	100			SPN
Sept. 13	4:40 a.m.	80	64	15,600	4,650		31		51		97	97	98	100			SPWCM
Sept. 13	4:40 a.m.	80	64	15,600	3,580		1		88		97	97	98	100			SPN
Sept. 13	7:00 a.m.	67	66	10,200	4,180		69		92		96	96	97	100			SPWCM
Sept. 13	1:45 p.m.	9.0	76	6,050	3,380		79		97		99	100	--	--			SPWCM
Sept. 25	11:00 a.m.	84	65	10,400	3,920		45		75		87	91	95	100			SPWCM
Sept. 25	11:00 a.m.	84	65	10,400	4,260		8		71		87	91	95	100			SPN
Sept. 25	4:30 p.m.	45	67	5,750	3,150		62		87		91	94	98	100			SPWCM

RIO GRANDE BASIN--Continued

PECOS RIVER NEAR ARTESIA, N. MEX.

LOCATION.--At gaging station at bridge on State Highway 83, 4.3 miles east of Artesia, Eddy County, 7.0 miles north of mouth of Rio Penasco, and 17 miles north of McMillan Dam.
DRAINAGE AREA.--15,300 square miles, approximately (contributing area).
RECORDS AVAILABLE.--Chemical analyses: July 1937 to September 1954.
Water temperatures: April 1949 to September 1954.
Sediment records: January 1949 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 9,760 ppm Aug. 2, 4; minimum, 566 ppm Aug. 25.
Hardness: Maximum, 3,120 ppm July 11-13; minimum, 330 ppm Aug. 25.
Specific conductance: Maximum observed, 14,600 micromhos June 18; minimum observed, 877 micromhos Aug. 25.
Water temperatures: Maximum observed, 89°F July 8; minimum observed, 33°F Dec. 24.
Sediment concentrations: Maximum daily, 10,900 ppm Aug. 27; minimum daily, no flow on many days in July and August.
Sediment loads: Maximum daily, 96,000 tons May 19; minimum daily, 0 tons on many days.
EXTREMES, 1937-54.--Dissolved solids: Maximum, 10,900 ppm Aug. 11-13, 17-21, 1945; minimum, 566 ppm Aug. 25, 1954.
Hardness: Maximum, 3,430 ppm Aug. 11-13, 17-21, 1945; minimum, 326 ppm June 6, 1949.
Specific conductance: Maximum observed, 17,200 micromhos Aug. 20, 1945; minimum observed, 877 micromhos Aug. 25, 1954.
Water temperatures (1949-54): Maximum observed, 92°F June 30, 1953; minimum observed, 33°F Jan. 30, 31, Feb. 1, 1951, Dec. 30, 1952, Dec. 24, 1953.
Sediment concentrations (1949-54): Maximum daily, 14,600 ppm Oct. 6, 1950; minimum daily, no flow on many days.
Sediment loads (1949-54): Maximum daily, 116,000 tons July 23, 1950; minimum daily, 0 tons on many days.
REMARKS.--Values reported for dissolved solids are sums of determined constituents. Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge for water year October 1953 to September 1954 given in WSP 1342.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-10, 1953...	12.1	19		726	298	1,550		150	2,480	2,610		--		7,760	10.6	253	3,040	2,910	53	12	10,800	7.5
Oct. 11-20.....	20.4	17		652	271	1,350		150	2,210	2,350		--		6,920	9.41	381	2,740	2,620	52	11	9,920	7.4
Oct. 21-31.....	34.2	17		574	232	1,170		a142	2,000	1,970		3.0		6,040	8.21	558	2,390	2,260	52	10	8,560	7.7
Nov. 1-10.....	49.5	15		556	191	980		138	1,790	1,620		3.0		5,220	7.10	698	2,170	2,060	50	9.1	7,440	7.6
Nov. 11-20.....	53.3	17		564	201	990		166	1,880	1,660		4.3		5,400	7.34	777	2,230	2,100	49	9.1	7,580	7.6
Nov. 21-30.....	68.3	18		538	203	920		196	1,770	1,590		6.2		5,140	6.99	948	2,180	2,020	48	8.6	7,300	7.6
Dec. 1-10.....	68.5	16		532	199	912		202	1,720	1,580		6.0		5,060	6.88	936	2,150	1,980	48	8.6	7,190	7.6
Dec. 11-20.....	54.4	18		564	212	1,020		222	1,800	1,750		7.1		5,480	7.45	805	2,280	2,100	49	9.3	7,800	7.6
Dec. 21-31.....	53.1	18		582	218	1,210		212	1,930	2,060		5.1		6,130	8.34	879	2,350	2,180	53	11	8,880	7.6
Jan. 1-10, 1954...	56.3	17		574	222	1,240		196	1,980	2,060		4.6		6,190	8.42	941	2,340	2,180	53	11	8,820	7.5
Jan. 11-20.....	52.4	18		530	220	1,220		186	1,920	1,980		4.3		5,980	8.13	846	2,230	2,070	54	11	8,630	7.7
Jan. 21-31.....	47.8	16		540	207	1,330		179	1,980	2,100		--		6,260	8.51	808	2,200	2,050	57	12	9,090	7.6
Feb. 1-10.....	47.9	17		560	235	1,240		170	1,940	2,090		--		6,170	8.39	798	2,360	2,220	53	11	8,870	7.4
Feb. 11-20.....	37.6	16		580	233	1,320		174	2,040	2,150		--		6,420	8.73	652	2,400	2,260	54	12	9,070	7.4
Feb. 21-28.....	43.0	14		572	231	1,290		168	2,060	2,130		--		6,380	8.68	741	2,380	2,240	54	12	9,050	7.3

a Includes equivalent of 10 parts per million of carbonate (CO_3).

Mar. 1-10, 1954..	44.5	14		572	238	1,290		173	2,080	2,100		--		6,380	8.68	767	2,410	2,260	54	11	9,000	7.4
Mar. 11-20.....	40.0	16		603	231	1,340		177	2,140	2,120		--		6,540	8.89	706	2,450	2,310	54	12	9,160	7.1
Mar. 21-31.....	34.5	11		633	249	1,550		159	2,290	2,390		--		7,200	9.79	671	2,600	2,470	56	13	10,100	7.3
Apr. 1-7.....	18.1	13		676	270	1,750		162	2,500	2,710		--		8,000	10.9	391	2,800	2,660	58	14	11,300	7.2
Apr. 8-10.....	545	27		631	107	370		181	1,840	500		1.0		3,560	4.84	5,240	2,010	1,870	29	3.6	4,400	7.4
Apr. 11-20.....	559	18		619	95	240		164	1,760	340		2.4		3,160	4.30	4,770	1,940	1,800	21	2.4	3,740	7.4
Apr. 21-30.....	55.4	18		659	150	768		129	2,070	1,160		1.5		4,890	6.65	731	2,260	2,160	42	7.0	6,460	7.1
May 1-10.....	25.7	18		615	228	1,180		163	2,200	1,830		1.3		6,150	8.36	427	2,470	2,340	51	10	8,460	7.2
May 11-17.....	22.1	17		696	218	1,580		154	2,460	2,470		--		7,520	10.2	449	2,630	2,510	57	13	10,400	6.7
May 18.....	238	21		639	181	1,070		167	2,140	1,670		2.5		5,810	7.90	3,730	2,340	2,200	50	9.7	8,020	6.9
May 19-23.....	1,632	17		425	52	288		148	1,150	425		4.8		2,430	3.30	10,710	1,270	1,150	33	3.5	3,260	7.5
May 24-31.....	107	24		588	123	770		159	1,750	1,200		3.7		4,540	6.17	1,310	1,970	1,840	46	7.5	6,210	7.4
June 1-10	26.2	23		647	212	1,220		169	2,170	1,940		22		6,320	8.60	447	2,490	2,350	52	11	8,740	7.4
June 11-20.....	18.2	21		759	227	1,850		177	2,610	2,830		--		8,380	11.4	412	2,830	2,680	58	15	11,700	7.2
June 21-30.....	5.57	24		759	241	1,820		168	2,620	2,890		--		8,440	11.5	127	2,880	2,750	58	15	11,600	--
July 1-10.....	2.23	22		242	237	1,690		131	2,640	2,640		--		8,040	10.9	48.4	2,830	2,720	57	14	11,000	7.4
July 11-13.....	b .53	16		820	260	2,010		95	2,880	3,160		--		9,190	12.5	13.2	3,120	3,040	58	16	12,700	7.1
Aug. 2, 4	4.0	34		820	236	2,270		133	2,850	3,480		--		9,760	13.3	105	3,020	2,910	62	18	13,400	7.1
Aug. 3, 10.....	b139	14		212	24	182		94	558	265		2.2		1,300	1.77	488	628	550	39	3.2	1,870	7.4
Aug. 8-9	615	17		385	64	600		136	1,130	960		2.7		3,170	4.31	5,260	1,220	1,110	52	7.5	4,570	7.2
Aug. 11-14, 16-23	182	26		480	59	240		117	1,360	335		2.6		2,560	3.48	1,260	1,440	1,340	27	2.8	3,190	7.4
Aug. 15	479	26		564	88	604		145	1,640	910		2.1		3,910	5.32	5,060	1,770	1,650	43	6.2	5,200	7.1
Aug. 24, 26-28....	758	19		232	37	140		151	652	179		2.6		1,340	1.82	2,740	731	608	29	2.3	1,870	7.3
Aug. 25	2,330	18		119	8.2	60		196	195	69		1.0		566	.77	3,560	330	170	28	1.4	877	7.3
Aug. 29-31	155	16		310	52	261		132	905	370		3.9		1,980	2.69	829	988	880	36	3.6	2,760	7.3
Sept. 1-10.....	64.7	20		421	93	546		137	1,320	795		3.9		3,270	4.45	571	1,430	1,320	45	6.3	4,590	7.3
Sept. 11-13.....	22.3	20		516	164	1,010		127	1,820	1,570		5.8		5,170	7.03	311	1,960	1,860	53	9.9	7,290	7.2
Sept. 14-20.....	20.9	21		665	237	1,610		142	2,290	2,610		--		7,500	10.2	423	2,630	2,520	57	14	10,600	7.5
Sept. 21-30.....	17.5	21		688	260	1,740		149	2,440	2,810		--		8,030	10.9	379	2,790	2,660	58	14	11,300	7.1
Weighted average	c109	19		478	107	539		160	1,440	843		--		3,510	4.77	1,030	1,630	1,500	42	5.8	4,760	--

b No flow July 14 to Aug. 1, Aug. 5-7.
c Average for 343 days of flow.

RIO GRANDE BASIN--Continued

PECOS RIVER NEAR ARTESIA, N. MEX.--Continued

Temperature (°F) of water, water year October 1953 to September 1954
/Once-daily measurement, generally between 11 a.m. and 6 p.m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a 65	a 60	a 52	a 40	56	52	64	65	a 68	82	--	81
2	a 70	64	53	41	--	52	69	a 67	a 72	80	79	82
3	a 72	61	a 46	a 38	49	a 41	71	65	76	81	80	82
4	67	a 55	38	a 40	--	a 40	72	63	a 70	85	a 83	82
5	65	55	48	47	56	44	68	64	75	85	--	a 77
6	53	a 54	45	48	54	46	72	74	a 74	85	--	a 77
7	66	58	43	a 41	47	50	--	a 65	78	78	--	b 80
8	70	a 50	b 35	50	51	52	66	a 74	78	89	--	a 74
9	a 60	a 48	a 38	a 45	48	62	a 59	78	78	78	75	b 78
10	a 59	a 46	42	a 42	a 52	b 63	68	75	a 76	80	b 79	a 74
11	68	--	35	43	49	58	62	70	b 80	82	a 78	80
12	a 60	--	a 34	a 36	a 45	53	57	72	a 80	80	85	76
13	68	--	a 37	38	54	45	60	72	78	86	a 80	a 72
14	70	--	40	a 37	a 50	44	59	a 71	a 78	--	83	a 70
15	a 63	55	a 35	a 40	a 53	45	66	a 71	80	--	80	78
16	a 68	a 51	a 38	a 38	52	52	62	70	--	--	a 78	80
17	a 68	53	43	43	49	b 58	69	a 70	78	--	b 79	77
18	63	55	42	a 44	a 44	51	73	b 68	b 80	--	a 73	80
19	65	a 48	45	a 45	a 45	59	73	68	80	--	82	80
20	a 60	48	46	45	47	a 52	70	72	83	--	b 82	79
21	65	44	a 44	43	a 48	62	67	70	b 84	--	b 80	75
22	68	a 42	36	a 38	a 48	60	70	a 65	b 80	--	79	73
23	60	48	34	a 39	52	66	69	74	83	--	78	73
24	60	51	33	a 41	a 48	62	71	a 62	a 80	--	74	b 68
25	59	a 48	a 36	54	a 49	a 51	70	--	b 80	--	75	72
26	b 52	a 44	34	55	64	61	70	69	80	--	78	a 70
27	a 51	a 48	35	53	54	62	75	--	83	--	79	75
28	a 58	a 46	38	a 48	a 46	60	71	a 68	84	--	a 78	75
29	a 58	a 47	43	a 51	--	a 60	64	75	84	--	b 80	75
30	60	--	40	50	--	60	65	a 71	82	--	80	77
31	62	--	36	51	--	64	--	a 74	--	--	a 80	--
Average	63	51	40	44	50	54	67	70	79	82	79	76

a Measurement before 11 a.m.
b Measurement after 6 p.m.

PECOS RIVER NEAR ARTESIA, N. MEX.--Continued

Suspended sediment, water year October 1953 to September 1954

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	11			47			70		
2	8.0			46			69		
3	7.5			47			68		
4	6.5			47			69		
5	7.0			48			69		
		52	2		111	15		112	21
6	17			48			69		
7	13			50			70		
8	20			53			69		
9	17			53			67		
10	14			56			65		
11	16			56			65		
12	14			59			58		
13	16			53			54		
14	16			49			54		
15	19	139	8	49			54		
					117	17		203	30
16	21			50			54		
17	25			49			52		
18	26			48			51		
19	25			56			54		
20	26			64			48		
21	23			68			47		
22	21	242	19	68			51		
23	26			68			51		
24	37			68			45		
25	37			68			40		
					127	23		87	12
26	38			69			45		
27	34			69			55		
28	36			69			67		
29	39	160	17	68			64		
30	40			68			60		
31	45			--	--	--	59		
Total	701.0	--	321	1,711	--	550	1,813	--	642

Day	January			February			March		
1	57			55			45		
2	56			56			46		
3	56			47			44		
4	57			45			44		
5	58			41			40		
		68	10		73	9		46	6
6	57			40			45		
7	55			44			45		
8	56			49			47		
9	56			50			45		
10	55			52			44		
11	55			48			43		
12	56	80	12	45			40		
13	57			39			44		
14	58			33			43		
15	57			38			47		
					90	9		44	5
16	53	86	12	41			44		
17	46			33			40		
18	44			33			40		
19	51			32			35		
20	47			34			24		
21	42			35			26		
22	47			44			30		
23	59			41			42		
24	55			48			37		
25	53			47	67	8	39	57	6
		78	10						
26	50			44			40		
27	44			42			37		
28	45			43			32		
29	43			--	--	--	38	42	4
30	46			--	--	--	39		
31	42			--	--	--	20		
Total	1,613	--	330	1,199	--	244	1,225	--	168

RIO GRANDE BASIN--Continued

PECOS RIVER NEAR ARTESIA, N. MEX.--Continued

Suspended sediment, water year October 1953 to September 1954--Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Tons per day	Mean discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Tons per day	Mean discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Tons per day
1	17			47			59		
2	19			30			46		
3	14			32	67	6	31		
4	10	57	3	32			23		
5	16			23			18		
6	28			23			17	207	14
7	23			22			17		
8	144	592	s 644	25	43	2	17		
9	692	3,920	7,320	13			17		
10	800	4,000	8,640	10			17		
11	800	3,920	9,100	21			17		
12	940	3,900	9,900	15			16		
13	960	3,890	10,100	7.5	47	2	14		
14	960	3,830	9,930	5.5			12	65	2
15	880	3,670	8,720	34			11		
16	525	2,780	s 4,180	40	240	26	11		
17	184	1,500	745	32	160	14	30		
18	108	780	227	238	1,950	s 809	37		
19	101	580	158	4,040	8,800	96,000	20		
20	70	430	81	3,000	3,920	s 25,800	14		
21	67	420	76	603	2,780	s 4,360	9.0	111	4
22	57	290	45	321	1,910	s 1,650	6.5		
23	58	130	20	197	970	516	5.9		
24	53			163	700	308	3.8		
25	50			142	790	303	2.2		
26	55	129	18	124	790	264	2.2		
27	49			115			3.2		
28	42			95			5.6	92	2
29	60			79	220	50	9.0		
30	63	251	43	67			8.3		
31	--	--	--	68			--	--	--
Total	7,905	--	70,058	9,664.0	--	130,350	499.7	--	216

Day	July			August			September		
	Mean discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Tons per day	Mean discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Tons per day	Mean discharge (cfs)	Suspended sediment: Mean concentration (ppm)	Suspended sediment: Tons per day
1	5.9			0	--	0	97	412	s 108
2	3.8			7.8	292	s 24	190	850	s 446
3	2.4	84	1	1.7	90	(t)	101	390	106
4	2.1			.1	50	(t)	67	280	51
5	1.4			0	--	0	48	120	16
6	1.2			0	--	0	43	72	8
7	1.4			0	--	0	40	71	8
8	1.9			19	990	sa 210	23	99	6
9	1.3			1,210	10,500	s 37,800	18	70	3
10	.9	39	(t)	277	3,310	s 2,800	20	109	6
11	.7			94	596	s 158	21	118	7
12	.5			73	679	s 142	21	140	8
13	.4			25	330	22	25	148	10
14	0	--	0	14	250	9	26	141	10
15	0	--	0	479	3,480	s 4,900	20	89	5
16	0	--	0	570	4,310	6,630	19	103	5
17	0	--	0	585	3,620	5,720	22	129	8
18	0	--	0	353	2,400	s 2,480	19	137	7
19	0	--	0	138	480	179	20	141	8
20	0	--	0	72	100	19	20	73	4
21	0	--	0	49	60	8	22	103	6
22	0	--	0	60	271	s 75	15	137	6
23	0	--	0	156	1,400	s 689	14	148	6
24	0	--	0	1,380	9,510	s 43,800	13	137	5
25	0	--	0	2,330	8,820	s 52,900	17	129	6
26	0	--	0	1,020	9,610	s 23,500	14	170	6
27	0	--	0	394	10,900	s 11,700	15	160	6
28	0	--	0	238	5,400	3,470	28	150	11
29	0	--	0	180	2,200	1,070	23	436	27
30	0	--	0	150	680	275	14	473	18
31	0	--	0	134	400	145	--	--	--
Total	23.9	--	6	10,009.6	--	198,725	1,035	--	927

Total discharge for year (cfs-days) 37,399.2
Total load for year (tons) 402,537

s Computed by subdividing day.
t Less than 0.50 ton.
a Computed from estimated concentration graph.

PECOS RIVER NEAR ARTESIA, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1953 to September 1954
(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; V, visual accumulation tube)

Date of collection	Time	Discharge (cfs)	Water temperature (°F)	Suspended sediment											Methods of analysis
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters									
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
Apr. 8, 1954	4:30 p.m.	101	--	2,820	--		--		--		21	78	99		100		VWM
Apr. 9	9:35 a.m.	728	--	6,150	6,560		56		81		96	100	--		--		VPWCM
Apr. 9	10:55 a.m.	710	62	4,450	4,110		53		77		92	99	100		--		VPWCM
Apr. 9	12:20 p.m.	710	--	3,070	4,730		57		84		96	100	--		--		VPWCM
Apr. 9	3:00 p.m.	728	74	4,300	5,830		59		85		96	100	--		--		VPWCM
Apr. 11	4:00 p.m.	860	63	3,920	3,680		61		74		89	99	100		--		SPWCM
Apr. 13	9:00 a.m.	980	56	3,610	3,120		51		71		87	98	100		--		SPWCM
Apr. 14	2:50 p.m.	980	66	3,360	3,560		51		71		86	95	99		100		SPWCM
Apr. 15	2:10 p.m.	880	66	3,160	3,780		47		66		91	98	100		--		VPWCM
Apr. 15	6:15 p.m.	860	61	3,320	3,900		46		65		90	98	100		--		VPWCM
Apr. 16	7:05 a.m.	692	59	3,330	5,800		45		65		84	93	100		--		VPWCM
Apr. 16	8:00 a.m.	675	60	3,040	3,980		48		68		88	95	100		--		VPWCM
Apr. 16	9:40 a.m.	580	61	2,840	5,170		51		72		90	96	100		--		VPWCM
May 18	10:46 p.m.	1,900	67	14,500	4,150		43		65		91	99	100		--		SPWCM
May 19	7:25 a.m.	3,750	63	8,600	4,070		48		66		83	98	100		--		SPWCM
May 19	4:00 p.m.	3,860	69	8,300	3,860		20		65		82	97	100		--		SPN
May 19	4:00 p.m.	3,860	69	8,300	3,770		47		68		82	97	100		--		SPWCM
May 19	8:50 p.m.	3,860	69	5,530	3,540		45		54		75	94	100		--		SPWCM
May 20	6:35 p.m.	1,220	72	3,660	2,860		58		87		89	97	100		--		SPWCM
Aug. 9	6:15 a.m.	1,560	74	13,400	5,540		61		85		96	99	100		--		SPWCM
Aug. 9	6:15 a.m.	1,560	74	13,400	5,200		4		85		96	99	100		--		SPN
Aug. 10	8:00 a.m.	300	74	3,470	3,470		63		80		87	96	100		--		SPWCM
Aug. 15	5:50 p.m.	570	80	5,350	4,170		61		82		93	98	100		--		SPWCM
Aug. 17	6:30 p.m.	570	79	3,320	3,010		58		81		91	97	100		--		SPWCM
Aug. 24	12:05 p.m.	1,450	--	15,400	3,300		7		75		96	99	100		--		SPN
Aug. 24	12:05 p.m.	1,450	--	15,400	3,250		55		86		96	99	100		--		SPWCM
Aug. 24	6:10 p.m.	2,180	72	10,600	4,370		1		68		94	99	100		--		SPN
Aug. 24	6:10 p.m.	2,180	72	10,600	4,840		47		75		94	99	100		--		SPWCM
Aug. 25	3:45 p.m.	3,430	75	14,000	4,120		45		74		91	98	100		--		SPWCM
Aug. 25	7:10 p.m.	3,230	72	5,680	3,270		46		72		88	98	100		--		SPWCM
Aug. 26	12:05 p.m.	860	78	16,200	4,600		67		91		97	99	100		--		SPWCM

RIO GRANDE BASIN--Continued

RIO PENASCO AT DAYTON, N. MEX.
(Formerly published as Rio Penasco near Dayton, N. Mex.)

LOCATION.--At gaging station 3 feet upstream from crest of abandoned diversion dam, 1 mile northeast of old Dayton railway station, 31 miles upstream from mouth, and 7 miles southeast of Artesia, Eddy County.
DRAINAGE AREA.--1,070 square miles, approximately.
RECORDS AVAILABLE.--Water temperatures: September 1951 to September 1954.
Sediment records: September 1951 to September 1954.
EXTREMES, 1953-54.--Sediment concentrations: Maximum daily, 9,650 ppm Aug. 24; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 28,700 tons Aug. 24; minimum daily, 0 tons on many days.
EXTREMES, 1951-54:--Sediment concentrations: Maximum daily, 15,500 ppm June 18, 1953; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 36,000 tons June 18, 1953; minimum daily, 0 tons on many days.
REMARKS.--Flow occured only on days indicated. Records of discharge for water year October 1953 to September 1954 given in WSP 1342.

Suspended sediment and temperature (°F) of water, for water year October 1953 to September 1954
/Once-daily temperature measurement, between 11 a. m. and 7 p. m./

Day	Mean discharge (cfs)	Suspended sediment		Temperature (°F)
		Mean concentration (ppm)	Tons per day	
Aug. 10, 1954	100	5,220	s3,920	74
Aug. 11	18	2,300	s136	75
Aug. 12	2	300	1.6	b65
Aug. 23	192	7,380	s7,050	74
Aug. 24	910	9,650	s28,700	73
Aug. 25	291	3,050	s3,430	75
Aug. 26	17	1,300	a60	--
Aug. 27	1	500	a1.4	--
Total discharge for year (cfs-days)				1,531
Total load for year (tons)				43,299.0

s Computed by subdividing day.
a Computed from estimated concentration graph.
b Measurement at 9 a. m.

RIO PENASCO AT DAYTON, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1953 to September 1954
(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 (cfs)	Water temperature (°F)	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	0.500	1.000	2.000	
Aug. 10, 1954....	12:00 p.m.	59	70	19,300	3,910		27		35		62	94	98	99	100		SPWCM
Aug. 10.....	12:00 p.m.	59	70	19,300	3,780		10		32		62	94	98	99	100		SPN
Aug. 10.....	6:00 p.m.	190	74	9,220	3,450		36		57		78	94	98	99	100		SPWCM
Aug. 10.....	6:00 p.m.	190	74	9,220	4,170		19		46		78	94	98	99	100		SPN
Aug. 11.....	4:00 a.m.	29	73	4,170	3,910		69		82		86	98	100	--	--		SPWCM
Aug. 11.....	11:00 a.m.	12.1	75	2,700	4,180		92		96		100	--	--	--	--		SPWCM
Aug. 11.....	11:00 a.m.	12.1	75	2,700	3,280		22		94		100	--	--	--	--		SPN
Aug. 11.....	7:00 p.m.	9.6	72	1,030	2,570		86		91		98	100	--	--	--		SPWCM
Aug. 12.....	3:00 a.m.	5.5	60	1,440	1,680		34		36		66	93	97	99	100		SPWCM
Aug. 23.....	10:00 p.m.	69	74	8,560	3,180		44		71		85	96	99	100	--		SPWCM
Aug. 24.....	10:00 a.m.	770	68	7,710	3,480		41		67		83	96	99	100	--		SPWCM
Aug. 24.....	10:00 a.m.	770	68	7,710	3,630		14		48		83	96	99	100	--		SPN
Aug. 24.....	12:00 m.	527	69	5,850	2,200		47		65		88	97	100	--	--		SPWCM
Aug. 24.....	2:00 p.m.	1,210	73	8,410	4,130		45		76		91	98	100	--	--		SPWCM
Aug. 24.....	4:00 p.m.	589	74	6,020	3,360		55		78		93	99	100	--	--		SPWCM
Aug. 24.....	6:00 p.m.	341	74	6,030	2,740		47		79		92	97	99	100	--		SPWCM
Aug. 24.....	8:00 p.m.	215	75	13,500	3,820		36		74		88	96	99	100	--		SPWCM
Aug. 24.....	10:00 p.m.	162	72	10,000	2,800		45		74		92	98	100	--	--		SPWCM
Aug. 25.....	7:00 a.m.	1,320	70	7,080	3,430		48		77		95	99	100	--	--		SPWCM
Aug. 25.....	9:00 a.m.	505	68	4,880	2,480		44		78		93	99	100	--	--		SPWCM
Aug. 25.....	9:00 p.m.	505	68	4,880	2,900		16		55		93	99	100	--	--		SPN
Aug. 25.....	1:00 p.m.	370	75	2,050	3,120		58		92		99	100	--	--	--		SPWCM

RIO GRANDE BASIN--Continued

PECOS RIVER AT DAM SITE 3, NEAR CARLSBAD, N. MEX.

LOCATION.--At gaging station at dam site 3 of Carlsbad project of Bureau of Reclamation, about 1 mile upstream from flow line of Lake Avalon, 1.3 miles downstream from Rocky Arroyo, and 8 miles northwest of Carlsbad, Eddy County.
DRAINAGE AREA.--17,620 square miles, approximately (contributing area).
REMARKS.--Samples collected at approximately weekly intervals. Records of discharge for water year October 1953 to September 1954 given in WSP 1342.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of Collection	Mean discharge (cfs)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Chloride (Cl)	Specific conductance (micromhos) at 25°C)
Oct. 8, 1953	23	138	0	770	5,060
Oct. 21	21	143	0	780	5,100
Oct. 22	21	133	0	750	5,040
Oct. 28	37	119	0	1,330	6,980
Nov. 5	52	113	0	1,560	7,570
Nov. 13	62	115	0	1,470	7,280
Nov. 18	54	120	0	1,370	6,950
Nov. 27	79	122	9	1,390	6,850
Dec. 4	66	128	0	1,340	6,700
Dec. 9	64	140	0	1,420	6,820
Dec. 15	62	179	0	1,480	7,070
Dec. 26	45	143	0	1,550	7,150
Jan. 2, 1954	72	155	0	1,740	7,930
Jan. 8	59	125	0	1,670	7,790
Jan. 11	49	117	0	1,670	7,750
Jan. 14	72	96	8	1,700	7,750
Jan. 18	49	106	0	1,680	7,740
Jan. 30	60	112	0	1,740	8,050
Feb. 3	67	73	12	1,840	8,220
Feb. 8	52	106	0	1,690	7,840
Feb. 23	49	80	7	1,850	8,430
Feb. 24	47	120	0	1,780	8,230
Mar. 2	47	138	0	1,830	8,450
Mar. 9	44	127	0	1,880	8,560
Mar. 16	45	149	0	2,130	9,400
Mar. 24	25	132	0	1,870	8,670
Apr. 10	540	145	0	845	5,580
Apr. 13	718	145	0	340	3,760
Apr. 14	830	175	0	290	3,540
Apr. 24	60	102	0	715	5,110
Apr. 28	48	111	0	1,080	6,420
May 5	27	112	0	1,600	7,980
May 21	1,250	124	0	330	3,090
May 27	17	152	0	68	866
June 7	21	146	0	800	5,190
June 14	20	138	0	800	5,220
June 21	18	109	0	810	5,300
June 27	15	122	0	820	5,290
June 28	14	102	0	820	5,310
July 3	15	134	0	1,190	6,720
July 9	13	129	0	940	5,760
July 16	8.4	142	0	870	5,510
July 23	6.9	117	0	840	5,350
July 30	5.4	119	0	760	4,940
Aug. 7	4.8	130	0	455	3,340
Aug. 11	288	97	0	485	3,610
Aug. 13	32	117	0	445	3,270
Aug. 21	68	128	0	300	3,360
Aug. 27	21	122	0	102	1,100
Sept. 5	18	141	0	605	4,160
Sept. 12	312	98	0	360	2,720
Sept. 19	100	148	0	810	5,110
Sept. 26	30	154	0	780	5,040
Sept. 28	26	151	0	775	5,060

CARLSBAD MAIN CANAL AT HEAD, NEAR CARLSBAD, N. MEX.

LOCATION.--At gaging station 200 feet downstream from headgates in Avalon Dam and 5.0 miles north of Carlsbad, Eddy County.
RECORDS AVAILABLE.--Chemical analyses: February 1939 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 6,650 ppm Apr. 4-10; minimum, 552 ppm Aug. 24-31.
Hardness: Maximum, 2,810 ppm Apr. 4-10; minimum, 338 ppm Aug. 24-31.
Specific conductance: Maximum observed, 9,250 micromhos Apr. 9; minimum observed, 609 micromhos Aug. 27.
EXTREMES, 1939-54.--Dissolved solids: Maximum, 6,650 ppm Apr. 4-10, 1954; minimum, 552 ppm Aug. 24-31, 1954.
Hardness: Maximum, 2,810 ppm June 1-10, 1945, Apr. 4-10, 1954; minimum, 338 ppm Aug. 24-31, 1954.
Specific conductance: Maximum observed, 9,730 micromhos June 5, 1945; minimum observed, 401 micromhos June 3, 1948.
REMARKS.--Values reported for dissolved solids are sums of determined constituents. Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge furnished by Surface Water Branch, Santa Fe district for water year October 1953 to September 1954. Monthly diversions to canal below Lake Avalon for water year October 1953 to September 1954 given in WSP 1342.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Jan. 5-10, 1954 ..	a 118	17		615	212	820		143	2,000	1,410		2.1		5,150	7.00	1,640	2,410	2,290	43	7.3	7,040	7.2
Apr. 4-10.....	321	9.3		722	246	1,200		144	2,430	1,970		1.7		6,650	9.04	5,760	2,810	2,700	48	9.9	9,020	7.4
Apr. 11-20.....	374	15		596	133	259		137	1,830	410		1.4		3,310	4.50	3,340	2,030	1,920	22	2.5	3,960	7.5
Apr. 21, May 3...	a 145	13		627	107	303		122	1,920	400		1.2		3,430	4.66	1,340	2,000	1,900	25	2.9	4,070	7.5
May 19-21.....	a 188	14		675	166	780		116	2,210	1,180		3.9		5,090	6.92	2,580	2,370	2,270	42	7.0	6,610	7.6
May 24, June 1...	a 116	12		345	59	227		97	996	340		2.4		2,030	2.76	636	1,100	1,020	31	3.0	2,770	7.2
June 28-30.....	223	12		429	81	304		91	1,280	465		2.2		2,620	3.56	1,580	1,400	1,330	32	3.5	3,490	7.1
July 1-4	a 334	14		671	145	717		95	2,110	1,100		3.8		4,810	6.54	4,340	2,270	2,190	41	6.5	6,180	7.1
Aug. 12-23	195	13		492	100	341		102	1,540	490		2.9		3,030	4.12	1,600	1,640	1,560	31	3.7	3,850	7.9
Aug. 24-31.....	a 101	9.3		101	21	45		82	277	56		2.5		552	.75	1,510	338	272	22	1.1	830	7.4
Sept. 5-10.....	234	9.6		106	25	55		100	285	76		1.4		607	.83	384	368	286	24	1.2	924	7.4
Sept. 11-20	212	9.3		278	76	228		96	902	342		2.2		1,880	2.56	1,080	1,010	928	33	3.1	2,610	7.5
Sept. 21-25.....	a 94	10		314	86	282		95	1,040	416		2.2		2,200	2.99	558	1,140	1,060	35	3.6	2,980	7.6
Weighted average	b 202	12		492	119	423		115	1,550	658		2.1		3,310	4.50	1,800	1,720	1,620	35	4.4	4,280	--

a No flow Oct. 1 to Jan. 4, Jan. 11 to Apr. 3, May 4-18, 22-23, June 2-27, July 5 to Aug. 1, 3-8, 10-11, Sept. 1-4, 26-30.
b Average for 96 days of flow which includes more than 99 percent runoff for water year.

RIO GRANDE BASIN--Continued

PECOS RIVER AT CARLSBAD, N. MEX.

LOCATION.--At gaging station at Green Street Bridge in Carlsbad, Eddy County, half a mile upstream from Dark Canyon.
DRAINAGE AREA.--18,100 square miles, approximately (contributing area).
RECORDS AVAILABLE.--Chemical analyses: May 1937 to September 1946, July 1951 to September 1954.
Water temperatures: July 1951 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 2,830 ppm July 11-20; minimum, 2,230 ppm Aug. 21-31.
Hardness: Maximum, 1,530 ppm Apr. 21-30; minimum, 1,200 ppm Aug. 21-31.
Specific conductance: Maximum observed, 4,150 micromhos Aug. 1; minimum observed, 2,660 micromhos Aug. 29.
Water temperatures: Maximum observed, 89°F Sept. 7; minimum observed, 48°F Jan. 10.
EXTREMES, 1937-46, 1951-54.--Dissolved solids: Maximum, 3,590 ppm May 1, 1941; minimum, 360 ppm May 22, 1941.
Hardness: Maximum, 1,970 ppm May 1, 1941; minimum, 290 ppm May 22, 1941.
Specific conductance: Maximum observed, 5,870 micromhos Apr. 25, 1942; minimum observed, 649 micromhos May 22, 1941.
Water temperatures (1951-54): Maximum observed, 92°F July 21, 1953; minimum observed, 48°F Jan. 10, 1954.
REMARKS.--Values reported for dissolved solids are sums of determined constituents. Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge for water year October 1953 to September 1854 given in WSP 1342.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-10, 1953....	35.5	19		376	125	228		198	1,120	438		3.9		2,410	3.28	231	1,450	1,290	25	2.6	3,320	7.5
Oct. 11-20.....	28.1	19		368	121	246		192	1,110	450		3.5		2,410	3.28	183	1,420	1,260	27	2.8	3,310	7.6
Oct. 21-31.....	29.8	19		362	112	256		184	1,100	440		3.4		2,380	3.24	192	1,360	1,210	29	3.0	3,230	7.7
Nov. 1-10.....	30.6	20		366	115	223		196	1,050	435		3.9		2,310	3.14	191	1,390	1,230	26	2.6	3,200	7.7
Nov. 11-20.....	31.7	20		366	112	240		194	1,080	432		3.2		2,350	3.20	201	1,370	1,210	28	2.8	3,190	7.9
Nov. 21-30.....	29.0	19		342	100	291		212	1,060	438		2.8		2,360	3.21	185	1,260	1,090	33	3.6	3,170	7.7
Dec. 1-15.....	31.3	16		336	99	267		212	1,010	425		3.4		2,260	3.07	191	1,250	1,070	32	3.3	3,130	7.6
Dec. 16-31.....	34.9	17		348	102	276		205	1,050	442		3.8		2,340	3.18	221	1,290	1,120	32	3.3	3,210	7.7
Jan. 1-10, 1954....	34.8	16		352	104	286		215	1,070	450		3.3		2,390	3.25	225	1,310	1,130	32	3.4	3,230	7.8
Jan. 11-20.....	36.2	15		372	115	265		202	1,110	464		3.1		2,440	3.32	239	1,400	1,240	29	3.1	3,380	7.2
Jan. 21-31.....	44.2	18		386	116	267		210	1,140	468		3.6		2,500	3.40	298	1,440	1,270	29	3.1	3,400	7.5
Feb. 1-10.....	39.9	19		390	116	269		191	1,160	474		3.4		2,530	3.44	273	1,450	1,290	29	3.1	3,420	7.7
Feb. 11-20.....	28.5	20		394	117	267		180	1,170	480		3.5		2,540	3.45	195	1,460	1,320	28	3.0	3,460	7.7
Feb. 21-28.....	29.5	18		394	115	276		196	1,160	486		3.4		2,550	3.47	203	1,460	1,300	29	3.1	3,460	7.7
Mar. 1-10.....	34.6	20		398	118	272		204	1,170	484		3.0		2,560	3.48	239	1,480	1,310	29	3.1	3,500	7.7
Mar. 11-20.....	47.0	20		406	120	272		214	1,180	490		3.0		2,600	3.54	330	1,510	1,330	28	3.0	3,510	7.7
Mar. 21-31.....	53.0	25		384	114	302		219	1,150	500		2.7		2,590	3.52	371	1,430	1,250	32	3.5	3,550	7.2
Apr. 1-10.....	28.2	23		388	118	309		210	1,190	505		2.4		2,640	3.59	201	1,450	1,280	27	3.5	3,610	7.6
Apr. 11-20.....	37.4	19		396	115	298		200	1,190	500		2.1		2,620	3.56	265	1,460	1,300	31	3.4	3,570	7.4
Apr. 21-30.....	38.4	18		416	120	291		203	1,240	500		1.5		2,690	3.66	279	1,530	1,360	29	3.2	3,650	7.4
May 1-10.....	30.4	19		406	121	295		179	1,240	505		2.0		2,680	3.64	220	1,510	1,360	30	3.3	3,630	7.5
May 11-20.....	31.2	18		388	120	291		187	1,180	505		2.0		2,600	3.54	219	1,460	1,310	30	3.3	3,570	7.5
May 21-31.....	46.0	16		333	96	297		185	1,060	435		2.3		2,330	3.17	289	1,230	1,070	34	3.7	3,160	7.2

June 1-10, 1954...	37.7	15		357	106	336	189	1,180	475		2.9		2,560	3.48	261	1,330	1,170	35	4.0	3,400	7.3
June 11-20	26.9	17		385	110	342	193	1,220	515		2.2		2,690	3.66	195	1,410	1,260	34	3.9	3,610	7.1
June 21-30	28.9	17		393	119	339	194	1,240	535		3.2		2,740	3.73	214	1,470	1,310	33	3.8	3,690	7.6
July 1-10.....	26.9	19		401	119	345	186	1,260	548		2.8		2,790	3.79	203	1,490	1,340	33	3.9	3,750	7.4
July 11-20	23.1	20		409	116	357	184	1,280	558		3.0		2,830	3.85	177	1,500	1,350	34	4.0	3,810	7.5
July 21-31	23.1	21		397	116	334	191	1,230	535		3.0		2,730	3.71	170	1,470	1,310	33	3.8	3,690	7.6
Aug. 1-10.....	31.4	16		349	97	300	183	1,070	465		3.1		2,390	3.25	203	1,270	1,120	34	3.7	3,280	7.6
Aug. 11-20.....	18.6	16		333	97	294	180	1,040	452		3.2		2,320	3.16	117	1,230	1,080	34	3.6	3,190	7.5
Aug. 21-31.....	38.8	17		302	109	274	183	1,020	414		1.6		2,230	3.03	234	1,200	1,050	33	3.4	3,030	7.6
Sept. 1-10	29.4	17		322	121	279	195	1,060	456		2.4		2,350	3.20	187	1,300	1,140	32	3.4	3,220	7.6
Sept. 11-20.....	32.5	17		341	126	306	201	1,130	490		2.4		2,510	3.41	220	1,370	1,200	33	3.6	3,400	7.9
Sept. 21-30.....	33.9	17		353	126	317	204	1,160	502		5.6		2,580	3.51	236	1,400	1,230	33	3.7	3,460	7.8
Weighted average	33.3	18		370	113	287	198	1,130	474		3.0		2,500	3.40	225	1,390	1,230	31	3.3	3,400	--

RIO GRANDE BASIN--Continued

PECOS RIVER AT CARLSBAD, N. MEX.--Continued

Temperature (°F) of water, water year October 1953 to September 1954
/Once-daily measurement, usually between 5 p.m. and 7:30 p.m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	75	70	62	53	65	60	71	79	80	84	86	85
2	80	-64	61	54	64	60	70	71	82	--	83	87
3	72	68	--	58	65	53	70	66	82	85	85	86
4	72	68	59	59	67	54	74	--	80	83	83	85
5	75	64	57	60	66	58	75	72	78	83	82	83
6	70	68	54	58	61	59	73	76	78	85	83	86
7	72	66	57	61	62	61	71	75	83	82	79	89
8	75	68	55	60	64	61	71	76	81	86	81	87
9	77	65	58	60	64	67	75	78	84	83	83	82
10	75	64	57	48	63	70	72	75	84	82	83	85
11	72	68	--	55	64	64	74	75	82	85	88	86
12	74	68	52	55	60	63	71	78	82	84	87	83
13	72	65	57	52	65	63	72	--	83	86	87	85
14	74	65	57	55	65	62	75	75	80	84	85	83
15	74	67	60	58	61	60	--	--	82	83	83	85
16	75	68	59	58	63	61	--	79	--	82	84	84
17	75	66	59	55	65	65	76	78	84	81	83	83
18	74	65	61	58	59	63	75	72	79	82	84	85
19	74	61	61	58	61	69	75	77	85	85	83	86
20	75	62	62	56	61	63	75	79	80	84	84	84
21	72	60	59	57	64	66	78	76	81	85	82	85
22	71	59	49	57	63	70	76	78	83	--	79	81
23	70	61	50	59	62	71	80	78	84	85	80	80
24	69	61	50	60	61	61	--	78	84	87	81	80
25	--	62	52	61	65	62	77	75	85	82	82	80
26	70	63	54	61	65	67	78	80	85	86	81	82
27	70	60	55	60	60	--	--	81	84	88	87	82
28	71	63	52	62	61	--	78	80	85	85	84	--
29	65	64	56	65	--	65	70	--	--	84	85	83
30	70	64	52	--	--	68	72	78	83	85	83	84
31	70	--	57	65	--	72	--	80	--	87	87	--
Average	73	65	56	58	63	63	74	76	82	84	83	84

RIO GRANDE BASIN--Continued

REFINERY INTAKE CANAL NEAR LOVING, N. MEX.

(Weekly samples taken from canal in sec. 13, T. 23 S., R. 28 E., representing water in Harroun Canal diverted from Pecos River at dam in sec. 11, T. 23 S., R. 28 E.)

Date of collection	Specific conductance (micromhos at 25°C)	Chloride (Cl) ppm
Oct. 1, 1953	4,270	670
Oct. 8	4,300	680
Oct. 15	4,480	720
Oct. 22	4,570	720
Oct. 29	1,880	256
Nov. 5	4,100	680
Nov. 12	4,680	770
Nov. 19	4,790	790
Nov. 26	4,480	710
Dec. 3	4,270	660
Dec. 10	4,320	680
Dec. 17	4,320	670
Dec. 24	4,360	690
Jan. 7, 1954	4,050	610
Jan. 14	4,000	620
Jan. 21	4,160	635
Jan. 28	4,140	625
Feb. 4	4,170	640
Feb. 10	4,130	650
Feb. 18	4,570	740
Feb. 25	4,420	735
Mar. 4	4,230	655
Mar. 11	4,220	665
Mar. 18	4,270	675
Mar. 25	4,400	710
Apr. 1	4,420	710
Apr. 8	4,320	665
Apr. 15	4,330	680
Apr. 22	4,310	675
Apr. 29	4,400	690
May 6	4,560	735
May 13	4,820	790
May 20	4,730	760
May 27	4,400	680
June 5	3,960	615
June 10	4,020	620
June 17	4,180	655
June 24	4,320	680
July 8	4,620	765
July 15	4,630	760
July 24	5,970	1,100
July 29	6,410	1,300
Aug. 5	5,470	955
Aug. 14	5,910	1,140
Aug. 19	4,640	750
Aug. 26	1,570	205
Sept. 2	1,730	245
Sept. 9	2,730	405
Sept. 16	3,660	580
Sept. 23	4,140	665
Sept. 30	4,360	705

PECOS RIVER EAST OF MALAGA, N. MEX.

LOCATION.--One and one-half miles upstream from gaging station near Malaga, which is 3 miles southeast of Malaga, Eddy County, and 3 miles downstream from Black River.
DRAINAGE AREA.--19,190 square miles, approximately above gaging station (contributing area).
RECORDS AVAILABLE.--Chemical analyses: July 1937 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 7,710 ppm Aug. 11-22; minimum, 717 ppm Aug. 24.
Hardness: Maximum, 2,730 ppm Aug. 11-22; minimum, 459 ppm Aug. 24.
Specific conductance: Maximum observed, 11,300 micromhos Aug. 18, 19; minimum observed, 1,140 micromhos Aug. 24.
EXTREMES, 1937-54.--Dissolved solids: Maximum, 7,710 ppm Aug. 11-22, 1954; minimum, 384 ppm Sept. 21-22, 1941.
Hardness: Maximum, 2,740 ppm Aug. 21-31, 1953; minimum, 254 ppm Sept. 21-22, 1941.
Specific conductance: Maximum observed, 11,300 micromhos Aug. 18-19, 1954; minimum observed, 450 micromhos Sept. 21, 1941.
REMARKS.--Values reported for dissolved solids are sums of determined constituents. Records of specific conductance of daily samples available in district offices at Albuquerque, N. Mex. Records of discharge for gaging station near Malaga for water year October 1953 to September 1954 given in WSP 1342.
No appreciable inflow between sampling point and gaging station.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-10, 1953	21.3	28		624	230		1,250	190	2,120	2,020		7.3		6,370	8.66	366	2,500	2,350	52	11	8,760	7.7
Oct. 11-22	22.8	30		616	231		1,330	183	2,100	2,160		--		6,560	8.92	404	2,490	2,340	54	12	9,110	7.9
Oct. 23-25	589	9.9		213	66		249	131	629	410		5.1		1,650	2.24	2,620	803	696	40	3.8	2,500	7.6
Oct. 26-31	46.7	16		260	92		516	142	816	835		5.3		2,610	3.55	329	1,030	910	52	7.0	4,010	7.5
Nov. 1-6	39.8	19		354	133		669	166	1,130	1,110		6.6		3,500	4.76	376	1,430	1,290	50	7.7	5,190	7.7
Nov. 7-9	36.3	15		440	165		782	174	1,450	1,290		5.6		4,230	5.75	415	1,780	1,630	49	8.1	6,150	7.8
Nov. 10-20	38.6	16		494	195		810	187	1,650	1,360		7.2		4,620	6.28	481	2,030	1,880	46	7.8	6,500	7.8
Nov. 21-30	52.3	16		508	191		727	153	1,730	1,210		1.7		4,460	6.07	630	2,050	1,930	44	7.0	6,230	7.8
Dec. 1-10	28.0	20		528	186		842	201	1,730	1,380		1.7		4,790	6.51	362	2,080	1,920	47	8.0	6,760	7.5
Dec. 11-20	22.1	20		554	200		1,070	219	1,850	1,710		5.4		5,520	7.51	329	2,200	2,020	51	9.9	7,640	7.5
Dec. 21-31	40.0	19		516	188		722	220	1,630	1,240		4.8		4,430	6.02	478	2,060	1,880	43	6.9	6,350	7.5
Jan. 1-10, 1954	44.8	21		488	186		580	210	1,510	1,060		6.3		3,950	5.37	478	1,980	1,810	39	5.7	5,750	7.5
Jan. 11-20	56.1	18		488	179		559	208	1,520	1,000		6.6		3,870	5.26	586	1,950	1,780	38	5.5	5,500	7.6
Jan. 21-31	61.1	16		480	175		558	205	1,500	990		5.2		3,830	5.21	632	1,920	1,750	39	5.5	5,400	7.6
Feb. 1-10	55.4	16		484	175		621	173	1,570	1,060		5.6		4,020	5.47	601	1,930	1,780	41	6.1	5,610	7.6
Feb. 11-20	43.6	14		502	185		696	172	1,650	1,180		4.0		4,320	5.88	509	2,010	1,870	43	6.7	6,010	7.6
Feb. 21-28	55.5	14		508	193		612	164	1,620	1,110		5.8		4,140	5.63	620	2,060	1,930	39	5.6	5,870	7.4
Mar. 1-10	43.8	13		500	181		624	158	1,640	1,070		4.3		4,110	5.59	486	1,990	1,860	41	6.1	5,700	7.5
Mar. 11-20	13.4	14		532	193		917	148	1,800	1,500		7.0		5,040	6.85	182	2,120	2,000	48	8.7	7,090	7.5
Mar. 21-31	12.7	16		586	214		1,130	172	1,960	1,850		4.8		5,850	7.96	201	2,340	2,200	51	10	8,280	7.4

Apr. 1-10, 1954...	11.4	16		608	224		1,210	187	2,020	2,000		--		6,170	8.39	190	2,440	2,280	52	11	8,750	7.2
Apr. 11-20.....	14.8	16		592	222		1,150	181	1,980	1,900		--		5,950	8.09	238	2,390	2,240	51	10	8,470	7.4
Apr. 21-24.....	12.0	15		612	228		1,160	189	2,010	1,940		--		6,060	8.24	196	2,460	2,310	51	10	8,620	7.2
Apr. 25.....	1,050	14		282	21		59	159	606	110		1.1		1,170	1.59	3,320	790	660	14	.9	1,620	7.1
Apr. 26-27.....	42.5	12		358	88		300	123	978	555		6.3		2,360	3.21	271	1,260	1,150	34	3.7	3,450	7.5
Apr. 28-30.....	16.7	17		482	142		738	167	1,470	1,220		3.2		4,150	5.64	187	1,790	1,650	47	7.6	5,970	7.4
May 1-10.....	17.1	20		592	204		1,170	193	2,000	1,850		4.8		5,940	8.08	274	2,320	2,160	52	11	8,250	7.2
May 11-16.....	11.4	24		584	214		1,170	200	2,040	1,830		5.0		5,960	8.11	183	2,340	2,170	52	10	8,240	7.3
May 17-19.....	37.3	15		433	90		430	176	1,270	650		4.1		2,980	4.05	300	1,450	1,310	39	4.9	4,090	7.4
May 20-31.....	32.2	18		532	185		950	177	1,830	1,490		3.4		5,100	6.94	443	2,090	1,940	50	9.0	7,010	7.4
June 1-10.....	16.5	20		584	202		1,100	194	1,990	1,740		4.2		5,740	7.81	256	2,290	2,130	51	10	7,940	7.2
June 11-20.....	12.7	17		611	226		1,340	191	2,050	2,180		--		6,520	8.87	224	2,450	2,300	54	12	9,210	7.4
June 21-30.....	18.1	21		615	226		1,330	162	2,160	2,110		--		6,540	8.89	320	2,460	2,330	54	12	9,160	7.3
July 1-10.....	10.3	25		605	220		1,300	159	2,130	2,050		--		6,410	8.72	178	2,410	2,280	54	11	8,960	7.4
July 11-20.....	8.19	25		665	238		1,440	166	2,190	2,380		--		7,020	9.55	155	2,640	2,500	54	12	9,970	7.4
July 21-31.....	7.59	24		653	237		1,530	162	2,200	2,490		--		7,210	9.81	148	2,600	2,470	56	13	10,200	7.4
Aug. 1-10.....	7.31	25		663	231		1,570	173	2,140	2,580		--		7,290	9.91	144	2,600	2,460	57	13	10,400	7.4
Aug. 11-22.....	6.40	27		673	255		1,670	169	2,280	2,720		--		7,710	10.5	133	2,730	2,590	57	14	11,000	7.4
Aug. 23.....	580	13		220	48		251	126	611	390		4.1		1,600	2.18	2,510	746	644	42	4.0	2,390	7.6
Aug. 24.....	857	8.3		161	14		56	154	301	98		2.8		717	.98	1,660	459	333	21	1.1	1,140	7.4
Aug. 25-31.....	89.4	15		322	126		419	144	1,000	760		3.1		2,720	3.70	657	1,320	1,200	41	5.0	4,080	7.5
Sept. 1-10.....	10.9	19		461	152		1,060	170	1,390	1,770		4.0		4,940	6.72	145	1,780	1,640	57	11	7,630	7.4
Sept. 11-20.....	11.3	19		576	172		1,340	192	1,610	2,290		--		6,100	8.30	186	2,140	1,990	58	13	9,280	7.5
Sept. 21-30.....	22.0	37		528	214		1,400	150	1,830	2,270		12		6,360	8.65	378	2,200	2,070	58	13	8,990	7.9
Weighted average.	39.0	16		418	141		620	168	1,310	1,040		4.5		3,630	4.94	382	1,620	1,490	45	6.7	5,180	--

RIO GRANDE BASIN--Continued

PECOS RIVER AT PIERCE CANYON CROSSING, NEAR MALAGA, N. MEX.

LOCATION.--At Pierce Canyon crossing, one quarter mile downstream from gaging station which is 6 miles southeast of Malaga, Eddy County.
DRAINAGE AREA.--19,260 square miles, approximately, above gaging station (contributing area).
RECORDS AVAILABLE.--Chemical analyses: March 1938 to September 1941, October 1951 to September 1954.
Water temperatures: October 1952 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 23,700 ppm Aug. 11-21; minimum, 456 ppm Aug. 24.
Hardness: Maximum, 3,420 ppm Aug. 11-21; minimum, 236 ppm Aug. 24.
Specific conductance: Maximum observed, 34,400 micromhos Aug. 2; minimum observed, 758 micromhos Aug. 24.
Water temperatures: Maximum observed, 90°F July 24; minimum observed, 37°F Dec. 24.
EXTREMES, 1938-41, 1951-54.--Dissolved solids: Maximum 23,700 ppm Aug. 11-21, 1954; minimum, 280 ppm Sept. 21, 1941.
Hardness: Maximum, 3,420 ppm Aug. 11-21, 1954; minimum, 202 ppm Sept. 21, 1941.
Specific conductance: Maximum observed, 34,400 micromhos Aug. 2, 1954; minimum observed, 433 micromhos Sept. 21, 1941.
Water temperatures (1952-54): Maximum observed, 90°F Aug. 3, 1953, July 24, 1954; minimum observed, 37°F Dec. 24, 1953.
REMARKS.--Values reported for dissolved solids are sums of determined constituents. Records of specific conductance of daily samples available in district office of Albuquerque, N. Mex. Records of discharge for water year October 1953 to September 1954 given in WSP 1342. No appreciable inflow between sampling point and gaging stations except during periods of heavy local rains.

Chemical analyses, *in parts per million*, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-10, 1953...	30.0	25		631	310	2,790		167	2,350	4,490		--		10,700	14.6	867	2,850	2,710	68	23	18,600	7.9
Oct. 11-21.....	29.3	20		631	293	2,670		177	2,320	4,270		--		10,300	14.0	815	2,780	2,630	68	22	18,000	7.9
Oct. 22-23, 25....	417	9.1		269	96	491		126	856	805		4.6		2,590	3.52	2,920	1,070	962	50	6.5	4,010	7.7
Oct. 24.....	224	6.7		173	49	233		98	478	395		5.6		1,390	1.89	841	633	552	44	4.0	2,250	7.9
Oct. 26-29.....	57.2	10		254	117	1,350		130	838	2,170		--		4,800	6.53	741	1,110	1,010	72	18	7,940	7.7
Oct. 30-31, Nov. 10	41.5	13		409	181	1,590		162	1,290	2,650		--		6,210	8.45	696	1,760	1,630	66	16	11,500	7.8
Nov. 11-20.....	41.2	14		528	235	1,700		179	1,600	2,950		--		7,120	9.68	792	2,280	2,140	62	15	12,900	7.8
Nov. 21-30.....	54.1	14		524	232	1,930		195	1,920	3,050		--		7,770	10.6	1,130	2,260	2,100	65	18	11,400	7.7
Dec. 1-10.....	38.9	13		484	215	2,050		193	1,780	3,210		--		7,850	10.7	824	2,090	1,930	68	19	11,700	7.6
Dec. 11-20.....	31.5	16		514	233	2,520		212	1,920	3,940		--		9,250	12.6	787	2,240	2,070	71	23	13,800	7.7
Dec. 21-31.....	51.1	17		526	229	2,120		215	1,890	3,350		--		8,240	11.2	1,140	2,250	2,080	67	19	12,200	7.8
Jan. 1-10, 1954...	57.3	14		493	206	1,750		210	1,750	2,750		--		7,070	9.62	1,090	2,080	1,900	65	17	10,500	7.8
Jan. 11-20.....	62.1	12		482	203	1,490		181	1,670	2,410		--		6,360	8.65	1,070	2,040	1,890	61	14	9,510	7.3
Jan. 21-30.....	63.7	10		490	195	1,430		195	1,670	2,290		--		6,180	8.40	1,060	2,020	1,860	61	14	9,140	7.2
Jan. 31-Feb. 10..	59.7	11		528	231	2,550		183	1,800	4,110		--		9,320	12.7	1,500	2,270	2,120	71	23	14,000	7.2
Feb. 11-20.....	48.1	12		537	273	3,710		167	1,980	5,910		--		12,500	17.0	1,620	2,460	2,330	77	33	18,900	7.3
Feb. 21-27.....	58.0	10		537	265	3,260		166	2,000	5,170		--		11,300	15.4	1,770	2,430	2,290	74	29	17,000	7.1
Feb. 28-Mar. 10..	50.8	9.2		504	212	1,590		154	1,810	2,530		--		6,730	9.15	923	2,130	2,000	62	15	9,890	7.1
Mar. 11-20.....	28.0	6.7		529	234	1,990		116	1,870	3,240		--		7,930	10.8	600	2,280	2,190	65	18	11,800	7.1
Mar. 21-31.....	24.4	7.5		548	244	2,290		128	1,960	3,690		--		8,800	12.0	580	2,370	2,270	68	20	13,100	7.1

Apr. 1-10, 1954 ...	22.2	9.4		563	270	2,720	151	2,080	4,360	--		10,100	13.7	605	2,510	2,390	70	24	14,900	7.1
Apr. 11, 14-20.....	189	11		586	274	2,930	163	2,080	4,720	--		10,700	14.6	546	2,590	2,460	71	25	16,000	7.3
Apr. 12-13.....	15.5	11		180	57	641	75	385	1,140	8.4		2,460	3.35	103	684	622	67	11	4,310	7.0
Apr. 21-24.....	19.0	14		596	289	3,530	167	2,190	5,620	--		12,300	16.7	631	2,680	2,540	74	30	18,400	7.3
Apr. 25-26.....	496	11		314	24	151	123	737	241	2.9		1,540	2.09	2,060	882	781	27	2.2	2,200	7.3
Apr. 27-28.....	34.5	10		308	73	775	93	807	1,300	4.6		3,320	4.52	309	1,070	992	61	10	5,310	7.2
Apr. 29-30.....	27.5	13		424	118	1,780	125	1,120	2,940	--		6,460	8.79	480	1,540	1,440	72	20	10,300	7.4
May 1-10.....	27.1	13		527	220	3,090	156	1,790	4,930	--		10,600	14.4	776	2,220	2,090	75	29	16,300	7.4
May 11-18.....	32.0	12		576	257	3,370	147	2,250	5,210	--		11,700	15.9	1,010	2,490	2,370	75	29	17,400	7.9
May 19-31.....	40.0	11		514	203	2,090	155	1,900	3,230	--		8,020	10.9	866	2,120	1,990	68	20	12,000	7.6
June 1-10	31.0	13		537	229	2,550	167	2,070	3,930	--		9,410	12.8	788	2,280	2,140	71	23	14,400	7.6
June 11-20	24.2	10		540	248	3,440	159	2,130	5,310	--		11,800	16.0	771	2,370	2,240	76	31	17,600	7.4
June 21-30	24.1	14		630	278	3,880	186	2,430	6,000	--		13,300	18.1	865	2,720	2,560	76	32	19,800	7.4
July 1-10	13.2	17		691	301	4,630	155	2,670	7,170	--		15,600	21.2	556	2,960	2,830	77	37	22,600	7.2
July 11-20.....	10.3	20		690	343	5,960	161	2,870	9,190	--		19,200	26.1	534	3,130	3,000	81	46	27,500	7.2
July 21-31.....	5.96	21		664	356	6,710	156	2,930	10,300	--		21,100	28.7	340	3,120	2,990	82	52	30,600	7.2
Aug. 1-10.....	8.35	21		696	375	7,540	174	3,050	11,600	--		23,400	31.8	528	3,280	3,140	83	57	33,500	7.3
Aug. 11-21.....	8.89	23		720	394	7,610	177	3,050	11,800	--		23,700	32.2	569	3,420	3,270	83	57	33,300	7.4
Aug. 22-23, 30-31 .	118	17		412	171	2,030	145	1,450	3,190	15		7,360	10.0	2,340	1,730	1,610	72	21	11,200	7.2
Aug. 24.....	750	9.1	•	83	7.1	63	120	150	83	2.2		456	.62	923	236	138	37	1.8	758	7.8
Aug. 25-29.....	167	15		337	131	939	132	1,200	1,460	5.0		4,150	5.64	1,870	1,380	1,270	60	11	6,220	7.2
Sept. 1-10.....	19.9	17		410	189	3,550	171	1,560	5,490	17		11,300	15.4	607	1,800	1,660	81	36	17,200	7.4
Sept. 11-20.....	16.6	20		543	269	5,000	181	2,150	7,750	18		15,800	21.5	708	2,460	2,310	82	44	23,100	7.4
Sept. 21-30.....	27.4	25		560	342	4,770	176	2,310	7,530	--		15,600	21.2	1,150	2,800	2,660	79	39	22,600	7.8
Weighted average	44.2	13		452	191	2,000	160	1,590	3,170	--		7,510	10.2	896	1,910	1,780	69	20	11,400	--

RIO GRANDE BASIN--Continued

PECOS RIVER AT PIERCE CANYON CROSSING, NEAR MALAGA, N. MEX.--Continued

Temperature (°F) of water, water year October 1953 to September 1954
/Once-daily measurement, usually during daylight hours./

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

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PECOS RIVER NEAR RED BLUFF, N. MEX.

LOCATION.--At pipeline bridge, 2½ miles downstream from gaging station at Red Bluff, Eddy County, which is 0.2 mile downstream from Red Bluff Creek, and 5.5 miles upstream from Delaware River.
DRAINAGE AREA.--19,540 square miles, approximately, above gaging station (contributing area).
RECORDS AVAILABLE.--Chemical analyses: July 1937 to September 1954.
Water temperatures: October 1952 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 18,300 ppm July 21-31; minimum, 783 ppm May 24-25.
Hardness: Maximum, 3,550 ppm July 21-31; minimum, 290 ppm May 24-25.
Specific conductance: Maximum observed, 27,600 micromhos Aug. 1, Sept. 30; minimum observed, 1,200 micromhos May 24.
Water temperatures: Maximum observed, 89°F June 22, 24, July 20; minimum observed, 38°F Dec. 24.
EXTREMES, 1937-54.--Dissolved solids: Maximum, 22,800 ppm Sept. 1-20, 1953; minimum, 456 ppm June 3, 1948.
Hardness: Maximum, 3,860 ppm Sept. 1-10, 1953; minimum 256 ppm June 3, 1948.
Specific conductance: Maximum observed, 33,200 micromhos Sept. 18, 1953; minimum observed, 268 micromhos Sept. 19, 1946.
Water temperatures (1952-54): Maximum observed, 90°F Aug. 3, 1953; minimum observed, 38°F Dec. 24, 1953.
REMARKS.--Values reported for dissolved solids are sums of determined constituents. Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge for gaging station at Red Bluff, for water year October 1953 to September 1954 given in WSP 1342.
No appreciable inflow between sampling point and gaging station except during periods of heavy local rains.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-2, 1953...	27.5	7.3		717	379	5,050		75	3,000	7,900		--		17,100	23.3	1,270	3,350	3,290	77	38	25,300	6.9
Oct. 3-4.....	304	8.9		224	94	1,230		107	729	1,960		3.0		4,300	4.85	3,530	946	858	74	17	7,230	7.7
Oct. 5-6.....	41.5	8.4		146	52	645		86	384	1,070		2.8		2,350	3.20	263	578	508	71	12	4,230	7.3
Oct. 7.....	36.0	16		389	173	2,350		125	1,350	3,750		--		8,090	11.0	786	1,680	1,580	75	25	12,800	7.7
Oct. 8-18.....	25.0	13		566	279	3,460		146	2,180	5,450		--		12,000	16.3	810	2,560	2,440	75	30	18,100	7.6
Oct. 19-22.....	32.0	12		615	313	3,990		129	2,480	6,250		--		13,700	18.6	1,180	2,820	2,720	75	33	20,400	7.5
Oct. 23-26.....	651	7.0		240	66	361		137	673	595		3.0		2,010	2.73	3,530	870	758	47	5.3	3,180	7.3
Oct. 27-29.....	58.0	6.1		224	86	939		120	695	1,510		2.5		3,520	4.79	551	912	814	69	14	5,870	7.3
Oct. 30-Nov. 1..	47.0	7.3		272	121	1,560		140	914	2,480		--		5,420	7.37	688	1,180	1,060	74	20	8,920	7.3
Nov. 2-10.....	42.6	8.2		335	165	2,180		125	1,150	3,510		--		7,410	10.1	852	1,510	1,410	76	24	12,000	7.3
Nov. 11-20.....	42.6	8.3		428	212	2,520		135	1,680	3,940		--		8,850	12.0	1,020	1,940	1,830	74	25	13,500	7.7
Nov. 21-30.....	48.3	9.2		516	233	2,210		166	1,950	3,470		--		8,470	11.5	1,100	2,250	2,110	68	20	12,600	7.8
Dec. 1-10.....	37.4	8.0		507	221	1,930		166	1,890	3,030		--		7,690	10.4	777	2,170	2,040	66	18	11,400	7.7
Dec. 11-20	30.4	10		512	232	2,510		180	1,930	3,920		--		9,200	12.5	755	2,230	2,080	71	23	13,800	7.6
Dec. 21-31.....	41.0	12		526	236	2,550		183	1,980	3,980		--		9,370	12.7	1,040	2,280	2,130	71	23	13,900	7.8
Jan. 1-10, 1954 .	47.4	11		501	214	1,980		186	1,840	3,090		--		7,730	10.5	989	2,130	1,980	67	19	11,400	7.9
Jan. 11-20.....	53.8	8.8		471	192	1,690		173	1,680	2,650		--		6,780	9.22	985	1,960	1,820	65	17	10,200	7.3
Jan. 21-Feb. 2..	58.8	6.9		476	185	1,570		164	1,690	2,460		--		6,470	8.80	1,030	1,950	1,810	64	15	9,630	7.4
Feb. 3-12.....	50.6	6.2		475	199	2,280		155	1,740	3,560		--		8,340	11.3	1,140	2,000	1,880	71	22	12,700	7.4
Feb. 13-20.....	45.8	7.3		501	239	3,640		145	1,970	5,660		--		12,100	16.5	1,500	2,230	2,110	78	34	18,300	7.4
Feb. 21-28.....	55.4	8.6		512	241	3,770		150	2,020	5,840		--		12,500	17.0	1,870	2,270	2,150	78	34	18,800	7.1

RIO GRANDE BASIN--Continued

PECOS RIVER NEAR RED BLUFF, N. MEX.--Continued

Chemical analyses, in parts per million, water year October 1953 to September 1954--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Mar. 1-2, 1954..	64.0	8.3		513	241	3,220		145	2,000	5,010		--		11,100	15.1	1,920	2,270	2,150	75	29	16,700	7.6
Mar. 3-10	51.0	14		503	211	1,790		141	1,850	2,810		--		7,250	9.86	998	2,120	2,010	65	17	10,800	7.4
Mar. 11-20	38.1	7.8		515	213	2,030		130	1,910	3,170		--		7,910	10.8	814	2,160	2,050	67	19	11,800	7.0
Mar. 21-31.....	33.4	3.7		522	227	2,540		126	1,990	3,960		--		9,300	12.6	839	2,240	2,130	71	23	13,900	7.0
Apr. 1-10.....	25.5	3.1		557	244	2,910		143	2,150	4,520		--		10,500	14.3	723	2,390	2,280	73	26	15,600	7.1
Apr. 11-13.....	71.7	11		459	187	1,840		145	1,400	3,070		--		7,040	9.57	1,360	1,910	1,800	68	18	11,000	7.1
Apr. 14-16.....	75.0	9.6		146	38	408		146	272	710		4.0		1,660	2.26	336	520	401	63	7.8	2,980	7.5
Apr. 17.....	33.0	13		254	78	958		115	589	1,650		2.4		3,600	4.90	321	954	860	69	13	6,050	6.9
Apr. 18-20.....	21.7	13		309	194	2,450		148	1,370	3,790		--		8,200	11.2	480	1,570	1,450	77	27	12,900	7.1
Apr. 21-24.....	14.2	3.8		514	227	3,190		157	1,960	4,950		--		10,900	14.8	418	2,220	2,090	76	29	16,700	7.2
Apr. 25, 29-30..	338	16		373	47	670		159	966	1,020		5.9		3,180	4.32	2,900	1,120	994	56	8.7	4,860	7.2
Apr. 26-28.....	114	9.9		310	30	292		133	764	440		7.3		1,920	2.61	591	897	788	41	4.2	2,820	7.2
May 1-5, 7.....	24.8	7.7		341	88	1,250		92	1,040	1,970		3.1		4,740	6.45	317	1,210	1,140	69	16	7,460	7.5
May 6, 8-10.....	21.8	5.4		412	180	2,450		85	1,420	3,940		--		8,450	11.5	497	1,770	1,700	75	25	13,200	7.5
May 11-18	47.9	5.1		479	216	3,260		113	1,710	5,170		--		10,900	14.8	1,410	2,080	1,990	77	31	16,800	7.2
May 19-20.....	39.5	8.9		191	95	904		111	601	1,500		1.4		3,360	4.57	358	867	776	69	13	5,650	7.1
May 21, 27-31 ..	58.7	7.8		481	194	2,380		135	1,790	3,680		--		8,600	11.7	1,360	2,000	1,890	72	23	13,100	7.2
May 22-23.....	91.0	7.4		333	124	1,470		108	1,170	2,290		--		5,450	7.41	1,340	1,340	1,250	70	17	8,690	7.1
May 24-25.....	52.0	6.7		95	13	164		115	205	240		2.4		783	1.06	110	290	196	55	4.2	1,340	7.5
May 26.....	61.0	5.8		171	50	637		85	514	1,000		2.8		2,420	3.29	399	632	562	69	11	4,060	7.1
June 1-10	30.0	5.5		573	246	2,070		110	2,230	3,210		--		8,390	11.4	680	2,440	2,350	65	18	12,200	7.1
June 11-12, 16, 19-20	21.8	4.8		495	228	2,350		91	1,990	3,640		--		8,750	11.9	515	2,170	2,100	70	22	13,000	7.0
June 13-15, 17-18	48.4	5.5		298	119	1,450		93	1,080	2,260		--		5,260	7.15	687	1,230	1,160	72	18	8,450	7.2
June 21-30	17.4	3.4		474	232	3,070		66	1,850	4,850		--		10,500	14.3	493	2,140	2,080	76	29	16,000	7.0
July 1-10.....	11.6	3.6		618	316	4,590		54	2,660	7,090		--		15,300	20.8	479	2,840	2,800	78	37	22,400	7.0
July 11-20	8.64	3.8		680	346	4,800		62	2,870	7,450		--		16,200	22.0	378	3,120	3,070	77	37	23,200	7.1
July 21-31	4.09	4.7		789	385	5,400		67	3,320	8,360		--		18,300	24.9	202	3,550	3,500	77	39	26,000	7.1
Aug. 1-10.....	11.8	5.3		617	313	5,440		73	2,620	8,410		--		17,400	23.7	554	2,830	2,770	81	44	24,000	7.1
Aug. 11-21.....	2.61	4.7		539	272	4,710		72	2,310	7,260		--		15,100	23.4	106	2,460	2,400	81	41	22,400	7.1
Aug. 22-24	996	11		156	20	184		130	372	267		2.6		1,080	1.47	2,900	471	364	46	3.7	1,710	7.4
Aug. 25-Sept. 4 .	111	15		361	143	1,090		127	1,320	1,680		2.7		4,670	6.35	1,400	1,490	1,380	61	12	7,090	7.3
Sept. 5-10.....	14.8	13		380	182	2,170		136	1,390	3,440		--		7,640	10.4	305	1,700	1,580	74	23	11,900	7.1
Sept. 11-30	16.3	14		410	229	3,830		111	1,730	5,960		--		12,200	16.6	537	1,960	1,870	81	38	18,800	7.2
Sept. 21-30	20.7	13		570	282	5,350		72	2,280	8,340		--		16,900	23.0	945	2,580	2,520	82	46	24,400	7.4
Weighted average	55.9	9.3		371	143	1,590		136	1,290	2,490		--		5,960	8.11	900	1,510	1,400	70	18	9,050	--

RIO GRANDE BASIN--Continued

PECOS RIVER NEAR RED BLUFF, N. MEX.--Continued

Temperature (°F) of water, water year October 1953 to September 1954
/Once-daily measurement, usually between 4 p.m. and 6 p.m./

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

RIO GRANDE BASIN--Continued

PECOS RIVER BELOW RED BLUFF DAM NEAR ORLA, TEX.

LOCATION.--Just below dam, 3 miles upstream from Salt (Screwbean) Draw, 5 miles northwest of Orla, Reeves County, and 14 miles upstream from gaging station near Orla.
DRAINAGE AREA.--21,300 square miles, approximately, above gaging station (contributing area).
RECORDS AVAILABLE.--Chemical analyses: July 1937 to September 1954.
Water temperatures: March 1953 to September 1954.
EXTREMES, 1953-54.--Dissolved solids: Maximum, 15,200 ppm Oct. 1-16; minimum, 4,280 ppm Sept. 1-30.
Hardness: Maximum, 3,430 ppm Oct. 1-16; minimum, 1,260 ppm Sept. 1-30.
Specific conductance: Maximum daily, 23,900 micromhos Oct. 1; minimum daily, 5,010 micromhos Sept. 13.
Water temperatures: Maximum observed, 80°F on several days during July and August; minimum observed, 40°F on several days during December.
EXTREMES, 1937-54.--Dissolved solids: Maximum, 15,600 ppm Sept. 17-30, 1953; minimum, 1,090 ppm June 1-2, 1948.
Hardness: Maximum, 3,430 ppm July 1-31, Oct. 1-16, 1953; minimum, 602 ppm June 1-2, 1948.
Specific conductance: Maximum daily, 24,200 micromhos Sept. 28, 30, 1953; minimum daily, 1,610 micromhos June 2, 1948.
REMARKS.--Values reported for dissolved solids are sums of determined constituents. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for gaging station near Orla for water year October 1953 to September 1954 given in WSP 1342. Mean discharge values reported are adjusted to reflect inflow from Salt (Screwbean) Draw which enters Pecos River between sampling point and gaging station.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-16, 1953.	12.1	15		785	359	4,290		110	2,980	6,790				15,200	20.7	497	3,430	3,250	73	32	21,900	7.4
Oct. 17-31	13.7	13		737	308	2,930		97	2,740	4,640				11,500	15.6	425	3,110	2,940	67	23	16,400	7.1
Nov. 1-30.....	14.4	11		685	278	2,510		88	2,540	3,960				10,000	13.6	389	2,850	2,780	66	20	14,500	7.1
Dec. 1-31.....	14.1	11		568	234	2,050		82	2,110	3,240				8,250	11.2	314	2,380	2,310	65	18	12,200	7.0
Jan. 1-31, 1954.	10.2	10		540	223	2,340		120	2,000	3,660				8,830	12.0	243	2,260	2,170	69	21	12,800	7.9
Feb. 1-28	23.5	8.8		538	218	2,240		106	2,000	3,510				8,570	11.7	544	2,240	2,150	69	21	12,500	7.6
Mar. 1-31.....	230	7.8		552	225	2,330		107	2,060	3,640				8,870	12.1	5,510	2,300	2,210	69	21	12,800	7.7
Apr. 1-30.....	16.9	9.6		566	228	2,230		112	2,070	3,510				8,670	11.8	396	2,350	2,260	67	20	12,800	7.6
May 1-19, 28-31	10.6	11		570	226	2,180		120	2,060	3,440				8,550	11.6	245	2,350	2,250	67	20	12,700	7.9
May 20-27	307	8.2		541	181	1,740		104	1,860	2,740				7,120	9.68	5,900	2,090	2,010	64	17	10,500	7.5
June 1-7	25.8	17		544	214	2,080		140	2,000	3,240				8,160	11.1	568	2,240	2,120	67	19	12,100	7.7
June 8-30	180	11		492	155	1,530		105	1,670	2,380				6,290	8.55	3,060	1,860	1,780	64	15	9,300	7.8
July 1-31	209	12		466	139	1,380		103	1,600	2,120				5,770	7.85	3,260	1,730	1,650	63	14	8,530	7.7
Aug. 1-31.....	143	12		508	138	1,430		107	1,620	2,250				6,010	8.17	2,320	1,840	1,750	63	15	8,900	7.4
Sept. 1-30.....	148	14		356	91	1,040		106	1,100	1,620		8.0		4,280	5.82	1,710	1,260	1,180	64	13	6,620	7.4
Weighted average	88.4	11		498	167	1,700		106	1,720	2,650				6,790	9.25	1,620	1,930	1,840	66	17	10,000	--

RIO GRANDE BASIN--Continued

PECOS RIVER BELOW RED BLUFF DAM NEAR ORLA, TEX.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

RIO GRANDE BASIN--Continued

PECOS RIVER BELOW GRANDFALLS, TEX.

LOCATION.--At gaging station at bridge on State Farm-to-Market Road 11, between Grandfalls and Imperial, 7.1 miles southeast of Grandfalls, Ward County, and 10 miles downstream from Chacatori Draw.
DRAINAGE AREA.--27,820 square miles, approximately (contributing area).
RECORDS AVAILABLE.--Chemical analyses: April 1939 to June 1942, October 1946 to September 1954.
EXTREMES, 1953-54.--Hardness: Maximum, 3,520 ppm Sept. 1-30; minimum, 246 ppm June 14.
Specific conductance: Maximum daily, 20,100 micromhos May 21-22, minimum daily, 904 micromhos June 14.
EXTREMES, 1939-42, 1946-53.--Hardness: Maximum, 4,460 ppm Mar. 1-31, 1953; minimum, 246 ppm June 14, 1954.
Specific conductance: Maximum daily, 35,700 micromhos Feb. 9-10, 15, 19-20, 1953; minimum daily, 904 micromhos June 14, 1954.
REMARKS.--Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1953 to September 1954 given in WSP 1342.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-31, 1953..	9.24	--				2,610		114	2,950	4,340							3,440	3,350	61	19	15,500	7.6
Dec. 1-31.....	11.3	23				2,620		175	2,890	4,470							3,420	3,280	60	19	15,700	7.7
Jan. 1-31, 1954 .	11.2	--				2,670		197	2,910	4,380							3,280	3,120	62	20	15,300	7.9
Feb. 1-28.....	10.6	--				2,700		173	2,950	4,430							3,280	3,140	62	20	16,000	7.9
Mar. 1-31	9.42	--				2,880		148	3,040	4,580							3,420	3,000	58	21	16,400	8.0
Apr. 1-30.....	19.7	13				2,610		129	2,830	4,220							3,200	3,090	63	20	15,400	7.6
May 1-31.....	9.11	7.8				2,910		127	3,150	4,770							3,500	3,400	63	21	17,100	8.0
June 1-12	15.9	--				2,620		128	2,930	4,380							3,400	3,300	61	20	15,700	7.7
June 13, 18-19...	300	--				809		160	1,010	1,530							1,240	1,110	53	10	6,290	7.8
June 14.....	360	--				--		130	--	129							246	139	--	--	904	8.1
June 15-17	47.7	--				528		154	639	890							840	714	56	7.9	4,000	7.9
June 20-30	12.3	--				1,600		159	1,880	2,620							2,200	2,070	60	15	10,000	7.9
July 1-3, 16-31 ..	16.5	--				1,810		145	2,300	3,170							2,610	2,490	56	15	12,000	7.8
July 4-8	1.56	--				790		119	984	1,500							1,180	1,080	53	10	6,150	7.8
July 9-15	7.67	--				1,420		128	1,770	2,300							2,000	1,900	59	14	9,170	7.8
Aug. 1-31.....	7.38	18		764	358	2,450		134	2,800	4,000				10,500	14.3	209	3,380	3,270	61	18	14,700	7.5
Sept. 1-30.....	7.16	--				2,690		136	3,010	4,350							3,520	3,140	62	20	15,700	7.4
Weighted average	a15.0	--		--	--	2,120		148	2,380	3,290				--	--	--	2,570	2,450	64	18	12,070	--

a Represents 94 percent of runoff for water year.

PECOS RIVER NEAR GIRVIN, TEX.

LOCATION.--At supplementary gage at bridge on U. S. Highway 67, about half a mile downstream from Panhandle and Santa Fe Railway bridge, 2.1 miles east of Girvin, Pecos County, 6½ miles downstream from Comanche Creek and 7.8 miles downstream from regular gaging station.
DRAINAGE AREA.--29,560 square miles, approximately (contributing area at supplementary gage).
RECORDS AVAILABLE.--Chemical analyses: October 1939 to June 1941, October 1946 to September 1947, October 1953 to September 1954.
Water temperatures: October 1953 to September 1954.
EXTREMES, 1953-54.--Hardness: Maximum, 4,360 ppm Sept. 1-30; minimum, 640 ppm June 16-18.
Specific conductance: Maximum daily, 22,700 micromhos Sept. 26, 30; minimum daily, 2,050 micromhos June 16.
Water temperatures: Maximum observed, 93°F June 1; minimum observed, 41°F Dec. 25.
EXTREMES, 1939-41, 1946-47, 1953-54.--Hardness: Maximum, 4,360 ppm Sept. 1-30, 1954; minimum, 640 ppm June 16-18, 1954.
Specific conductance: Maximum daily, 22,700 micromhos Sept.26, 30, 1954; minimum daily, 1,480 micromhos May 29, 1941.
REMARKS.--Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1953 to September 1954 given in WSP 1342.

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-31, 1953 ..	21.8	--				2,940	52	3,140	4,670								3,420	3,380	65	22	17,000	7.4
Nov. 1-30	18.3	12				3,500	59	3,460	5,460								3,740	3,690	67	25	18,300	7.2
Dec. 1-31	20.7	17				3,720	131	3,670	5,800								4,020	3,910	67	26	19,600	7.7
Jan. 1-31, 1954 ..	21.6	--				3,730	169	3,550	5,700								3,770	3,630	68	26	19,200	8.0
Feb. 1-28	22.8	--				3,720	149	3,640	5,700								3,870	3,750	68	26	19,900	7.7
Mar. 1-31	22.4	--				3,830	143	3,810	5,900								4,030	3,910	63	25	20,500	7.9
Apr. 1-10, 13-14, 20-30	26.2	2.9				3,630	96	3,660	5,720								3,880	3,800	66	25	20,000	7.4
Apr. 11-12, 15-19	35.7	4.4				2,440	114	2,540	3,660								2,590	2,500	67	21	13,700	7.6
May 1-21	18.4	12				3,660	66	3,550	5,510								3,570	3,520	69	27	19,100	7.4
May 22	31	12				1,400	72	1,450	2,150								1,560	1,510	66	15	8,500	7.7
May 23-31	24.9	13				2,440	63	2,640	3,960								2,690	2,640	63	20	14,600	7.4
June 1-15, 27-30	52.9	--				2,670	86	2,600	4,130								2,790	2,720	67	22	14,200	7.6
June 16-18	186	--				310	154	491	570								640	514	51	5.3	2,870	7.9
June 19-22	45	--				1,110	170	1,180	1,700								1,360	1,220	64	13	6,960	8.0
June 23-26	27.8	--				1,780	177	1,790	2,780								2,060	1,920	65	17	10,600	7.9
July 1-31	22.7	--				3,580	91	3,410	5,510								3,610	3,540	68	26	18,900	7.5
Aug. 1-31	12.3	8.6				4,060	61	4,080	6,140								4,120	4,070	68	28	21,100	7.4
Sept. 1-30	6.92	--				4,030	56	4,170	6,240								4,360	4,310	66	27	21,500	6.8
Weighted average	23.3	--				3,150	109	3,140	4,880								3,340	3,250	67	24	17,000	--

RIO GRANDE BASIN--Continued

PECOS RIVER NEAR GIRVIN, TEX.--Continued

Temperature (°F) of water, water year October 1953 to September 1954

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

RIO GRANDE BASINS--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN RIO GRANDE BASIN IN NEW MEXICO

Chemical analyses, in parts per million, water year October 1953 to September 1954

Date of collection	Discharge (cfs)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Chloride (Cl)	Specific conductance (micromhos at 25°C)
HAGERMAN CANAL AT DEXTER					
Oct. 20, 1953		187	0	1,190	5,500
Nov. 30		123	7	51	1,350
Jan. 11, 1954		245	0	1,130	5,260
Mar. 4		246	0	1,320	5,900
Apr. 12		248	0	1,270	5,890
May 18		194	0	1,040	4,940
June 28		264	0	1,340	6,060
Aug. 11		209	0	500	3,020
Sept. 27		229	0	1,260	5,480
LAKE McMILLAN AT McMILLAN DAM NEAR LAKEWOOD					
Sept. 28, 1954		81	0	3,350	12,900
PECOS RIVER BELOW LAKE McMILLAN DAM NEAR LAKEWOOD					
Oct. 22, 1953		100	0	3,600	13,800
Nov. 30		62	0	1,730	7,840
Jan. 11, 1954		61	0	2,260	9,620
Apr. 13		136	0	310	3,630
Apr. 24		84	8	2,470	10,400
May 20		140	0	370	3,380
June 28		104	0	1,690	8,650
Aug. 11		129	0	390	3,070
PECOS RIVER AT FORD CROSSING IN MAJOR JOHNSON SPRING AREA NEAR LAKEWOOD					
Oct. 22, 1953		166	0	780	5,410
Dec. 1		87	0	1,670	7,610
Jan. 11, 1954		99	0	2,130	9,160
Feb. 24		124	0	2,310	9,750
Apr. 13		144	0	320	3,670
May 21		124	0	310	2,970
Aug. 11		100	0	375	2,930
Sept. 28		200	0	1,040	6,010
BLACK RIVER AT HARKEY CROSSING, SEC. 9, T. 24 S., R. 27 E., NEAR MALAGA					
Dec. 1, 1953		203	0	17	1,720
Jan. 12, 1954		206	0	24	1,850
Feb. 26		210	0	15	1,730
Apr. 13		199	0	21	1,710
June 29		166	0	18	1,640
July 26		166	0	12	1,550
Aug. 10		167	0	13	1,530
Sept. 28		186	0	18	1,620

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