Quality of Surface Waters of the United States 1956

Parts 5 and 6

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 Iowa, Minnesota, and Wisconsin and with other agencies by personnel of the Water Resources Division under the direction of C. G. Paulsen, chief hydraulic engineer, succeeded by L. B. Leopold, and of S. K. Love, chief, Quality of Water Branch. The data were collected and computed under the supervision of the following engineers or district chemists:

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PARTS 5 and 6

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.

Publication of annual records of chemical analyses, suspended sediment, and water temperature was begun by the Geological Survey in 1941. The records prior to 1948 were published each year 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 in this volume were collected from October 1, 1955, to September 30, 1956. The records are arranged by drainage basins according to Geological Survey practice in reporting records of streamflow: Stations on tributary

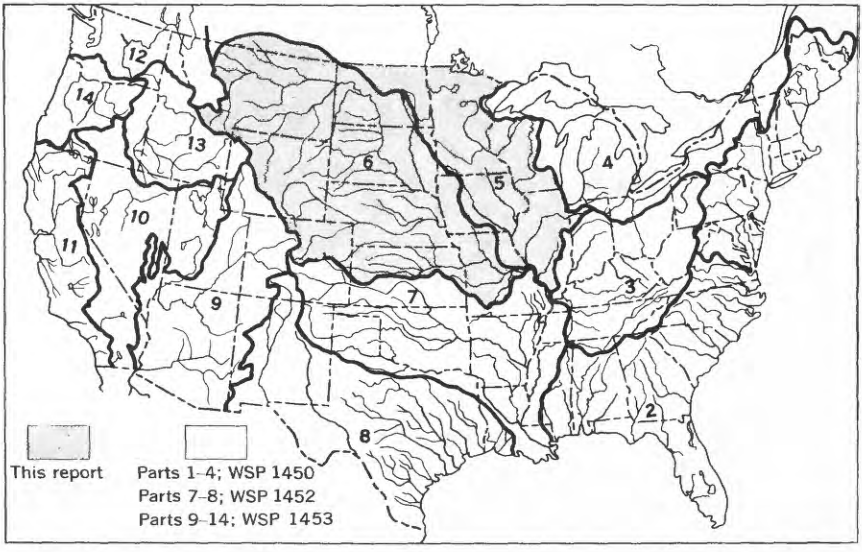

Figure 1.--Map of the United States showing basins covered by the four water-supply papers on quality of surface waters in 1956. The shaded portion represents the section of the country covered by this volume; the unshaded portion represents the section of the country covered by other water-supply papers.

streams are listed between stations on the main stem in the order in which those tributaries enter the main stem. Descriptive statements are given for each sampling station for which regular series of chemical analyses, temperature observations, 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 mineralization, hardness, water temperature, sediment loads, and other pertinent data. Records of water discharge of the streams at or near the sampling period are included in most tables of analyses.

During the year ending September 30, 1956, 101 regular sampling stations on 72 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 62 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, analyses made of the daily samples before compositing have not been reported. The specific conductance of almost all daily samples was determined, and as noted in the table head-

ings this information is available for reference at the district offices listed under Division of Work, on page 20.

Quantities of suspended sediment are reported for 51 stations during the year ending September 30, 1956. 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 45 of the stations.

Material which is transported almost in continuous contact with the stream bed and the material that bounces along the bed in short skips or leaps is termed "bedload" and is not considered in this report. All other undissolved fragmental material in transport is termed "suspended sediment" and generally constitutes the major part of the total sediment load. At the present time no reliable routine method has been developed for determining bedload.

COLLECTION AND EXAMINATION OF SAMPLES

CHEMICAL QUALITY

Samples for chemical analysis were usually collected at or near points on streams where gaging stations are maintained for measurement of water discharge. Two methods of compositing water samples for analysis are used by the Geological Survey: (1) Equal volume method—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 from the 21st to the end of the month. Composite samples were prepared for shorter periods if the specific conductance of the daily samples indicated that the mineral content of the water had changed significantly. Conversely, composite samples were occasionally prepared for longer periods if the specific conductance of the daily samples indicated that the mineral content had remained nearly uniform. (2) Discharge method—Composite samples were prepared by mixing together a volume from each sample in proportion to the product of the rate of water discharge at the time of sampling and the time interval represented by that sample. Generally, each daily sample is assumed to represent an equal time interval; therefore, the volume from each sample is proportional only to the water discharge at the time of sampling. Compositing samples by the discharge method was limited to some streams west of the Mississippi River.

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., 1955).

TEMPERATURE

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

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

SEDIMENT

In general, suspended-sediment samples were collected daily with U. S. depth-integrating cable-suspended samplers (U. S. Interagency, 1948, p. 70-76 and U. S. Interagency, 1952, p. 86-90) from a fixed sampling point at one vertical in the cross section. The US DH-48 hand sampler was used at many stations during periods of low flow. Depth-integrated samples were collected periodically at three or more verticals in the cross section to determine the cross-sectional distribution of the concentration of suspended sediment with respect to that at the daily sampling vertical. In streams where transverse distribution of sediment concentration ranges widely, 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 daily mean 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, daily mean 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 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 loads of suspended sediment were estimated on the basis of water discharge, sediment concentrations observed immediately preceding and following the periods, and suspended-sediment loads for other periods of similar discharge. The estimates were further guided by weather conditions and sediment discharge for other stations.

In many instances where there were no observations for several days, the suspended-sediment loads for individual days are not estimated, because numerous factors influencing the quantities of transported sediment made it very difficult to make accurate estimates for individual days. However, estimated loads of suspended sediment for missing days in otherwise continuous period of sampling have been included in monthly and annual totals for most streams to provide a complete record. For some streams, samples were collected about weekly, monthly, or less frequently, and only rates of sediment discharge at the time of sampling are shown.

In addition to the records of quantities of suspended sediment transported, records of the particle sizes of sediment are included. The particle sizes of the suspended sediments for many of the stations, and the particle sizes of the bed material for some of the stations were determined periodically. As much of the material carried in suspension is finer than 0.062 mm, the pipet method (Kilmer and Alexander, 1949) or the bottom withdrawal tube method (U. S. Interagency, 1943, p. 82-90) were used in most of the analyses. For most samples, material between 1.0 mm and 0.062 mm was analyzed by the visual accumulation tube method (U. S. Interagency 1957). Separation of sand from the silt-clay-colloid fraction was by sieve. For some samples all sediment coarser than 0.062 mm was analyzed by the sieve method. For material finer than 0.062 mm the settling medium used was native water or distilled water to which a dispersing agent had been added. Because sedimentation diameters of the clay and colloidal fractions are often affected by the chemical character of the settling medium, analyses made with native water may more nearly simulate particle sizes existing in the stream. Results of analyses with dis-

tilled water containing a dispersing agent 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 pipet method; therefore, the concentration of sediment for analyses was often different from the concentration in the stream. The concentration at which analyses were made is indicated in the appropriate tables.

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. Equivalents per million are calculated by dividing the concentration in parts per million by the chemical combining weights of the individual constituents. For convenience in making this conversion the reciprocals of chemical combining weights of the most commonly reported constituents (ions) are given in the following table:

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

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

The hardness, expressed in terms of an equivalent quantity of calcium carbonate ($CaCO_3$), is calculated from the equivalents of calcium and magnesium, or is determined by direct titration. 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.

The value usually reported as dissolved solids is the residue

on evaporation after drying at 180°C for 1 hour. For some waters, particularly those containing moderately large quantities of soluble salts, the value reported is calculated from the quantities of the various determined constituents using the carbonate equivalent of the reported bicarbonate. The calculated sum of the constituents may be given instead of or in addition to the residue. 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 is given for most analyses and was determined by means of a conductance bridge and using a standard potassium chloride solution as reference. Specific conductance values are expressed in micromhos per centimeter at 25°C. Specific conductance in micromhos is 1 million times the reciprocal of specific resistance at 25°C. Specific resistance is the resistance in ohms of a column of water 1 centimeter long and 1 square centimeter in cross section. The discharge of the streams is reported in cubic feet per second (see Streamflow, p. 17) and the temperature in degrees Fahrenheit. Color is expressed in units of the platinum-cobalt scale proposed by Hazen (1892, p. 427-428). Hydrogen-ion concentration 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 that is generally used in Survey laboratories determines the activity of the hydrogen ions as distinguished from concentration.

An average of analyses for the water year is given for most daily sampling stations. Most of these averages are arithmetical or time-weighted; when analyses during a year are all on 10-day composites of daily samples with no missing days, the arithmetical and time-weighted averages are equivalent. A time-weighted 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 discharge-weighted average approximates 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. A discharge-weighted average is computed by multiplying the discharge for the sampling period by the concentrations of the individual constituents for the corresponding period and dividing the sum of the products

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by the sum of the discharges. Discharge-weighted averages are usually lower than arithmetical averages for most streams because at times of high discharge the rivers generally have lower concentrations of dissolved solids.

The concentration of sediment in parts per million is computed as 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 of material finer than indicated sizes in millimeters. The size classification used in this report is that recommended by the American Geophysical Union subcommittee on Terminology (Lane and others, 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 with which the water has been in contact and the length of time of contact. Some streams are fed by both surface runoff and ground 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. Ground water is generally more highly mineralized than surface runoff because 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 drainage from irrigated lands.

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, pH, and dissolved solids. Aluminum, manganese, color, acidity, oxygen consumed, and other dissolved constituents and physical properties are reported for certain streams. Phenolic

material and minor elements including strontium, chromium, nickel, copper, lead, zinc, cobalt, arsenic, cadmium, and others are occasionally determined for a few streams in connection with specific problems in local areas and the results are reported when appropriate. 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 a few contain more than 50 parts, but most waters contain from 1 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 stream turbines.

Aluminum (Al)

Aluminum is generally 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 almost 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 almost 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 but 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 content, 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 in about the same amount 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 may indicate contamination by sewage or other organic matter. The quantities of nitrate present in surface waters are generally 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 cause methemoglobinemia (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 of boron is detrimental to citrus and other boron-sensitive crops. Boron is reported in Survey analyses of surface waters in arid and semiarid regions where irrigation is practiced or contemplated, but few of the surface waters analyzed have harmful concentrations of boron.

Dissolved solids

The reported quantity of dissolved solids--the residue on evaporation--consists mainly of the dissolved mineral constituents in the water. It may also contain some organic matter and water of crystallization. Waters with less than 500 parts per million of dissolved solids are usually satisfactory for domestic and some industrial uses. Water 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, but generally water containing more than about 2,000 ppm is considered to be unsuitable for long-term irrigation under average conditions.

PROPERTIES AND CHARACTERISTICS OF WATER

Water temperature

Large quantities of water are used in industrial operation; therefore temperature and seasonal fluctuations of that temperature are major considerations in planning the use of water for cooling in industrial plants. Water at high temperature can carry less oxygen in solution than at low temperature. Consequently water temperature can affect or determine the pollution characteristics of a stream. Temperature data are required in studies of water intended for aquatic life. A few degrees rise in temperature may seriously limit the capacity of a stream to support fish life.

Oxygen consumed

The amount of 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. Waters of naturally high color may have relatively high values for oxygen consumed, and 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 generally 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 (see p.7), 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 of 7.0 indicates that the water is neither acid nor alkaline. pH readings progressively lower than 7.0 denote increasing acidity and those progressively higher than 7.0 denote increasing alkalinity. 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 per centimeter at 25° C)

The specific conductance of a water is a measure of its capacity to conduct a current of electricity (see p.7). 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.

Hardness

Hardness is the characteristic of water that receives the most attention in industrial and domestic use. It is commonly 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 generally requires some softening before being used for most purposes.

Acidity

The acidity of a natural water represents the content of free carbon dioxide and other uncombined gases, organic acids, mineral acids and salts of strong acids and weak bases that hydrolyze to give hydrogen ions. Sulfates of iron and aluminum in mine and industrial wastes are common sources of acidity.

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

The proportion of sodium to the total cation concentration is termed "percent sodium", and 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 constituents in the water is explained on page 10 under "Sodium and potassium". 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).

Sodium-adsorption-ratio

Of more significance than percent sodium for use as an index of the sodium or alkali hazard to the soil is the sodium-adsorption-ratio because it relates more directly to the adsorption of sodium by the soil. The term, "sodium-adsorption-ratio (SAR)" was introduced by the U. S. Salinity Laboratory Staff (1954), and is a ratio expressing the relative activity of sodium ions in exchange reactions with the soil. It is expressed by the equation:

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

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

Waters are divided into four classes with respect to sodium or alkali hazard: low, medium, high, and very high, depending upon the SAR and the specific conductance. At a conductance of 100 micromhos per centimeter the dividing points are at SAR values of 10, 18, and 26, but at 5,000 micromhos the corresponding dividing points are SAR values of approximately 2.5, 6.5, and 11. Waters range in respect to sodium hazard from those which can be used for irrigation on almost all soils to those which are 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 part of it 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, plant 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 characteristics, the size of particles transported, as well as the total sediment load, is in constant adjustment with the characteristics and physical features of the stream and drainage area.

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 daily mean discharges for the composite period. 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.

PUBLICATIONS

Reports giving records of chemical quality and temperatures of surface waters and suspended-sediment loads of streams in the

area covered by this volume for the water years 1941-56, are listed below:

Numbers of water-supply papers containing records for Parts 5 and 6, 1941-56

Year	WSP	Year	WSP	Year	WSP	Year	WSP
1941	942	1945	1030	1949	1162	1953	1291
1942	950	1946	1050	1950	1187	1954	1351
1943	970	1947	1102	1951	1198	1955	1401
1944	1022	1948	1132	1952	1251	1956	1451

Geological Survey reports containing chemical quality, temperature, and sediment data obtained before 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 waters 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 chemical quality of water and sediment investigations in the Missouri River and Red River of the North basins in North Dakota, South Dakota, Nebraska, Kansas, Montana, Wyoming, and Colorado were begun in 1945. Most of the investigations were made as part of the program of the United States Department of Interior for development of the Missouri River basin with funds provided directly to the Geological Survey. Financial assistance was provided by the Bureau of Reclamation and the Bureau of Land Management of the Interior Department for some of the sediment investigations in Montana, Wyoming, South Dakota, and Nebraska, and by the Soil Conservation Service of the Agriculture Department for some of the sediment investigations in Colorado, Nebraska, and Iowa.

The investigations in Minnesota and Wisconsin and some of the investigations in Iowa were made in cooperation with these states.

In addition to the above, many investigations were made through funds appropriated directly to the Geological Survey.

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, succeeded by L. B. Leopold, and S. K. Love, chief of the Quality of Water Branch.

Most of the investigations were made under the direction of P. C. Benedict, regional engineer, Lincoln, Nebr. The sediment investigations in Iowa were made under the direction of V. R. Bennion, district engineer, Iowa City, Iowa and those in Wisconsin under the direction of W. L. Lemar, district chemist, succeeded by G. W. Whetstone, Columbus, Ohio.

Any additional basic data on file for the streams, lakes, and reservoirs shown in this report can be obtained from the Geological Survey district offices listed below:

State	Office
Colorado Kansas Minnesota Nebraska	Iowa (Chemical Quality data) North Dakota South Dakota	510 Rudge-Guenzel Bldg. Lincoln, Nebr.
Montana Wyoming		1214 Big Horn Ave. Worland, Wyo.
Iowa (sediment data)		508 Hydraulic Laboratory University of Iowa
Wisconsin (sediment data)		2822 East Main St. Columbus, Ohio

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U. S. Interagency Report 8, 1948, A study of methods used in measurement and analysis of sediment loads of streams, measurement of the sediment discharge of streams, p. 70-76; U. S. Engineer Office, St. Paul, Minn.

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CHEMICAL ANALYSES, WATER TEMPERATURES, AND SEDIMENT

PART 5. HUDSON BAY AND UPPER MISSISSIPPI RIVER BASINS

RED RIVER OF THE NORTH BASIN

WILD RICE RIVER NEAR ABERCROMBIE, N. DAK.

LOCATION.--Three-quarters of a mile downstream from gaging station, 160 feet upstream from rubble masonry dam, 3½ miles northwest of Abercrombie, Richland County, and 7¾ miles downstream from Antelope Creek.
DRAINAGE AREA.--2,170 square miles, approximately, of which about 530 square miles is probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: August 1955 to June 1956 (discontinued).
REMARKS.--No flow during October to March, July, and September. Records of discharge for water year October 1955 to September 1956 given in WSP 1438.

Chemical analyses, in parts per million, August 1955 to June 1956

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				Hardness as $CaCO_3$		Per cent 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					
														Residue at 180°C	Sum									
Aug. 5, 1955....	9.6	34	0.26	89	52	132	18	493	279	50	0.5	0.3	0.48	908		1.23		437	33	38	2.8	1,320	8.0	
Apr. 6, 1956....	290	11	.42	27	11	27	9.5	70	78	16	.0	25	.10	284		.39		112	55	32	1.1	374	6.9	
Apr. 13	582	9.6	.22	28	12	16	7.8	92	65	7.0	.0	11	.06	225		.31		118	43	21	.6	327	7.2	
Apr. 16	410	11	.12	39	16	24	8.4	116	108	11	.0	8.2	.10	297		.40		162	67	23	.8	449	7.4	
Apr. 25	70	14	.20	76	32	71	9.9	210	263	30	.4	.7	.20	632		.86		322	150	32	1.7	929	7.6	
May 8.....	34	9.9	.02	94	38	93	11	280	320	38	.2	1.4	.29	776		1.06		390	160	33	2.1	1,120	7.8	
June 6.....	10	9.1	.02	172	22	127	14	386	388	54	.1	.9	.39	1,020	979	1.38		524	207	34	2.4	1,430	8.0	

RED RIVER OF THE NORTH AT FARGO, N. DAK.

LOCATION.--At intake of Fargo Water Works, about 0.7 mile upstream from Island Park Dam and gaging station at Fargo, Cass County, and about 23.3 miles upstream from Sheyenne River.
DRAINAGE AREA.--6,800 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: October 1955 to September 1956.
Water temperatures: October 1955 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 380 ppm Aug. 11; minimum, 174 ppm Dec. 1-2.
Hardness: Maximum, 273 ppm Dec. 20 to Jan. 18; minimum, 154 ppm Dec. 1-2, 18-19.
Specific conductance: Maximum daily, 592 micromhos Aug. 11; minimum daily, 275 micromhos Dec. 1.
Water temperatures: Maximum, 77°F June 11-14, 21; minimum, 33°F on many days during November to January, March to April.
REMARKS.--Daily samples for chemical analysis composited by discharge. Records of specific conductance of daily samples available in district office at Lincoln, Nebr. Records of discharge for water year October 1955 to September 1956 given in WSP 1438.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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, 1955	402	11	0.00	38	27	8.9	3.8	255	0	23	3.0	0.1	0.3	0.15	237	0.32	257	205	0	8	0.3	409	7.7
Nov. 1-30	299	8.6	.00	39	30	9.4	3.9	261	0	27	4.0	.1	.0	.08	249	.34	201	219	5	8	.3	434	7.7
Dec. 1-2	175	8.5	.01	30	19	5.3	2.2	170	6	13	.0	--	.0	.05	174	.24	82.2	154	5	7	.2	306	8.3
Dec. 3-4	191	11	.01	41	33	10	4.0	252	14	24	3.0	--	.1	.08	272	.37	140	240	10	8	.3	463	8.4
Dec. 5-6	170	8.1	.01	29	22	6.8	2.7	182	6	16	1.0	--	.0	.05	192	.26	88.1	164	5	8	.2	328	8.3
Dec. 7-17	163	12	.01	43	35	10	4.2	295	0	27	4.5	.2	.1	.10	291	.40	128	250	8	8	.3	493	8.0
Dec. 18-19	165	9.4	.01	32	18	5.3	2.2	178	0	17	1.0	--	.0	.04	176	.24	78.4	154	8	7	.2	307	7.9
Dec. 20-Jan. 18, 1956	213	13	.01	51	36	11	4.3	312	0	33	5.5	.2	1.1	.09	315	.43	181	273	17	8	.3	536	7.8
Jan. 19-Feb. 17	233	15	.00	51	35	10	4.2	307	0	26	5.0	.1	2.5	.09	309	.42	194	271	19	7	.3	523	7.5
Feb. 18-Mar. 8	194	14	.01	47	35	10	4.0	308	0	20	4.0	.6	1.0	.05	304	.41	159	262	9	8	.3	518	7.9
Mar. 9-31	282	14	.00	45	35	10	4.0	297	0	31	3.0	.1	1.0	.07	307	.42	234	257	13	8	.3	511	7.8
Apr. 1-8	624	12	.00	41	29	10	5.4	238	0	43	4.0	.1	5.2	.24	278	.38	468	222	27	9	.3	463	8.0
Apr. 9-14	2,075	13	.02	38	21	12	6.8	148	0	71	4.5	.1	12	.42	272	.37	1,520	180	59	12	.4	414	7.8
Apr. 15-30	1,553	14	.01	50	26	13	6.0	184	0	104	4.0	.1	5.2	.22	331	.45	1,390	233	82	11	.4	509	7.8
May 1-14	834	8.8	.00	43	30	12	3.7	233	0	58	5.5	.1	.4	.09	282	.38	635	229	38	10	.3	484	7.7
May 15-17	903	9.7	.00	46	32	16	4.2	237	0	77	6.0	.1	.4	.09	326	.44	795	247	53	12	.4	532	7.6
May 18-June 8	969	10	.03	42	27	10	3.8	224	0	53	3.5	.1	.1	.09	268	.36	701	218	34	9	.3	449	8.0
June 9-15	831	11	.06	43	28	9.3	3.7	236	0	46	2.0	.1	.1	.08	271	.37	608	224	30	8	.3	456	7.8
June 16-30	617	13	.11	38	28	7.7	3.4	240	0	27	2.5	.1	.3	.09	246	.33	410	212	15	7	.2	425	7.9
July 1-26	306	13	.03	38	28	8.0	3.1	242	0	25	2.0	.1	.2	.13	247	.34	204	210	12	8	.2	421	7.9
July 27-28	192	13	.02	47	33	13	4.2	254	0	70	3.0	.2	.2	.12	320	.44	166	252	44	10	.4	519	8.2
July 29-Aug. 10	339	13	.00	41	28	9.7	3.5	250	0	35	3.0	.1	.2	.10	259	.35	237	216	11	9	.3	444	8.0
Aug. 11	424	13	.03	55	32	20	5.2	210	0	139	.0	--	.2	.09	380	.52	435	270	98	14	.5	592	8.0
Aug. 12-31	200	14	.02	45	28	15	5.6	209	0	83	3.5	.2	.2	.10	305	.41	165	229	58	12	.4	501	7.9
Sept. 1-30	114	9.3	.01	46	30	12	4.7	261	0	49	4.0	.2	.2	.10	300	.41	92.3	240	26	10	.3	490	7.9
Weighted average a	443	12	0.02	43	29	11	4.5	b 234	--	52	3.8	0.1	2.2	0.14	282	0.38	337	225	33	9	0.3	466	--

a Includes estimates where data are missing. Represents 100 percent of runoff for water year October 1955 to September 1956.
b Includes carbonate as bicarbonate.

RED RIVER OF THE NORTH BASIN--Continued

RED RIVER OF THE NORTH AT FARGO, N. DAK.--Continued

Temperature (° F) of water, water year October 1955 to September 1956
/Once-daily measurement at 9 a.m./

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

a Measurement between 7 a.m. and 8 a.m.
b Measurement between 10 a.m. and 1 p.m.

SHEYENNE RIVER NEAR WARWICK, N. DAK.

LOCATION.--At gaging station at highway bridge, 3.3 miles south of Warwick, Benson County.
DRAINAGE AREA.--2,100 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: January 1951 to September 1956.
Water temperatures: January 1951 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 747 ppm June 24 to July 23; minimum, 174 ppm Apr. 17-22.
Hardness: Maximum, 394 ppm Mar. 5; minimum, 79 ppm Apr. 17-22.
Specific conductance: Maximum daily, 1,200 micromhos July 2; minimum daily, 249 micromhos Apr. 19.
Water temperatures: Minimum, freezing point Mar. 3, 7.
EXTREMES, 1951-56.--Dissolved solids: Maximum, 1,230 ppm Mar. 21-23, 1955; minimum, 174 ppm Apr. 17-22, 1956.
Hardness: Maximum, 424 ppm Mar. 21-23, 1955; minimum, 76 ppm Mar. 30 to Apr. 2, 1955.
Specific conductance: Maximum daily, 1,940 micromhos Feb. 1, 1955; minimum daily, 240 micromhos Apr. 4, 1955.
Water temperatures: Maximum (1951-55), 86°F July 21, 1955; minimum, freezing point on several days during winter months.
REMARKS.--Daily samples for chemical analysis composited by discharge. Records of specific conductance of daily samples available in district office at Lincoln, Nebr. Records of discharge for water year October 1955 to September 1956 given in WSP 1438.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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. 1-28, 1955	2.57	--	--	--	--	38	--	293	0	--	--	--	--	--	335	0.46	2.32	212	0	28	1.1	551	7.9
Oct. 29-Nov. 3	3.15	--	--	--	--	64	--	314	0	--	--	--	--	--	376	.51	3.20	192	0	42	2.0	608	7.9
Nov. 4-12	2.87	--	--	--	--	115	--	455	0	--	--	--	--	--	570	.78	4.42	231	0	52	3.3	876	8.1
Nov. 13-21	1.91	--	--	--	--	100	--	422	0	--	--	--	--	--	515	.70	2.66	235	0	48	2.8	807	8.0
Nov. 22-27	2.10	--	--	--	--	130	--	480	7	--	--	--	--	--	609	.83	3.45	249	0	53	3.6	939	8.3
Nov. 28-Dec. 27	2.05	29	0.08	64	24	76	5.8	397	7	69	11	0.2	1.4	0.18	492	.67	2.72	260	0	38	2.1	766	8.2
Dec. 28-Jan. 3, 1956	2.00	--	--	--	--	57	--	364	0	--	--	--	--	--	428	.58	2.31	253	0	33	1.6	678	8.1
Jan. 4	1.60	--	--	--	--	34	--	242	6	--	--	--	--	--	300	.41	1.30	186	0	28	1.1	474	8.3
Jan. 5-15	1.47	--	--	--	--	60	--	378	0	--	--	--	--	--	448	.61	1.78	262	0	33	1.6	703	8.2
Jan. 16-30	1.48	--	--	--	--	74	--	440	0	--	--	--	--	--	522	.71	2.09	292	0	36	1.9	812	8.0
Jan. 31-Feb. 12	1.60	--	--	--	--	67	--	436	0	--	--	--	--	--	505	.69	2.18	300	0	33	1.7	800	8.1
Feb. 13-25	2.00	29	.01	76	34	61	5.4	453	0	79	11	.1	1.1	.12	535	.73	2.89	329	0	28	1.5	830	8.1
Feb. 26-29	2.30	--	--	--	--	57	--	434	9	--	--	--	--	--	527	.72	3.27	335	0	27	1.4	817	8.2
Mar. 1-4	2.60	--	--	--	--	38	--	364	0	--	--	--	--	--	425	.58	2.98	282	0	23	1.0	658	8.1
Mar. 5	2.60	--	--	--	--	72	--	460	39	--	--	--	--	--	636	.86	4.46	394	0	28	1.6	978	8.2
Mar. 6-25	2.06	--	--	--	--	46	--	399	0	--	--	--	--	--	470	.64	2.61	307	0	25	1.1	737	8.0
Mar. 26-28	2.60	--	--	--	--	37	--	336	10	--	--	--	--	--	421	.57	2.96	278	0	22	1.0	647	8.3
Mar. 29-Apr. 13	6.73	--	--	--	--	48	--	382	0	--	--	--	--	--	460	.63	8.36	286	0	27	1.2	711	8.1
Apr. 14-16	598	--	--	--	--	33	--	156	0	--	--	--	--	--	236	.32	381	99	0	42	1.4	364	8.2
Apr. 17-22	2,335	--	--	--	--	23	--	108	0	--	--	--	--	--	174	.24	1,100	79	0	39	1.1	272	7.6

Apr. 23-26	510	--	--	--	--	37	--	171	0	--	--	--	--	--	274	.37	377	128	0	39	1.4	423	7.9
Apr. 27-30	248	--	--	--	--	53	--	216	0	--	--	--	--	--	348	.47	233	162	0	42	1.8	545	8.0
May 1-8	154	--	--	--	--	71	--	276	0	--	--	--	--	--	446	.61	185	200	0	44	2.2	683	8.1
May 9-22	97.5	--	--	--	--	92	--	344	0	--	--	--	--	--	539	.73	142	238	0	46	2.6	823	8.2
May 23-June 6	63.3	--	--	--	--	107	--	382	0	--	--	--	--	--	625	.85	107	275	0	46	2.8	946	8.2
June 7-8	789	20	.10	34	15	50	6.3	214	0	76	8.0	.2	1.1	.14	312	.42	665	148	0	41	1.8	499	8.1
June 9-12	513	--	--	--	--	64	--	288	0	--	--	--	--	--	395	.54	547	134	0	51	2.4	611	7.9
June 13-17	163	--	--	--	--	74	--	296	0	--	--	--	--	--	482	.66	212	224	0	42	2.1	723	8.1
June 18-23	83.2	--	--	--	--	109	--	384	0	--	--	--	--	--	621	.84	140	256	0	48	3.0	928	8.0
June 24-July 23	27.9	--	--	--	--	144	--	496	0	--	--	--	--	--	747	1.02	56.3	287	0	52	3.7	1,110	8.1
July 24-Aug. 1	6.43	--	--	--	--	120	--	436	7	--	--	--	--	--	643	.87	11.2	270	0	49	3.2	973	8.2
Aug. 2-Sept. 1	4.37	--	--	--	--	91	--	394	0	--	--	--	--	--	538	.73	6.35	256	0	44	2.5	828	8.1
Sept. 2-30	9.23	18	.01	49	33	103	7.0	419	0	125	16	.2	.5	.27	563	.77	14.0	258	0	46	2.8	883	8.1
Weighted average a	79.5	--	--	--	--	46	--	b 195	--	--	--	--	--	--	301	0.41	64.6	132	0	43	1.7	464	--

a Represents 100 percent of runoff for water year October 1955 to September 1956.
b Includes carbonate as bicarbonate.

RED RIVER OF THE NORTH BASIN--Continued

SHEYENNE RIVER NEAR WARWICK, N. DAK.--Continued

Temperature (° F) of water, water year October 1955 to September 1956
/Once-daily measurement between 3 p.m. and 4 p.m./

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

a Measurement at 2 p.m.
b Measurement between 5 p.m. and 6 p.m.

MAUVAIS COULEE NEAR CHURCHS FERRY, N. DAK.

LOCATION.--At gaging station at bridge on U. S. Highway 281, 1 mile downstream from Little Coulee and 6 miles south of Churchs Ferry, Ramsey County.
RECORDS AVAILABLE.--Chemical analyses: June 1954 to September 1956.
REMARKS.--No flow during December to March. Records of discharge for water year October 1955 to September 1956 given in WSP 1438.

Chemical analyses, in parts per million, November 1955 to September 1956

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 (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, 1955	0.1	--	--	80	41	63	--	365	0	190	22	--	--	--	627	0.85		370	71	26	1.4	950	7.4
Apr. 20, 1956	167	12	0.08	37	13	24	9.7	106	0	98	12	0.0	9.3	0.06	274	.37		148	61	24	.9	429	7.1
Apr. 23	83	12	.13	42	15	25	9.7	128	0	102	11	.0	8.3	.06	301	.41		166	61	23	.8	463	7.2
Apr. 25	93	13	.06	42	14	33	9.6	150	0	93	15	.0	8.0	.08	324	.44		164	41	29	1.1	487	7.4
Apr. 26	123	12	.07	39	15	32	10	144	0	87	14	.0	8.1	.07	316	.43		159	41	29	1.1	477	7.5
Apr. 27	371	12	.30	39	16	26	9.3	148	0	77	12	.0	8.0	.07	295	.40		162	41	25	.9	452	7.5
May 1	513	11	.06	34	15	22	8.8	131	0	72	9.5	.0	8.4	.06	259	.35		146	39	23	.8	404	7.4
May 2	528	11	.06	33	14	21	8.1	127	0	71	8.5	.0	7.4	.07	253	.34		141	37	23	.8	393	7.6
May 3	546	11	.07	33	14	20	8.0	122	0	68	8.5	.0	7.8	.05	248	.34		139	39	23	.7	381	7.6
May 15	462	7.4	.31	40	18	25	10	171	0	81	12	.0	3.6	.12	313	.43		175	35	22	.8	467	7.8
May 16 a	80	18	.03	61	26	24	9.5	195	0	143	10	.0	1.0	.07	407	.55		257	97	16	.7	604	7.8
May 30	345	4.8	.03	37	18	21	10	159	0	80	9.0	.0	2.3	.11	289	.39		167	37	20	.7	442	7.3
June 8	284	6.6	.03	39	19	24	11	177	0	79	9.5	.1	2.5	.09	305	.41		177	32	21	.8	473	7.3
June 27	155	--	--	47	20	23	--	203	0	75	8.5	--	--	--	323	.44		199	33	19	.7	512	7.7
Aug. 20	28.7	32	.04	62	25	29	16	273	0	90	12	.3	4.1	.13	419	.57		257	33	19	.8	628	7.5
Sept. 18	15.8	--	--	75	22	29	--	288	0	100	12	--	--	--	470	.64		276	40	18	.8	670	7.3

a Sample collected near Maza, N. Dak., NW¼NE¼ sec. 36, T. 157 N., R. 66 W.

RED RIVER OF THE NORTH BASIN--Continued

SOURIS RIVER NEAR VERENDRYE, N. DAK.

LOCATION.--At gaging station, 2.7 miles north of Verendrye, McHenry County, and 7½ miles southwest of (19 miles upstream from) mouth of Wintering River.
DRAINAGE AREA.--12,200 square miles, approximately
RECORDS AVAILABLE.--Chemical analyses: October 1949 to August 1951, August 1952 to September 1956.
REMARKS.--Records of discharge for water year October 1956 to September 1956 given in WSP 1438.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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 (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. 18, 1955	60	--	--	--	--	119	--	394	0	185	23	--	--	--	--	--		281	0	47	3.1	1,020	7.3
Nov. 23	73	8.1	0.03	65	40	108	13	404	0	220	26	0.2	2.8	0.14	697	0.95		328	0	41	2.6	1,040	7.4
Dec. 21	36	26	.02	71	25	35	3.4	355	0	54	8.0	.1	4.6	.10	401	.55		278	0	21	.9	647	7.4
Jan. 19, 1956	36	13	.08	91	46	122	14	497	0	220	33	.2	2.2	.18	815	1.11		417	9	38	2.6	1,230	7.5
Feb. 18	40	--	--	--	--	119	--	480	0	218	33	--	--	--	--	--		412	18	39	2.6	1,200	7.5
Mar. 23	600	--	--	27	13	36	--	136	0	84	6.0	--	--	--	274	.37		121	9	38	1.4	421	6.9
Apr. 2	335	--	--	38	19	46	--	196	0	111	8.5	--	--	--	375	.51		175	14	35	1.5	557	7.3
Apr. 10	494	--	--	45	26	57	--	242	0	133	9.5	--	--	--	442	.60		219	21	35	1.7	672	7.6
Apr. 13	860	--	--	43	25	60	--	235	0	144	8.5	--	--	--	445	.61		209	16	37	1.8	671	7.5
May 3	1,720	--	--	37	21	40	--	200	0	99	5.0	.7	--	--	333	.45		180	16	32	1.3	520	7.5
May 20	1,100	--	--	38	24	43	--	216	0	109	8.5	--	--	--	373	.51		194	17	31	1.3	577	7.5
June 14	330	4.9	.04	42	25	57	11	257	0	119	8.0	.1	2.2	.14	410	.56		208	0	36	1.7	647	7.8
July 17	248	--	--	--	--	62	--	247	0	111	11	--	--	--	--	--		188	0	40	2.0	648	7.6
Aug. 16	169	--	--	40	22	56	--	236	0	106	13	--	--	--	379	.52		190	0	39	1.8	616	7.5
Sept. 7	120	12	.02	59	21	60	11	283	0	116	15	.3	3.6	.13	446	.61		232	0	35	1.7	699	7.5

WINTERING RIVER NEAR KARLSRUHE, N. DAK.

LOCATION.--At gaging station at highway bridge, 4 miles upstream from mouth, and 7 miles northeast of Karlsruhe, McHenry County.
DRAINAGE AREA.--675 square miles.
RECORDS AVAILABLE.--Chemical analyses: August 1955 to June 1956 (discontinued).
REMARKS.--Records of discharge for water year October 1955 to September 1956 given in WSP 1438.

Chemical analyses, in parts per million, August 1955 to June 1956

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 (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. 26, 1955.....	2.7	22	0.04	54	27	40	3.4	342	0	44	8.0	0.1	1.9	0.15	375	0.51		244	0	26	1.1	608	8.2
Oct. 18.....	4.1	19	.00	63	23	37	2.8	332	0	61	6.5	.1	.6	.11	364	.50		252	0	24	1.0	613	7.9
Nov. 23	3.2	24	.02	69	25	36	3.2	358	0	60	7.5	.2	2.0	.10	404	.55		375	81	22	.9	646	7.6
Dec. 21	1.3	12	.03	78	44	120	14	461	0	225	32	.3	10	.15	785	1.07		375	0	40	2.7	1,160	7.3
Apr. 11, 1956.....	160	15	.28	23	9.4	56	6.3	150	0	89	6.0	.1	1.4	.23	302	.41		96	0	54	2.5	441	7.3
Apr. 16	90	18	.24	28	13	88	7.6	218	0	130	11	.2	2.0	.33	431	.59		123	0	59	3.5	631	7.4
May 3.....	28	23	.26	42	21	123	7.0	326	0	178	14	.1	1.6	.33	586	.80		190	0	57	3.9	868	7.8
May 20.....	13	16	.27	60	26	119	6.4	410	0	176	17	.0	1.9	.31	663	.90		257	0	49	3.2	969	8.0
June 14.....	6.4	21	.07	58	31	126	5.6	456	0	150	15	.0	4.1	.33	669	.91		270	0	50	3.3	994	8.0

SOURIS RIVER NEAR WESTHOPE, N. DAK.

LOCATION.--At gaging station, 1,200 feet upstream from second crossing of international boundary, 1 mile downstream from Fish and Wildlife Service dam 357, 7 miles northeast of Westhope, Bottineau County, and 11 miles downstream from Boundary Creek.
DRAINAGE AREA.--17,600 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: June 1954 to September 1956.
Water temperatures: October 1954 to September 1955.
REMARKS.--Daily samples for chemical analysis composited by discharge. Records of specific conductance of daily samples available in district office at Lincoln, Nebr. Records of discharge for water year October 1955 to September 1956 given in WSP 1438.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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: Parts per million: Residue at 180°C	Dissolved solids: Parts per million: Sum	Dissolved solids: Tons per acre-foot	Dissolved solids: 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. 1-27, 1955..	149	--	--	42	36	84	--	336	150	12	--	1.8	0.15	533	--	0.72	214	254	0	41	2.3	818	7.9	
Oct. 28-Nov. 11 .	14.2	--	--	45	38	86	--	343	161	13	--	2.0	.14	550	--	.75	21.1	268	0	40	2.3	846	7.9	
Nov. 12-30.....	4.71	--	--	52	43	94	--	392	170	16	--	2.2	.14	614	--	.84	7.81	306	0	40	2.3	941	7.8	
Dec. 15.....	1	8.1	0.01	70	55	117	17	509	218	21	0.3	3.4	.19	793	--	1.08	2.14	402	0	38	2.5	1,170	7.7	
Jan. 17, 1956....	15	22	.12	129	96	191	25	892	378	37	.4	.9	.30	1,370	1,320	1.86	55.5	718	0	36	3.1	1,910	7.5	
Feb. 16.....	15	17	.03	181	94	235	28	1,040	400	48	.4	14	.32	1,620	1,530	2.20	65.6	836	0	37	3.5	2,230	7.4	
Mar. 25.....	130	--	--	121	72	158	--	785	275	44	--	6.7	.21	1,130	--	1.54	397	597	0	34	2.8	1,680	7.4	
Mar. 30.....	130	--	--	100	60	134	--	616	228	37	--	13	.18	941	--	1.28	330	497	0	36	2.6	1,410	7.3	
Apr. 4.....	130	--	--	85	53	118	--	526	205	31	--	13	.12	818	--	1.11	287	429	0	37	2.5	1,230	7.3	
Apr. 18.....	1,170	--	--	26	15	29	--	137	67	7.0	--	4.8	.07	241	--	.33	761	125	13	32	1.1	386	7.3	
Apr. 26-May 6...	2,225	--	--	35	19	38	--	175	102	6.5	.0	1.8	.12	306	--	.42	1,840	164	20	32	1.3	497	7.8	
May 7-June 7....	2,228	11	.03	53	28	51	11	268	136	9.0	.2	1.7	.11	450	--	.61	2,710	248	28	30	1.4	694	8.0	
May 18 a.....	2,320	10	.04	48	28	49	11	254	138	8.5	.0	1.8	.12	451	--	.61	2,830	235	27	30	1.4	680	7.7	
June 8-22	976	--	--	53	37	61	--	320	150	9.0	--	3.5	.17	515	--	.70	1,360	286	24	32	1.6	779	7.9	
June 23-July 16 ..	394	--	--	38	28	54	--	252	113	9.5	--	3.2	.14	409	--	.56	435	210	3	36	1.6	629	8.0	
July 17-Aug. 13..	323	--	--	30	27	59	--	238	110	9.0	--	1.2	.15	399	--	.54	348	184	0	41	1.9	607	7.7	
Aug. 14-31.....	94.7	8.4	.02	27	29	64	9.6	256	113	11	.2	1.6	.12	404	--	.55	103	186	0	41	2.0	625	7.9	
Sept. 1-30.....	141	--	--	31	30	68	--	279	111	12	--	2.2	.12	440	--	.60	168	201	0	41	2.1	676	8.0	
Weighted average b	623	--	--	46	28	52	--	257	128	8.9	--	2.0	0.12	427	--	0.58	718	229	20	33	1.5	661	--	
Weighted average c	443	--	--	46	27	52	--	255	125	9.4	--	2.6	0.12	424	--	0.58	507	226	19	33	1.5	654	--	

a Not included in weighted average.
b Represents 87 percent of runoff for water year October 1955 to September 1956.
c Includes estimated data for missing periods. Represents 100 percent of runoff for water year October 1955 to September 1956.

MISCELLANEOUS ANALYSES OF STREAMS AND LAKES IN THE RED RIVER OF THE NORTH BASIN

Chemical analyses, in parts per million, water year October 1955 to September 1956

Date of collection	Pool elevation (ft)	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			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million		Tons per acre-foot	Calcium, magnesium	Non-carbonate				
															Residue at 180°C	Sum							
DEVILS LAKE NEAR DEVILS LAKE, N. DAK.																							
Jan. 4, 1956 ..	1,416.17	15	0.20	114	359	1,960	208	742	55	4,250	920	0.6	9.2	1.5	8,340	8,260	11.3	1,760	1,060	68	20	10,100	8.5
June 8	1,418.69	1.2	.03	80	277	1,440	150	514	75	3,100	690	.6	.5	1.2	6,280	6,070	8.54	1,340	794	67	17	7,970	8.8
Sept. 23	1,419.04	--	.01	95	246	1,300	144	504	71	2,800	627	.6	2.0	1.1	5,780	5,540	7.86	1,250	719	66	16	7,380	8.7
EAST DEVILS LAKE NEAR HAMAR, N. DAK.																							
June 8, 1956 ..	1,402.0		0.05	48	2,330	11,300	978	1,100	468	27,100	14,510		2.4	6.0	49,000	47,300	66.6	9,690	8,010	69	50	43,800	8.9
Sept. 24	1,400.7		.01	36	2,750	13,400	1,230	1,830	368	31,800	5,340		.0	7.0	58,900	55,900	80.1	11,400	9,280	69	55	49,800	8.7
WESTERN STUMP LAKE NEAR LAKOTA, N. DAK.																							
June 8, 1956 ..	1,395.7		0.05	114	406	2,090	143	280	65	4,470	1,220		0.6	2.0	8,970	8,660	12.2	1,960	1,620	68	21	11,200	8.8
Sept. 24	1,395.2		.00	149	909	4,260	279	430	31	9,660	2,570		.8	3.4	18,900	18,100	25.7	4,110	3,710	67	29	20,200	8.4
EASTERN STUMP LAKE NEAR LAKOTA, N. DAK.																							
June 8, 1956 ..	1,384.9		0.07	184	6,240	21,700	1,320	919	193	55,600	11,200		1.8	12	104,000	96,900	141	26,100	25,000	63	71	74,400	8.4
Sept. 24	1,384.3		.00	225	6,940	27,700	1,490	1,200	141	72,100	12,600		5.3	15	135,000	122,000	184	29,100	27,900	66	71	82,100	8.3
BALDHILL CREEK NEAR DAZEY, N. DAK.																							
Oct. 28, 1955 .	a 1.7	18	0.00	58	37	89	7.6	356	0	171	25	0.2	0.8	0.25	596		0.81	297	5	39	2.3	903	7.8
Dec. 22.....	a .1	31	.09	90	30	222	8.5	518	0	295	81	.1	7.3	.46	1,030	1,020	1.40	346	0	58	5.2	1,570	7.4
Mar. 26, 1956.	a 11.0	15	.02	42	17	31	8.0	189	0	80	8.5	.0	6.5	.11	314		.43	174	19	27	1.0	487	7.2
Apr. 8.....	a 11.5	14	.05	39	15	22	6.8	164	0	65	7.0	.0	4.7	.10	270		.37	160	26	22	.8	415	7.3
Apr. 11.....	a 448	6.8	.07	28	7.3	6.0	5.3	84	0	26	2.0	.0	23	.05	170		.23	100	31	11	.3	244	7.2
Apr. 23.....	a 41	21	.05	52	22	33	7.2	200	8	109	8.5	.4	2.5	.13	374		.51	220	43	24	1.0	559	8.5
May 10	a 13	16	.01	77	31	54	7.5	319	0	158	16	.1	1.0	.15	534		.73	321	59	26	1.3	813	8.2
June 4.....	a 6.1	11	.01	73	41	77	7.6	354	0	205	19	.1	.9	.22	631		.86	350	60	32	1.8	950	8.1
RED RIVER OF THE NORTH AT OSLO, MINN.																							
June 10, 1956.		--	--	--	--	--	--	168	0	78	23	--	--	--	--		--	219	65	--	--	518	7.7
Aug. 10-Sept. 2		13	0.03	54	26	22	4.9	235	0	80	17	0.2	0.9	0.11	341		0.46	243	50	16	0.6	550	7.8
Sept. 3-4.....		11	.04	43	14	7.2	4.4	156	0	43	8.0	.2	1.5	.07	220		.30	164	36	8	.2	350	8.0
Sept. 5-14....		11	.04	54	21	17	5.1	166	0	99	19	.3	1.4	.10	323		.44	221	85	14	.5	505	7.9

a Discharge, in cubic feet per second.

MISCELLANEOUS ANALYSES OF STREAMS AND LAKES IN THE RED RIVER OF THE NORTH BASIN--Continued

Chemical analyses, in parts per million, water year October 1955 to September 1956--Continued

Date of collection	Pool elevation (ft)	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: Parts per million, Residue at 180°C	Dissolved solids: Parts per million, Sum	Dissolved solids: Tons per acre-foot	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
WILLOW CREEK NEAR UPHAM, N. DAK.																							
Oct. 19, 1955	a 0.3	8.5	0.00	60	57	44	12	368	0	168	8.0	0.3	4.7	0.21	575		0.78	384	82	19	1.0	866	7.5
Apr. 11, 1956	a 30	6.9	.13	18	8.5	10	8.9	74	0	41	2.5	.0	4.2	.06	155		.21	80	19	19	.5	227	7.0
Apr. 13	a 666	7.2	.26	26	7.5	17	7.8	83	0	45	5.0	.0	32	.08	215		.29	96	28	26	.8	300	7.0
May 2	a 621	19	.14	43	28	31	9.2	216	0	117	3.5	.1	1.1	.11	380		.52	224	47	22	.9	560	7.7
May 19	a 396	13	.02	54	44	48	10	290	0	185	7.0	.1	.8	.15	534		.73	316	78	24	1.2	787	8.1
June 10	a 102	13	.05	61	48	35	10	336	0	150	3.5	.0	1.3	.17	538		.73	348	72	17	.8	781	7.9
DEEP RIVER NEAR UPHAM, N. DAK.																							
June 29, 1954	a 43.4	--	--	52	51	45	--	402	0	94	11	--	--	--	510		0.69	338	8	22	1.1	781	7.9
Aug. 16, 1955	ab .001	8.8	0.05	43	54	41	14	350	0	126	12	0.1	1.1	0.15	518		.70	330	43	20	1.0	770	7.6
Apr. 11, 1956	a 15	5.7	.05	27	16	15	11	82	0	93	6.5	.0	5.0	.03	235		.32	133	66	18	.6	360	7.0
Apr. 20	a 3.5	12	.13	25	14	8.9	10	133	0	34	2.5	.0	2.1	.06	203		.28	119	10	13	.4	289	7.4
May 2	a 46	16	.14	36	20	12	10	180	0	54	3.5	.0	1.0	.07	257		.35	174	26	12	.4	400	7.5
May 19	a 20	14	.03	51	28	17	12	246	0	79	6.0	.0	.9	.06	353		.48	243	41	13	.5	539	7.9
June 10	a 3.0	11	.04	50	37	21	13	260	18	81	5.5	.1	1.8	.05	378		.51	276	32	13	.5	599	8.6
CUT BANK CREEK AT UPHAM, N. DAK.																							
Apr. 4, 1956	a 0.5	5.8	0.08	33	11	11	8.5	60	0	108	3.5	0.1	2.2	0.07	225		0.31	129	80	15	0.4	342	6.8
Apr. 11	a 8.3	6.5	.05	37	20	24	10	79	0	157	8.0	.0	3.3	.06	322		.44	176	111	22	.8	487	6.9
May 2	a 7.0	11	.05	48	33	38	9.9	246	0	128	11	.0	.6	.11	407		.55	256	54	24	1.0	644	8.0
May 19	a 7.6	8.2	.03	68	48	71	13	373	6	188	19	.1	1.0	.12	640		.87	366	50	29	1.6	949	8.2
June 10	a 1.6	18	.07	63	59	98	11	507	7	172	17	.2	1.8	.17	740		1.01	401	0	34	2.1	1,090	8.3

a Discharge, in cubic feet per second.
b Estimated.

PAINT CREEK AT WATERVILLE, IOWA

LOCATION.--At gaging station, on downstream side of bridge on State Highway 373 and 0.5 mile northwest of Waterville, Allamakee County.
DRAINAGE AREA.--42.8 square miles (revised).
RECORDS AVAILABLE.--Water temperatures: November 1952 to September 1956.
Sediment records: November 1952 to September 1956.
EXTREMES, 1955-56.--Water temperatures: Maximum, 78°F June 19; minimum, freezing point on many days during November to April.
Sediment concentrations: Maximum daily, 8,900 ppm May 6; minimum daily, not determined.
Sediment loads: Maximum daily, 13,000 tons May 6; minimum daily, not determined.
EXTREMES, 1952-56.--Water temperatures: Maximum, 78°F June 19, 1956; minimum, freezing point on many days during winter months.
Sediment concentrations: Maximum daily, 10,200 ppm July 4, 1955; minimum daily, not determined.
Sediment loads: Maximum daily, 23,000 tons July 26, 1953; minimum daily, less than 0.050 ton on Jan. 24-31, 1955.
REMARKS.--Flow affected by ice Jan. 15-25, Mar. 1-4, 9-12. Records of discharge for water water year October 1955 to September 1956 given in WSP 1438.

Temperature (° F) of water, water year October 1955 to September 1956
/Once-daily measurement between 1 p.m. and 6 p.m./

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

a Measurement between 8 a.m. and 12 m.

PAINT CREEK BASIN--Continued

PAINT CREEK AT WATERVILLE, IOWA--Continued

Suspended sediment, water year October 1955 to September 1956

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	5.9			6.4	--		5.9	--	
2	5.9			5.9	--		5.9	--	
3	5.4	56	0.8	5.9	--		6.4	--	
4	5.4			5.9	62		6.4	--	
5	6.4			5.9	--		6.4	--	
6	8.0	95	2.1	5.9	--		6.4	36	
7	6.8	75	1.4	5.9	--	e 1.0	5.9	--	e 0.6
8	6.4	35	.6	5.9	62		5.9	--	
9	5.9			5.9	--		5.9	--	
10	5.9	49	.8	5.9	--		5.9	--	
11	5.9			6.4	--		5.9	--	
12	5.9			5.9	--		5.9	--	
13	5.9	54	.9	5.4	--		5.0	36	
14	5.9			5.4	--		5.0	--	
15	5.9			5.4	62		5.0	--	
16	5.9			5.4	--	e .9	5.0	--	
17	5.9			5.4	--		5.0	--	e .5
18	5.9	70	1.1	5.4	--		5.0	--	
19	5.9			5.6	--		5.0	--	
20	5.9			5.8	--		5.0	--	
21	5.9			5.8	--		5.0	--	
22	5.9			5.9	--		5.0	31	
23	6.4	35	.6	5.9	62		5.0	--	
24	5.9			5.9	--		4.6	--	
25	5.9			5.9	--	e 1.0	4.6	--	
26	5.9			5.9	--		4.6	--	e .4
27	5.9			5.9	--		4.6	--	
28	5.9	--	e .6	5.9	--		4.6	--	
29	5.9			5.9	--		5.0	--	
30	6.4			5.4	62		5.0	--	
31	6.4	--	e 1.0	--	--	--	5.4	--	
Total	187.4	--	27.1	174.0	--	29.3	166.2	--	15.7

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	5.9	--		4.6	--		25	340	sa 75
2	5.9	--		4.6	--		200	1,210	s 1,480
3	5.4	23		4.3	--		90	344	s 110
4	5.4	--		4.3	12		100	415	s 192
5	5.4	--	e 0.3	4.3	--	e 0.1	159	1,200	sa 1,000
6	5.4	--		4.0	--		29	302	s 27
7	5.4	23		4.0	--		14	100	3.8
8	4.6	--		4.0	12		7.4	44	.9
9	4.6	20		4.0	--		6.4	21	
10	4.6	--		4.0	--		5.8	21	
11	4.6	--		4.0	13		5.4	--	
12	4.6	--		4.0	--		5.2	--	
13	4.6	--		4.0	13		5.0	21	
14	4.6	--	e .2	4.0	--		5.0	21	
15	4.5	--		4.0	--	e .1	5.0	--	e .3
16	4.4	--		4.0	--		5.0	21	
17	4.2	--		4.3	--		5.0	25	
18	4.0	20		4.3	13		5.0	--	
19	4.0	--		4.3	--		5.0	25	
20	4.0	--		4.3	--		5.4	40	
21	4.0	--		4.3	--		5.9	--	e 1.3
22	4.0	--		4.3	7		6.4	124	2.1
23	4.0	13		4.3	--		9.1	--	e 3.4
24	4.2	--		4.3	--		13	100	sa 4.2
25	4.4	--		4.3	--	e .1	92	776	s 419
26	4.6	--	e .2	4.3	--		153	3,040	s 1,620
27	4.6	--		4.3	--		351	2,380	s 3,260
28	4.6	13		4.3	7		440	1,620	s 1,900
29	4.6	--		5.0	30	.4	55	349	s 82
30	4.6	--		--	--	--	20	85	sa 4.8
31	4.6	13		--	--	--	79	1,670	s 1,050
Total	144.3	--	6.9	122.7	--	3.2	1,912.0	--	11,239.1

e Estimated.
s Computed by subdividing day.
a Computed from partly estimated concentration graph.

PAINT CREEK BASIN--Continued

PAINT CREEK AT WATERVILLE, IOWA--Continued

Suspended sediment, water year October 1955 to September 1956--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	94	2,730	s 944	8.0	65	1.4	10	157	4.2
2	39	778	s 95	11	75	2.2	8.5	132	3.0
3	40	1,910	s 260	11	93	2.8	8.0	82	1.8
4	17	940	s 46	14	93	3.5	7.4	74	1.5
5	13	235	8.3	11	63	1.9	7.0	62	1.2
6	11	176	5.2	254	8,900	sa13,000	6.6		
7	10	155	4.2	18	552	27	6.2		
8	9.1	100	2.5	13	165	5.8	5.8	53	.9
9	8.0	180	3.9	12	127	4.1	5.2		
10	6.8	--	e 2.8	11	88	2.6	4.8		
11	6.8	93		9.7	70	1.8	4.3	42	.5
12	6.8	--		8.5	61	1.4	3.6		
13	6.4	--	e 1.7	9.7	62	1.6	3.6	44	
14	5.9	--		8.5	43	1.0	3.6	36	e .4
15	5.4			8.0	40	.9	3.6	--	
16	5.4			6.8	24		3.6	68	
17	5.0	24	.3	7.4	31		3.6	55	
18	4.6			6.8	26	e .5	4.3	79	
19	4.6			6.4	--		4.0	69	
20	4.3			6.4	28		3.6	--	
21	4.3			6.4			4.0	--	e .7
22	4.3	45	.5	5.4			4.0	67	
23	4.3			5.4	27	.4	4.0	36	
24	4.3			5.4			4.0	61	
25	6.4	36	.6	5.4			4.0	57	
26	6.4			5.4			6.0	116	1.9
27	15	128	s 6.4	5.4	36	.5	6.1	140	2.3
28	8.0	197	4.3	6.4	50	.9	4.3	80	
29	9.1	162	4.0	100	5,950	s 3,400	4.3	64	.7
30	9.7	72	1.9	28	1,560	118	4.3	47	
31	--	--	--	13	370	13	--	--	--
Total	374.9	--	1,400.4	627.4	--	16,595.4	152.3	--	31.3

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	4.3	23		8.5	498	11	7.4	190	3.8
2	4.6	40		8.0	150	3.2	4.0	60	.6
3	4.0	20		7.4	93	1.9	4.0	48	.5
4	4.3	--	e 0.4	6.8	63	1.2	3.0	53	.4
5	5.0	35		76	2,800	sa 1,200	11	152	s 5.0
6	4.0	44		7.4	430	8.6	8.0	123	2.7
7	4.0			6.8	112	2.1	4.6		
8	5.9			6.8	88	1.6	4.0		
9	4.6	76	.9	6.4	82	1.4	3.6		
10	3.6			5.4	108	1.6	4.0		
11	3.2			5.0	83	1.1	4.0	48	.5
12	3.2	43	.4	4.6			3.6		
13	3.2			4.3			3.6		
14	3.0	--	e .4	4.0	52	.6	3.2		
15	3.2			3.6			3.6		
16	3.0			3.6			4.0	43	
17	3.2	43	.4	3.2	82	.7	3.6	--	
18	3.2			3.0			3.6	48	
19	3.6			3.0	59		3.6	--	
20	3.6			3.2	43		3.6	--	
21	3.6			3.2	36		3.6	--	
22	3.6	18	.2	3.2	73	e .4	3.6	47	e .5
23	3.2	56	.5	3.2	32		3.2	--	
24	5.5	160	s 4.1	3.0	--		3.6	--	
25	8.2	220	sa 5.0	3.0	--		3.6	57	
26	4.3	128	1.5	5.0	240	sa 4.4	3.6	--	
27	3.6	75	.7	3.6	--	e 1.5	3.6	--	
28	3.6	125	1.2	3.6	--	e .8	3.2	--	
29	3.6	--		5.0	--	e 3.0	3.2	35	e .3
30	4.0	50	e .5	60	1,400	sb 300	3.6	--	
31	112	4,800	sa2,700	12	--	e 20	--	--	--
Total	231.9	--	2,724.4	281.8	--	1,570.7	124.8	--	24.4

Total discharge for year (cfs-days) 4,499.7

Total load for year (tons) 33,667.9

e Estimated.

s Computed by subdividing day.

a Computed from partly estimated concentration graph.

b Computed from estimated concentration graph.

PAINT CREEK BASIN--Continued

PAINT CREEK AT WATERVILLE, IOWA--Continued

Particle-size analyses of suspended sediment, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet ; 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	
Mar. 2, 1956.....	4:40 p.m.	830	37	5,710	3,450		25		47		96	100					SPWCM
May 29.....	5:30 a.m.	24	67	1,750	2,500		67		84		99	100					SPWCM
May 29.....	1:05 p.m.	260	67	26,900	2,720		28		61		94	98	99	100			SPWCM

BLACK EARTH CREEK AT BLACK EARTH, WIS.

LOCATION.--At gaging station, 0.7 mile east of Black Earth, Dane County, 2.1 miles upstream from Vermont Creek, and 150 feet south of U. S. Highway 14.
DRAINAGE AREA.--45.9 square miles.
RECORDS AVAILABLE.--Water temperatures: February 1954 to September 1956.
Sediment records: February 1954 to September 1956.
EXTREMES, 1955-56.--Water temperatures: Maximum, 78°F June 10; minimum, freezing point on several days during November to January.
Sediment concentrations: Maximum daily, 2,010 ppm May 13; minimum daily, 1 ppm Dec. 31.
Sediment loads: Maximum daily, 1,400 tons May 13; minimum daily, 0.1 ton on several days during October, December, and January.
EXTREMES, 1954-56.--Water temperatures: Maximum, 78°F July 7, 1955, June 10, 1956; minimum, freezing point on several days during winter months each year.
Sediment concentrations: Maximum daily, 2,010 ppm May 13, 1956; minimum daily, 1 ppm Dec. 31, 1955.
Sediment loads: Maximum daily, 3,960 tons July 3, 1954; minimum daily, 0.1 ton on several days during October, December 1955, and January 1956.
REMARKS.--Flow affected by ice Nov. 28 to Dec. 1, 15-22, Jan. 21-26, Jan. 29 to Feb. 5.
Records of discharge for water year October 1955 to September 1956 given in WSP 1438.

Temperature (° F) of water, water year October 1955 to September 1956
/Once-daily measurement at about 8 a.m./

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

WISCONSIN RIVER BASIN--Continued

BLACK EARTH CREEK AT BLACK EARTH, WIS.--Continued

Suspended sediment, water year October 1955 to September 1956

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.....	22	9	0.5	26	18	1.3	21	22	1.2
2.....	22	12	.7	25	23	1.6	21	20	1.1
3.....	22	18	1.1	25	12	.8	21	15	.8
4.....	22	10	.6	25	8	.5	23	12	.7
5.....	26	10	.7	25	13	.9	22	16	1.0
6.....	26	8	.6	25	11	.7	22	15	.9
7.....	25	4	.3	24	9	.6	22	11	.6
8.....	25	4	.3	24	13	.8	22	11	.6
9.....	24	8	.5	24	13	.8	21	8	.4
10.....	23	3	.2	25	21	1.4	21	8	.4
11.....	22	3	.2	24	21	1.4	21	10	.6
12.....	22	5	.3	23	20	1.2	21	12	.7
13.....	22	2	.1	23	18	1.1	20	14	.8
14.....	22	2	.1	22	13	.8	20	10	.5
15.....	23	7	.4	24	10	.6	20	15	.8
16.....	24	3	.2	23	5	.3	20	17	.9
17.....	25	8	.5	22	3	.2	20	10	.5
18.....	24	12	a .8	23	13	.8	20	10	.5
19.....	24	12	.8	22	12	.7	20	10	.5
20.....	24	12	.8	22	18	1.1	20	7	.4
21.....	23	10	.6	22	15	.9	20	7	.4
22.....	23	8	.5	23	13	.8	20	7	.4
23.....	24	2	.1	23	16	1.0	20	10	.5
24.....	25	9	.6	22	18	1.1	25	7	.5
25.....	24	17	1.1	22	18	1.1	25	11	.7
26.....	24	20	1.3	22	19	1.1	22	7	.4
27.....	24	18	1.2	21	20	1.1	21	4	.2
28.....	24	15	1.0	21	25	a 1	21	8	.4
29.....	38	26	2.7	21	30	1.7	21	13	.7
30.....	32	8	.7	21	24	1.4	21	5	.3
31.....	29	15	1.2	--	--	--	21	1	.1
Total.	759	--	20.7	694	--	28.8	655	--	18.5

Day	January			February			March		
1.....	21	2	0.1	19	6	0.3	37	--	e 10.
2.....	21	5	.3	19	4	.2	65	--	e 20
3.....	20	5	.3	19	3	.2	44	59	s 7.4
4.....	20	2	.1	19	3	.2	29	12	.9
5.....	21	2	.1	19	6	a .3	27	12	.9
6.....	21	4	.2	19	11	.6	53	--	e 70
7.....	20	5	.3	19	7	.4	74	330	sb 95
8.....	20	2	.1	19	7	.4	29	37	2.9
9.....	20	3	.2	19	10	.5	26	34	2.4
10.....	20	3	.2	19	10	.5	26	43	3.0
11.....	20	2	.1	19	30	1.5	25	22	1.5
12.....	20	2	.1	19	27	1.4	23	21	1.3
13.....	20	2	.1	19	22	1.1	22	15	.9
14.....	20	2	.1	19	30	1.5	21	19	1.1
15.....	20	2	.1	19	23	1.2	21	28	1.6
16.....	20	3	.2	19	22	1.1	22	25	1.5
17.....	20	3	.2	20	43	2.3	23	20	1.2
18.....	20	2	.1	19	23	1.2	25	15	1.0
19.....	20	2	.1	19	18	.9	35	--	e 9
20.....	20	2	.1	19	23	1.2	69	--	e 30
21.....	20	2	.1	19	25	1.3	49	100	sb 16
22.....	20	3	a .2	19	30	1.5	41	--	e 10
23.....	20	4	.2	19	15	.8	36	70	sb 8
24.....	20	5	.3	62	--	e 25	26	15	1.0
25.....	20	3	.2	70	110	b 20	34	--	e 9
26.....	20	3	.2	41	--	e 10	141	508	s 284
27.....	20	7	.4	38	60	b 6	60	201	s 41
28.....	20	5	.3	26	16	1.1	116	--	e 170
29.....	19	5	.2	25	18	1.2	58	--	e 55
30.....	19	5	.2	--	--	--	31	42	3.5
31.....	19	8	.4	--	--	--	38	--	e 12
Total.	621	--	5.8	700	--	83.9	1,326	--	871.1

e Estimated.
s Computed by subdividing day.
a Computed from estimated concentration graph.
b Computed from partly estimated concentration graph.

WISCONSIN RIVER BASIN--Continued

BLACK EARTH CREEK AT BLACK EARTH, WIS.--Continued

Suspended sediment, water year October 1955 to September 1956--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	39	137	14	28	42	3.2	25	27	1.8
2	40	80	8.6	26	28	2.0	25	38	2.6
3	38	38	3.9	25	30	2.0	24	30	1.9
4	32	38	3.3	26	52	3.6	23	28	1.7
5	28	27	2.0	25	38	2.6	23	20	1.2
6	28	25	1.9	59	354	s 71	23	8	.5
7	29	18	1.4	32	66	5.7	23	25	1.6
8	28	16	1.2	27	45	3.3	22	18	1.1
9	25	18	1.2	27	48	3.5	22	25	1.5
10	25	25	1.7	28	40	3.0	23	21	1.3
11	25	20	1.4	29	138	11	22	28	1.7
12	25	20	1.4	105	1,750	s 831	22	22	1.3
13	25	18	1.2	194	2,010	s 1,400	22	19	1.1
14	25	26	1.8	52	198	s 30	21	42	2.4
15	25	12	.8	40	80	8.6	21	31	1.8
16	25	10	.7	37	45	4.5	22	32	1.9
17	24	7	.4	37	36	3.6	43	--	e 150
18	23	11	.7	33	46	4.1	43	--	e 85
19	22	35	2.1	54	102	15	24	57	3.7
20	25	35	sb 2	41	100	11	22	67	4.0
21	22	31	1.8	32	57	4.9	28	185	14
22	22	20	1.2	29	25	2.0	39	--	e 25
23	22	16	1.0	28	53	4.0	25	97	6.5
24	22	15	.9	28	65	4.9	22	92	5.5
25	22	28	1.7	27	63	4.6	21	108	6.1
26	22	35	2.1	26	61	4.3	22	115	6.8
27	49	--	e 140	26	52	3.6	21	109	6.2
28	62	1,400	sb 280	27	66	4.8	20	67	3.6
29	68	320	sb 65	28	67	5.1	20	70	3.8
30	38	70	7.2	26	66	4.6	20	82	4.4
31	--	--	--	25	42	2.8	--	--	--
Total	905	--	552.6	1,227	--	2,464.3	733	--	350.0

Day	July			August			September		
1	20	65	3.5	20	32	1.7	24	32	2.1
2	20	73	3.9	19	25	1.3	20	10	.5
3	20	56	3.0	19	25	1.3	19	24	1.2
4	20	54	2.9	19	27	1.4	18	8	.4
5	20	52	2.8	19	35	1.8	28	15	1.1
6	20	55	3.0	19	47	2.4	25	10	.7
7	20	56	3.0	19	27	1.4	20	14	.8
8	27	56	4.1	19	27	1.4	20	26	1.4
9	23	51	3.2	19	34	1.7	19	20	1.0
10	21	55	3.1	19	40	2.0	19	13	.7
11	20	57	3.1	20	46	2.5	19	5	.2
12	20	62	3.3	21	--	e 3	19	9	.5
13	20	57	3.1	22	55	3.3	19	10	.5
14	20	56	3.0	19	25	1.3	19	12	.6
15	20	52	2.8	18	34	1.6	19	11	.6
16	20	50	2.7	18	35	1.7	20	17	.9
17	20	50	2.7	18	30	1.4	19	10	.5
18	20	45	2.4	19	30	1.5	19	9	.5
19	40	203	s 40	19	21	1.1	19	10	.5
20	48	426	s 67	19	18	.9	19	7	.4
21	23	68	4.2	19	28	1.4	19	33	1.7
22	22	48	2.8	20	34	1.8	19	30	1.5
23	21	68	3.8	19	52	2.7	19	22	1.1
24	20	57	3.1	19	35	1.8	19	25	1.3
25	20	52	2.8	19	20	1.0	19	32	1.6
26	20	45	2.4	19	25	1.3	18	34	1.6
27	19	33	1.7	18	23	1.1	18	18	.9
28	19	43	2.2	18	30	1.4	19	15	.8
29	20	28	1.5	20	27	1.4	19	30	a 2
30	20	28	1.5	23	23	1.4	19	63	3.2
31	27	40	2.9	36	48	4.7	--	--	--
Total	690	--	191.5	614	--	54.7	591	--	30.8

Total discharge for year (cfs-days) 9,515
Total load for year (tons) 4,672.7

e Estimated.
s Computed by subdividing day.
a Computed from estimated concentration graph.
b Computed from partly estimated concentration graph.

WISCONSIN RIVER BASIN--Continued

BLACK EARTH CREEK AT BLACK EARTH, WIS.--Continued

Particle-size analyses of suspended sediment, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; 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	
Mar. 26, 1956	5:40 p.m.	266		1,280	1,560	34	41	57	79	95	99	100					SBWCM
Apr. 28	10:00 a.m.	47		1,600	1,400	65	81	93	98	99	99	100					SBWCM
May 6	9:50 a.m.	103		792	1,380	57	68	81	91	97	99	100					SBWCM
May 12	4:30 p.m.	273		4,440	3,640	60	75	85	94	99	99	100					SBWCM
May 13	7:50 a.m.	406		3,970	3,260	61	72	84	95	99	99	100					SBWCM
May 13	7:50 a.m.	406		3,970	3,630	39	51	73	92	99	100	--					SBNM
June 17	8:35 a.m.	37		1,100	682	78	86	97	98	99	99	100					SBWCM
June 21	10:40 a.m.	28		492	658	77	84	96	98	100	--	--					BWCM
July 19	5:30 p.m.	83		610	976	48	62	77	90	98	100	--					SBWCM
July 20	7:10 a.m.	61		611	699	74	85	93	96	99	100	--					SBWCM

ROCK RIVER AT AFTON, WIS.

LOCATION.--Temperature recorder at gaging station on right bank, 20 feet downstream from highway bridge in Afton, Rock County, and 0.8 mile upstream from Bass Creek.
DRAINAGE AREA.--3,300 square miles, approximately.
RECORDS AVAILABLE.--Water temperatures: September 1954 to September 1956.
EXTREMES, 1955-56.--Water temperatures: Maximum, 84°F June 13-14, 20-21, 23-24; minimum, freezing point on many days during December to February.
EXTREMES, 1954-56.--Water temperatures: Maximum, 89°F July 27-30, Aug. 4, 1955; minimum, freezing point on many days during winter months each year.
REMARKS.--Records of discharge for water year October 1955 to September 1956 given in WSP 1438.

Temperature (° F) of water, water year October 1955 to September 1956
/Recorder with temperature attachment, continuous ethyl alcohol-actuated thermograph/

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

ROCK RIVER BASIN--Continued

YELLOWSTONE RIVER NEAR BLANCHARDVILLE, WIS.

LOCATION.--At gaging station 0.6 mile upstream from bridge on County Road F, 2.7 miles upstream from Yellowstone Lake Dam, 7 miles southwest of Blanchardville, Lafayette County, and about 9 miles upstream from mouth.
DRAINAGE AREA.--29.1 square miles.
RECORDS AVAILABLE.--Water temperatures: August 1954 to September 1956.
Sediment records: August 1954 to September 1956.
EXTREMES, 1955-56.--Water temperatures: Maximum, 87°F June 17; minimum, freezing point on many days during November to February.
Sediment concentrations: Maximum daily, 927 ppm Feb. 24; minimum daily, 1 ppm Oct. 20-25, Dec. 29-30.
Sediment loads: Maximum daily, 508 tons Feb. 24; minimum daily, less than 0.050 ton on many days during October to March and May.
EXTREMES, 1954-56.--Water temperatures: Maximum, 89°F July 27, 1955; minimum, freezing point on many days during winter months each year.
Sediment concentrations: Maximum daily, 1,190 ppm Mar. 3, 1955; minimum daily, 1 ppm on several days each year.
Sediment loads: Maximum daily, 1,020 tons Mar. 1, 1955; minimum daily, less than 0.050 ton on many days each year.
REMARKS.--Flow affected by ice Nov. 25-26, Dec. 7-8, 14-24, 31, Jan. 1, Jan. 4 to Feb. 28. Records of discharge for water year October 1955 to September 1956 given in WSP 1438.

Temperature (° F) of water, water year October 1955 to September 1956
/Once-daily measurement at varying hours/

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

ROCK RIVER BASIN--Continued

YELLOWSTONE RIVER NEAR BLANCHARDVILLE, WIS.--Continued

Suspended sediment, water year October 1955 to September 1956

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	7.0	11	0.2	7.5	8	0.2	5.8	5	0.1
2	7.0	13	.2	7.2	5	.1	6.4	7	.1
3	7.0	11	.2	7.0	4	.1	7.0	7	.1
4	7.0	8	.2	7.0	7	.1	7.0	6	.1
5	11.0	12	.4	7.2	4	.1	6.1	3	(t)
6	8.8	7	.2	7.2	8	.2	5.8	6	.1
7	7.8	10	.2	7.0	17	.3	6	5	.1
8	7.2	10	.2	7.2	14	.3	6	3	(t)
9	6.4	8	.1	7.2	13	.2	5.6	6	.1
10	6.4	7	.1	7.2	12	.2	5.3	7	.1
11	6.1	4	.1	7.2	17	.3	5.0	3	(t)
12	6.4	3	.1	7.0	23	.4	5.0	12	.2
13	6.1	2	(t)	7.0	26	.5	5.8	8	.1
14	6.1	3	(t)	6.7	22	.4	6	5	.1
15	6.4	4	.1	7.0	15	.3	5	6	.1
16	6.4	3	.1	6.1	22	.4	5	7	.1
17	7.0	5	.1	6.1	19	.3	5	12	.2
18	7.0	6	.1	6.7	25	.4	5	11	.1
19	7.2	3	.1	6.7	21	.4	5	8	.1
20	7.2	1	(t)	6.7	16	.3	5	8	.1
21	7.2	1	(t)	6.7	10	.2	5	12	.2
22	7.2	1	(t)	7.0	13	.2	5	5	.1
23	7.8	1	(t)	6.7	12	.2	7	2	(t)
24	8.4	1	(t)	5.8	3	(t)	9	2	(t)
25	7.8	1	(t)	6	2	(t)	11.0	2	.1
26	7.8	2	(t)	6	4	.1	8.1	2	(t)
27	7.5	8	.2	5.6	3	(t)	7.0	2	(t)
28	8.4	10	.2	5.3	3	(t)	6.7	2	(t)
29	16.2	15	a .6	5.8	4	.1	6.1	1	(t)
30	10.4	5	.1	5.8	4	.1	5.8	1	(t)
31	8.4	8	.2	--	--	--	6	2	(t)
Total	238.6	--	4.2	199.6	--	6.6	189.5	--	2.7

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	6	2	(t)	6	8	0.1	108	530	s 319
2	6.7	3	0.1	6	13	.2	35	247	s 38
3	6.1	9	.1	6	14	.2	13.5	59	2.2
4	5	13	.2	6	20	.3	12.4	20	.7
5	5	15	b .2	6	8	.1	11.4	11	.3
6	5	16	.2	6	17	.3	13.2	71	s 3.4
7	5			6	12	.2	11.4	21	.6
8	5			6	3	(t)	8.1	10	.2
9	5			6	2	(t)	7.8	7	.1
10	5	--	e .2	7	2	(t)	8.1	5	.1
11	5			7	4	.1	7.2	7	.1
12	5	13	.2	7	3	.1	6.7	3	.1
13	5	15	.2	7	6	.1	7.0	2	(t)
14	5	12	.2	6	5	.1	7.0	2	(t)
15	5	8	.1	6	6	.1	6.7	10	.2
16	5	8	.1	6	7	.1	6.7	12	.2
17	5	8	.1	6	5	.1	6.7	16	.3
18	5	10	.1	6	5	.1	6.7	18	.3
19	5	13	.2	5	5	.1	6.1	12	.2
20	5	10	.1	5	4	.1	6.1	13	.2
21	5	13	.2	5	3	(t)	6.4	10	.2
22	5	12	.2	5	3	(t)	6.4	7	.1
23	5	13	.2	5	3	(t)	6.4	8	.1
24	5	16	.2	133	927	s 508	5.8	7	.1
25	5	5	.1	82	160	s 63	6.1	18	.3
26	5	6	.1	100	287	s 211	6.4	18	.3
27	5	8	b .1	25	106	s 10	7.0	15	.3
28	6	8	b .1	9	44	1.1	14.2	35	ss 2
29	6	9	.1	66	200	s 106	8.8	17	.4
30	6	13	.2	--	--	--	7.2	14	.3
31	6	9	.1	--	--	--	7.0	13	.2
Total	162.8	--	4.7	552	--	901.7	377.5	--	370.6

e Estimated.
s Computed by subdividing day.
t Less than 0.050 ton.
a Computed from estimated concentration graph.
b Computed from partly estimated concentration graph.

ROCK RIVER BASIN--Continued

YELLOWSTONE RIVER NEAR BLANCHARDVILLE, WIS.--Continued

Suspended sediment, water year October 1955 to September 1956--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	7.2	18	0.3	9.7	18	0.5	7.0	27	0.5
2	10.4	24	.7	8.4	23	.5	6.7	28	.5
3	9.7	20	.5	8.4	24	.5	6.4	23	.4
4	7.5	22	.4	9.7	19	.5	6.1	13	.2
5	7.2	18	.3	10.4	15	.4	5.8	12	.2
6	7.0	12	.2	11.7	15	.5	5.8	18	.3
7	7.5	10	.2	9.4	15	.4	5.8	12	.2
8	7.0	10	.2	8.1	15	.3	5.8	8	.1
9	7.0	10	.2	9.4	23	.6	5.6	8	.1
10	6.4	11	.2	10.0	11	.3	5.3	6	.1
11	6.4	12	.2	9.7	8	.2	5.3	10	.1
12	6.1	15	.2	8.4	13	.3	5.3	8	.1
13	5.8	12	.2	8.4	13	.3	5.0	5	.1
14	5.8	10	.2	7.2	9	.2	4.8	9	.1
15	5.8	16	.2	7.0	6	.1	5.0	8	.1
16	5.8	14	.2	7.0	9	.2	5.8	7	.1
17	5.8	13	.2	7.2	8	.2	7.0	9	.2
18	5.6	15	.2	6.1	4	.1	5.6	10	.2
19	5.3	16	.2	5.8	5	.1	5.6	12	.2
20	5.3	14	.2	5.8	7	.1	5.0	10	.1
21	5.3	10	.1	5.8	3	(t)	7.2	41	.1
22	5.3	8	.1	5.8	2	(t)	8.8	43	.1
23	5.3	10	.1	5.6	4	.1	5.0	11	.1
24	5.6	8	.1	5.3	5	.1	4.4	14	.2
25	5.8	5	.1	5.6	5	.1	4.0	12	.1
26	5.8	7	.1	5.6	4	.1	4.8	10	.1
27	18.2	121	s 7.1	6.7	3	.1	4.8	7	.1
28	18.6	141	7.1	8.4	44	s 2.0	4.0	12	.1
29	21	126	s 7.9	18.6	257	13	4.0	9	.1
30	12.4	30	1.0	9.4	45	1.1	4.0	7	.1
31	--	--	--	7.5	22	.4	--	--	--
Total	237.9	--	28.9	252.1	--	23.4	165.7	--	5.0

Day	July			August			September		
1	4.0	6	0.1	5.0	22	0.3	5.6	37	0.6
2	4.0	5	.1	4.2	16	.2	4.4	24	.3
3	4.0	8	.1	4.2	22	.2	4.4	23	.3
4	4.2	21	.2	4.2	23	.3	6.1	27	.4
5	4.2	22	.2	4.2	26	.3	11.4	30	.9
6	4.2	21	.2	3.8	18	.2	7.2	22	.4
7	4.6	20	.2	3.6	9	.1	5.3	19	.3
8	11.0	--	e 2	3.8	12	.1	4.8	27	.3
9	5.0	9	.1	3.8	13	.1	4.6	31	.4
10	4.6	8	.1	3.6	8	.1	4.8	27	.3
11	4.4	9	.1	10.0	--	e 2	4.6	20	.2
12	4.4	12	.1	5.3	20	.3	4.4	23	.3
13	4.2	15	.2	4.8	17	.2	4.6	23	.3
14	4.0	13	.1	4.2	9	.1	4.6	18	.2
15	4.0	11	.1	3.8	13	.1	4.8	14	.2
16	3.8	10	.1	3.8	13	.1	4.8	15	.2
17	3.8	9	.1	4.0	12	.1	4.6	17	.2
18	4.0	13	.1	4.4	17	.2	4.6	18	.2
19	4.4	22	.3	4.4	14	.2	4.6	17	.2
20	5.3	24	.3	4.0	22	.2	4.6	9	.1
21	5.6	21	.3	4.0	26	.3	4.8	15	.2
22	4.6	23	.3	4.0	21	.2	4.8	13	.2
23	4.4	25	.3	4.0	13	.1	4.8	10	.1
24	4.0	22	.2	4.0	8	.1	4.6	10	.1
25	3.8	15	.2	4.0	11	.1	4.6	39	.5
26	3.6	12	.1	5.0	12	.2	4.8	60	.8
27	3.6	13	.1	4.6	9	.1	4.8	21	.3
28	3.6	16	.2	4.2	8	.1	5.0	10	.1
29	3.4	22	.2	5.6	14	.2	5.6	13	.2
30	3.6	25	.2	16.4	166	s 16	5.3	14	.2
31	7.5	32	.6	26	318	s 42	--	--	--
Total	139.8	--	7.5	170.9	--	64.8	153.9	--	9.0

Total discharge for year (cfs-days) 2,840.3

Total load for year (tons) 1,429.1

e Estimated.

s Computed by subdividing day.

t Less than 0.050 ton.

YELLOWSTONE RIVER NEAR BLANCHARDVILLE, WIS.--Continued

Particle-size analyses of suspended sediment, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; 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	
Feb. 24, 1956....	2:25 p.m.	317		2,730	3,700	27	32	42	60	92	99	100					SBWCM
Feb. 24.....	9:15 p.m.	182		560	616	29	43	54	73	95	100	--					SBWCM
Feb. 26.....	6:20 p.m.	379		1,390	1,840	27	36	46	63	90	99	100					SBWCM
May 28.....	9:50 p.m.	24		226	374	69	84	95	99	99	99	100					SBWCM
May 29.....	9:30 a.m.	38		287	532	54	70	80	92	98	100	--					SBWCM
Aug. 30	9:55 p.m.	40		493	806	49	61	72	84	97	100	--					SBWCM
Aug. 31	12:25 a.m.	80		1,380	1,120	42	52	63	79	94	99	100					SBWCM
Aug. 31	12:25 a.m.	80		1,380	1,170	17	29	50	70	93	99	100					SBNM

ROCK RIVER BASIN--Continued

MOUNT VERNON CREEK NEAR MOUNT VERNON, WIS.

LOCATION.--At gaging station at bridge on State Highway 92, 0.9 mile upstream from West Branch Sugar River and 2.5 miles southeast of Mount Vernon, Dane County.
DRAINAGE AREA.--16.1 square miles.
RECORDS AVAILABLE.--Water temperatures: January 1954 to September 1956.
Sediment records: January 1954 to September 1956.
EXTREMES, 1955-56.--Water temperatures: Maximum, 74°F June 13; minimum, freezing point Dec. 19-20.
Sediment concentrations: Maximum daily, 614 ppm Feb. 24; minimum daily, 5 ppm May 20,25.
Sediment loads: Maximum daily, 196 tons Feb. 24; minimum daily, 0.2 ton May 20, 24-25, July 18.
EXTREMES, 1954-56.--Water temperatures: Maximum, 75°F July 14, 1955; minimum, freezing point on several days during winter months.
Sediment concentrations: Maximum daily, 2,010 ppm Apr. 7, 1954; minimum daily, 1 ppm Sept. 20, 1955.
Sediment loads: Maximum daily, 498 tons Apr. 7, 1954; minimum daily, less than 0.050 ton Sept. 20, 1955.
REMARKS.--Flow affected by ice Nov. 17, 27-28, Dec. 6, 15-16, 19-20, 30, Jan. 21-24, 31, Feb. 4, 22. Records of discharge for water year October 1955 to September 1956 given in WSP 1438.

Temperature (° F) of water, water year October 1955 to September 1956
/Once-daily measurement at varying hours/

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

ROCK RIVER BASIN--Continued

MOUNT VERNON CREEK NEAR MOUNT VERNON, WIS.--Continued

Suspended sediment, water year October 1955 to September 1956

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	14	9	0.3	14	20	0.8	13	12	0.4
2	14	17	.6	14	19	.7	13	10	.4
3	14	15	a .6	14	13	.5	14	8	.3
4	14	11	.4	14	10	.4	15	17	.7
5	16	11	.5	14	10	.4	13	20	.7
6	15	13	.5	14	8	.3	13	18	.6
7	15	11	.4	13	10	.4	13	31	1.1
8	15	14	.6	13	12	.4	13	42	1.5
9	15	13	.5	13	11	.4	12	37	1.2
10	15	18	.7	14	14	.5	12	29	.9
11	14	12	.4	14	10	.4	12	26	.8
12	15	8	.3	13	9	.3	13	30	1.0
13	14	12	.4	13	10	.4	12	40	1.3
14	15	11	.4	13	15	.5	12	50	1.6
15	15	10	.4	13	19	.7	12	53	1.7
16	15	16	.6	14	16	.6	12	50	1.6
17	15	12	.5	13	22	.8	13	52	1.8
18	15	11	.4	13	15	.5	13	51	1.8
19	15	14	.6	13	13	.4	13	43	1.5
20	15	13	.5	13	12	.4	13	40	1.4
21	15	9	.4	13	11	.4	13	45	1.6
22	15	10	.4	14	13	.5	13	49	1.7
23	15	11	.4	14	14	.5	13	45	1.6
24	16	11	.5	13	14	.5	15	33	1.3
25	15	16	.6	13	15	.5	15	19	.8
26	15	12	.5	13	15	.5	13	20	.7
27	15	8	.3	13	27	.9	13	18	.6
28	16	10	a .4	13	37	1.3	13	14	.5
29	19	22	1.1	13	29	1.0	13	21	.7
30	16	15	.6	13	22	.8	13	20	.7
31	15	21	.8	--	--	--	13	18	a .6
Total	467	--	15.6	401	--	16.7	403	--	33.1
	January			February			March		
1	13	16	0.6	13	18	0.6	25	--	e 20
2	13	10	.4	13	20	.7	20	82	s 5.3
3	13	12	.4	13	25	.9	16	72	3.1
4	13	14	.5	13	28	1.0	14	41	1.5
5	13	20	.7	13	30	1.0	15	45	1.8
6	13	19	.7	13	28	1.0	34	320	sb 60
7	12	19	.6	13	42	1.5	29	250	sb 25
8	12	22	.7	13	35	1.2	15	98	4.0
9	13	25	.9	14	30	1.1	17	90	sb 4
10	13	41	1.4	16	30	1.3	18	110	sb 6
11	12	15	.5	15	28	1.1	14	38	1.4
12	12	23	.7	14	26	1.0	13	46	1.6
13	12	32	1.0	14	26	1.0	13	52	1.8
14	13	21	.7	14	19	.7	13	47	1.6
15	13	17	.6	13	18	.6	13	45	1.6
16	13	22	.8	13	25	.9	13	51	1.8
17	12	22	.7	13	26	.9	15	55	2.2
18	12	22	.7	13	23	.8	15	78	3.2
19	13	24	.8	13	23	.8	13	57	2.0
20	13	25	.9	13	30	1.0	14	55	2.1
21	13	23	.8	13	28	1.0	13	47	1.6
22	13	25	.9	13	27	.9	13	40	1.4
23	13	22	.8	13	25	.9	13	41	1.4
24	13	16	.6	74	614	s 196	12	42	1.4
25	13	16	.6	56	--	e 60	24	--	e 25
26	13	17	.6	32	--	e 20	26	340	sb 30
27	13	18	.6	19	--	e 5	16	105	4.5
28	13	19	.7	13	28	1.0	32	220	sb 20
29	13	17	.6	15	29	1.2	17	81	3.7
30	13	14	.5	--	--	--	14	47	1.8
31	13	15	.5	--	--	--	14	37	1.4
Total	396	--	21.5	517	--	305.1	533	--	242.2

e Estimated.
s Computed by subdividing day.
a Computed from estimated concentration graph.
b Computed from partly estimated concentration graph.

ROCK RIVER BASIN--Continued

MOUNT VERNON CREEK NEAR MOUNT VERNON, WIS.--Continued

Suspended sediment, water year October 1955 to September 1956--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	14	53	2.0	17	25	1.1	14	26	1.0
2	17	82	3.8	16	27	1.2	14	28	1.0
3	18	83	4.0	16	25	1.1	14	33	1.2
4	16	75	3.2	16	22	1.0	14	40	1.5
5	14	72	2.7	16	20	.9	14	45	a 2
6	14	55	2.1	17	23	1.0	14	38	1.4
7	16	36	1.6	15	23	.9	14	33	1.2
8	14	21	.8	14	25	.9	14	34	1.3
9	14	24	.9	14	22	.8	14	23	.9
10	13	37	1.3	16	34	1.5	14	21	.8
11	13	36	1.3	16	33	1.4	14	24	.9
12	13	37	1.3	14	25	.9	14	36	1.4
13	12	45	1.4	14	30	1.1	14	34	1.3
14	12	38	1.2	13	22	.8	13	48	1.7
15	12	23	.7	13	15	.5	13	55	1.9
16	12	21	.7	13	22	.8	14	51	1.9
17	12	18	.6	14	16	.6	13	47	1.6
18	12	20	.6	13	14	.5	13	48	1.7
19	12	27	.9	13	11	.4	14	52	2.0
20	12	23	.7	13	5	.2	13	54	1.9
21	12	20	.6	13	8	.3	12	40	1.3
22	12	17	.6	13	11	.4	13	41	1.4
23	12	15	.5	14	12	.4	12	29	.9
24	12	18	.6	14	6	.2	12	17	.6
25	12	20	.6	14	5	.2	12	14	.4
26	12	15	.5	14	10	.4	13	88	3.1
27	22	116	s 7.5	14	8	.3	13	19	.7
28	30	152	12	14	16	.6	12	20	.6
29	31	151	s 14	17	38	1.7	13	17	.6
30	20	50	2.7	16	20	.9	13	10	.6
31	--	--	--	14	28	1.0	--	--	--
Total	447	--	71.4	450	--	24.0	400	--	38.8

	July			August			September		
1	13	9	0.3	11	20	0.6	16	31	1.3
2	13	11	.4	11	13	.4	13	44	1.5
3	13	19	.7	10	20	.5	12	62	2.0
4	13	30	1.0	10	16	.4	12	39	1.3
5	13	33	1.2	11	12	.4	25	100	sb 8
6	13	30	1.0	11	13	.4	17	30	1.4
7	13	27	.9	10	16	.4	15	18	.7
8	13	24	.8	11	12	.4	14	32	1.2
9	12	24	.8	11	21	.6	14	21	.8
10	11	15	.4	11	16	.5	14	24	.9
11	11	15	.4	16	92	s 4.2	14	36	1.4
12	11	25	.7	27	241	s 38	14	36	1.4
13	11	20	.6	61	234	s 58	13	34	1.2
14	10	20	.5	16	35	1.5	13	29	1.0
15	10	20	.5	14	26	1.0	13	23	.8
16	10	17	.4	13	34	1.2	13	20	.7
17	10	11	.3	13	34	1.2	13	18	.6
18	9.5	9	.2	13	25	.9	13	19	.7
19	11	--	e 2	12	17	.6	13	25	.9
20	13	--	e 5	12	14	.4	13	16	.6
21	11	31	.9	12	16	.5	13	15	.5
22	10	23	.6	12	18	.6	13	26	.9
23	10	22	.6	12	19	.6	12	25	.8
24	10	17	.4	12	19	.6	12	16	.5
25	10	26	.7	12	19	.6	12	27	.9
26	9.8	27	.7	12	19	.6	12	16	.5
27	9.8	21	.6	12	17	.6	12	13	.4
28	9.5	27	.7	12	11	.4	12	14	.4
29	9.5	23	.6	40	228	s 43	12	30	1.0
30	9.5	12	.3	59	303	s 65	12	12	.4
31	12	28	.9	59	120	s 27	--	--	--
Total	344.6	--	25.1	558	--	251.1	406	--	34.7

Total discharge for year (cfs-days) 5,322.6
Total load for year (tons) 1,079.3

e Estimated.
s Computed by subdividing day.
a Computed from estimated concentration graph.
b Computed from partly estimated concentration graph.

ROCK RIVER BASIN--Continued

MOUNT VERNON CREEK NEAR MOUNT VERNON, WIS.--Continued

Particle-size analyses of suspended sediment, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet ; 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	
Mar. 26, 1956....	8:20 a.m.	19		327	535	73	74	88	95	98	99	99	100				SBWCM
Aug. 12.....	8:20 p.m.	79		1,310	2,010	42	55	67	83	97	99	99	100				SBWCM
Aug. 13.....	5:55 a.m.	86		397	614	83	93	95	96	98	99	100	--				SBWCM
Aug. 13.....	9:30 a.m.	59		260	403	66	78	82	88	92	94	95	97		100		SBWCM
Aug. 29.....	7:35 a.m.	49		698	1,080	34	39	50	72	88	98	98	100				SBWCM
Aug. 29.....	8:45 a.m.	99		1,040	1,350	41	53	63	78	90	98	99	100				SBWCM
Aug. 30.....	11:05 a.m.	30		945	1,390	40	49	64	84	97	98	99	100				SBWCM
Aug. 30.....	6:55 p.m.	122		291	555	58	69	77	84	92	96	98	100				SBWCM

IOWA RIVER BASIN

IOWA RIVER AT IOWA CITY, IOWA

LOCATION.--At Benton Street Bridge at Iowa City, Johnson County, 0.5 mile downstream from gaging station, 0.4 mile upstream from Ralston Creek, and 3.8 miles downstream from Clear Creek.
DRAINAGE AREA.--3,271 square miles (revised).
RECORDS AVAILABLE.--Chemical analyses: September 1906 to September 1907, January 1944 to September 1954.
Water temperatures: January 1944 to September 1956.
Sediment records: October 1943 to September 1956.
EXTREMES, 1955-56.--Water temperatures: Maximum, 89°F June 20; minimum, freezing point Jan. 22.
Sediment concentrations: Maximum daily, 1,420 ppm May 16; minimum daily, not determined.
Sediment loads: Maximum daily, 7,480 tons Aug. 31; minimum daily, not determined.
EXTREMES, 1943-56.--Water temperatures (1944-56): Maximum, 89°F July 4, 1949, June 20, 1956; minimum, freezing point on many days during winter months.
Sediment concentrations: Maximum daily, 7,600 ppm June 13, 1953; minimum daily, 4 ppm Feb. 10-22, 1945, Feb. 5, 1947.
Sediment loads: Maximum daily, 177,000 tons May 23, 1944; minimum daily, 2 tons Jan. 28, Feb. 2-8, 10, 1951.
REMARKS.--Records of discharge for water year October 1955 to September 1956 given in WSP 1438.

Temperature (° F) of water, water year October 1955 to September 1956
/Once-daily measurement between 7 a.m. and 10 a.m. October to April and after 4 p.m. May to September/

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

a Measurement between 11 a.m. and 3 p.m.

IOWA RIVER BASIN--Continued

IOWA RIVER AT IOWA CITY, IOWA--Continued

Suspended sediment, water year October 1955 to September 1956

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	263	70	50	148			65		
2	112	128	39	145			65		
3	254	130	89	126	46	17	62	46	8
4	101	90	26	128			62		
5	115			124			65		
6	126			126			70		
7	130			124			79		
8	128	62	21	126	48	16	78	51	10
9	114			118			76		
10	124			115			73		
11	152	59	24	114			70		
12	414	67	75	110			72		
13	380	53	54	112	57	17	70	64	12
14	324	58	51	108			68		
15	191	57	29	110			65		
16	346	63	59	112			65		
17	284	65	50	103			62		
18	142	55	21	78	66	15	61	94	16
19	214	60	35	60			60		
20	200	53	29	60			60		
21	192	--	e 30	80			58		
22	178	72	35	190			58		
23	159	72	31	88	71	21	58	63	10
24	163			90			58		
25	161			105			58		
26	140	60	24	112	--	e 16	58	77	12
27	144			112	--	e 14	58		
28	159			91	48	10	61		
29	150			75			62		
30	148			66			61		
31	156			--	--	--	63		
Total	5,864	--	1,064	3,256	--	490	2,001	--	352
	January			February			March		
1	62	56	10	47	83	11	343	38	35
2	61			48			378	44	45
3	65			48			355	35	34
4	73			47			265	31	22
5	72			48			482	30	39
6	70	67	12	50	77	9	503	22	30
7	68			38			407	28	31
8	69			44			160	24	10
9	69			56			208	30	17
10	65			32			322	29	25
11	63	55	9	51	75	14	290	21	13
12	62			51			213		
13	61			63			201		
14	53			91			240		
15	53			96			213		
16	63	40	7	98	33	7	204	16	11
17	66			82			266		
18	66			66			252		
19	66			68			292		
20	63			79			285		
21	60	64	10	91	15	4	241	28	22
22	61			82			180		
23	58			88	33	8	312		
24	54			544	95	sa 200	277		
25	47			800	240	sa 550	450		
26	50	60	8	426	160	sa 190	518	41	57
27	51			539	203	295	464	61	80
28	50			296	131	105	472	80	102
29	44			335	60	54	495	83	111
30	45			--	--	--	485	64	84
31	45			--	--	--	495	50	67
Total	1,855	--	288	4,404	--	1,615	10,288	--	1,019

e Estimated.
s Computed by subdividing day.
a Computed from partly estimated concentration graph.

IOWA RIVER BASIN--Continued

IOWA RIVER AT IOWA CITY, IOWA--Continued

Suspended sediment, water year October 1955 to September 1956--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.....	525	50	71	256	270	187	446	139	167
2.....	703	82	156	320	232	200	512	141	195
3.....	702	110	208	326	163	143	381	178	183
4.....	1,020	240	sa 700	384	143	148	258	225	157
5.....	972	268	703	364	132	130	394	217	231
6.....	706	700	1,330	433	137	137	190	210	108
7.....	590	623	992	392	167	167	249	170	114
8.....	458	261	323	270	95	69	328	125	111
9.....	482	200	261	732	260	sa 600	210	105	60
10.....	434	153	179	686	308	570	184	70	35
11.....	327	118	104	522	314	443	231	72	45
12.....	434	141	165	534	143	206	178	130	62
13.....	166	132	59	508	128	176	179	125	60
14.....	330	135	120	454	103	126	211	110	63
15.....	291	150	118	1,120	183	s 701	181	91	44
16.....	306	141	117	1,760	1,420	6,750	168	80	36
17.....	268	157	114	1,160	1,090	3,410	170	95	44
18.....	250	158	107	834	810	1,820	122	102	34
19.....	240	129	84	656	551	976	132	82	39
20.....	222	118	71	570	333	512	368	85	84
21.....	236	135	86	518	223	312	222	107	64
22.....	238	132	85	412	150	167	131	95	34
23.....	177	141	67	338	160	146	118	82	26
24.....	156	153	64	316	160	137	120	92	30
25.....	175	118	56	282	142	108	129	106	37
26.....	224	136	82	355	126	121	244	80	53
27.....	352	140	133	334	129	116	90	59	14
28.....	364	158	155	291	121	95	76	53	11
29.....	414	205	229	326	106	93	176	89	42
30.....	300	240	194	307	94	78	90	71	17
31.....	--	--	--	334	126	74	--	--	--
Total.	12,062	--	7,133	16,094	--	18,918	6,488	--	2,200
	July			August			September		
1.....	78			1,690	1,050	4,780	910	505	1,240
2.....	78			1,550	725	3,030	486	366	480
3.....	84	83	19	1,790	1,050	5,070	639	284	490
4.....	78			1,330	782	2,810	488	289	381
5.....	80			777	535	1,120	364	320	315
6.....	198	103	55	446	411	495	404	210	229
7.....	152	210	210	396	357	382	376	192	195
8.....	202	220	220	274	282	209	450	204	248
9.....	462	160	160	265	203	145	472	215	274
10.....	174	122	122	260	143	100	522	187	264
11.....	179	175	85	239	132	85	576	234	364
12.....	76	455	93	412	180	sb 300	485	242	317
13.....	185	435	217	1,140	850	sa 2,700	434	165	193
14.....	74	253	51	732	443	876	331	155	139
15.....	140	190	72	657	308	546	258	120	84
16.....	75	123	25	781	542	1,140	274	128	95
17.....	150	83	34	984	587	1,560	303	144	118
18.....	392	120	s 238	1,260	653	2,220	187	99	50
19.....	766	700	sa 1,900	854	550	1,270	230	87	54
20.....	588	753	1,200	586	360	570	180	75	36
21.....	382	595	614	384	242	251	165	92	41
22.....	397	210	225	316	227	194	168	68	31
23.....	339	203	186	260	163	114	145	64	25
24.....	176	357	170	226	100	61	158	78	33
25.....	135	268	98	253	103	70	156	56	24
26.....	235	260	165	182	104	51	167	63	28
27.....	85	278	64	182	94	46	88	71	17
28.....	77	215	45	170	96	44	152	72	30
29.....	192	165	86	96	73	19	72	69	13
30.....	72	148	29	509	140	sa 300	144	60	23
31.....	1,280	650	sa 3,300	2,100	1,230	s 7,480	--	--	--
Total.	7,581	--	9,759	21,101	--	38,038	9,784	--	5,831

Total discharge for year (cfs-days)..... 100,778

Total load for year (tons)..... 86,707

s Computed by subdividing day.

a Computed from partly estimated concentration graph.

b Computed from estimated concentration graph.

IOWA RIVER AT IOWA CITY, IOWA--Continued

Particle-size analyses of suspended sediment, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet ; 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 11, 1956.....	10:45 a.m.	485	67	351	3,780		91		97		100	--					SPWCM
May 16	9:05 a.m.	1,770	63	1,600	5,170		82		99		100	--					SPWCM
May 16	9:05 a.m.	1,770	63	1,600	5,560		66		97		100	--					SPNM
July 20	9:00 a.m.	711	67	729	2,280		93		95		96	100					SPWCM
July 31	2:15 p.m.	2,050	76	739	2,550		60		89		99	99	99		100		SPWCM

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IOWA RIVER BASIN--Continued

RALSTON CREEK AT IOWA CITY, IOWA

LOCATION (revised).--At gaging station, on upstream side of bridge on State Highway 1, at east edge of Iowa City, Johnson County, and 2.2 miles upstream from mouth.
DRAINAGE AREA.--3.01 square miles.
RECORDS AVAILABLE.--Sediment records: April 1952 to September 1956.
EXTREMES, 1955-56.--Sediment concentrations: Maximum daily, 3,630 ppm July 6; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 2,300 tons July 18; minimum daily, 0 tons on many days.
EXTREMES, 1952-56.--Sediment concentrations: Maximum daily, 4,970 ppm May 24, 1953; minimum daily, no flow on many days each year.
Sediment loads: Maximum daily, 2,300 tons July 18, 1956; minimum daily, 0 tons on many days each year.
REMARKS.--No flow during period October to December; record is omitted. Maximum observed sediment concentration during water year, 58,800 ppm July 6. Records of discharge for water year October 1955 to September 1956 given in WSP 1438.

Suspended sediment, January to September 1956

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	--	0	0.11	216	0.1
2.....				0	--	0	.07		(t)
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.....				3.1	120	sa 3.0	0		0
14.....				.52	45	.1	0		0
15.....				.05	--	(t)	0		0
16.....				0	--	0	0		0
17.....				0	--	0	0		0
18.....				.01	--		0		0
19.....				.01	43		0		0
20.....				.01	--	(t)	0		0
21.....				.01	60		0		0
22.....				0	--	0	0		0
23.....				.23	--	e .2	0		0
24.....				13	550	sa 22	0		0
25.....				.46	--	e .3	0		0
26.....				.05	330	.1	0		0
27.....				.02	--	(t)	0		0
28.....				.01	80	(t)	0		0
29.....				.04	130	(t)	0		0
30.....				--	--	--	0		0
31.....				--	--	--	0		0
Total.	0		0	17.52	--	25.7	0.18		0.1

e Estimated.
s Computed by subdividing day.
t Less than 0.050 ton.
a Computed from partly estimated concentration graph.

IOWA RIVER BASIN--Continued

RALSTON CREEK AT IOWA CITY, IOWA--Continued

Suspended sediment, January to September 1956--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	--	0			
2	0	--	0	0	--	0			
3	.11	49	(t)	0	--	0			
4	0	--	0	0	--	0			
5	0	--	0	.01	--	(t)			
6	0	--	0	.03	--	(t)			
7	0	--	0	0	--	0			
8	0	--	0	0	--	0			
9	0	--	0	1.2	1,760	s 20			
10	0	--	0	.09	460	.1			
11	0	--	0	.06	380	.1			
12	0	--	0	.01	--	(t)			
13	0	--	0	.09	220	sa .2			
14	0	--	0	.19	--	e .3			
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	0	--	0	0	--	0			
25	0	--	0	0	--	0			
26	0	--	0	0	--	0			
27	0	--	0	0	--	0			
28	.04	--	(t)	0	--	0			
29	.13	148	.1	0	--	0			
30	.02	28	(t)	0	--	0			
31	--	--	--	0	--	0			
Total	0.30	--	0.1	1.68	--	20.7	0		0

	July			August			September		
1	0	--	0	14	2,510	s 470	0.38		e 0.5
2	0	--	0	.29	--	e .1	.16		e .1
3	0	--	0	.11	24	}	.08		(t)
4	0	--	0	.04	--	(t)	.09		e .1
5	0	--	0	.01	--	}	.79		e 5.0
6	3.9	3,630	s 140	0	--	0	.10		e .1
7	.12	1,590	s 1.1	0	--	0	.07		(t)
8	0	--	0	0	--	0	.03	}	
9	0	--	0	0	--	0	.02	}	(t)
10	0	--	0	0	--	0	.01	}	
11	0	--	0	0	--	0	0		0
12	0	--	0	.87	305	s 6.2	0		0
13	0	--	0	.27	700	.5	0		0
14	0	--	0	.01	--	(t)	0		0
15	0	--	0	0	--	0	0		0
16	0	--	0	0	--	0	0		0
17	0	--	0	12	2,080	s 433	0		0
18	77	1,780	s2,300	14	2,010	s 346	0		0
19	1.3	2,200	sa 75	.27	150	.1	0		0
20	.17	2,050	1.0	.09	}		0		0
21	.01	--	(t)	.03	}	-- (t)	0		0
22	0	--	0	0	--	0	0		0
23	0	--	0	0	--	0	0		0
24	0	--	0	0	--	0	0		0
25	.20	600	sb .6	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	63	2,210	s 1,320	0		0
31	42	3,220	s1,160	9.4	585	s 62	--		--
Total	124.70	--	3,677.7	114.39	--	2,637.9	1.73		5.9

Total discharge for year (cfs-days) 260.50

Total load for year (tons) 6,368.1

e Estimated.

s Computed by subdividing day.

t Less than 0.050 ton.

a Computed from partly estimated concentration graph.

b Computed from estimated concentration graph.

IOWA RIVER BASIN--Continued

RALSTON CREEK AT IOWA CITY, IOWA--Continued

Particle-size analyses of suspended sediment, January to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; 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 9, 1956.....	11:45 a.m.	6.8	55	7,280	4,040		72		94		98	100	--				SPWCM
July 6	4:40 p.m.	19	68	31,000	2,160		44		82		98	99	99		100		SPWCM
July 18	5:35 p.m.	1,630	67	37,100	5,290		34		69		99	99	100				SPWCM
Aug. 30.....	8:30 p.m.	770	70	6,730	2,630		28		63		99	99	100				SPWCM

DES MOINES RIVER AT EUCLID AVENUE BRIDGE, AT DES MOINES, IOWA

LOCATION.--At Euclid Avenue Bridge in Des Moines, Polk County, 2.1 miles upstream from gaging station, 4.9 miles upstream from Raccoon River, and 2.4 miles downstream from Beaver Creek.
DRAINAGE AREA.--6,245 square miles (revised), upstream from gaging station.
RECORDS AVAILABLE.--Chemical analyses: November 1954 to June 1955.
Water temperatures: November 1954 to September 1956.
Sediment records: November 1954 to September 1956.
EXTREMES, 1955-56.--Water temperatures: Maximum, 90°F Aug. 4; minimum, freezing point on many days during November to March.
Sediment concentrations: Maximum daily, 2,250 ppm May 31; minimum daily, not determined.
Sediment loads: Maximum daily, 5,510 tons May 31; minimum daily, not determined.
EXTREMES, 1954-56.--Water temperatures: Maximum daily, 95°F July 28, 1955; minimum, freezing point on many days during winter months each year.
Sediment concentrations: Maximum daily, 3,840 ppm July 11, 1955; minimum daily, not determined.
Sediment loads: Maximum daily, 59,100 tons July 11, 1955; minimum daily, not determined.
REMARKS.--Flow affected by ice Nov. 29 to Dec. 5, Jan. 1 to Feb. 18, Mar. 1-4, 12-21. No appreciable inflow between sampling site and gaging station except during periods of heavy local runoff. Discharge records at gaging station at Des Moines for water year October 1955 to September 1956 given in WSP 1438.

Temperature (° F) of water, water year October 1955 to September 1956
/Once-daily measurement between 1 p.m. and 6 p.m./

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

a Measurement after 7 p.m.
b Measurement before 12 m.

DES MOINES RIVER BASIN--Continued

DES MOINES RIVER AT EUCLID AVENUE BRIDGE AT DES MOINES, IOWA--Continued

Suspended sediment, water year October 1955 to September 1956

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	68			92			60		
2	72	22	4.2	92			61		
3	72			92	14	3.5	62	39	6.4
4	68			92			62		
5	68	20	3.7	92			62		
6	68			128			62		
7	65			98			62		
8	78	29	13	81	17	4.1	63	35	5.9
9	336			76			62		
10	255			68			59		
11	235			65			58		
12	205			68			58		
13	170	30	14	72	27	5.3	58	40	6.3
14	150			72			58		
15	130			87			57		
16	110			63			55		
17	100			58			53		
18	98	16	4.3	72	33	6.2	50	47	6.6
19	98			81			50		
20	96			76			50		
21	92			81			50		
22	92			98			50		
23	96	16	4.1	87	27	6.2	52	40	5.7
24	100			65			56		
25	100			92			58		
26	100			76			58		
27	94			65			59		
28	100	21	5.4	56	31	5.3	60	31	5.0
29	96			58			60		
30	94			58			60		
31	92			--	--	--	60		
Total	3,598	--	229.4	2,361	--	153.0	1,785	--	184.5

	January			February			March		
1	60			64			82		
2	60			64			95		
3	60	43	7.0	64	56	9.7	105	7	2.2
4	60			64			125		
5	60			64			165		
6	61			63			237		
7	62			62			179		
8	62	40	6.7	60	39	6.4	128	18	10
9	62			60			210		
10	62			60			295		
11	62			62			228		
12	62			63			210		
13	62	23	3.9	64	55	9.4	190	22	13
14	62			64			240		
15	60			64			200		
16	60			65			200		
17	60			66			250		
18	60	31	5.0	66	40	7.2	300	16	11
19	60			68			260		
20	60			68			215		
21	60			68			250	19	13
22	60			68			380	21	22
23	60	.46	7.5	68	41	7.7	448	22	27
24	60			72			628	68	115
25	60			72			755	83	169
26	60			72			860	118	274
27	60			72			938	55	139
28	60	37	6.1	76	6	1.2	1,020	127	350
29	60			76			1,050	215	610
30	62			--	--	--	1,150	220	683
31	64			--	--	--	1,140	173	532
Total	1,883	--	187.1	1,919	--	206.8	12,533	--	3,115.0

DES MOINES RIVER BASIN--Continued

DES MOINES RIVER AT EUCLID AVENUE BRIDGE AT DES MOINES, IOWA--Continued

Suspended sediment, water year October 1955 to September 1956--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	922	115	286	275			755	1,320	2,690
2	907	153	375	295			1,080	630	1,840
3	1,000	203	548	336	42	35	740	373	745
4	1,070	200	578	305			560	318	481
5	1,020	160	441	336			560	320	484
6	907	140	343	369			560	308	466
7	830	142	318	380			654	460	sa 900
8	755	103	210	413	68	80	830	760	1,700
9	710	80	115	485			560	380	575
10	641	50	87	522			435	225	264
11	548	45	67	560	116	175	347	128	120
12	485	88	89	560	119	180	275	77	57
13	448	63	76	510	110	151	245	78	52
14	424	46	53	695	460	sa 900	219	47	28
15	358	34	33	641	430	744	194	50	26
16	347	30	28	587	255	404	172	47	22
17	336	32	29	498	180	242	165	52	23
18	325	19	17	460	123	153	142	60	23
19	305	35	29	424	125	143	142	60	23
20	305	39	32	380	102	105	135	91	33
21	305	36	30	369	70	70	135	68	25
22	255	40	28	336	63	57	110	71	21
23	245	25	17	305	50	41	104	75	21
24	255	35	24	315	42	36	98	70	19
25	255	31	21	295	39	31	87	81	19
26	237	34	22	295	38	30	104	103	29
27	237	35	22	285	31	24	122	90	30
28	265	80	57	275	28	21	122	63	21
29	285	40	31	275	37	27	255	110	76
30	275	25	19	640	650	sa 2,000	245	63	42
31	--	--	--	907	2,250	5,510	--	--	--
Total	15,257	--	4,025	13,328	--	11,619	10,152	--	10,855

Day	July			August			September		
1	202	55	30	135	67	24	122	46	15
2	186	47	24	135	64	23	110	41	12
3	219	50	30	135	46	17	98	47	12
4	275	80	59	150	41	17	194	60	31
5	305	87	72	128	45	16	237	203	130
6	285	62	48	219	67	40	228	148	91
7	285	62	48	424	128	147	228	88	54
8	325	112	98	510	187	257	275	79	59
9	305	115	95	498	170	229	228	66	41
10	369	95	95	448	155	187	172	58	27
11	325	72	63	380	228	234	135	47	17
12	245	48	32	325	73	64	122	45	15
13	219	38	22	305	90	74	98	57	15
14	265	49	35	275	76	56	81	85	19
15	369	60	60	228	64	39	81	35	7.7
16	228	97	60	237	55	35	76	39	8.0
17	179	74	36	202	43	23	72	64	12
18	172	71	33	219	50	30	72	53	10
19	157	72	31	194	71	37	68	57	10
20	135	59	22	228	41	25	68	49	9.0
21	165	48	21	237	36	23	81	43	9.4
22	165	56	25	228	32	20	76	52	11
23	150	47	19	186	36	18	68	47	8.6
24	135	44	16	182	35	16	63	56	9.5
25	135	54	20	157	38	15	65	52	9.1
26	135	53	19	157	41	17	63	46	7.8
27	116	53	17	150	47	19	63	47	8.0
28	255	320	sa 260	142	48	18	65	61	11
29	194	132	69	128	54	19	65	39	6.9
30	179	67	32	135	70	26	68	17	3.1
31	150	63	26	128	52	18	--	--	--
Total	6,829	--	1,517	7,195	--	1,783	3,442	--	679.1

Total discharge for year (cfs-days) 80,282
Total load for year (tons) 34,553.9

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

DES MOINES RIVER BASIN--Continued

EAST FORK HARDIN CREEK NEAR CHURDAN, IOWA

LOCATION.--At gaging station on upstream side of highway bridge, 4.4 miles upstream from mouth and 6.5 miles southeast of Churdan, Greene County.
DRAINAGE AREA.--24.0 square miles (revised).
RECORDS AVAILABLE.--Sediment records: July 1952 to September 1956.
EXTREMES, 1955-56.--Sediment concentrations: Maximum daily, 300 ppm May 13; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 55 tons May 13; minimum daily, 0 tons on many days.
EXTREMES, 1952-56.--Sediment concentrations: Maximum daily, 668 ppm Mar. 17, 1954; minimum daily, no flow on many days each year.
Sediment loads: Maximum daily, 236 tons July 10, 1955; minimum daily, 0 tons on many days each year.
REMARKS.--No flow during period October to December; record is omitted. Flow affected by ice Mar. 2-6, 9-21. Records of discharge for water year October 1955 to September 1956 given in WSP 1438.

Suspended sediment, January to September 1956

Day	January			February			March		
		Suspended sediment			Suspended sediment			Suspended sediment	
	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day
1							0	--	0
2							.20	73	sa .1
3							.15		
4							.10		
5							.07	--	(t)
6							.05		
7							0	--	0
8							0	--	0
9							.01		
10							.02		
11							.04	--	(t)
12							.04		
13							.07		
14							.10		
15							.15	--	(t)
16							.25		
17							.35	--	
18							.60	--	
19							.50	4	
20							.45	--	(t)
21							.55	--	
22							.40	--	
23							.40	--	
24							.23		
25							.23		
26							.23		
27							.19	--	(t)
28							.16		
29							.19		
30							.16		
31							.19		
Total	0		0	0		0	6.08	--	0.3

s Computed by subdividing day.
t Less than 0.050 ton.
a Computed from estimated concentration graph.

DES MOINES RIVER BASIN--Continued

EAST FORK HARDIN CREEK NEAR CHURDAN, IOWA--Continued

Suspended sediment, January to September 1956--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	0.23			0.02	--	(t)	0.13		
2	.16			.56	--	(t)	.13		
3	.23		(t)	.27			.11		(t)
4	.19			.16	5		.13		
5	.19			.16	--	(t)	.11		
6	.11	51		.13	--		44		e 30
7	.11			.13	--		34	140	sb 14
8	.11			.08	49	(t)	10		e 3
9	.11		(t)	.08	--		4.7		e 1
10	.08			.19			2.8		e .5
11	.08			.40	--	e .1	1.9		
12	.06			.33			1.4		e .3
13	.04			63	300	sb 55	1.0		
14	.02		(t)	8.8	--	e 2.3	.87		
15	.01			3.3	--	e .5	.63		
16	0		0	2.0	--	e .3	.63		
17	0		0	1.3			.50		e .1
18	0		0	.87			.45		
19	0		0	.63			.40		
20	0		0	.56	--	e .1	.35		
21	0		0	.50			.27		
22	0		0	.45			.27		
23	0		0	.35			.23		(t)
24	0		0	.27			.13		
25	0		0	.23	--	(t)	.11		
26	0		0	.23			1.4		e .3
27	0		0	.27			.70		e .1
28	0		0	.19	--		.35		
29	0		0	.23	11	(t)	.16		(t)
30	0		0	.56	--		.19		
31	--		--	.23	--		--		--
Total	1.73		0.2	86.48	--	59.4	108.05		50.6

Day	July			August			September		
1	0.16						0	--	0
2	.16						0	--	0
3	.23						0	--	0
4	.40						0	--	0
5	.19		(t)				.75	55	sa .2
6	.11						.63	52	.1
7	.23						.08	40	(t)
8	.35						0	--	0
9	.16						0	--	0
10	.04						0	--	0
11	.06		(t)				0	--	0
12	.13	24					0	--	0
13	.06						0	--	0
14	.01						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	0		0				0	--	0
25	0		0				0	--	0
26	0		0				0	--	0
27	0		0				0	--	0
28	0		0				0	--	0
29	0		0				0	--	0
30	0		0				0	--	0
31	0		0				--	--	--
Total	2.29		0.2	0		0	1.46	--	0.3

Total discharge for year (cfs-days) 206.09

Total load for year (tons) 111.0

e Estimated.

s Computed by subdividing day.

t Less than 0.050 ton.

a Computed from estimated concentration graph.

b Computed from partly estimated concentration graph.

PART 6A. MISSOURI RIVER BASIN ABOVE SIOUX CITY, IOWA

MARIAS RIVER BASIN

TWO MEDICINE RIVER NEAR BROWNING, MONT.

LOCATION.--At gaging station at bridge on U. S. Highway 89, 15 miles upstream from Badger Creek, and 11 miles southeast of Browning, Glacier County.
DRAINAGE AREA.--316 square miles.
RECORDS AVAILABLE.--Chemical analyses: August 1955 to September 1956 (discontinued).
Water temperatures: October 1955 to September 1956 (discontinued).
EXTREMES, August 1955 to September 1956.--Dissolved solids: Maximum, 222 ppm July 3; minimum, 64 ppm June 15-25.
Hardness: Maximum, 166 ppm July 3; minimum, 52 ppm June 15-25.
Specific conductance: Maximum daily, 354 micromhos July 3; minimum daily, 108 micromhos June 22.
Water temperatures: Minimum, freezing point on many days during November to April.
REMARKS.--Daily samples for chemical analysis composited by discharge. Records of specific conductance of daily samples available in district office at Worland, Wyo. Records of discharge for water year October 1954 to September 1955 given in WSP 1389 and for water year October 1955 to September 1956 given in WSP 1439.

Chemical analyses, in parts per million, August 1955 to September 1956

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					
Aug. 4, 1955 a.....	154	5.5	--	--	--	3.1	0.5	86	14	0.4	--	0.2	0.01	104	0.14	43.2	80	9	7	0.1	168	8.1	
Aug. 11-Sept. 14 a b.....	63.7	2.4	0.00	20	7.1	3.0	.9	86	18	.5	0.0	.4	.01	101	.14	17.4	79	8	8	.1	166	7.9	
Oct. 1-9	98.1	3.9	.01	23	6.9	4.8	.6	96	18	.0	.0	.0	.03	107	.15	28.3	86	7	11	.2	190	7.8	
Oct. 10	179	--	.10	--	--	4.7	1.2	104	33	.0	--	.1	.02	160	.22	77.3	108	23	8	.2	233	8.0	
Oct. 11-31	127	4.2	.02	24	6.1	3.7	.6	88	19	.0	.0	.1	.02	106	.14	36.3	85	13	9	.2	181	7.8	
Nov. 1-4.....	129	4.9	.06	23	5.5	4.3	.5	86	18	.0	.1	.1	.01	108	.15	37.6	80	9	11	.2	180	7.7	
Nov. 5-11.....	228	4.9	.07	21	5.7	3.4	.6	74	16	1.5	.1	.0	.03	99	.13	60.9	76	15	9	.2	159	7.4	
Nov. 12-Dec. 13...	124	4.6	.12	25	6.7	4.3	.7	92	22	.0	.1	.0	.01	127	.17	42.5	90	15	9	.2	198	7.5	
Dec. 14-17.....	109	6.4	.02	30	8.5	5.6	.4	102	41	.0	.1	.0	.06	148	.20	43.6	110	26	10	.2	245	7.9	
Dec. 18-22.....	134	4.1	.00	25	7.9	4.4	.1	93	24	.0	.1	.0	.01	119	.16	43.1	95	19	9	.2	208	7.6	
Dec. 23-Jan. 18, 1956	169	4.2	.01	28	7.8	5.2	.4	98	34	.0	.0	.0	.03	134	.18	61.1	102	22	10	.2	226	7.6	
Jan. 19-28	129	3.7	.00	27	7.9	6.5	.4	104	28	.0	.1	.1	.03	126	.17	43.9	100	15	12	.3	223	7.8	
Jan. 29-Feb. 10 ...	98.8	4.3	.00	28	8.3	5.1	.4	108	27	.0	.0	.1	.03	129	.18	34.4	104	15	10	.2	227	7.8	
Feb. 11-24.....	66.8	4.3	.00	33	9.1	6.5	.4	127	29	.5	.0	.0	.03	149	.20	26.9	120	16	10	.3	260	8.0	
Feb. 25-Mar. 18...	63.0	3.7	.04	28	8.8	5.2	.8	112	29	.0	.1	.1	.02	138	.19	23.5	106	14	10	.2	231	7.8	
Mar. 19-25.....	352	3.4	.05	33	10	6.8	1.4	94	61	.0	.1	.2	.02	172	.23	163	124	47	11	.3	281	7.6	
Mar. 26-Apr. 13...	227	4.1	.01	31	9.4	6.1	1.4	98	48	.0	.1	.1	.07	157	.21	96.2	116	36	10	.3	260	7.8	
Apr. 14-19.....	872	4.2	.02	23	6.0	3.4	.8	82	23	.0	.0	.1	.04	113	.15	266	82	15	8	.2	181	7.7	
Apr. 20-23.....	1,131	4.9	.22	20	5.8	3.0	.6	76	19	.0	.1	.2	.05	104	.14	318	74	12	8	.2	162	7.8	
Apr. 24-May 5.....	434	4.5	.00	25	6.7	4.4	.6	86	28	.0	.1	.1	.02	115	.16	135	90	19	10	.2	200	7.7	
May 6-10.....	847	5.2	.00	31	8.9	6.2	2.1	92	52	.0	.2	.1	.04	162	.22	370	114	39	10	.3	261	7.7	

May 11-18.....	1,763	5.2	.00	28	5.4	2.8	1.1	94	20	.0	.1	.6	.04	137	.19	652	92	15	6	.1	198	7.5
May 19-June 5.....	3,088	4.4	.00	19	3.6	1.4	.5	70	8.0	.0	.1	.1	.02	76	.10	634	62	5	5	.1	134	7.3
June 6-14	1,418	3.8	.00	15	4.0	1.9	.3	62	7.0	.0	.2	.1	.02	67	.09	257	54	3	7	.1	114	7.5
June 15-25	1,179	4.8	.03	15	3.5	1.8	.3	60	7.5	.0	.1	.0	.02	64	.09	204	52	3	7	.1	119	7.5
June 26-July 2.....	694	4.7	--	17	4.3	2.1	.3	68	11	.0	.1	.0	.01	78	.11	146	60	4	7	.1	135	7.9
July 3	1,160	5.7	--	47	12	6.7	1.2	106	90	.0	--	.9	.02	222	.30	695	166	79	8	.2	354	7.6
July 4-7.....	1,196	5.6	.04	21	5.5	2.9	.6	74	21	.0	.1	.2	.04	96	.13	310	75	14	8	.1	164	7.7
July 8-31.....	461	4.6	.00	19	5.0	2.2	.3	74	10	.0	.0	.1	.02	79	.11	98.3	68	7	7	.1	144	7.4
Aug. 1-20.....	171	4.3	.00	21	6.0	3.8	.2	86	14	.0	.0	.1	.01	100	.14	46.2	77	6	10	.2	168	7.7
Aug. 21-Sept. 30...	98.1	3.8	.00	23	7.7	3.5	.3	95	18	.0	.0	.1	.02	105	.14	27.8	89	11	8	.2	188	7.9
Weighted average c	468	4.5	0.02	21	5.5	2.7	0.6	78	17	0.0	0.1	0.1	0.03	97	0.13	123	75	11	7	0.1	163	--

a Not included in weighted average.
b Samples collected at Two Medicine Canal near Browning, Mont.
c Includes estimates where data are missing. Represents 100 percent of runoff for water year October 1955 to September 1956.

MARIAS RIVER BASIN--Continued

TWO MEDICINE RIVER NEAR BROWNING, MONT.--Continued

Temperature (° F) of water, water year October 1955 to September 1956
/Once-daily measurement between 8 a.m. and 12 m./

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

a Measurement between 1 p.m. and 6 p.m.
b Measurement between 7 p.m. and 11 p.m.

BADGER CANAL NEAR DUPUYER, MONT.

LOCATION.-- Lat 48°21', long 112°34', in sec. 18, T. 30 N., R. 7 W., at bridge on U. S. Highway 89, 12 miles northwest of Dupuyer, Pondera County.
RECORDS AVAILABLE.--Chemical analyses: August 1955 to September 1956 (discontinued)
REMARKS.--No discharge records available for this station.

Chemical analyses, in parts per million, August 1955 to September 1956

Date of collection	Discharge (cfs)[a]	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_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				
Aug. 4, 1955	--	7.8	--	--	--	20	1.4	176	6	111	1.0	0.2	0.1	0.03	296	0.40		226	72	16	0.6	503	8.5
Aug. 12	--	6.6	0.05	48	27	17	1.0	180	0	115	.5	.4	.2	.15	315	.43		230	82	14	.5	506	8.1
Aug. 19	--	7.3	.06	45	27	17	1.2	174	0	117	.0	.5	.3	.06	308	.42		224	81	14	.5	493	8.1
Aug. 29	--	6.0	.04	39	27	21	1.0	160	0	120	1.0	.5	.2	.07	307	.42		209	78	18	.6	488	8.0
Sept. 2	--	4.9	.08	39	28	20	1.0	159	0	120	1.0	.4	1.4	.07	313	.43		212	82	17	.6	479	8.0
Sept. 9	--	5.8	.04	40	30	20	1.1	170	0	125	1.0	.4	1.0	.06	316	.43		223	84	16	.6	499	8.1
Sept. 16	--	6.3	.05	43	29	19	1.0	163	4	123	.5	.4	.3	.07	323	.44		227	87	15	.6	504	8.4
Sept. 23	--	7.0	.05	46	29	21	2.2	182	0	125	1.0	.4	.4	.07	347	.47		234	85	16	.6	530	8.0
Sept. 30	--	5.7	.00	48	30	22	1.2	188	0	134	1.0	.4	.1	.07	342	.45		244	90	16	.6	552	7.4
Oct. 7	--	8.4	.00	47	31	23	1.2	186	0	131	.0	.3	.2	.13	348	.47		244	91	17	.6	550	7.9
Oct. 14	--	7.0	.00	51	30	24	1.4	192	0	139	.0	.4	.2	.06	365	.50		249	92	17	.7	566	7.8
Oct. 21	--	6.4	.00	51	31	23	1.4	197	0	145	.0	.6	.3	.07	367	.50		253	91	16	.6	566	8.0
Oct. 28	--	7.8	.00	62	37	55	2.0	293	0	180	1.5	.9	.3	.10	500	.68		305	65	28	1.4	766	8.1
May 25, 1956	--	7.5	.03	52	26	23	1.6	266	0	67	.0	.3	.8	.09	315	.43		236	18	17	.7	525	8.0
May 31	--	5.3	.01	53	30	18	1.6	215	0	111	1.0	.4	4.6	.07	337	.46		255	79	13	.5	555	7.5
June 7	35	7.0	.01	50	29	16	1.4	197	0	112	.0	.4	1.4	.12	323	.44		245	83	12	.4	528	7.8
June 15	80	5.1	.01	48	30	21	1.0	190	0	128	.0	.4	.4	.07	334	.45		242	86	16	.6	544	7.7
June 22	18	6.3	.01	49	30	24	1.3	222	0	111	.0	.4	.2	.09	338	.46		246	64	17	.7	559	8.2
June 29	13	6.4	.00	45	29	17	1.0	180	4	112	.0	.3	.2	.09	312	.42		232	78	14	.5	506	8.3
July 6	13	7.8	.02	51	25	21	1.7	242	0	76	.0	.2	.6	.09	304	.41		230	32	16	.6	507	8.0
July 20	21	5.1	.01	39	29	19	1.0	183	0	102	.0	.2	.4	.08	297	.40		216	66	16	.6	484	7.7
July 27	50	4.9	.01	42	27	14	.8	169	0	105	.0	.2	.3	.07	284	.39		216	77	12	.4	462	8.1
Aug. 3	80	5.6	.00	42	26	16	1.1	169	0	106	.0	.3	.6	.07	292	.40		212	73	14	.5	471	8.0
Aug. 10	--	5.6	.00	45	27	33	1.5	168	0	151	.0	.3	.7	.07	361	.49		223	85	24	1.0	566	7.9
Aug. 17	45	5.4	.00	44	25	14	.9	165	0	107	.0	.3	.4	.06	291	.40		214	79	12	.4	465	8.0
Aug. 24	55	5.9	.00	42	27	14	.9	161	0	106	.0	.3	1.1	.07	284	.39		214	82	12	.4	463	7.9
Aug. 31	25	5.0	.00	44	25	16	1.0	162	0	113	.0	.3	.3	.05	292	.40		214	81	14	.5	470	8.2
Sept. 7	25	5.0	.00	40	26	17	1.0	154	0	113	.5	.3	.5	.05	292	.40		208	82	15	.5	471	7.8
Sept. 14	--	5.7	.00	43	28	24	1.8	166	0	134	1.0	.4	.5	.06	324	.44		222	86	19	.7	526	8.1
Sept. 21	25	4.9	.00	44	27	21	1.1	163	0	129	.0	.4	.6	.05	331	.45		221	87	17	.6	513	7.8
Sept. 28	25	6.0	.00	45	27	18	.8	163	0	119	.0	.4	.2	.06	316	.43		222	88	15	.5	493	8.2

a Estimated.

MARIAS RIVER BASIN--Continued

TWO MEDICINE CANAL NEAR CUT BANK, MONT.

LOCATION.--Lat 48°38', long 112°30', in sec. 10, T. 33 N., R. 7 W., at bridge on U. S. Highway 2, 8 miles west of Cutbank, Glacier County.
RECORDS AVAILABLE.--Chemical analyses: August 1955 to September 1956 (discontinued).
REMARKS.--No discharge records available for this station.

Chemical analyses, in parts per million, August 1955 to September 1956

Date of collection	Discharge (cfs)[a]	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. 3, 1955	15	3.0	0.00	20	6.1	2.8	1.2	79	3	13	0.5	0.1	0.0	0.04	86	0.12		75	5	7	0.1	161	8.6
Aug. 17	--	2.9	.06	21	6.9	3.6	.7	87	0	16	.5	.1	1.2	.01	100	.14		81	10	9	.2	179	7.5
Aug. 24	--	2.6	.05	18	7.1	3.9	1.2	81	0	13	.0	.1	.7	.00	94	.13		74	8	10	.2	162	7.5
Aug. 31	--	2.3	.06	24	5.8	3.2	.4	91	0	16	.0	.0	.5	.02	95	.13		84	9	8	.2	178	7.9
Sept. 7	--	1.6	.06	23	6.4	3.1	1.3	85	2	16	.5	.2	.2	.01	97	.13		84	11	7	.1	175	8.4
Sept. 14	--	2.0	.06	24	6.8	3.2	.6	94	0	17	.0	.1	.7	.01	106	.14		88	11	7	.1	187	7.8
May 31, 1956	80	3.6	.05	18	4.3	1.9	.8	70	0	13	.0	.1	.6	.03	77	.10		63	6	6	.1	131	7.3
June 8	75	3.3	.08	15	4.8	1.3	.5	66	0	10	.0	.1	.3	.02	72	.10		57	3	5	.1	119	7.7
June 16	90	2.6	.03	17	4.2	1.4	.4	67	0	11	.0	.1	1.0	.02	73	.10		60	5	5	.1	128	6.9
June 22	45	2.8	.03	15	3.9	1.4	.4	63	0	7.5	.0	.1	.4	.02	64	.09		54	2	5	.1	114	7.7
June 29	25	2.8	.02	16	4.7	1.6	.6	68	0	10	.0	.1	.3	.01	68	.09		59	3	5	.1	126	7.9
July 6	7	3.9	.03	31	9.6	7.0	.7	84	0	61	.0	.1	.8	.04	164	.22		117	48	11	.3	270	7.2
July 13	28	4.2	.02	17	5.3	2.1	.2	65	3	12	.0	.1	1.0	.06	79	.11		64	6	7	.1	139	8.5
July 20	20	4.0	.02	17	5.5	2.1	.4	66	4	12	.0	.1	.1	.05	79	.11		65	4	6	.1	140	8.7
July 27	60	3.2	.01	18	5.9	2.1	.5	76	0	14	.0	.1	.4	.04	81	.11		69	7	6	.1	147	7.7
Aug. 3	120	3.7	.01	18	5.6	2.1	.5	76	0	11	.0	.0	.3	.02	80	.11		68	6	6	.1	144	7.6
Aug. 10	25	3.0	.01	19	5.5	2.1	.5	77	0	11	.0	.0	.4	.02	84	.11		70	7	6	.1	150	7.7
Aug. 17	40	2.7	.00	19	5.5	2.3	.4	77	0	11	.0	.0	.3	.02	83	.11		70	7	7	.1	149	7.7
Aug. 24	50	2.8	.01	18	6.1	2.3	.4	78	0	11	.0	.0	.2	.01	83	.11		70	6	7	.1	150	8.1
Aug. 31	60	2.6	.01	21	6.7	2.7	.4	84	0	16	.0	.0	.2	.00	94	.13		80	11	7	.1	170	7.6
Sept. 7	45	3.3	.01	21	6.0	2.7	.4	86	0	10	.0	.1	.2	.01	92	.13		77	6	7	.1	161	8.0
Sept. 14	30	2.7	.01	21	5.7	2.7	.4	84	0	11	.0	.0	.3	.01	91	.12		76	7	7	.1	162	7.4
Sept. 21	30	3.0	.00	22	5.9	2.7	.5	88	0	14	.0	.1	.3	.01	91	.12		79	7	7	.1	170	7.5
Sept. 28	50	2.9	.01	22	5.6	2.5	.4	86	0	13	.0	.0	.4	.01	91	.12		78	7	6	.1	165	7.7

a Estimated.

MARIAS RIVER BASIN--Continued

TETON RIVER NEAR CHOTEAU, MONT.

LOCATION.--Lat 47°47', long 112°9', in sec. 5, T. 23 N., R. 4 N., at bridge on U. S. Highway 89, 3½ miles southeast of Choteau, Teton County.
RECORDS AVAILABLE.--Chemical analyses: August 1955 to September 1956.
REMARKS.--No discharge records available for this station.

Chemical analyses, in parts per million, August 1955 to September 1956

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 (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. 2, 1955		--	--	53	20	12	--	220	6	43	1.0	0.2	0.3	0.03	--	--		214	24	11	0.4	437	8.3
Sept. 1		7.7	0.05	53	26	19	1.0	261	0	62	2.0	.2	.4	.04	295	0.40		237	23	15	.5	512	8.0
Sept. 29		--	--	63	21	20	--	261	4	67	1.2	--	--	.05	--	--		244	23	15	.6	522	8.3
Nov. 2		9.1	.01	63	29	19	1.0	293	0	75	1.5	.3	.5	.08	344	.47		275	35	13	.5	677	8.0
Dec. 6		9.2	.00	59	26	27	.8	292	0	68	1.0	.3	1.2	.08	337	.46		255	16	19	.7	585	8.1
Jan. 4, 1956		8.5	.04	60	24	24	1.4	286	0	67	1.5	.2	.6	.05	328	.45		248	13	17	.7	565	8.0
Feb. 2		7.8	.04	56	29	25	1.2	285	0	71	2.0	.2	.7	.06	331	.45		258	20	17	.7	567	7.9
Mar. 6		7.0	.01	60	26	20	1.2	284	0	60	2.0	.4	.2	.05	322	.44		256	23	14	.5	545	8.1
Apr. 4		7.2	.04	58	20	21	2.0	258	0	56	1.5	.1	.3	.03	292	.40		225	13	17	.6	498	8.2
May 8		8.2	.01	67	28	41	1.9	297	0	118	9.0	.6	.6	.07	431	.59		284	40	24	1.1	682	8.1
June 19		7.8	.01	53	19	15	--	248	0	48	.0	--	--	.11	263	.36		212	9	13	.4	455	8.0
July 18		6.3	.02	54	19	15	1.0	241	0	39	.5	.3	.8	.03	257	.35		211	13	13	.4	454	7.8
Aug. 2		8.5	.01	55	22	15	1.5	252	0	54	.5	.3	.4	.04	280	.38		228	21	12	.4	484	8.1
Sept. 6		6.7	.03	57	22	24	1.2	260	0	70	1.5	.3	.2	.04	316	.43		234	21	18	.7	530	7.9

MARIAS RIVER BASIN--Continued

GREENFIELD-PRIEST BUTTE LAKE DRAIN NEAR CHOTEAU, MONT.

LOCATION.--Lat 47°47', long 112°07', in N½ sec. 4, T. 23 N., R. 4 W., at outlet pipe of drain, 4 miles southeast of Choteau, Teton County.
RECORDS AVAILABLE.--Chemical analyses: August 1955 to September 1956.
REMARKS.--No discharge records available for this station.

Chemical analyses, in parts per million, August 1955 to September 1956

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			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
															Parts per million		Tons per acre-foot	Calcium, magnesium	Noncarbonate				
															Residue at 180°C	Sum							
Aug. 2, 1955	--	--	--	158	1,480	3,270	--	202	28	12,700	312	1.6	2.2	1.9	--	--	--	6,480	6,270	51	18	17,000	8.6
Sept. 1	--	6.8	0.09	104	1,110	2,620	35	183	49	9,610	325	1.4	.1	2.1	12,200	14,000	16.6	4,750	4,520	54	16	14,700	8.8
Sept. 29	--	--	--	123	1,040	2,760	--	312	50	9,500	345	--	--	1.9	--	--	--	4,600	4,260	56	18	14,200	8.7
Nov. 2	--	2.8	.02	128	1,120	2,960	22	423	39	10,100	375	1.8	.5	1.8	16,600	15,000	22.6	4,920	4,510	57	18	15,000	8.5
Dec. 6	a 1	8.6	.00	478	237	410	8.4	347	0	2,450	52	.4	2.0	.52	4,550	3,820	6.19	2,170	1,890	29	3.8	4,400	7.8
Jan. 4, 1956	a .1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4,470	--
Apr. 4	--	2.1	.17	167	1,060	2,570	23	419	0	9,750	284	1.2	3.2	1.6	15,100	14,100	20.5	4,790	4,450	54	16	13,700	7.9
May 8	--	4.4	.01	158	894	2,240	16	496	19	7,800	290	1.8	.1	1.3	13,000	11,700	17.7	4,070	3,630	54	15	12,200	8.3
June 19	--	--	--	--	--	1,110	--	--	--	--	--	--	--	--	--	--	--	3,490	--	41	--	11,600	--
July 18	--	12	.10	74	804	2,200	14	158	86	7,530	327	1.6	.2	2.5	11,900	11,100	16.2	3,490	3,220	58	16	12,700	9.1
Sept. 6	--	1.1	.09	109	749	2,100	16	468	30	6,840	336	1.4	.9	1.5	11,100	10,400	15.1	3,350	2,920	58	16	11,900	8.4

a Estimated.

TETON RIVER NEAR DUTTON, MONT.

LOCATION.--At gaging station at Kerr Bridge, 1 mile downstream from Hunt Coulee and 10 miles northeast of Dutton, Teton County.
RECORDS AVAILABLE.--Chemical analyses: August 1954 to September 1956.
Water temperatures: August 1954 to September 1956.
Sediment records: August 1954 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 3,370 ppm Nov. 5-14; minimum, 422 ppm Mar. 10 to Apr. 3.
Hardness: Maximum, 1,280 ppm Nov. 5-14; minimum, 256 ppm Mar. 10 to Apr. 3.
Specific conductance: Maximum daily, 4,300 micromhos Nov. 7, 8, 11; minimum daily, 618 micromhos Mar. 21.
Water temperatures: Minimum, freezing point on many days during November to February.
Sediment concentrations: Maximum daily, 4,450 ppm May 10; minimum daily, not determined.
Sediment loads: Maximum daily, 8,100 tons Aug. 3; minimum daily, not determined.
EXTREMES, 1954-56.--Dissolved solids: Maximum, 5,190 ppm Sept. 7-8, 1954; minimum, 410 ppm Aug. 24 to Sept. 5, 1954.
Hardness: Maximum, 1,970 ppm Sept. 7-8, 1954; minimum, 254 ppm Mar. 28 to Apr. 8, 1955.
Specific conductance: Maximum daily, 6,090 micromhos Sept. 15, 1954; minimum daily, 617 micromhos Apr. 5, 1955.
Water temperatures: Maximum (1954-55), 78°F July 15, 16, 1955; minimum, freezing point on many days during winter months each year.
Sediment concentrations: Maximum daily, 5,410 ppm May 19, 1955; minimum daily, not determined.
Sediment loads: Maximum daily, 13,000 tons May 19, 1955; minimum daily, not determined.
REMARKS.--Daily samples for chemical analysis composited by discharge. Records of specific conductance of daily samples available in district office at Worland, Wyo. Flow affected by ice Nov. 1, 2, Nov. 11 to Mar. 30. Records of discharge for water year October 1955 to September 1956 given in WSP 1439.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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. 1-11, 1955	73.5	--	--	88	166	400	--	323	0	1,390	47	--	0.2	0.31	2,390	3.25	474	904	639	49	5.8	2,970	8.2
Oct. 12-13	66.5	--	--	68	76	144	--	274	8	505	14	--	.2	.18	1,000	1.36	180	480	242	39	2.9	1,400	8.3
Oct. 14-17	78.0	--	--	78	111	237	--	312	0	855	27	--	.2	.20	1,540	2.09	324	652	396	44	4.0	2,020	8.2
Oct. 18-22	78.4	--	--	85	183	434	--	313	7	1,510	52	--	.1	.34	2,570	3.50	544	964	696	49	6.1	3,140	8.3
Oct. 23-25	79.7	--	--	75	107	231	--	318	0	813	26	--	.1	.23	1,470	2.00	316	628	367	44	4.0	1,960	8.2
Oct. 26-Nov. 4	95.0	--	--	69	82	165	--	306	0	575	19	--	.4	.17	1,110	1.51	285	508	257	41	3.2	1,530	8.1
Nov. 5-14	66.7	--	--	123	237	548	--	413	9	1,980	69	--	1.3	.38	3,370	4.58	607	1,280	927	48	6.7	3,980	8.2
Nov. 15-25	48.2	--	--	100	131	271	--	364	5	1,010	33	--	2.0	.18	1,910	2.46	249	788	481	42	4.2	2,340	8.2
Nov. 26-Dec. 2	48.6	--	--	60	59	100	--	268	4	350	11	--	1.9	.11	744	1.01	97.6	392	166	36	2.2	1,080	8.3
Dec. 3-26	51.9	7.3	0.01	66	49	71	2.2	297	0	253	7.0	0.4	4.9	.08	634	.86	88.8	366	122	30	1.6	936	8.0
Dec. 27-31	57.0	--	--	75	39	55	--	326	0	186	6.0	--	1.3	.06	561	.76	86.3	348	81	25	1.3	843	8.0
Jan. 1-3, 1956	61.7	--	--	--	--	58	--	--	--	218	5.0	--	2.1	--	--	--	--	--	--	--	--	--	--
Jan. 4-31	61.1	7.1	.01	61	44	55	1.9	286	0	206	6.0	.5	2.1	.07	533	.72	87.9	334	99	26	1.3	822	8.1
Feb. 1-29	51.9	--	--	71	42	52	--	304	0	198	5.5	--	2.1	.09	538	.73	75.4	348	99	24	1.2	825	8.0
Mar. 1-9	81.1	--	--	73	41	48	--	308	0	194	5.5	--	1.7	.06	543	.74	119	350	97	23	1.1	825	8.1
Mar. 10-Apr. 3	170	9.2	.04	45	35	42	3.2	240	0	146	4.5	.3	1.3	.09	422	.57	194	256	59	26	1.1	658	7.9
Apr. 4-11	160	6.5	--	68	66	120	--	278	0	445	14	--	1.1	.15	902	1.23	390	441	213	37	2.5	1,280	8.1
Apr. 12-19	124	5.0	--	77	143	272	--	316	0	1,060	36	--	.3	.25	1,980	2.70	663	780	521	42	6.0	2,440	8.2

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MARIAS RIVER BASIN--Continued

TETON RIVER NEAR DUTTON, MONT.--Continued

Chemical analyses, in parts per million, water year October 1955 to September 1956--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. 20-30, 1956	137	5.4	--	77	143	290	--	344	5	1,060	36	--	0.4	0.23	1,940	2.63	718	780	490	44	6.3	2,440	8.2
May 1-6	194	--	--	81	133	292	--	352	0	975	36	--	.5	.25	1,800	2.45	943	748	459	46	4.6	2,340	8.1
May 7-8	358	--	--	80	105	208	--	372	20	663	24	--	.6	.23	1,380	1.88	1,330	632	293	42	3.6	1,890	8.4
May 9-14	531	--	--	75	81	156	--	384	0	485	17	--	1.3	.16	1,080	1.47	1,550	520	205	39	3.0	1,510	8.1
May 15-20	296	--	--	80	90	192	--	342	0	613	24	--	.1	.19	1,260	1.71	1,010	571	291	42	3.5	1,740	8.2
May 21-June 8	416	--	--	61	57	110	--	260	0	370	15	--	.2	.11	777	1.06	873	387	174	38	2.4	1,140	7.9
June 9-15	227	--	--	66	73	146	--	288	0	495	19	--	.1	.14	968	1.32	593	464	228	41	2.9	1,380	8.0
June 16-30	310	8.8	0.01	59	65	108	2.5	326	0	365	13	0.3	.1	.13	800	1.09	670	416	149	36	2.3	1,160	8.1
July 1-14	269	--	--	54	51	95	--	293	0	293	10	--	.3	.11	672	.91	488	346	106	37	2.2	1,010	8.0
July 15-24	159	--	--	56	62	117	--	267	0	415	15	--	.0	.14	822	1.12	353	394	175	38	2.6	1,190	8.1
July 25-Aug. 2	113	--	--	41	40	58	--	211	5	200	6.0	--	.1	.10	467	.64	142	266	85	32	1.5	727	8.3
Aug. 3-4	471	--	--	70	33	49	--	246	0	208	5.0	--	5.9	.11	510	.69	649	312	110	25	1.2	770	8.2
Aug. 5-28	160	--	--	58	61	115	--	278	0	395	15	--	.2	.12	814	1.11	352	396	168	38	2.5	1,170	8.2
Aug. 29-30	149	--	--	51	42	70	--	256	8	225	6.0	--	.2	.12	546	.74	220	300	77	33	1.8	836	8.4
Aug. 31-Sept. 10	108	--	--	65	104	220	--	319	0	760	31	--	.2	.22	1,400	1.90	408	588	326	44	3.9	1,880	8.2
Sept. 11-30	77.4	3.5	.00	68	79	158	2.3	293	0	575	22	.4	.1	.15	1,100	1.50	230	496	256	41	3.1	1,520	8.2
Weighted average a	145	--	--	65	71	136	--	b 299	--	469	17	--	0.8	0.14	959	1.30	375	456	211	39	2.8	1,330	--

a Includes estimates where data are missing. Represents 100 percent of runoff for water year October 1955 to September 1956.
b Includes carbonate as bicarbonate.

MARIAS RIVER BASIN--Continued

TETON RIVER NEAR DUTTON, MONT.--Continued

Temperature (° F) of water, water year October 1955 to September 1956
/Once-daily measurement between 7 a.m. and 11 a.m./

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

MARIAS RIVER BASIN--Continued

TETON RIVER NEAR DUTTON, MONT.--Continued

Suspended sediment, water year October 1955 to September 1956

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			75			50		
2	82			80			50		
3	79			124			50		
4	76			134			50		
5	73			102			50		
		36	7		43	11		28	4
6	71			84			55		
7	71			79			55		
8	68			85			55		
9	67			84			60		
10	68			83			60		
11	68			55			65		
12	65			40			65		
13	68			25			60		
14	75			30			55		
15	78			35			45		
		39	8		14	2		42	5
16	77			40			40		
17	82			45			35		
18	83			50			30		
19	82			55			30		
20	73			55			40		
21	74			55			50		
22	80			55			55		
23	81			50			60		
24	80			45			60		
25	78			45			60		
					12	2			
26	77	61	14	45			60	22	3
27	83			45			60		
28	87			50			60		
29	92			50			55		
30	99			50			55		
31	99			--	--	--	55		
Total	2,421	--	304	1,850	--	150	1,630	--	123

Day	January			February			March		
1	60			45			80		
2	60			50			85		
3	65			55			85		
4	70			55			85		
5	70			55			85		
		20	4		36	5			
6	75			60			80		
7	75			60			80		
8	75			60			75		
9	75			60			75		
10	75			60			75	33	7
11	75			55			75		
12	75			55			75		
13	75			50			75		
14	70			40			75		
15	65			35			75		
		29	5		29	3			
16	60			30			80		
17	60			30			85		
18	60			30			90		
19	65			35			105	154	44
20	65			40			125	218	74
21	65			50			140	232	88
22	65			60			165	335	149
23	65			65			185	530	265
24	60			65			210	975	553
25	55			65	19	3	240	950	616
		19	2						
26	45			60			280	980	741
27	35			60			300	--	e 600
28	30			60			300	--	e 500
29	30			60			290	640	501
30	35			--	--	--	280	690	522
31	40			--	--	--	270	685	499
Total	1,895	--	112	1,505	--	107	4,325	--	5,278

e Estimated.

MARIAS RIVER BASIN--Continued

TETON RIVER NEAR DUTTON, MONT.--Continued

Suspended sediment, water year October 1955 to September 1956--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	245	570	377	146	157	62	332	360	323
2	213	--	e 300	163	188	83	369	440	438
3	192	--	e 240	169	194	89	482	750	a 1,000
4	185	--	e 200	185	275	137	514	870	1,210
5	179	354	171	229	403	249	444	700	839
6	176	--	e 160	270	600	a 440	412	555	617
7	165	--	e 160	335	1,060	959	362	440	a 440
8	151	375	153	380	1,230	1,260	302	300	a 240
9	143	343	132	467	1,690	2,130	264	205	146
10	142	302	116	668	4,450	8,030	240	195	126
11	140	258	98	677	3,520	6,430	229	198	122
12	135	170	62	534	1,380	1,990	232	160	a 100
13	129	165	57	444	820	983	215	140	a 80
14	128	112	39	398	600	a 650	200	115	62
15	124	92	31	342	480	443	206	300	167
16	123	--	e 26	284	395	303	332	1,100	sb 1,200
17	120	--	e 20	256	302	209	423	1,500	a 1,700
18	118	55	18	264	300	214	502	1,800	b 2,400
19	118	47	15	296	345	276	416	710	797
20	117	44	14	332	485	435	362	370	362
21	116	45	14	356	675	649	339	270	247
22	117	51	16	434	1,400	1,640	366	360	356
23	129	47	16	498	1,550	2,080	342	350	323
24	142	58	22	506	1,450	1,980	290	230	180
25	146	117	46	478	1,100	1,420	267	172	124
26	153	119	49	452	915	1,120	242	157	103
27	148	104	42	441	600	714	224	155	94
28	145	95	37	423	552	630	206	108	60
29	145	90	35	390	498	524	178	100	48
30	145	95	37	366	402	397	158	100	43
31	--	--	--	335	341	308	--	--	--
Total	4,429	--	2,703	11,518	--	36,834	9,450	--	13,947

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	145	75	29	116	74	23	120		
2	148	75	30	134	122	44	116		
3	179	300	a 140	440	4,000	sb 8,100	107		
4	383	2,100	sb 2,500	502	3,800	sb 6,000	103		
5	558	1,880	2,830	275	900	a 650	107	82	24
6	452	950	1,160	213	400	a 240	109		
7	352	510	485	189	300	a 150	107		
8	290	260	204	179	244	118	102		
9	242	158	103	192	240	124	96		
10	222	123	74	178	190	91	94		
11	202	118	64	187	187	94	94		
12	200	110	a 60	196	191	101	94	57	15
13	209	120	b 70	187	180	a 90	95		
14	183	98	48	174	160	a 75	93		
15	176	98	47	170	148	68	98		
16	179	100	48	155	122	51	87		
17	176	90	43	148	125	50	81		
18	178	86	41	145	102	40	77		
19	176	85	40	142	100	38	75		
20	165	74	33	143	110	a 42	72		
21	150	81	33	138	125	47	71		
22	140	60	a 22	118	98	31	69		
23	130	51	18	114	80	25	67	24	5
24	124	60	20	107	70	a 20	66		
25	122	39	13	99	70	a 19	68		
26	113	39	12	102	90	a 24	67		
27	106	60	17	137	209	77	65		
28	106	60	a 17	155	221	92	65		
29	107	70	20	153	195	81	69		
30	107	62	18	145	--	e 50	74		
31	110	66	20	123	86	28	--	--	--
Total	6,130	--	8,259	5,456	--	16,683	2,608	--	372

Total discharge for year (cfs-days) 53,217
Total load for year (tons) 84,872

e Estimated.
s Computed by subdividing day.
a Computed from estimated concentration graph.
b Computed from partly estimated concentration graph.

TETON RIVER NEAR DUTTON, MONT.--Continued

Particle-size analyses of suspended sediment, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; 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. 5, 1956	2:00 p.m.	174	--	355	805	--	77		91		97	98	99		100	--	BWCM
Apr. 18	2:15 p.m.	117	56	99	935	--	88		95		99	100	--		--	--	BWCM
May 9	11:55 a.m.	444	51	1,570	2,350	3	5		74		92	98	99		100	--	VPN
May 9	11:55 a.m.	444	51	1,570	2,330	52	67		76		92	98	99		100	--	VPWCM
May 15	7:10 p.m.	315	59	417	1,690	--	68		78		94	97	98		99	100	BWCM
June 5	10:20 a.m.	452	61	688	643	--	50		--		90	95	97		98	100	BWCM
June 19	11:00 a.m.	426	--	675	1,270	--	52		74		90	96	100		--	--	VPWCM
July 4	10:30 a.m.	390	--	1,930	1,470	--	63		78		91	97	100		--	--	VPWCM
July 5	9:30 a.m.	566	60	2,000	1,180	--	58		75		85	94	100		--	--	VPWCM
Aug. 3	6:15 p.m.	835	56	9,120	3,370	--	70		91		95	98	100		--	--	VPWCM

Particle-size analyses of bed material, water years October 1954 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed; V, visual accumulation tube)

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									
						0.062	0.125	0.250	0.500	1.000	2.000	4.000	8.000	16.000	32.000		
Oct. 5, 1954	4	107				6	13	28	44	59	68	78	87	94	100		SV
May 18, 1955	5	641				0	1	6	9	15	20	26	43	92	100		SV
Aug. 31	5	94				1	2	13	31	36	42	52	69	89	100		SV
Apr. 18, 1956	6	117				2	4	23	44	50	54	61	73	90	100		SV
June 5	5	452				1	3	16	36	49	56	64	72	87	100		SV
July 18	5	179				4	9	36	64	71	74	81	89	99	100		SV

WILLOW CREEK NEAR GLASGOW, MONT.

LOCATION.--At gaging station, about 6 miles south of Glasgow, Valley County, and about 8 miles upstream from mouth.
DRAINAGE AREA.--536 square miles.
RECORDS AVAILABLE.--Sediment records: October 1953 to September 1956.
EXTREMES, 1955-56.--Sediment concentrations: Maximum daily, 44,000 ppm Aug. 31; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 74,000 tons Aug. 31; minimum daily, 0 tons on many days.
EXTREMES, 1953-56.--Sediment concentrations: Maximum daily, 58,000 ppm Apr. 5, 1954; minimum daily, no flow on many days each year.
Sediment loads: Maximum daily, 390,000 tons Apr. 6, 1954; minimum daily, 0 tons on many days each year.
REMARKS.--Records of discharge for water year October 1955 to September 1956 given in WSP 1439.

Monthly and annual summary of water and suspended-sediment discharge, water year October 1955 to September 1956

Month	Discharge (cfs-days)	Runoff (acre-feet)	Suspended sediment					
			Load (tons)	Daily load (tons)			Concentration (ppm)	
				Mean	Maximum	Minimum	Weighted mean	Maximum observed
October	0	0	0	0	0	0		--
November	0	0	0	0	0	0		--
December	0	0	0	0	0	0		--
January	0	0	0	0	0	0		--
February	0	0	0	0	0	0		--
March	1,532.9	3,040	a 56,807	1,830	20,800	0		18,600
April	8.6	17	a 22	.7	14	0		110
May	389.0	772	a 20,348	656	15,000	0		49,800
June	1,366.7	2,710	a 109,170	3,640	39,800	0		50,500
July	85.8	170	b 1,155	37	600	0		--
August	1,024.7	2,030	a 105,142	3,390	74,000	0		53,800
September	188.5	374	b 15,216	507	13,000	0		--
Water year	4,596.2	9,110	307,860	841	74,000	0		53,800

a Includes estimated daily loads.
b Computed from estimated daily loads.

MILK RIVER BASIN--Continued

WILLOW CREEK NEAR GLASGOW, MONT.--Continued

Particle-size analyses of suspended sediment, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; 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	
May 11, 1956	10:50 a.m.	24	50	2,230	3,570		93		--		99						PWCM
June 21	4:50 p.m.	585	62	40,200	29,400		70		95		100						PWCM
June 22	8:15 a.m.	140	56	30,800	21,400		80		97		100						PWCM
June 22	3:00 p.m.	272	56	30,500	23,800		69		91		99						PWCM
June 23	8:35 a.m.	678	56	27,800	20,800		72		93		99	100					VPWCM
June 24	9:30 a.m.	120	63	25,000	17,700		81		99		100						PWCM
June 25	11:30 a.m.	46	64	18,700	29,000		93		--		100						PWCM

YELLOWSTONE RIVER AT BILLINGS, MONT.

LOCATION.--At gaging station at bridge on U. S. Highway 87, 1 mile northeast of Billings, Yellowstone County, and 12 miles upstream from Pryor Creek.
DRAINAGE AREA.--11,870 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1956.
Water temperatures: December 1950 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 450 ppm Nov. 15-19; minimum, 104 ppm May 24 to June 14, June 16 to July 2.
Hardness: Maximum, 258 ppm Nov. 15-19; minimum, 64 ppm June 16 to July 2.
Specific conductance: Maximum daily, 758 micromhos Nov. 18; minimum daily, 140 micromhos June 14.
Water temperatures: Maximum, 77°F Aug. 1; minimum, freezing point on many days during November to February.
EXTREMES, 1950-56.--Dissolved solids: Maximum, 868 ppm Feb. 2, 1951; minimum, 96 ppm June 19, 1951.
Hardness: Maximum, 476 ppm Feb. 2, 1951; minimum, 52 ppm May 21-23, 1954.
Specific conductance: Maximum daily, 1,210 micromhos Feb. 2, 1951; minimum daily, 129 micromhos May 22, 1954.
Water temperatures: Maximum, 80°F July 24, 1955; minimum, freezing point on many days during winter months.
REMARKS.--Daily samples for chemical analysis composited by discharge. Records of specific conductance of daily samples available in district office at Worland, Wyo. Records of discharge for water year October 1955 to September 1956 given in WSP 1439.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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. 1-31, 1955	2,996	--	--	--	--	35	--	170	--	--	--	--	--	308	0.42	2,490	175	36	30	1.1	492	7.7	--
Nov. 1-14	3,111	--	--	--	--	34	--	176	--	--	--	--	--	314	.43	2,640	180	36	29	1.1	498	7.6	--
Nov. 15-19	1,280	--	--	--	--	48	--	236	--	--	--	--	--	450	.61	1,560	258	64	29	1.3	684	8.0	--
Nov. 20-Dec. 17	2,793	--	--	--	--	31	--	170	--	--	--	--	--	304	.41	2,290	176	37	28	1.0	484	7.5	--
Dec. 18-22	1,860	--	--	--	--	36	--	190	--	--	--	--	--	362	.49	1,820	209	53	27	1.1	556	7.7	--
Dec. 23-30	3,662	15	0.00	38	12	27	3.4	141	83	2.5	0.2	1.6	0.19	250	.34	2,470	144	28	28	1.0	403	7.8	10
Dec. 31-Jan. 17, 1956	2,817	--	--	--	--	30	--	158	--	--	--	--	--	291	.40	2,210	166	36	28	1.0	459	7.6	--
Jan. 18-19	1,750	--	--	--	--	34	--	178	--	--	--	--	--	352	.48	1,660	200	[illegible]	27	1.0	537	8.0	--
Jan. 20-Feb. 1	2,331	--	--	--	--	29	--	157	--	--	--	--	--	288	.39	1,810	164	35	28	1.0	467	7.8	--
Feb. 2-24	2,435	--	--	--	--	31	--	159	--	--	--	--	--	302	.41	1,990	172	42	28	1.0	475	7.8	--
Feb. 25-Mar. 12	2,776	--	--	--	--	30	--	152	--	--	--	--	--	283	.38	2,120	164	39	29	1.0	456	7.8	--
Mar. 13-17	2,670	--	--	--	--	32	--	161	--	--	--	--	--	306	.42	2,210	174	42	29	1.1	487	8.0	--
Mar. 18-25	5,900	14	.00	47	11	27	3.5	169	76	5.5	.4	2.6	.15	280	.38	4,460	164	25	26	.9	436	7.7	13
Mar. 26-Apr. 3	5,101	--	--	--	--	23	--	150	--	--	--	--	--	249	.34	3,430	146	23	26	.8	397	7.6	--
Apr. 4-16	4,082	--	--	--	--	30	--	160	--	--	--	--	--	272	.37	3,000	160	29	29	1.0	450	7.9	--
Apr. 17-22	5,795	--	--	--	--	21	--	144	--	--	--	--	--	218	.30	3,410	133	15	25	.8	359	7.7	--
Apr. 23-May 11	7,194	--	--	--	--	19	--	130	--	--	--	--	--	206	.28	4,000	123	16	25	.7	335	7.8	--
May 12-19	10,260	--	--	--	--	14	--	132	--	--	--	--	--	191	.26	5,290	121	13	20	.6	307	7.7	--

YELLOWSTONE RIVER BASIN--Continued

YELLOWSTONE RIVER AT BILLINGS, MONT.--Continued

Chemical analyses, in parts per million, water year October 1955 to September 1956--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					
May 20-23, 1956...	26,420	--	--	--	--	6.6	--	105	--	--	--	--	--	142	0.19	10,130	96	10	13	0.3	220	7.6	--
May 24-June 14....	41,280	12	0.00	20	3.7	6.6	1.1	76	16	0.0	0.2	0.5	0.06	104	.14	11,590	65	3	18	.4	162	7.2	10
June 15.....	34,800	--	--	--	--	8.2	--	132	--	--	--	--	--	168	.23	15,790	120	12	13	.3	273	8.2	--
June 16-July 2.....	24,550	--	--	--	--	8.1	--	78	--	--	--	--	--	104	.14	6,890	64	0	22	.4	167	7.5	--
July 3-25	12,780	--	--	--	--	12	--	88	--	--	--	--	--	133	.18	4,590	77	5	25	.6	216	7.6	--
July 26-Aug. 17 ...	6,849	--	--	--	--	19	--	113	--	--	--	--	--	179	.24	3,310	104	11	29	.8	297	7.7	--
Aug. 18-Sept. 6 ...	4,557	--	--	--	--	26	--	146	--	--	--	--	--	246	.33	3,030	142	22	28	.9	402	7.8	--
Sept. 7-30	3,589	13	.01	39	15	30	2.9	157	88	6.0	.4	.3	.19	271	.37	2,630	158	29	29	1.0	440	7.8	3
Weighted average a	8,074	--	--	--	--	15	--	108	--	--	--	--	--	170	0.23	3,710	101	12	24	0.6	271	--	--

a Represents 100 percent of runoff for water year October 1955 to September 1956.

YELLOWSTONE RIVER BASIN--Continued

YELLOWSTONE RIVER AT BILLINGS, MONT.--Continued

Temperature (° F) of water, water year October 1955 to September 1956
/Once-daily measurement at approximately 4 p.m./

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

YELLOWSTONE RIVER BASIN--Continued

WIND RIVER AT RIVERTON, WYO.

LOCATION.--At gaging station, at bridge on State Highway 320, 1.1 miles southeast of Riverton, Fremont County, and 1½ miles upstream from Popo Agie River.
DRAINAGE AREA.--2,320 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: March 1947 to September 1949.
Water temperatures: April 1947 to September 1949, April to September 1953, August 1954 to September 1956.
Sediment records: October 1948 to December 1953, August 1954 to September 1956.
EXTREMES, 1955-56.--Water temperatures: Maximum, 69°F Sept. 13; minimum, freezing point on many days during November to March.
Sediment concentrations: Maximum daily, 4,180 ppm May 23; minimum daily, not determined.
Sediment loads: Maximum daily, 48,400 tons May 23; minimum daily, not determined.
EXTREMES, 1947-56.--Water temperatures: Maximum (1947-48, 1953, 1954-56), 73°F Aug. 31, 1948; minimum (1947-49, 1954-56), freezing point on many days during winter months.
Sediment concentrations (1948-56): Maximum daily, 8,500 ppm July 23, 1955; minimum daily, not determined.
Sediment loads (1948-56): Maximum daily, 48,400 tons May 23, 1956; minimum daily, less than 0.50 ton May 18, 30, 1955.
REMARKS.--Flow affected by ice Nov. 18-23, Dec. 4 to Mar. 21. Records of discharge for water year October 1955 to September 1956 given in WSP 1439.

Temperature (°F) of water, water year October 1955 to September 1956
(Once-daily measurement between 1 p.m. and 6 p.m. October to March and between 6 a.m. and 9 a.m. April to September)

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

a Includes estimated temperature, 32° F, on missing days.

YELLOWSTONE RIVER BASIN--Continued

WIND RIVER AT RIVERTON, WYO.--Continued

Suspended sediment, water year October 1955 to September 1956

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	280			472	28	36	504		
2	275			335	20	18	504	100	133
3	280	22	16	190	20	10	472		
4	262			270	22	16	450	--	
5	275	23	17	222	26	16	450	--	
6	345	43	40	239			450	--	
7	350	42	40	226	11	7	450	--	
8	448	180	sa 340	222			450	--	
9	774	339	708	248	20	sa 15	450	--	
10	758	262	536	345	130	b 120	450	--	
11	734	270	535	402	98	106	450	--	
12	702	242	459	460	67	83	450	--	
13	670	219	396	408			450	--	e 120
14	630	148	252	408			450	--	
15	602	119	193	402	52	54	450	--	
16	574	89	138	325			450	--	
17	553	74	110	365			450	--	
18	532	60	86	400	15	16	450	--	
19	518			400	--	e 20	450	111	
20	511			400	150	b 160	450	--	
21	518	35	49	450	295	358	460	--	
22	525			500	175	236	490	--	
23	525			500	75	101	650	120	a 220
24	518			525	130	a 180	600	190	a 300
25	490			511	215	297	550	240	b 360
26	478			546	95	b 140	520	280	a 400
27	478			532	29	42	520	280	a 400
28	478	19	24	504			500	220	a 300
29	460			511	42	57	500	187	252
30	466			490			450	--	e 180
31	484			--	--	--	450	--	e 140
Total	15,493	--	4,376	11,808	--	2,432	14,820	--	5,231

Day	January			February			March		
1	450			420	--		450		
2	470			400	--		450		
3	500			400	--		450		
4	520			400	--		450		
5	520			400	--		420		
6	520			420	122		420		
7	520			450	--		420		
8	520			450	--		420		
9	540			450	--		420		
10	540			450	--		420	90	98
11	520			450	--		400		
12	500			450	--		360		
13	500			450	--		380		
14	500			480	46		380		
15	500			480	--	e 110	380		
16	500	131	172	450	54		360		
17	500			450	--		360		
18	500			420	168		340		
19	470			420	--		320	425	367
20	470			420	--		370	700	699
21	470			420	--		400	685	740
22	470			450	42		581	982	1,540
23	470			450	70		630	1,020	1,740
24	470			450	--		686	1,030	s 2,030
25	450			450	130		638	1,180	s 2,240
26	450			450	--		678	1,060	1,940
27	450			450	--		623	755	1,270
28	450			450	--		518	357	499
29	450			450	--		466	198	249
30	420			--	--	--	478	165	213
31	420			--	--	--	478	180	b 240
Total	15,030	--	5,332	12,730	--	3,190	14,146	--	15,531

e Estimated.
s Computed by subdividing day.
a Computed from partly estimated concentration graph.
b Computed from estimated concentration graph.

YELLOWSTONE RIVER BASIN--Continued

WIND RIVER AT RIVERTON, WYO.--Continued

Suspended sediment, water year October 1955 to September 1956--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.....	511	245	338	345	116	108	5,940	2,220	35,600
2.....	518	210	294	355	62	59	7,470	2,060	41,500
3.....	454	115	141	335	40	36	7,600	1,560	32,000
4.....	553	420	sa 800	419	74	84	7,250	1,360	26,400
5.....	424	623	s 867	360	95	92	7,140	1,440	27,800
6.....	380	85	87	518	190	266	6,960	1,320	24,800
7.....	402			602	554	s 1,070	5,520	1,520	22,700
8.....	414	66	75	454	1,240	s 1,790	4,440	1,520	18,200
9.....	419			694	650	1,220	4,420	1,480	17,700
10.....	448			670	450	814	4,930	1,440	19,200
11.....	460	65	81	567	250	383	5,080	1,390	19,100
12.....	490	175	232	472	135	172	5,160	1,340	18,700
13.....	424	80	92	436	--	e 100	5,250	1,240	17,600
14.....	414	--	e 70	355	75	72	4,990	1,030	13,900
15.....	414	--	e 70	198	801	s 352	4,660	1,160	14,600
16.....	454	78	96	127	170	58	4,770	1,090	14,000
17.....	546	240	a 360	262	293	s 338	3,800	810	8,310
18.....	532	186	267	766	1,880	s 5,130	2,830	697	5,330
19.....	454	150	184	1,240	3,610	s 13,100	2,650	697	4,990
20.....	442	62	74	1,950	3,540	s 20,600	2,880	808	s 6,610
21.....	525	119	169	2,920	4,140	s 34,400	2,950	688	5,480
22.....	646	340	sa 650	3,480	4,110	38,600	2,580	536	3,730
23.....	742	528	1,060	4,290	4,160	48,400	2,320	484	3,030
24.....	654	223	394	5,080	3,450	47,300	2,210	510	3,040
25.....	581	124	194	5,250	2,800	39,700	2,220	584	s 3,690
26.....	595	108	174	5,290	2,320	33,100	2,440	604	3,980
27.....	560	140	212	4,890	1,910	25,200	2,530	654	4,470
28.....	574	136	211	4,680	1,940	24,500	2,770	704	5,270
29.....	546	131	193	5,580	2,060	31,000	2,820	680	5,180
30.....	386	360	375	5,560	1,730	26,000	2,800	646	4,880
31.....	--	--	--	5,420	1,750	25,600	--	--	--
Total.	14,962	--	7,985	63,565	--	419,644	129,380	--	431,790

	July			August			September		
1.....	2,760	586	4,370	1,040	121	340	355		
2.....	2,500	536	3,620	997	101	272	315		
3.....	2,360	484	3,080	952	62	159	285		
4.....	1,870	322	1,630	808	75	164	285		
5.....	1,770	327	1,560	630	57	97	340		
6.....	1,440	220	855	484	70	91	320		
7.....	1,330	150	539	340	84	77	315	23	20
8.....	1,340	125	452	260			305		
9.....	1,310	118	417	220			310		
10.....	1,280	124	429	190			335		
11.....	1,350	115	419	170			345		
12.....	1,530	460	sa 2,500	170			345		
13.....	1,500	670	2,710	172			380	37	36
14.....	1,480	220	879	183	40	22	397	67	72
15.....	1,280	96	332	214			375	36	36
16.....	1,190	72	231	198			365		
17.....	1,080	73	213	194			365		
18.....	979	61	161	210			355		
19.....	943	59	150	226			330	23	21
20.....	898	56	136	270			330		
21.....	1,160	119	373	345	100	93	315		
22.....	1,200	90	292	305	37	30	234		
23.....	1,200	80	259	257	14	10	218		
24.....	907	58	142	266	14	10	218		
25.....	853	48	111	330			206		
26.....	844	51	116	340			198	12	7
27.....	808	54	118	330	23	22	206		
28.....	644	44	100	355			198		
29.....	919	568	s 1,920	386			198		
30.....	1,090	909	s 2,880	345			206		
31.....	997	164	s 485	360			--	--	--
Total.	41,012	--	31,479	11,547	--	1,783	8,929	--	573

Total discharge for year (cfs-days)..... 353,422
Total load for year (tons)..... 929,346

e Estimated.
s Computed by subdividing day.
a Computed from partly estimated concentration graph.

WIND RIVER AT RIVERTON, WYO.--Continued

Particle-size analyses of suspended sediment, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; 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. 20, 1956	8:45 a.m.	a 370	32	498	1,700	--	25		39		74	88	94		100	--	VPWCM
Mar. 23	12:10 p.m.	539	40	822	4,120	5	8		81		82	85	95		100	--	VPN
Mar. 23	12:10 p.m.	539	40	822	4,020	54	59		78		82	85	95		100	--	VPWCM
May 8	2:20 p.m.	436	62	380	4,740	--	5		44		94	95	98		100	--	VPWCM
May 21	5:50 p.m.	3,480	62	5,660	3,980	--	18		42		79	89	97		100	--	VPWCM
May 23	9:30 p.m.	5,250	58	5,050	6,920	--	23		44		77	88	96		99	100	VPWCM
May 28	4:40 p.m.	4,820	52	1,750	3,360	--	13		24		58	78	94		99	100	VPWCM
May 30	5:30 p.m.	5,680	60	1,610	3,060	6	8		21		58	76	93		99	100	VPN
May 30	5:30 p.m.	5,680	60	1,610	2,840	10	12		25		58	76	93		99	100	VPWCM
June 5	3:40 p.m.	6,940	60	1,380	4,790	--	35		35		64	80	96		100	--	VPWCM
June 12	4:25 p.m.	5,350	66	1,400	4,790	--	11		24		60	80	94		100	--	VPWCM
June 13	3:10 a.m.	5,270	58	1,250	4,850	--	16		32		64	81	96		100	--	VPWCM
June 13	9:50 a.m.	4,750	60	1,150	3,350	--	12		25		55	73	93		99	100	VPWCM
June 20	10:45 a.m.	2,430	65	463	2,610	--	12		27		53	70	90		100	--	VPWCM
June 27	12:00 m.	2,290	72	365	1,160	--	8		15		34	50	77		99	100	VPWCM

a Daily mean discharge.

YELLOWSTONE RIVER BASIN--Continued

POPO AGIE RIVER NEAR RIVERTON, WYO.

LOCATION.--At gaging station, at bridge on county road, 1¾ miles upstream from mouth and 1.9 miles southeast of Riverton, Fremont County. Prior to Sept. 1956, gaging station at site 600 feet downstream.
DRAINAGE AREA.--2,010 square miles, approximately.
RECORDS AVAILABLE.--*Water temperatures:* March to September 1949, May to September 1953, October 1955 to September 1956.
Sediment records: March 1949 to December 1953, October 1955 to September 1956.
EXTREMES, 1955-56.--Water temperatures: Maximum, 71°F July 29; minimum, freezing point on many days during November to March.
Sediment concentrations: Maximum daily, 3,900 ppm May 29; minimum daily, not determined.
Sediment loads: Maximum daily, 47,100 tons May 29; minimum daily, not determined.
EXTREMES, 1949-53, 1955-56.--Water temperatures: Maximum (1949, 1953, 1955-56), 82°F Aug. 7, 1949; minimum (1949, 1955-56), freezing point on many days during winter months.
Sediment concentrations: Maximum daily, 3,900 ppm May 29, 1956; minimum daily, not determined.
Sediment loads: Maximum daily, 47,100 tons May 29, 1956; minimum daily, not determined.
REMARKS.--Flow affected by ice Nov. 11-24, Nov. 26 to Mar. 24. Records of discharge for water year October 1955 to September 1956 given in WSP 1439.

Temperature(° F) of water, water year October 1955 to September 1956
/Once-daily measurement between 1 p.m. and 6 p.m. November to March and between 6 a.m. and 9 a.m. October, April to September/

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

a Includes estimated temperature, 32° F, on missing days.

YELLOWSTONE RIVER BASIN--Continued

POPO AGIE RIVER NEAR RIVERTON, WYO.--Continued

Suspended sediment, water year October 1955 to September 1956

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	166			190	36	18	240	71	
2	155			174	56	26	240	--	
3	152			163	49	22	230	46	
4	150	40	16	169	65	30	200	--	
5	142			190	94	48	150	--	
6	137			190	46	24	170	164	
7	145			180			170	--	
8	169			180			170	--	
9	166			183			170	--	
10	166			196			170	66	
11	160			200			170	--	
12	155			190			170	--	e 34
13	155			180	56	28	170	--	
14	158			180			170	--	
15	155			180			150	--	
16	155	76	32	180			160	--	
17	155			180			170	--	
18	152			190			170	--	
19	150			190			170	68	
20	150			200	440	a 240	170	--	
21	150			230	800	b 500	190	--	
22	152			260	180	b 130	240	36	
23	155			270			300	440	b 360
24	158			270			260	800	b 550
25	160			272			240	800	a 500
26	160			270	60	42	220	800	b 480
27	169	101	48	260			220	650	b 380
28	183			250			220	300	b 180
29	190			250			200	240	b 130
30	186			240			180	--	e 100
31	190			--	--	--	170	--	e 50
Total	4,946	--	992	6,257	--	1,738	6,020	--	3,478

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	180			130	--		140		
2	190			120	--		140		
3	190			130	--		140		
4	200			130	--		160		
5	200			130	--		160		
6	200			130	26		160		
7	210			130	--		160		
8	210			130	23		160		
9	210			140	--		160	44	18
10	210			140	--		160		
11	210			140	--		150		
12	210			140	--		140		
13	210			150	--		150		
14	210			150	9		150		
15	200			150	--	e 8	160		
16	200	45	22	140	10		180		
17	190			140	--		200	56	30
18	180			130	14		230	--	e 44
19	180			140	--		280	95	72
20	170			140	--		310	220	184
21	170			140	--		320	290	251
22	170			140	15		330	620	552
23	170			140	12		330	804	716
24	170			140	--		320	860	743
25	170			140	62		320	940	812
26	160			140	41		284	1,220	935
27	160			140	--		298	1,520	1,220
28	160			140	--		325	1,320	1,160
29	150			140	--		268	1,780	1,290
30	140			--	--	--	240	990	642
31	130			--	--	--	240	600	a 380
Total	5,710		682	3,990	--	232	6,765	--	9,319

e Estimated.
a Computed from estimated concentration graph.
b Computed from partly estimated concentration graph.

YELLOWSTONE RIVER BASIN--Continued

POPO AGIE RIVER NEAR RIVERTON, WYO.--Continued

Suspended sediment, water year October 1955 to September 1956--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	222	495	297	380	230	236	3,970	560	6,000
2	226	455	278	338	190	173	4,510	480	5,840
3	219	465	275	357	170	164	4,780	425	5,490
4	219	355	210	405	200	219	4,670	350	4,410
5	208	305	171	475	290	372	4,640	355	4,450
6	205	245	136	535	395	571	5,120	320	4,420
7	196	200	106	614	490	812	4,340	270	3,160
8	205	240	133	670	560	1,010	3,460	316	2,950
9	222	260	a 160	712	515	990	3,540	312	2,980
10	230	240	149	719	420	815	3,810	296	3,040
11	268	350	253	642	295	511	4,050	275	3,010
12	264	390	278	568	210	322	3,980	223	2,400
13	244	255	168	600	320	518	3,820	247	2,550
14	240	--	e 130	607	635	1,040	3,700	259	2,590
15	233	--	e 100	523	810	1,140	3,460	231	2,160
16	268	320	sb 260	505	455	620	3,150	194	1,650
17	294	475	377	517	280	391	2,600	175	1,230
18	272	315	231	614	340	564	2,000	168	907
19	256	410	283	775	652	1,360	1,820	157	771
20	240	365	237	1,120	1,390	4,200	1,980	175	936
21	264	290	207	1,510	1,520	6,200	2,000	175	945
22	325	295	259	1,930	1,550	8,080	1,650	142	633
23	385	310	322	2,460	1,430	9,500	1,280	110	380
24	380	290	298	2,760	1,070	7,970	1,160	114	357
25	361	255	249	3,440	809	7,510	1,260	114	388
26	390	285	300	3,940	574	6,110	1,410	128	487
27	400	275	297	3,790	458	4,690	1,380	132	492
28	442	310	370	3,470	405	3,790	1,350	114	416
29	448	310	375	4,130	3,900	s 47,100	1,330	119	427
30	395	255	272	4,900	2,210	29,200	1,270	106	363
31	--	--	--	3,970	690	7,400	--	--	--
Total	8,521	--	7,181	47,976	--	153,560	87,490	--	65,832

	July			August			September		
1	1,250	97	327	395	247	263	171		
2	1,160	84	263	370	124	124	152		
3	1,050	80	227	380	1,700	b 1,700	147		
4	929	80	201	366	157	155	145		
5	873	62	146	325	90	79	145		
6	852	66	152	298	72	58	145		
7	719	50	97	252	44	30	135		
8	691	50	93	216	45	26	130		
9	691	44	82	199			128	44	16
10	670	48	87	186			125		
11	663	41	73	171			123		
12	635	45	77	171			121		
13	635	41	70	174	35	16	128		
14	607	36	59	166			128		
15	548	--	e 50	150			125		
16	511	28	39	142			123		
17	470	28	36	150			121		
18	436	30	35	166	82	37	112		
19	390	32	34	193	80	42	105		
20	343	21	19	219	87	51	103		
21	307	22	18	248	96	64	97		
22	289	24	19	233	78	49	93		
23	280	16	12	212	83	48	93		
24	268	15	11	196	65	34	99	21	5
25	240	14	9	193	58	30	97		
26	226	14	9	183	72	36	87		
27	226	19	12	174			87		
28	226	22	13	160			99		
29	226	28	17	147	52	22	99		
30	464	800	sb 1,200	145			95		
31	390	352	371	150			--	--	--
Total	17,265	--	3,858	6,730	--	3,080	3,558	--	337

Total discharge for year (cfs-days) 205,228

Total load for year (tons) 250,289

e Estimated.

s Computed by subdividing day.

a Computed from estimated concentration graph.

b Computed from partly estimated concentration graph.

POPO AGIE RIVER NEAR RIVERTON, WYO.--Continued

Particle-size analyses of suspended sediment, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; 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	
May 9, 1956.....	3:10 p.m.	705	59	471	4,760	--	38		64		93	99	100	--	--		VPWCM
May 21	8:10 p.m.	1,670	60	1,600	4,000	--	29		43		84	97	100	--	--		VPWCM
May 24	6:30 a.m.	3,970	55	969	2,830	--	29		44		74	86	96	100	--		VPWCM
May 28	3:25 p.m.	3,420	52	412	2,660	--	31		43		65	72	92	99	100		VPWCM
May 30	3:20 p.m.	5,070	57	1,260	6,060	6	10		70		88	92	97	99	100		VPN
May 30	3:20 p.m.	5,070	57	1,260	6,280	44	54		74		88	92	97	99	100		VPWCM
June 5.....	2:15 p.m.	4,640	58	348	2,700	--	29		32		61	69	82	98	100		VPWCM
Aug. 3.....	9:50 a.m.	366	66	1,980	5,990	2	3		92		100	--	--	--	--		VPN
Aug. 3.....	9:50 a.m.	366	66	1,980	6,070	4	61		98		100	--	--	--	--		VPWCM

YELLOWSTONE RIVER BASIN--Continued

MUSKRAT CREEK NEAR SHOSHONI, WYO.

LOCATION.--At gaging station, 2 miles upstream from mouth and 7 miles southwest of Shoshoni, Fremont County.
DRAINAGE AREA.--760 square miles, approximately.
RECORDS AVAILABLE.--Sediment records: June 1950 to September 1956.
EXTREMES, 1955-56.--Sediment concentrations: Maximum daily, 67,000 ppm May 29; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 98,000 tons May 29; minimum daily, 0 tons on many days.
EXTREMES, 1950-56.--Sediment concentrations: Maximum daily, not determined; minimum daily, no flow on many days each year.
Sediment loads: Maximum daily, 150,000 tons (estimated) July 22, 1951; minimum daily, 0 tons on many days each year.
REMARKS.--Records of discharge for water year October 1955 to September 1956 given in WSP 1439.

Monthly and annual summary of water and suspended-sediment discharge, water year October 1955 to September 1956

Month	Discharge (cfs-days)	Runoff (acre-feet)	Suspended sediment					
			Load (tons)	Daily load (tons)			Concentration (ppm)	
				Mean	Maximum	Minimum	Weighted mean	Maximum observed
October	0	0	0	0	0	0		--
November	0	0	0	0	0	0		--
December	31	61	e 3,620	117	e 2,800	0		--
January	0	0	0	0	0	0		--
February	0	0	0	0	0	0		--
March	15	30	e 1,300	42	e 1,000	0		--
April	0	0	0	0	0	0		--
May	609	1,210	a 118,950	3,840	a 98,000	0		144,000
June	0	0	0	0	0	0		--
July	0	0	0	0	0	0		--
August	0	0	0	0	0	0		--
September	0	0	0	0	0	0		--
Water year	655	1,300	123,870	338	98,000	0		144,000

e Estimated.
a Partly estimated.

MUSKRAT CREEK NEAR SHOSHONI, WYO.--Continued

Particle-size analyses of suspended sediment, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; 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	
May 25, 1956....	9:00 p.m.	748	50	138,000	7,800		37		65		86	92	98		100		VPWCM
May 29	11:00 a.m.	92	54	60,900	4,760		53		82		96	98	99		100		VPWCM
May 29	5:20 p.m.	820	66	72,400	6,300		47		66		86	95	98		100		VPWCM
May 29	9:45 p.m.	1,010	59	70,300	3,580		50		69		81	90	96		100		VPWCM
May 30	11:55 a.m.	42	--	47,000	4,010		80		97		98	99	100		--		VPWCM

YELLOWSTONE RIVER BASIN--Continued

FIVEMILE CREEK ABOVE WYOMING CANAL, NEAR PAVILLION, WYO.

LOCATION.--At gaging station, 1,400 feet upstream from Wyoming Canal siphon and 4 miles north of Pavillion, Fremont County.
DRAINAGE AREA.--143 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1950 to November 1951.
Water temperatures: October 1950 to September 1951.
Sediment records: October 1949 to September 1956.
EXTREMES, 1955-56.--Sediment concentrations: Maximum daily, 21,000 ppm May 28; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 2,300 tons May 28; minimum daily, 0 tons on many days.
EXTREMES, 1949-56.--Sediment concentrations: Maximum daily, 77,400 ppm Sept. 20, 1950; minimum, no flow on many days each year.
Sediment loads: Maximum daily, 123,000 tons Sept. 20, 1950; minimum daily, 0 tons on many days each year.
REMARKS.--No flow during period July to September; record is omitted. Flow affected by ice Dec. 23-25, Mar. 3-5, Mar. 8-22. Records of discharge for water year October 1955 to September 1956 given in WSP 1439.

Suspended sediment, October 1955 to June 1956

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
2							0	--	0
3							0	--	0
4							0	--	0
5							0	--	0
6							0	--	0
7							0	--	0
8							0	--	0
9							0	--	0
10							0	--	0
11							0	--	0
12							0	--	0
13							0	--	0
14							0	--	0
15							0	--	0
16							0	--	0
17							0	--	0
18							0	--	0
19							0	--	0
20							0	--	0
21							0	--	0
22							0	--	0
23							4	3,240	s 99
24							3	3,750	30
25							4	2,400	sa 75
26							0	--	0
27							0	--	0
28							0	--	0
29							0	--	0
30							0	--	0
31							0	--	0
Total	0		0	0		0	11	--	204

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

YELLOWSTONE RIVER BASIN--Continued

FIVEMILE CREEK ABOVE WYOMING CANAL, NEAR PAVILLION, WYO.--Continued

Suspended sediment, October 1955 to June 1956--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
2							0	--	0
3							3	1,400	sa 22
4							3	1,000	sa 16
5							1	--	e 3
6							0	--	0
7							0	--	0
8							2	564	s 4
9							3	900	sa 9
10							2	369	s 6
11							0	--	0
12							0	--	0
13							0	--	0
14							0	--	0
15							0	--	0
16							.1	650	sa 1
17							3	1,380	s 21
18							5	3,740	s 109
19							5	4,320	s 98
20							8	5,280	s 163
21							12	5,980	s 286
22							13	7,940	s 401
23							14	10,700	s 564
24							8.8	9,320	s 319
25							6.8	7,190	s 171
26							3.3	6,200	sa 110
27							.2	--	e 3
28							2.2	--	e 50
29							1.6	--	e 30
30							1.5	--	e 20
31							1.3	--	e 15
Total	0		0	0		0	99.8	--	2,421

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	1.8	--	e 20	0.7	1,350	s 3	1	4,730	s 23
2	1.8	--	e 30	.4	635	s 2	.5	2,750	4
3	1.4	3,800	sa 28	.1	212	(t)	0	--	0
4	1.1	3,100	sa 22	.6	943	2	0	--	0
5	1.5	3,100	sa 30	.4	624	s 1	0	--	0
6	1.3	--	e 20	.5	1,100	sa 2	0	--	0
7	1.3	2,440	s 18	1.0	1,570	4	0	--	0
8	2.3	3,130	s 41	.6	1,100	sa 3	0	--	0
9	3.2	3,790	s 40	.2	400	sa 1	0	--	0
10	2.9	2,960	23	.6	562	s 1	0	--	0
11	2.0			.4	535	s 1	0	--	0
12	1.8			.7	600	sa 2	0	--	0
13	1.5			2.6	3,160	s 34	0	--	0
14	1.5			1.3	1,600	6	0	--	0
15	1.5	2,560	12	.8	950	2	0	--	0
16	1.6			.2	394	(t)	0	--	0
17	2.0			0	--	0	0	--	0
18	1.6	2,500	sa 14	0	--	0	0	--	0
19	1.7	1,790	s 10	0	--	0	0	--	0
20	1.5	1,380	6	0	--	0	0	--	0
21	1.2	1,050	3	0	--	0	0	--	0
22	1.2	1,100	4	0	--	0	0	--	0
23	1.8			0	--	0	0	--	0
24	1.8			0	--	0	0	--	0
25	1.4	3,950	17	7.8	8,000	sa 400	0	--	0
26	1.4			4.7	6,950	88	0	--	0
27	1.7			11	12,200	s 644	0	--	0
28	1.7			35	21,000	sa 2,300	0	--	0
29	1.9	6,600	sa 60	22	18,000	sa 1,200	0	--	0
30	1.0	4,550	12	7	--	e 120	0	--	0
31	--	--	--	3	--	e 50	--	--	--
Total	50.4	--	567	101.6	--	4,866	1.5	--	27

Total discharge for year (cfs-days) 264.3
Total load for year (tons) 8,085

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

YELLOWSTONE RIVER BASIN--Continued

FIVEMILE CREEK ABOVE WYOMING CANAL, NEAR PAVILLION, WYO.--Continued

Particle-size analyses of suspended sediment, October 1955 to June 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet ; 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	
Dec. 23, 1955....	3:45 p.m.	7.6	35	8,230	7,480		22		40		71	88	98		100		VPWCM
Mar. 24, 1956 ...	11:00 a.m.	26	38	10,700	2,350		27		31		74	93	99		100		VPWCM
Apr. 21.....	3:20 p.m.	1.5	64	1,640	3,800		20		62		76	92	99		100		VPWCM
Apr. 26.....	4:05 p.m.	1.7	64	3,200	4,420		29		46		70	89	99		100		VPWCM
May 27.....	9:15 p.m.	26	54	31,400	8,200		47		71		89	96	99		100		VPWCM
May 29.....	10:45 a.m.	48	60	27,200	5,800		31		49		81	94	98		99	100	VPWCM

YELLOWSTONE RIVER BASIN--Continued

FIVEMILE CREEK NEAR RIVERTON, WYO.

LOCATION.--At gaging station, 3 miles downstream from Ocean Drain, 12½ miles north of Riverton, Fremont County, and 13 miles upstream from mouth.
DRAINAGE AREA.--342 square miles.
RECORDS AVAILABLE.--Chemical analyses: September 1950 to November 1951.
Water temperatures: October 1950 to September 1951, October 1952 to September 1956.
Sediment records: October 1949 to September 1956.
EXTREMES, 1955-56.--Water temperatures: Maximum, 71°F July 25; minimum, freezing point on many days during November to April.
Sediment concentrations: Maximum daily, 25,600 ppm Apr. 15; minimum daily, not determined.
Sediment loads: Maximum daily, 13,800 tons May 29; minimum daily, not determined.
EXTREMES, 1949-56.--Water temperatures (1950-51, 1952-56): Minimum, freezing point on many days during winter months each year.
Sediment concentrations: Maximum daily, 89,500 ppm Sept. 20, 1950; minimum daily, not determined.
Sediment loads: Maximum daily, 199,000 tons Sept. 20, 1950; minimum daily, not determined.
REMARKS.--Flow affected by ice Nov. 15 to Mar. 25. Records of discharge for water year October 1955 to September 1956 given in WSP 1439.

Temperature (° F) of water, water year October 1955 to September 1956
/Once-daily measurement between 7 a.m. and 11 a.m./

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

YELLOWSTONE RIVER BASIN--Continued

FIVEMILE CREEK NEAR RIVERTON, WYO.--Continued

Suspended sediment, water year October 1955 to September 1956

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Snspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	134	4,050	1,470	36	1,610	156	28	275	21
2.....	132	4,300	1,530	35	1,780	168	28	275	21
3.....	130	4,550	1,600	40	2,880	s 335	33	255	23
4.....	116	4,150	1,300	40	2,220	240	32	285	25
5.....	97	3,300	864	39	2,210	233	30	180	15
6.....	91	3,150	774	35	2,050	194	29	265	21
7.....	89	2,950	709	34	1,810	166	28	225	17
8.....	70	2,550	482	33	1,800	160	31	365	31
9.....	58	2,300	360	39	1,970	207	33	455	41
10.....	54	2,300	335	40	1,700	a 180	33	560	50
11.....	50	2,040	275	40	1,200	a 130	33	580	52
12.....	48	2,090	271	34	1,290	118	33	915	82
13.....	48	2,010	260	31	900	a 75	33	575	51
14.....	47	1,190	151	33	1,110	99	33	550	49
15.....	47	2,190	278	28	--	e 60	31	530	44
16.....	45	2,160	262	28	--	e 50	32	555	48
17.....	44	1,860	221	28	--	e 40	35	1,180	112
18.....	43	1,940	225	29	510	40	38	920	94
19.....	43	1,940	225	31	425	36	38	970	100
20.....	42	1,530	174	34	650	60	30	1,430	116
21.....	41	1,690	187	37	765	76	26	1,170	82
22.....	40	1,870	202	38	1,170	120	33	1,200	107
23.....	38	1,660	170	38	640	66	170	1,330	610
24.....	38	1,580	162	38	480	a 50	100	1,320	356
25.....	38	1,500	154	38	400	41	32	1,410	122
26.....	39	1,390	146	38	625	64	31	1,640	137
27.....	38	1,390	143	38	465	48	29	1,710	134
28.....	40	1,450	157	36	385	37	28	1,320	100
29.....	37	1,580	158	32	200	a 17	28	960	73
30.....	36	1,510	147	28	260	20	28	645	49
31.....	36	1,610	156	--	--	--	26	480	34
Total.	1,849	--	13,548	1,048	--	3,286	1,172	--	2,817
	January			February			March		
1.....	28	715	54	20			11	382	11
2.....	30	770	62	20			12	379	12
3.....	30	690	56	20			12	840	27
4.....	30	810	66	21	192	11	12	1,200	39
5.....	30	1,320	107	22			12	1,290	42
6.....	30	1,530	124	22			11	585	17
7.....	30	1,370	111	22			12	405	13
8.....	30	1,590	129	22			15	1,300	53
9.....	30	1,210	98	22			13	1,490	52
10.....	30	1,650	134	22			12	420	14
11.....	30	2,010	163	22	374	21	12	300	10
12.....	29	2,190	171	21			12	315	10
13.....	28	1,410	107	20			12	410	13
14.....	28	1,600	121	19			11	385	11
15.....	27	1,640	120	18			11	605	18
16.....	26	1,650	116	18			12	2,050	66
17.....	25	2,400	162	18			13	2,750	97
18.....	25	1,520	103	18	185	8	15	3,800	154
19.....	25	1,640	111	17			16	5,650	244
20.....	25	1,730	117	15			17	8,250	379
21.....	25	1,900	128	13			18	9,000	437
22.....	25	1,610	109	12			19	11,300	580
23.....	25	1,000	68	11			18	12,500	608
24.....	25	2,000	135	10			17	9,700	445
25.....	25	1,710	115	10	236	7	15	9,650	391
26.....	24	1,300	84	10			15	5,860	237
27.....	23	1,110	69	10			11	2,720	81
28.....	22	1,120	67	10			11	6,160	s 229
29.....	21	864	49	11			15		
30.....	20	--	e 30	--	--	--	16	7,200	292
31.....	20	212	11	--	--	--	15		
Total.	821	--	3,097	496	--	358	423	--	5,166

e Estimated.
s Computed by subdividing day.
a Computed from partly estimated concentration graph.

YELLOWSTONE RIVER BASIN--Continued

FIVEMILE CREEK NEAR RIVERTON, WYO.--Continued

Suspended sediment, water year October 1955 to September 1956--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	14	6,000	227	50	6,550	884	80	6,750	1,460
2	13	4,520	159	43	6,500	755	99	8,200	2,190
3	13	6,850	240	43	5,250	610	100	8,050	2,170
4	13	7,450	261	43	5,450	633	100	8,000	2,160
5	13			42	5,200	590	106	7,950	2,280
6	8.8			48	6,000	778	91	6,950	1,710
7	9.2			50	5,750	776	89	6,600	1,590
8	11			46	4,450	553	95	7,550	1,940
9	11	5,100	138	47	4,850	615	161	9,650	4,190
10	11			68	7,710	1,420	140	7,450	2,820
11	10			57	5,700	877	144	6,400	2,490
12	10			53	5,150	737	138	6,200	2,310
13	10			62	5,800	971	179	9,700	4,690
14	13	12,500	s 469	56	4,800	726	193	9,700	5,050
15	40	25,600	2,760	46	5,000	621	184	9,350	4,650
16	55	20,700	3,070	51	5,250	723	170	8,850	4,060
17	57	14,800	2,280	57	5,650	870	176	8,550	4,060
18	34	8,050	739	63	5,300	902	175	7,500	3,540
19	32	9,120	s 916	74	5,600	1,120	200	9,650	5,210
20	53	11,100	1,590	70	6,050	1,140	193	8,500	4,430
21	62	8,700	1,460	74	6,450	1,290	190	8,150	4,180
22	62	7,850	1,310	94	9,420	2,390	194	8,500	4,450
23	65	7,050	1,240	89	8,450	2,030	197	8,950	4,760
24	65	7,100	1,250	91	8,300	2,040	207	8,550	4,780
25	61	8,150	1,340	94	9,550	2,420	207	8,650	4,830
26	58	8,000	a 1,300	104	10,500	2,950	201	7,850	4,260
27	53	8,900	a 1,300	108	8,450	2,460	193	7,350	3,830
28	62	8,700	a 1,500	170	14,000	a 6,400	192	7,150	3,710
29	57	8,150	1,250	244	20,900	13,800	187	8,050	4,060
30	52	7,400	1,040	170	14,400	s 7,100	171	7,200	3,320
31	--	--	--	96	7,250	1,880	--	--	--
Total	1,028.0	--	26,943	2,403	--	61,061	4,752	--	105,180

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	183	6,500	3,210	227	5,500	3,370	152	3,450	1,420
2	200	6,850	3,700	226	6,050	3,690	167	4,650	2,100
3	194	6,350	3,330	216	5,650	3,300	154	4,400	1,830
4	193	6,850	3,570	204	5,250	2,890	153	4,400	1,820
5	213	6,250	3,590	204	5,400	2,970	146	4,200	1,660
6	214	6,950	4,020	200	5,150	2,780	148	4,200	1,680
7	210	6,250	3,540	187	4,750	2,400	136	3,850	1,410
8	202	6,300	3,440	187	4,350	2,200	146	3,800	1,500
9	201	6,350	3,450	174	4,500	2,110	168	3,650	1,660
10	185	5,850	2,920	157	4,100	1,740	154	3,750	1,560
11	187	5,650	2,850	167	4,650	2,100	151	4,000	1,630
12	202	6,100	3,330	181	4,150	2,030	140	3,500	1,320
13	213	6,850	3,940	179	4,300	2,080	138	3,550	1,320
14	201	7,200	3,910	179	4,200	2,030	140	3,600	1,360
15	209	6,750	3,810	170	3,950	1,810	126	2,900	987
16	211	6,300	3,590	174	4,250	2,000	110	2,450	728
17	214	6,750	3,900	179	4,350	2,100	108	2,550	744
18	215	5,950	3,450	179	4,050	1,960	106	2,500	716
19	205	6,000	3,320	181	4,350	2,130	104	2,700	758
20	207	5,850	3,270	183	4,850	2,400	108	2,650	773
21	202	6,450	3,520	168	4,300	1,950	104	2,700	758
22	202	6,100	3,330	163	3,650	1,610	104	2,500	702
23	200	5,450	2,940	144	3,500	1,360	112	2,700	816
24	193	5,700	2,970	136	3,450	1,270	111	2,950	884
25	193	5,800	3,020	136	3,400	1,250	105	3,000	850
26	183	5,650	2,790	151	3,200	1,300	97	2,550	668
27	179	5,200	2,510	151	3,350	1,370	95	2,550	654
28	190	5,050	2,590	146	3,000	1,180	96	2,400	622
29	211	5,500	3,130	147	3,250	1,290	98	2,250	595
30	223	6,350	3,820	152	3,300	1,350	106	2,550	730
31	220	5,750	3,420	152	3,650	1,500	--	--	--
Total	6,255	--	104,180	5,400	--	63,520	3,783	--	34,255

Total discharge for year (cfs-days) 29,430.0

Total load for year (tons) 423,411

s Computed by subdividing day.

a Computed from partly estimated concentration graph.

YELLOWSTONE RIVER BASIN--Continued

FIVEMILE CREEK NEAR RIVERTON, WYO.--Continued

Particle-size analyses of suspended sediment, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; 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. 12, 1955	3:25 p.m.	47	56	2,080	1,760	--	17		22		30	39	65		87	99	VPWCM
Oct. 24	1:55 p.m.	37	54	1,660	2,910	--	18		28		43	51	74		94	100	VPWCM
Nov. 4	4:25 p.m.	43	43	3,520	6,250	--	25		41		56	64	82		95	99	VPWCM
Nov. 22	3:35 p.m.	39	32	1,940	2,740	--	20		31		39	49	69		86	97	VPWCM
Dec. 12	4:00 p.m.	34	32	1,520	2,980	--	18		30		48	55	72		96	100	VPWCM
Dec. 23	2:40 p.m.	a 170	32	1,640	1,870	--	49		76		92	96	99		100	--	VPWCM
Apr. 15, 1956	5:50 p.m.	47	61	27,600	2,300	--	46		68		91	97	99		100	--	VPWCM
Apr. 27	4:00 p.m.	47	56	5,920	5,330	--	29		45		66	82	91		97	100	VPWCM
May 16	4:00 p.m.	50	74	5,480	4,420	--	28		39		61	74	86		94	99	VPWCM
May 28	2:45 a.m.	152	56	11,800	7,040	--	0		37		74	87	95		99	100	VPN
May 28	2:45 a.m.	152	56	11,800	6,720	19	25		41		74	87	95		99	100	VPWCM
May 29	8:55 a.m.	251	52	21,200	3,720	--	39		56		80	91	98		100	--	VPWCM
June 8	4:05 p.m.	87	78	6,530	5,120	--	26		38		61	76	90		95	98	VPWCM
June 20	3:05 p.m.	196	72	7,920	6,420	0	1		37		64	80	93		99	100	VPN
June 20	3:05 p.m.	196	72	7,920	6,210	19	25		38		64	80	93		99	100	VPWCM
July 2	2:00 p.m.	214	69	7,550	3,090	--	29		44		68	82	94		99	100	VPWCM
July 6	7:55 a.m.	224	59	6,160	1,860	--	18		28		45	65	88		98	100	VPWCM
July 12	12:45 p.m.	215	74	6,520	2,200	--	20		28		53	70	88		96	99	VPWCM
July 17	11:10 a.m.	229	68	6,920	3,910	--	24		35		53	68	88		97	99	VPWCM
Aug. 1	12:10 p.m.	236	73	5,370	3,850	--	23		36		52	69	89		99	100	VPWCM
Aug. 23	11:30 a.m.	152	67	3,310	3,140	--	17		26		39	55	79		94	100	VPWCM
Sept. 13	1:00 p.m.	135	66	3,800	4,310	--	18		27		43	53	76		94	99	VPWCM
Sept. 25	3:00 p.m.	104	65	2,920	3,100	--	16		24		39	50	75		92	99	VPWCM

a Daily mean discharge.

YELLOWSTONE RIVER BASIN--Continued

FIVEMILE CREEK NEAR SHOSHONI, WYO.

LOCATION.--At gaging station, 1¼ miles upstream from normal high-water line of Boysen Reservoir and 5 miles west of Shoshoni, Fremont County.
DRAINAGE AREA.--397 square miles.
RECORDS AVAILABLE.--Chemical analyses: September 1949 to November 1951.
Water temperatures: December 1948 to September 1956.
Sediment records: August 1948 to September 1956.
EXTREMES, 1955-56.--Water temperatures: Maximum, 72°F Aug. 15; minimum, freezing point on many days during November to April.
Sediment concentrations: Maximum daily, 22,500 ppm May 29; minimum daily, not determined.
Sediment loads: Maximum daily, 25,000 tons May 29; minimum daily, not determined.
EXTREMES, 1948-56.--Water temperatures: Maximum, 84°F June 10, 1949; minimun, freezing point on many days during winter months.
Sediment concentrations: Maximum daily, 136,000 ppm June 12, 1949; minimum daily, 10 ppm Jan. 31, 1951.
Sediment loads: Maximum daily, 350,000 tons (estimated) Sept. 19, 1948; minimum daily, less than 0.50 ton Jan. 31, 1951.
REMARKS.--Flow affected by ice Nov. 14 to Dec. 24, Dec. 30 to Feb. 29. Records of discharge for water year October 1955 to September 1956 given in WSP 1439.

Temperature (° F) of water, water year October 1955 to September 1956
/Once-daily measurement between 8 a.m. and 11 a.m./

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

a Includes estimated temperature, 32° F, on missing days.

YELLOWSTONE RIVER BASIN--Continued

FIVEMILE CREEK NEAR SHOSHONI, WYO.--Continued

Suspended sediment, water year October 1955 to September 1956

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	214	4,250	2,460	64	925	160	50		
2	207	4,150	2,320	63	1,080	s 194	50	850	a 120
3	207	4,050	2,260	72	1,350	262	60		
4	211	3,750	2,140	74	1,520	304	57		
5	190	3,400	1,740	72	1,250	243	55	--	e 100
6	193	3,150	1,640	66	1,110	198	52	--	e 90
7	200	2,650	1,430	66	1,190	212	50	--	e 80
8	193	2,150	1,120	66	1,170	208	70		
9	141	1,650	628	66	1,120	200	70		
10	101	1,300	355	74	1,350	270	70		
11	92	1,350	335	80	1,180	255	70		
12	88	1,200	285	68	1,310	241	70		
13	84	1,300	295	61	830	137	70		
14	86	1,450	337	50	1,070	144	70	413	75
15	82	1,310	290	50			50		
16	82	1,150	255	50			55		
17	82	1,160	257	50	310	44	62		
18	82	1,150	255	50			70		
19	80	1,190	257	55			70		
20	80	980	212	60			70		
21	80	1,030	222	65			120	467	151
22	80	965	208	65			185	671	335
23	76	950	195	65			300	3,400	2,750
24	76	935	192	65			250	2,500	1,690
25	76	875	180	65			190	1,450	744
26	76	970	199	65	1,200	a 200	138	1,530	570
27	76	895	184	65			99	2,600	695
28	74	830	166	65			84	2,040	463
29	72	890	173	57			59	1,110	177
30	72	815	158	50			58	1,130	177
31	68	800	147	--	--	--	56	--	e 140
Total	3,521	--	20,895	1,884	--	5,292	2,780	--	9,617

Day	January			February			March		
1	55			40	--		36	1,210	118
2	54			35	--		37	1,580	158
3	54			35	--		183	2,870	s 2,830
4	54			37	--		55	2,550	379
5	54			40	--		53	2,310	331
6	54	876	128	40	--		52	1,650	232
7	54			42	--		52	2,250	316
8	54			43	--		64	2,300	397
9	54			43	460	e 60	68	3,850	707
10	55			40	--		52	1,750	246
11	57	610	94	41	570		52	1,200	s 187
12	60	1,210	196	43	--		47	805	102
13	60	900	146	40	--		47	725	92
14	60	795	129	37	--		45	1,130	137
15	60	905	147	35	639		47	1,380	s 185
16	60	890	144	30	--		47	3,250	412
17	60	1,090	177	22	--		50	4,350	587
18	60	955	155	22	524		66	3,300	588
19	60	950	154	22	--	e 32	47	4,150	527
20	60	995	161	22	--		50	5,350	722
21	60	1,150	186	22	595	35	50	5,650	763
22	60	1,300	a 220	22	805	48	47	5,800	736
23	60	1,420		22	990	59	54	6,950	1,010
24	60	--		24	1,140	74	47	7,850	996
25	60	--		25	1,060	72	45	6,600	802
26	57	1,580	e 190	25	1,110	75	34	5,950	546
27	54	--		25	980	66	23	4,200	261
28	52	1,130		28	1,080	82	20	3,150	170
29	50	--		32	1,150	99	30	4,550	369
30	47	--		--	--	--	31	5,000	418
31	45	--		--	--	--	30	4,500	364
Total	1,744	--	4,899	934	--	1,698	1,561	--	15,688

e Estimated.
s Computed by subdividing day.
a Computed from partly estimated concentration graph.

YELLOWSTONE RIVER BASIN--Continued

FIVEMILE CREEK NEAR SHOSHONI, WYO.--Continued

Suspended sediment, water year October 1955 to September 1956--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.....	31	4,200	352	103	4,250	1,180	277	5,500	4,110
2.....	28	3,350	253	90	3,900	948	246	5,450	3,620
3.....	30	3,050	247	88	3,450	820	214	5,800	3,350
4.....	30	4,000	324	90	3,650	887	204	5,800	3,190
5.....	30	3,550	288	82	3,450	764	214	6,350	3,670
6.....	27	2,550	186	95	3,900	1,000	183	5,150	2,540
7.....	27	3,200	233	108	4,250	1,240	193	5,200	2,710
8.....	24	3,350	217	97	4,000	1,050	172	4,850	2,250
9.....	24	3,250	211	92	3,500	869	235	7,250	4,600
10.....	24	3,150	204	128	5,950	2,060	246	5,300	3,520
11.....	24	3,150	204	123	4,450	1,480	256	5,250	3,630
12.....	23	.2,450	152	118	4,050	1,290	211	5,050	2,880
13.....	21	3,050	173	120	4,350	1,410	242	7,150	4,670
14.....	23	3,850	239	118	3,950	1,260	270	7,950	5,800
15.....	40	12,900	s 1,480	97	3,200	838	267	7,600	5,480
16.....	97	16,300	4,270	99	3,550	949	249	6,750	4,540
17.....	78	11,700	2,460	99	3,950	1,060	277	6,250	4,670
18.....	70	6,650	1,260	108	4,150	1,210	291	6,050	4,750
19.....	72	5,950	1,160	138	4,900	1,830	295	7,400	5,890
20.....	76	6,900	1,420	144	4,650	1,810	284	6,850	5,250
21.....	92	8,350	2,070	141	4,350	1,660	291	6,700	5,260
22.....	125	8,550	2,890	232	9,180	s 6,850	302	6,650	5,420
23.....	133	6,450	2,320	267	8,050	5,800	305	7,050	5,810
24.....	133	5,700	2,050	239	7,000	4,520	323	7,500	6,540
25.....	125	5,750	1,940	228	7,950	4,890	323	6,450	5,630
26.....	103	5,150	1,430	200	8,250	4,460	312	6,650	5,600
27.....	101	4,500	1,230	214	7,200	4,160	298	6,200	4,990
28.....	118	4,950	1,580	291	10,100	7,940	288	6,550	5,090
29.....	115	4,750	1,470	412	22,500	25,000	305	6,550	5,390
30.....	110	4,450	1,320	372	13,600	13,700	284	5,500	4,220
31.....	--	--	--	323	7,650	6,670	--	--	--
Total.	1,954	--	33,633	5,056	--	109,605	7,857	--	135,070

	July			August			September		
1.....	312	5,450	4,590	408	6,050	6,660	326	2,550	2,240
2.....	340	5,650	5,190	412	5,750	6,400	337	2,900	2,640
3.....	340	5,450	5,000	404	5,000	5,450	330	2,750	2,450
4.....	333	5,650	5,080	388	4,650	4,870	344	2,950	2,740
5.....	360	5,800	5,640	360	4,850	4,710	312	2,450	2,060
6.....	356	5,800	5,570	352	4,600	4,370	277	2,250	1,680
7.....	372	5,850	5,880	333	4,650	4,180	256	2,300	1,590
8.....	368	5,650	5,610	337	4,300	3,910	263	2,250	1,600
9.....	380	5,500	5,640	330	3,750	3,340	284	2,400	1,840
10.....	356	5,350	5,140	326	3,750	3,300	284	2,550	1,960
11.....	352	4,850	4,610	326	3,950	3,480	288	2,550	1,980
12.....	360	5,750	5,590	333	3,500	3,150	277	2,350	1,760
13.....	376	6,350	6,450	326	3,550	3,120	256	2,300	1,590
14.....	368	6,450	6,410	319	3,500	3,010	256	2,300	1,590
15.....	368	5,900	5,860	309	3,150	2,630	232	2,150	1,350
16.....	372	5,650	5,670	302	2,950	2,410	218	1,720	1,010
17.....	360	5,500	5,350	312	3,200	2,700	214	1,950	1,130
18.....	372	5,650	5,670	319	3,450	2,970	218	1,640	965
19.....	368	5,050	5,020	323	3,350	2,920	214	1,540	890
20.....	372	5,300	5,320	326	3,400	2,990	218	1,800	1,060
21.....	372	5,250	5,270	291	3,550	2,790	218	1,860	1,090
22.....	376	5,450	5,530	277	3,250	2,430	211	1,870	1,070
23.....	376	4,850	4,920	267	2,750	1,980	211	1,810	1,030
24.....	360	4,950	4,810	263	2,250	1,600	214	1,710	988
25.....	356	4,950	4,760	263	2,050	1,460	197	1,670	888
26.....	344	4,350	4,040	277	2,150	1,610	186	1,450	728
27.....	333	4,350	3,910	277	2,300	1,720	172	1,410	655
28.....	352	4,750	4,510	284	2,300	1,760	172	1,390	646
29.....	372	4,850	4,870	291	2,250	1,770	172	1,320	613
30.....	400	5,450	5,890	305	2,350	1,940	193	1,610	839
31.....	408	5,450	6,000	309	2,350	1,960	--	--	--
Total.	11,234	--	163,800	9,949	--	97,590	7,350	--	42,672

Total discharge for year (cfs-days)..... 55,824
Total load for year (tons)..... 640,459

s Computed by subdividing day.

YELLOWSTONE RIVER BASIN--Continued

FIVEMILE CREEK NEAR SHOSHONI, WYO.--Continued

Particle-size analyses of suspended sediment, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; 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. 12, 1955....	12:35 a.m.	86	52	1,230	1,340	--	21		29		38	47	78		97	100	VPWCM
Oct. 24	12:00 m.	72	44	962	1,490	--	22		27		35	40	69		92	100	VPWCM
Nov. 4.....	1:15 p.m.	68	45	894	1,850	--	30		41		53	61	84		98	100	VPWCM
Dec. 12.....	3:00 p.m.	67	32	402	887	--	37		48		67	83	100		--	--	VPWCM
Dec. 23.....	7:00 p.m.	760	34	7,260	4,520	--	40		65		82	88	96		100	--	VPWCM
Dec. 24.....	7:00 a.m.	a 250	33	2,180	3,330	--	47		67		83	90	97		100	--	VPWCM
Dec. 30.....	2:15 p.m.	58	32	1,500	2,200	--	20		28		43	70	99		100	--	VPWCM
Feb. 27, 1956 ...	1:00 p.m.	22	32	938	3,010	--	32		40		73	85	96		100	--	VPWCM
Mar. 26.....	11:50 a.m.	34	51	5,950	3,410	1	3		65		77	82	93		99	100	VPN
Mar. 26.....	11:50 a.m.	34	51	5,950	3,210	48	50		70		77	82	93		99	100	VPWCM
Apr. 9.....	3:45 p.m.	23	59	3,240	6,800	--	41		63		75	83	96		99	100	VPWCM
Apr. 16.....	10:00 a.m.	88	51	15,200	3,900	--	39		58		79	89	96		100	--	VPWCM
Apr. 27.....	10:15 a.m.	106	51	4,450	3,200	--	27		40		57	74	92		99	100	VPWCM
May 16.....	12:55 p.m.	112	68	3,240	6,400	--	25		38		64	79	93		99	100	VPWCM
May 26.....	11:50 a.m.	232	63	10,800	7,660	--	36		54		73	83	93		98	99	VPWCM
May 29.....	2:10 p.m.	460	63	22,000	6,980	--	27		41		69	87	95		99	100	VPWCM
June 20	1:45 p.m.	291	--	6,210	9,800	--	24		37		63	80	98		100	--	VPWCM
June 27	2:00 p.m.	312	75	5,740	8,110	--	20		32		56	71	87		98	100	VPWCM
July 6	9:20 a.m.	376	63	5,460	4,990	--	18		27		45	62	83		96	100	VPWCM
July 11.....	2:20 p.m.	364	76	4,870	1,540	--	16		26		43	58	80		94	100	VPWCM
July 12.....	2:45 p.m.	376	77	5,280	1,960	--	18		29		52	69	88		96	100	VPWCM
July 30.....	8:45 a.m.	420	67	5,440	1,810	--	18		30		48	65	86		97	99	VPWCM
Sept. 6.....	2:35 p.m.	274	64	2,570	4,760	--	23		36		52	64	83		96	100	VPWCM
Sept. 14.....	2:40 p.m.	249	67	2,590	3,320	--	19		29		46	60	82		97	100	VPWCM
Sept. 26.....	1:45 p.m.	186	61	1,500	1,630	--	20		28		42	57	81		96	98	VPWCM

a Daily mean discharge.

YELLOWSTONE RIVER BASIN--Continued

POISON CREEK NEAR SHOSHONI, WYO.

LOCATION.--At gaging station, half a mile upstream from normal high-water line of Boysen Reservoir and 1 mile west of Shoshoni, Fremont County.
DRAINAGE AREA.--519 square miles.
RECORDS AVAILABLE.--Water temperatures: March to June 1949.
Sediment records: March 1949 to December 1953, October 1955 to September 1956 (discontinued).
EXTREMES, 1955-56.--Sediment concentrations: Maximum daily, 36,000 ppm May 29; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 30,300 tons May 26; minimum daily, 0 tons on many days.
EXTREMES, 1949-53, 1955-56.--Sediment concentrations: Maximum daily, not determined; minimum daily, no flow on many days each year.
Sediment loads: Maximum daily, 30,300 tons May 26, 1956; minimum daily, 0 tons on many days each year.
REMARKS.--Records of discharge for water year October 1955 to September 1956 given in WSP 1439.

Monthly and annual summary of water and suspended-sediment discharge, water year October 1955 to September 1956

Month	Discharge (cfs-days)	Runoff (acre-feet)	Suspended sediment					
			Load (tons)	Daily load (tons)			Concentration (ppm)	
				Mean	Maximum	Minimum	Weighted mean	Maximum observed
October	4.0	7.9	(t)	0.01	--	--		40
November	2.2	4.4	(t)	.01	--	0		60
December	1.1	2.2	a 1	.03	1	0		382
January	0	0	0	0	0	0		--
February	0	0	0	0	0	0		--
March	44.3	88	a 1,038	33	a 280	0		21,500
April	9.0	18	a 6	.2	--	--		310
May	455.2	903	a 54,948	1,770	30,300	--		93,300
June	5.0	10	a 67	2.2	56	0		7,030
July	0	0	0	0	0	0		--
August	0	0	0	0	0	0		--
September	0	0	0	0	0	0		--
Water year	520.9	1,030	56,061	153	30,300	0		93,300

t Less than 0.50 ton.
a Partly estimated.

YELLOWSTONE RIVER BASIN--Continued

POISON CREEK NEAR SHOSHONI, WYO.--Continued

Particle-size analyses of suspended sediment, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; 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	
Mar. 5, 1956	5:20 p.m.	42	33	16,200	5,720		53		84		99	100	--	--			VPWCM
Mar. 22	6:20 p.m.	5.1	--	17,900	14,800		65		94		99	100	--	--			VPWCM
May 25	11:30 p.m.	1,490	45	51,800	4,560		40		76		95	98	99	100			VPWCM
May 26	12:15 a.m.	1,320	41	51,400	6,520		44		71		87	92	98	100			VPWCM
May 26	12:05 p.m.	e 46	64	18,200	7,210		64		91		97	98	99	100			VPWCM
May 29	9:30 a.m.	60	52	31,000	5,580		60		87		94	96	98	100			VPWCM
May 29	1:30 p.m.	111	63	37,600	6,500		49		77		95	98	100	--			VPWCM
May 29	4:05 p.m.	565	68	69,800	8,290		34		56		86	95	98	98	99	100	VPWCM
May 29	4:40 p.m.	888	--	64,600	9,230		42		70		94	98	99	100			VPWCM

e Estimated.

YELLOWSTONE RIVER BASIN--Continued

BADWATER CREEK AT BONNEVILLE, WYO.

LOCATION.--At gaging station at Bonneville, Fremont County, 3 miles upstream from normal high-water line of Boysen Reservoir.
DRAINAGE AREA.--790 square miles, approximately.
RECORDS AVAILABLE.--Sediment records: October 1947 to February 1954, August 1954 to September 1956.
EXTREMES, 1955-56.--Sediment concentrations: Maximum daily, 75,000 ppm May 29; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 210,000 tons May 29; minimum daily, 0 tons on many days.
EXTREMES, 1947-56.--Sediment concentrations: Maximum daily, 108,000 ppm July 11, 1949; minimum daily, no flow on many days each year.
Sediment loads: Maximum daily, 210,000 tons May 29, 1956; minimum daily, 0 tons on many days each year.
REMARKS.--No flow during periods October to December and July to September; record is omitted. Maximum observed sediment concentration during water year, 146,000 ppm May 25. Records of discharge for water year October 1955 to September 1956 given in WSP 1439.

Suspended sediment, January to June 1956

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	--	0
2.....							0	--	0
3.....							0	--	0
4.....							2	68	s 1
5.....							20	2,800	151
6.....							30	1,150	93
7.....							5	730	10
8.....							13	2,650	93
9.....							17	4,900	225
10.....							14	1,200	45
11.....							0	--	0
12.....							0	--	0
13.....							0	--	0
14.....							0	--	0
15.....							0	--	0
16.....							5	1,100	15
17.....							25	2,900	196
18.....							69	6,930	s 1,400
19.....							100	7,660	s 2,300
20.....							110	6,520	s 2,120
21.....							139	8,140	s 3,360
22.....							138	8,760	3,260
23.....							284	8,700	6,670
24.....							286	10,900	8,420
25.....							203	11,700	6,410
26.....							155	10,100	4,230
27.....							55	8,000	1,190
28.....							14	4,500	170
29.....							18	3,090	s 172
30.....							18	3,700	180
31.....							18	3,350	163
Total.	0		0	0		0	1,738	--	40,874

s Computed by subdividing day.

YELLOWSTONE RIVER BASIN--Continued

BADWATER CREEK AT BONNEVILLE, WYO.--Continued

Suspended sediment, January to June 1956--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.....	18	3,100	151	5	640	9	16	13,600	588
2.....	16	2,300	99	2	160	s 2	10	3,200	86
3.....	16	2,550	110	0	--	0	6.0	2,400	39
4.....	12	2,150	70	0	--	0	2.5	1,750	12
5.....	12	2,500	81	0	--	0	1.0	1,350	4
6.....	14	1,850	70	0	--	0	.5	800	1
7.....	14	2,050	77	3	2,870	s 40	.2	--	(t)
8.....	14	2,450	93	3	1,400	s 18	.2	--	(t)
9.....	14	1,950	74	0	--	0	0	--	0
10.....	12	4,450	144	0	--	0	0	--	0
11.....	12	7,500	243	0	--	0	0	--	0
12.....	13	8,100	284	0	--	0	0	--	0
13.....	14	4,000	151	0	--	0	0	--	0
14.....	12	6,350	206	1	1,100	sa 4	0	--	0
15.....	12	4,700	152	0	--	0	0	--	0
16.....	11	5,700	169	0	--	0	0	--	0
17.....	16	6,700	289	0	--	0	0	--	0
18.....	14	8,850	335	0	--	0	2	7,900	sa 70
19.....	9	4,950	120	0	--	0	1	6,400	sa 26
20.....	7	3,500	66	0	--	0	0	--	0
21.....	7	1,450	27	0	--	0	0	--	0
22.....	6	1,800	29	0	--	0	0	--	0
23.....	5	1,000	14	0	--	0	0	--	0
24.....	6	1,450	23	0	--	0	0	--	0
25.....	6	3,750	61	484	12,600	s 176,000	0	--	0
26.....	6	1,180	19	383	41,200	s 91,400	0	--	0
27.....	5	650	sa 10	267	60,600	s 63,300	0	--	0
28.....	6	710	12	30	22,000	1,780	0	--	0
29.....	7	920	17	771	75,000	sa 210,000	0	--	0
30.....	5	740	10	44	21,500	2,550	0	--	0
31.....	--	--	--	24	15,500	1,000	--	--	--
Total.	321	--	3,206	2,017	--	546,103	39.4	--	827

Total discharge for year (cfs-days)..... 4,115.4
Total load for year (tons)..... 591,010

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

BADWATER CREEK AT BONNEVILLE, WYO.--Continued

Particle-size analyses of suspended sediment, January to June 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; 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. 6, 1956	3:20 p.m.	39	32	2,610	3,860		36		43		60	88	100		--		VPWCM
Mar. 20	2:25 p.m.	98	53	9,300	4,800		41		57		86	97	100		--		VPWCM
Mar. 23	3:45 p.m.	300	51	13,400	2,900		32		47		69	88	99		100		VPWCM
Mar. 24	5:35 p.m.	325	47	16,800	1,700		35		37		68	87	98		100		VPWCM
Apr. 7	6:00 p.m.	12	49	2,440	2,420		2		68		89	98	100		--		VPN
Apr. 7	6:00 p.m.	12	49	2,440	2,470	42	62		69		89	98	100		--		VPWCM
May 25	11:15 p.m.	4,630	54	146,000	6,390		28		43		67	82	97		100		VPWCM
May 26	12:15 a.m.	4,660	50	104,000	5,000		32		50		75	86	97		100		VPWCM
May 26	2:00 p.m.	83	69	33,200	5,910		55		94		97	99	100		--		VPWCM
May 27	2:10 a.m.	590	53	134,000	3,950		33		57		80	92	98		100		VPWCM
May 27	9:35 a.m.	336	59	59,600	4,240		54		82		96	99	100		--		VPWCM
May 29	12:15 p.m.	911	56	72,800	5,500		35		54		80	92	98		100		VPWCM
May 29	7:00 p.m.	772	--	71,000	5,720		36		56		82	94	99		100		VPWCM

YELLOWSTONE RIVER BASIN--Continued

MUDDY CREEK NEAR PAVILLION, WYO.

LOCATION.--270 feet upstream from Wyoming Canal siphon, 1¼ miles downstream from gaging station, 4½ miles downstream from Sheep Creek, and 9½ miles northeast of Pavillion, Fremont County.

DRAINAGE AREA.--257 square miles.

RECORDS AVAILABLE.--Water temperatures: March to July 1949, October 1954 to September 1956.
Sediment records: March 1949 to November 1953, October 1954 to September 1956.

EXTREMES, 1955-56.--Water temperatures: Maximum, 75°F July 13, 14; minimum, freezing point on many days during November to March.
Sediment concentrations: Maximum daily, 58,000 ppm May 29; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 46,000 tons May 29; minimum daily, 0 tons on many days.

EXTREMES, 1949-53, 1954-56.--Water temperatures (1954-56): Maximum, 81°F Aug. 10, 1955; minimum, freezing point on many days during winter months.
Sediment concentrations: Maximum daily, not determined; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 140,000 tons (estimated) July 4, 1950; minimum daily, 0 tons on many days.

REMARKS.--No appreciable inflow between sampling point and gaging station except during periods of heavy local runoff. Flow affected by ice Nov. 2 to Apr. 1. Maximum observed sediment concentration during water year, 168,000 ppm May 29. Records of discharge for water year October 1955 to September 1956 given in WSP 1439.

Temperature (° F) of water, water year October 1955 to September 1956
/Once-daily measurement between 4 p.m. and 8 p.m. Many days of no flow/

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

a Includes estimated temperature, 32° F, on missing days.

YELLOWSTONE RIVER BASIN--Continued

MUDDY CREEK NEAR PAVILLION, WYO.--Continued

Suspended sediment, water year October 1955 to September 1956

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	0.7			2.2	348	2	1.0		
2	.7			2.0	185	1	1.0		
3	.8			2.0	970	5	1.0		
4	.8	34	(t)	2.0	1,960	11	1.0		
5	.7			1.5	1,180	5	1.0		
								172	(t)
6	.8			1.5	500	2	1.0		
7	1.0			1.5	715	3	1.0		
8	1.0			1.0	530	1	1.0		
9	1.0			1.0	1,310	4	1.0		
10	.9	79	(t)	1.0	--	e 5	1.0		
11	.9			.5	1,130	2	.8		
12	1.0			.4	1,210	1	.6		
13	1.4			.3	370	(t)	.5		
14	1.4			.2	151	(t)	.5		
15	1.4			.1	166	(t)	.5		
16	1.4			.1	450	(t)	.5	139	(t)
17	1.4			0	--	0	.5		
18	1.4	82	(t)	0	--	0	.5		
19	1.4			0	--	0	.5		
20	1.4			0	--	0	.5		
21	1.4			.1	265	(t)	.5		
22	1.4			.1	390	(t)	1.0	124	(t)
23	1.4			.1	120	(t)	5.0	430	6
24	2.2	280	2	.1	146	(t)	4.0	370	4
25	2.2	420	2	.1	285	(t)	2.0	295	2
26	3.0	215	2	.2	137	(t)	1.0	142	(t)
27	3.4	180	2	.4	157	(t)	.5	160	(t)
28	3.4	320	3	.6	186	(t)	.5	140	(t)
29	3.4	422	4	.8	156	(t)	.5		
30	3.8	450	5	1.0	208	1	.5	132	(t)
31	3.4	452	4	--	--	--	.5		
Total	50.5	--	29	20.8	--	45	31.4	--	21

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	0.5			0.2			0.7	202	(t)
2	.7			.2			1.0	570	2
3	.8			.2			2.0	575	3
4	.8			.2			3.0	245	2
5	.8			.2			3.0	225	2
					476	(t)			
6	.8			.3			2.0	178	1
7	.7			.4			2.0	216	1
8	.6			.5			2.0	321	2
9	.6			.5			3.0	284	2
10	.6			.5			3.0	550	4
11	.6			.5			3.0	680	6
12	.6			.5			2.0	520	3
13	.6			.5			2.0	220	1
14	.6			.5			2.0	285	2
15	.5			.5	273	(t)	3.0	374	3
16	.5	198	(t)	.5			4.0	296	3
17	.5			.5			5.0	457	6
18	.5			.5			5.0	434	6
19	.5			.5			5.0	820	11
20	.5			.5			5.0	1,750	24
21	.5			.5			6.0	2,750	45
22	.5			.5			7.0	4,250	80
23	.5			.5			10	7,150	193
24	.5			.5	159	(t)	12	8,200	266
25	.5			.5			10	11,600	313
26	.4			.5			10	13,300	359
27	.4			.6			9	2,400	58
28	.3			.6			9	7,300	177
29	.3			.6			8	12,400	268
30	.3			--	--	--	8	15,500	335
31	.3			--	--	--	8	--	e 340
Total	16.8		9	13.0	--	9	154.7	--	2,518

e Estimated.
t Less than 0.50 ton.

YELLOWSTONE RIVER BASIN--Continued

MUDDY CREEK NEAR PAVILLION, WYO.--Continued

Suspended sediment, water year October 1955 to September 1956--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	7.0	--	e 300	6.2			5	680	9
2	6.2	--	e 200	6.2			3.	385	3
3	6.8	10,800	s 271	5.0			1	255	1
4	6.8	9,150	168	5.0			.5	161	(t)
5	4.6	8,500	106	5.0			.4	80	(t)
6	5.0	7,950	107	5.0			.3		
7	6.8	6,500	119	5.0			.3		
8	6.2	7,950	133	4.2			.3		
9	5.0			3.8			.3		
10	8.0			3.8			.3	16	(t)
					2,860	35			
11	8.6			4.2			.2		
12	7.4			5.0			.1		
13	7.4			5.0			0	--	0
14	6.8			4.2			0	--	0
15	6.8			3.8			0	--	0
16	6.2			4.2			0	--	0
17	6.2			3.8			0	--	0
18	6.2			3.8			0	--	0
19	5.6			3.8			0	--	0
20	5.6	7,130	133	3.8			0	--	0
21	6.8			3.4	950	9	0	--	0
22	6.8			3.8	1,750	18	0	--	0
23	7.4			4.2	10,200	116	0	--	0
24	7.4			3.0	4,750	38	0	--	0
25	7.4			167	41,000	sa 32,000	0	--	0
26	7.4			21	15,800	s 2,450	0	--	0
27	7.4			86	25,300	s 22,000	0	--	0
28	7.4			38	26,000	sa 7,200	0	--	0
29	6.8			178	58,000	sa 46,000	0	--	0
30	6.2			102	52,100	s 35,200	0	--	0
31	--	--	--	10	2,780	75	--	--	--
Total	200.2	--	4,330	707.2	--	145,806	11.7	--	13

	July			August			September		
1	0	--	0	2.0	1,770	10	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	0		0	0		0
11	0	--	0	0		0	0		0
12	57	12,000	sb 8,000	0		0	0		0
13	26	23,000	sa 2,400	0		0	0		0
14	3.0	3,200	26	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	0	--	0	0		0	0		0
20	0	--	0	0		0	0		0
21	0	--	0	0		0	0		0
22	0	--	0	0		0	.1		
23	0	--	0	0		0	.5		
24	0	--	0	0		0	.8		
25	0	--	0	0		0	1.0		
26	0	--	0	0		0	1.0	21	(t)
27	0	--	0	0		0	1.0		
28	0	--	0	0		0	1.0		
29	7.6	13,000	sa 500	0		0	1.0		
30	23	27,000	sa 4,800	0		0	1.0		
31	42	29,000	sa 6,500	0		0	--		--
Total	158.6	--	22,226	2.0		10	7.4		(t)

Total discharge for year (cfs-days) 1,374.3

Total load for year (tons) 175,016

e Estimated.

s Computed by subdividing day.

t Less than 0.50 ton.

a Computed from partly estimated concentration graph.

b Computed from estimated concentration graph.

MUDDY CREEK NEAR PAVILLION, WYO.--Continued

Particle-size analyses of suspended sediment, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet ; 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. 24, 1956....	1:35 p.m.	19	38	11,000	3,200		39		60		82	94	99		100		VPWCM
Apr. 9.....	12:55 p.m.	5.0	52	6,340	4,300		48		67		91	96	99		100		VPWCM
Apr. 21.....	2:15 p.m.	6.2	66	4,990	4,150		2		70		92	98	100		--		VPN
Apr. 21.....	2:15 p.m.	6.2	66	4,990	3,880	42	50		74		92	98	100		--		VPWCM
May 23.....	10:00 a.m.	4.2	68	20,600	7,700		73		95		98	100	--		--		VPWCM
May 25.....	5:25 a.m.	291	54	63,800	8,450		33		50		81	95	100		--		VPWCM
May 25.....	8:15 a.m.	26	58	40,900	6,040		45		66		91	98	100		--		VPWCM
May 25.....	4:45 p.m.	29	64	14,000	10,800		62		85		96	99	100		--		VPWCM
May 27.....	5:15 p.m.	30	60	15,900	11,900		56		81		97	99	100		--		VPWCM
May 27.....	5:50 p.m.	461	59	112,000	7,700		28		43		81	96	100		--		VPWCM
May 27.....	6:40 p.m.	427	56	143,000	5,040		32		50		80	96	100		--		VPWCM
May 29.....	12:15 p.m.	14	61	33,400	6,370		35		51		73	96	100		--		VPWCM
May 29.....	9:40 p.m.	915	50	168,000	3,420		29		47		74	90	99		100		VPWCM

YELLOWSTONE RIVER BASIN--Continued

MUDDY CREEK NEAR SHOSHONI, WYO.

LOCATION.--At gaging station, 2½ miles upstream from normal high-water line of Boysen Reservoir and 9 miles northwest of Shoshoni, Fremont County.
DRAINAGE AREA.--340 square miles, approximately.
RECORDS AVAILABLE.--Water temperatures: March to July 1949.
Sediment records: March 1949 to September 1956.
EXTREMES, 1955-56.--Sediment concentrations: Maximum daily, 115,000 ppm May 30; minimum daily, no flow on many days during December to March.
Sediment loads: Maximum daily, 102,000 tons May 30; minimum daily, 0 tons on many days during December to March.
EXTREMES, 1949-56.--Sediment concentrations: Maximum daily (1951-56), 119,000 ppm July 22, 1951; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 200,000 tons (estimated) July 5, 1950; minimum daily, 0 tons on many days.
REMARKS.--Flow affected by ice Nov. 12 to Mar. 24. Records of discharge for water year October 1955 to September 1956 given in WSP 1439.

Suspended sediment, water year October 1955 to September 1956

Day	October			November			December		
		Suspended sediment			Suspended sediment			Suspended sediment	
	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day
1	5.2			5.4	--	e 15	1.5	--	
2	5.6			5.6	1,000	15	1.5	--	
3	5.8			6.6	--	e 40	.8	--	
4	5.8			7.6	2,620	54	.8	--	
5	5.8			6.6	--	e 32	.8	--	
6	6.2			5.6	--		.8	244	
7	7.0			5.6	876		.8	--	
8	6.6			5.0	--		.8	--	e 1
9	6.2			5.6	702	e 12	.8	154	
10	6.6			6.6	--		.8	--	
11	6.2			7.8	--		.8	--	
12	6.4			4.0	--	e 4	1.1	414	
13	6.6			3.5	--	e 3	1.3	--	
14	8.0			2.5	262	2	1.5	--	
15	7.0			2.0			1.2	--	
16	7.0	1,120	19	1.0			.5	431	
17	7.0			1.0			.3	--	(t)
18	7.4			1.0			.2	--	
19	6.8			1.0			0	--	0
20	6.6			1.0			0	--	0
21	6.6			1.5			0	--	0
22	6.6			2.0	217	1	3.5	--	e 3
23	6.2			1.7			10	285	8
24	6.2			1.5			12	315	10
25	6.0			1.5			15	--	e 18
26	6.0			1.5			15	--	e 22
27	6.0			1.5			15	575	23
28	6.4			1.5			15	--	e 20
29	6.2			1.5			7.0	--	e 8
30	6.2			1.5			3.5	301	3
31	6.4			--	--	--	3.0	--	e 2
Total	198.6		589	100.7	--	253	115.3	--	133

e Estimated.
t Less than 0.50 ton.

YELLOWSTONE RIVER BASIN--Continued

MUDDY CREEK NEAR SHOSHONI, WYO.--Continued

Suspended sediment, water year October 1955 to September 1956--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	2.5	--					0	--	0
2	2.0	--					0	--	0
3	1.8	112					.1	--	(t)
4	1.6	--					.5	--	(t)
5	1.5	116	e 1				5.0	700	a 9
6	1.4	--					1.0	230	1
7	1.3	--					1.0	230	1
8	1.1	--					1.3	600	a 2
9	1.0	177					1.6	700	a 3
10	.5	--					2.0	316	2
11	.5	181					.5	--	(t)
12	.5	--					.5	302	(t)
13	.5	177					.5	256	(t)
14	.5	--					1.0	--	e 1
15	.5	--	(t)				2.0	326	2
16	.5	182					4.0	440	5
17	.5	--					8.0	270	6
18	.5	--					15	550	a 22
19	.4	248					26	1,200	a 85
20	.3	--					25	2,090	141
21	.2	--					24	4,000	259
22	.1	--					23	6,550	407
23	.1	198	(t)				22	6,500	a 380
24	.1	--					22	6,900	a 400
25	.1	--					21	6,900	a 400
26	0	--	0				18	7,050	343
27	0	--	0				18	6,000	a 300
28	0	--	0				15	5,950	241
29	0	--	0				18	6,350	309
30	0	--	0				15	7,300	a 300
31	0	--	0				15	--	e 300
Total	20.0	--	11	0		0	306.0	--	3,921

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	14			18	4,200	204	18	5,900	287
2	13			13	2,700	a 95	14	4,000	151
3	13			51	15,000	a 2,100	59	14,000	sb 3,200
4	14			34	7,750	711	111	22,300	6,680
5	13			21	3,700	210	71	14,500	2,780
6	13			14	2,400	91	40	7,050	761
7	13			14	2,450	93	30	5,500	446
8	14			16	3,400	147	15	3,150	128
9	13			14	2,400	91	11		
10	13	6,110	247	15	2,200	sa 95	10		
11	16			22	5,200	sa 360	10		
12	16			38	6,450	662	12		
13	15			29	5,300	b 420	11		
14	16			29	4,950	388	14	2,250	73
15	16			26	4,250	298	12		
16	16			21	3,900	221	12		
17	18			18	3,250	158	14		
18	18			14	2,800	b 110	15		
19	19			14	2,200	83	18	2,800	136
20	34	10,800	s 1,800	12	--	e 46	33	6,220	s 600
21	47	14,000	sa 1,900	13	--	e 60	47	6,450	819
22	25	7,700	b 500	8.8	1,260	30	53	6,950	995
23	20			13	3,800	sa 150	54	6,750	984
24	19			15	5,100	207	49	6,200	820
25	16	4,890	211	31	12,900	s 1,830	43	5,650	656
26	13			54	76,900	s 16,600	40	4,650	502
27	13			35	17,000	1,610	35	4,800	454
28	27	7,400	539	63	55,000	sa 13,000	33	3,700	330
29	34	7,200	b 650	117	86,000	sa 38,000	34	4,150	381
30	28	5,200	393	230	115,000	s 102,000	21	1,850	105
31	--	--	--	44	25,000	s 3,710	--	--	--
Total	559	--	11,530	1,056.8	--	183,780	939	--	21,945

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

YELLOWSTONE RIVER BASIN--Continued

MUDDY CREEK NEAR SHOSHONI, WYO.--Continued

Suspended sediment, water year October 1955 to September 1956--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.....	24	2,700	b 170	34	11,500	1,060	40	--	e 340
2.....	33	6,400	570	36	5,200	505	29	--	e 200
3.....	29	3,450	270	50	7,650	1,030	20	2,650	143
4.....	27	2,700	197	63	8,000	1,360	18	2,050	100
5.....	37	4,050	405	63	--	e 1,400	32	3,470	s 316
6.....	44	4,050	481	85	11,100	2,550	27	2,950	215
7.....	47	5,350	679	93	11,700	2,940	17	1,650	76
8.....	41	4,850	537	58	8,600	1,350	13	--	e 50
9.....	39	4,150	437	50	7,450	1,010	12	--	e 40
10.....	39	4,550	479	40	5,850	632	11	1,150	34
11.....	36	3,900	379	44	6,150	731	16	2,280	112
12.....	28	3,500	265	52	7,450	1,050	18	2,050	100
13.....	44	21,300	s 3,230	52	6,550	920	20	2,050	111
14.....	33	12,200	1,090	28	3,500	sa 280	19	2,000	103
15.....	32	6,800	588	29	3,600	sa 300	12	--	e 46
16.....	37	6,100	609	40	4,000	432	10	--	e 36
17.....	40	6,150	664	44	4,550	541	10	1,210	33
18.....	40	5,250	567	58	6,600	1,030	12	1,020	33
19.....	29	3,800	298	58	--	e 1,100	10	812	22
20.....	23	2,800	174	66	6,900	1,230	7.8		
21.....	21	2,650	150	76	8,050	1,650	7.4		
22.....	18	2,300	112	52	6,150	863	7.8		
23.....	18	2,150	104	46	4,750	590	8.0		
24.....	22	3,350	199	43	3,650	424	8.0	994	21
25.....	19	2,400	123	49	4,700	622	7.8		
26.....	22	2,650	157	40	3,800	410	7.8		
27.....	24	2,600	168	32	3,700	320	7.8		
28.....	28	2,950	223	29	2,850	223	7.6		
29.....	29	3,120	s 258	40	3,600	389	8.6	--	e 26
30.....	50	13,500	s 1,930	43	3,650	424	12	--	e 38
31.....	49	16,000	2,120	36	3,450	335	--	--	--
Total.	1,002	--	17,633	1,529	--	27,701	436.6	--	2,363

Total discharge for year (cfs-days)..... 6,263.0
Total load for year (tons)..... 269,859

e Estimated.
s Computed by subdividing day.
a Computed from partly estimated concentration graph.
b Computed from estimated concentration graph.

YELLOWSTONE RIVER BASIN--Continued

MUDDY CREEK NEAR SHOSHONI, WYO.--Continued

Particle-size analyses of suspended sediment, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; 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, 1955	10:55 a.m.	6.4	40	588	1,200		27		36		48	74	100		--		VPWCM
Mar. 24, 1956	3:45 p.m.	40	38	14,400	3,700		34		50		73	89	99		100		VPWCM
Apr. 9	3:35 p.m.	15	55	6,800	2,730	44	50		72		84	94	100		--		VPWCM
May 16	10:55 a.m.	21	65	3,920	1,490		26		36		64	86	99		100		VPWCM
May 25	3:55 p.m.	42	77	20,900	4,990		18		29		76	95	100		--		VPWCM
May 25	4:30 p.m.	91	72	32,900	9,240		30		50		81	92	99		100		VPWCM
May 26	11:25 a.m.	82	64	135,000	13,400		45		72		89	94	99		100		VPWCM
May 28	1:30 p.m.	58	60	54,700	4,230		54		77		92	97	100		--		VPWCM
May 29	2:40 p.m.	115	63	71,700	2,600		38		55		79	92	98		100		VPWCM
May 30	9:20 a.m.	660	56	195,000	2,990		32		48		71	89	98		100		VPWCM
May 30	1:30 p.m.	172	63	169,000	5,620		36		54		80	91	98		100		VPWCM
June 20	2:20 p.m.	43	--	7,750	14,400		23		40		76	92	99		100		VPWCM
June 27	12:55 p.m.	41	78	5,840	6,970		18		28		65	90	98		100		VPWCM
July 6	8:45 a.m.	44	64	3,780	3,600		18		25		53	83	97		100		VPWCM
July 13	12:50 p.m.	71	74	57,100	8,560		51		77		90	96	99		100		VPWCM
July 30	9:15 a.m.	42	70	11,000	5,990		58		77		82	92	99		100		VPWCM
Aug. 6	2:00 p.m.	89	76	11,100	3,160		26		43		68	85	98		100		VPWCM
Aug. 21	2:15 p.m.	78	74	8,120	2,670		20		31		53	78	97		100		VPWCM
Aug. 31	8:40 a.m.	35	49	3,190	1,990		17		24		42	76	98		100		VPWCM
Sept. 14	9:50 a.m.	22	60	2,080	1,400		15		19		31	63	92		99	99	VPWCM

YELLOWSTONE RIVER BASIN--Continued

MUDDY CREEK NEAR SHOSHONI, WYO.--Continued

Particle-size analyses of bed material, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed; V, visual accumulation tube)

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									
							0.062	0.125	0.250	0.500	1.000	2.000	4.000	8.000	16.000	32.000	
May 16, 1956....	3	21					1	11	58	74	80	82	85	89	94	100	SV
May 25	3	91					3	8	50	72	76	79	83	90	99	100	SV
June 27.....	3	42					1	4	42	79	89	94	98	99	100	--	SV
Aug. 21.....	3	78					0	3	47	71	82	90	96	100	--	--	SV
Sept. 14	4	22					0	5	52	72	79	86	93	100	--	--	SV

YELLOWSTONE RIVER BASIN--Continued

FIFTEENMILE CREEK NEAR WORLAND, WYO.

LOCATION.--At gaging station, 1¾ miles upstream from mouth and 2¾ miles west of Worland, Washakie County.
DRAINAGE AREA.--594 square miles.
RECORDS AVAILABLE.--Sediment records: March 1951 to September 1956.
EXTREMES, 1955-56.--Sediment concentrations: Maximum daily, 109,000 ppm May 23; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 20,100 tons Sept. 13; minimum daily, 0 tons on many days.
EXTREMES, 1951-56.--Sediment concentrations: Maximum daily, 125,000 ppm Apr. 16, 1952; minimum daily, no flow on many days each year.
Sediment loads: Maximum daily, 418,000 tons May 22, 1952; minimum daily, 0 tons on many days each year.
REMARKS.--Flow affected by ice Dec. 24-27, Feb. 23 to Mar. 10, Mar. 16-18. Bureau of Land Management has extensive spreader systems on some of the tributaries above station. Records of discharge for water year October 1955 to September 1956 given in WSP 1439.

Suspended sediment, water year October 1955 to September 1956

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
2.....							0	--	0
3.....							0	--	0
4.....							0	--	0
5.....							0	--	0
6.....							0	--	0
7.....							0	--	0
8.....							0	--	0
9.....							0	--	0
10.....							0	--	0
11.....							0	--	0
12.....							0	--	0
13.....							0	--	0
14.....							0	--	0
15.....							0	--	0
16.....							0	--	0
17.....							0	--	0
18.....							0	--	0
19.....							0	--	0
20.....							0	--	0
21.....							0	--	0
22.....							0	--	0
23.....							0	--	0
24.....							200	12,800	s 11,500
25.....							55	9,470	1,410
26.....							13	4,710	s 176
27.....							4	2,800	30
28.....							0	--	0
29.....							0	--	0
30.....							0	--	0
31.....							0	--	0
Total	0		0	0		0	272	--	13,116

s Computed by subdividing day.

YELLOWSTONE RIVER BASIN--Continued

FIFTEENMILE CREEK NEAR WORLAND, WYO.--Continued

Suspended sediment, water year October 1955 to September 1956--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	--	0	38	2,010	s 230
2				0	--	0	32	1,550	s 153
3				0	--	0	29	4,420	s 607
4				0	--	0	140	9,600	s 5,700
5				0	--	0	55	7,770	1,150
6				0	--	0	10	2,820	s 88
7				0	--	0	6	1,390	23
8				0	--	0	19	2,470	s 281
9				0	--	0	17	2,230	102
10				0	--	0	2	1,160	s 8
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	2	300	2
17				0	--	0	3	800	6
18				0	--	0	80	16,500	s 5,260
19				0	--	0	73	18,000	s 3,830
20				0	--	0	45	21,000	2,550
21				0	--	0	11	20,600	612
22				0	--	0	9.3	21,600	s 609
23				17	1,460	s 229	1.2	19,700	64
24				50	3,640	s 556	0	--	0
25				31	1,520	s 140	0	--	0
26				38	1,120	s 137	0	--	0
27				36	1,560	s 163	0	--	0
28				14	844	s 34	0	--	0
29				24	1,870	s 220	0	--	0
30				--	--	--	0	--	0
31				--	--	--	0	--	0
Total	0		0	210	--	1,479	572.5	--	21,275

Day	April			May			June		
1				0		0			
2				0		0			
3				0		0			
4				0		0			
5				0		0			
6				0		0			
7				0		0			
8				0		0			
9				0		0			
10				0		0			
11				0		0			
12				0		0			
13				0		0			
14				0		0			
15				0		0			
16				0		0			
17				0		0			
18				0		0			
19				0		0			
20				0		0			
21				0		0			
22				0		0			
23				2.8	109,000	s 1,390			
24				0		0			
25				0		0			
26				0		0			
27				0		0			
28				0		0			
29				0		0			
30				0		0			
31				0		0			
Total	0		0	2.8		1,390	0		0

s Computed by subdividing day.

YELLOWSTONE RIVER BASIN--Continued

FIFTEENMILE CREEK NEAR WORLAND, WYO.--Continued

Suspended sediment, water year October 1955 to September 1956--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	1.5	7,300	a 30
2.....	3.3	7,000	sa 800	0	--	0	.6	4,100	a 7
3.....	2.8	37,800	s 448	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	0	--	0	0	--	0
11.....	0	--	0	0	--	0	0	--	0
12.....	0	--	0	0	--	0	0	--	0
13.....	0	--	0	0	--	0	108	43,000	s 20,100
14.....	0	--	0	0	--	0	15	48,100	2,020
15.....	0	--	0	0	--	0	7.2	21,800	424
16.....	0	--	0	0	--	0	3.0	7,400	60
17.....	0	--	0	0	--	0	.9	5,100	12
18.....	0	--	0	0	--	0	0	--	0
19.....	0	--	0	0	--	0	0	--	0
20.....	0	--	0	0	--	0	0	--	0
21.....	0	--	0	0	--	0	0	--	0
22.....	0	--	0	0	--	0	0	--	0
23.....	0	--	0	0	--	0	0	--	0
24.....	0	--	0	0	--	0	0	--	0
25.....	0	--	0	0	--	0	0	--	0
26.....	0	--	0	0	--	0	0	--	0
27.....	0	--	0	39	22,500	s 6,850	0	--	0
28.....	0	--	0	37	61,500	6,370	0	--	0
29.....	0	--	0	6.0	46,000	773	0	--	0
30.....	0	--	0	3.0	20,000	162	0	--	0
31.....	0	--	0	2.4	10,800	70	--	--	--
Total.	6.1	--	1,248	87.4	--	14,225	136.2	--	22,653

Total discharge for year (cfs-days)..... 1,287.0
Total load for year (tons)..... 75,386

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

YELLOWSTONE RIVER BASIN--Continued

FIFTEENMILE CREEK NEAR WORLAND, WYO.--Continued

Particle-size analyses of suspended sediment, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; 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	
Dec. 24, 1955....	2:10 p.m.	e 445	--	27,800	3,600	--	37		49		74	88	99		100		VPWCM
Dec. 26	10:45 a.m.	e 10	32	4,340	3,080	--	93		97		98	99	100		--		VPWCM
Mar. 5, 1956	10:00 a.m.	50	--	3,910	2,610	--	77		88		90	95	98		100		VPWCM
Mar. 18.....	8:30 a.m.	e 100	--	9,260	3,490	--	60		74		88	94	99		100		VPWCM
Aug. 27	4:25 p.m.	107	44	54,600	2,460	--	62		88		98	99	100		--		VPWCM
Aug. 28	9:20 a.m.	32	--	52,000	2,050	7	12		--		99	99	100		--		VPN
Aug. 28	9:20 a.m.	32	--	52,000	1,950	66	83		--		99	99	100		--		VPWCM
Sept. 13.....	11:10 a.m.	283	58	78,000	7,000	--	58		83		93	97	100		--		VPWCM

e Estimated.

BIGHORN RIVER NEAR MANDERSON, WYO.

LOCATION.--At gaging station at bridge on county highway, a quarter of a mile west of Rairden, 1¼ miles downstream from Fivemile Creek, and 6 miles southeast of Manderson, Big Horn County.
RECORDS AVAILABLE.--Chemical analyses: December 1950 to July 1953.
Water temperatures: August 1949 to October 1953, October 1955 to September 1956 (discontinued).
Sediment records: April 1949 to November 1953, October 1955 to September 1956 (discontinued).
EXTREMES, 1955-56.--Water temperatures: Maximum, 83°F July 23, 25; minimum, freezing point on many days during November to March.
Sediment concentrations: Maximum daily, 6,320 ppm Dec. 24; minimum daily, 65 ppm May 17.
Sediment loads: Maximum daily, 62,900 tons Feb. 24; minimum daily, 45 tons May 17.
EXTREMES, 1949-53, 1955-56.--Water temperatures: Maximum, 86°F July 14, 1953; minimum, freezing point on many days during winter months.
Sediment concentrations: Maximum daily, 47,600 ppm May 22, 1952; minimum daily, not determined.
Sediment loads: Maximum daily, 614,000 tons May 22, 1952; minimum daily, not determined.
REMARKS.--Flow affected by ice Nov. 15-21, Dec. 15-24, Feb. 1-22. Records of discharge for water year October 1955 to September 1956 given in WSP 1439.

Temperature (°F) of water, water year October 1955 to September 1956
(Twice-daily measurements between 7 a.m. and 10 a.m. and between 4 p.m. and 7 p.m.)

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

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER NEAR MANDERSON, WYO.--Continued

Suspended sediment, water year October 1955 to September 1956

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	814	585	1,290	1,150	2,180	s 9,720	1,680	1,180	s 5,810
2	769	461	957	1,400	3,410	s 14,400	1,660	1,100	s 5,360
3	614	257	s 485	1,420	3,160	s 13,200	1,680	1,020	s 5,100
4	614	314	s 590	1,460	2,860	s 13,200	1,960	800	4,230
5	578	258	s 439	1,460	2,000	s 9,280	1,710	532	s 2,770
6	542	269	s 442	1,490	2,080	s 9,360	1,920	560	2,900
7	560	227	s 384	685	666	s 1,530	1,920	568	2,940
8	560	229	s 387	1,270	1,540	s 7,190	2,060	600	3,340
9	548	188	s 302	1,460	1,620	s 7,580	2,030	776	4,250
10	554	173	s 286	1,470	1,650	s 7,850	1,960	792	4,190
11	572	266	s 506	1,520	2,030	s 9,680	1,890	1,140	s 6,640
12	727	692	s 1,710	1,530	1,920	s 9,170	1,890	1,280	s 7,500
13	806	828	s 2,000	1,490	2,240	s 10,400	1,490	544	2,190
14	870	1,060	s 2,960	830	766	s 2,130	2,110	424	2,420
15	838	687	s 1,700	1,630	952	s 5,430	2,240	328	1,980
16	814	710	s 1,780	1,960	656	s 3,820	2,270	464	2,840
17	814	687	s 1,690	2,240	840	s 5,540	2,520	760	5,170
18	814	562	s 1,390	1,770	571	s 3,290	2,310	104	649
19	838	612	s 1,480	1,570	536	2,270	1,500	80	324
20	830	578	s 1,440	1,640	864	s 4,030	2,000	216	1,170
21	838	498	s 1,220	785	2,510	5,320	2,200	192	1,140
22	814	462	s 1,120	1,330	3,180	s 12,400	2,700	168	1,220
23	838	476	s 1,230	1,540	2,270	s 10,100	3,380	3,400	31,000
24	838	566	s 1,380	1,480	1,740	s 8,000	2,900	6,320	49,500
25	838	515	s 1,270	910	460	s 1,040	1,890	2,950	s 16,200
26	822	679	s 1,730	1,620	1,570	s 7,960	1,200	800	2,590
27	854	736	s 1,790	1,680	1,500	s 7,460	1,030	416	1,160
28	846	911	s 2,440	950	624	1,600	1,680	1,540	s 7,940
29	846	888	2,030	1,820	1,350	s 7,770	1,780	2,120	s 10,700
30	846	513	s 1,260	1,530	1,260	s 5,690	1,860	888	4,460
31	830	494	s 1,170	--	--	--	1,890	446	2,280
Total	23,286	--	38,858	43,090	--	216,410	61,310	--	199,963
	January			February			March		
1	1,920	1,040	s 6,580	1,750	544	2,570	2,100	950	5,390
2	1,370	592	2,190	1,800	128	622	2,100	750	4,250
3	1,430	568	2,190	1,800	120	583	2,130	1,400	8,050
4	1,890	1,330	s 7,920	1,800	168	816	2,420	4,730	30,900
5	1,890	1,010	5,150	2,000	160	864	2,490	1,240	8,340
6	1,680	1,250	5,670	2,200	184	1,090	2,390	930	6,000
7	2,030	1,360	7,450	2,200	304	1,810	2,280	880	5,420
8	2,200	1,270	7,540	2,200	328	1,950	2,050	370	2,050
9	2,100	1,100	6,240	2,200	232	1,380	1,350	1,040	s 4,300
10	2,130	856	4,920	2,500	240	1,620	1,130	1,920	5,860
11	2,140	728	4,210	2,800	280	2,120	1,130	300	915
12	2,240	952	5,760	2,800	720	5,440	1,310	200	707
13	2,140	800	4,620	2,600	1,040	7,300	1,250	95	321
14	2,170	792	4,640	2,450	632	4,180	1,160	130	409
15	2,170	600	3,520	2,240	712	4,310	1,160	90	282
16	2,170	992	5,810	2,140	264	1,530	1,160	150	470
17	2,200	888	5,270	2,100	240	1,360	1,140	120	369
18	2,200	1,080	6,420	2,200	240	1,430	1,410	2,000	7,610
19	2,130	808	4,650	2,300	408	2,530	1,250	1,990	6,720
20	2,110	776	4,420	2,300	392	2,430	1,300	1,700	5,970
21	2,170	784	4,590	2,200	312	1,850	894	3,120	s 8,220
22	2,140	784	4,530	2,130	784	4,510	846	2,360	s 5,990
23	2,110	720	4,100	2,350	1,470	s 10,300	1,200	2,100	6,800
24	2,110	552	3,140	3,850	6,050	62,900	1,230	1,630	5,410
25	1,890	464	2,370	1,920	1,300	6,740	1,210	1,290	4,210
26	1,680	560	2,540	1,290	833	s 3,550	1,210	1,060	3,460
27	1,620	824	3,600	1,450	794	s 3,670	1,140	720	2,220
28	1,650	1,060	4,720	2,030	630	3,450	1,100	545	1,620
29	1,750	584	2,760	2,030	800	4,390	1,080	280	816
30	1,290	520	1,810	--	--	--	1,080	185	539
31	1,820	664	3,260	--	--	--	1,090	190	559
Total	60,540	--	142,590	63,630	--	147,295	44,790	--	144,177

s Computed by subdividing day.

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER NEAR MANDERSON, WYO.--Continued

Suspended sediment, water year October 1955 to September 1956--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	1,090	180	530	455	155	190	542	555	812
2	1,110	160	479	415	150	168	475	350	449
3	1,100	135	401	415	145	162	465	300	377
4	1,090	135	397	385	120	125	445	290	348
5	1,090	125	368	360	115	112	405	300	320
6	1,070	95	274	348	95	89	455	300	369
7	1,060	80	229	352	100	95	475	270	346
8	1,080	160	467	320	95	82	475	245	314
9	1,100	110	327	312	90	76	470	260	330
10	1,080	100	292	364	140	138	480	245	318
11	1,080	195	569	340	105	96	475	220	282
12	1,060	140	401	294	80	64	470	210	266
13	1,050	115	326	316	80	68	460	205	255
14	894	150	362	324	80	70	475	205	263
15	854	1,190	s 3,040	297	70	56	525	323	s 486
16	762	390	802	279	75	56	942	560	1,420
17	762	330	679	255	65	45	950	420	1,080
18	727	375	736	380	180	185	1,050	1,620	4,590
19	727	470	922	425	175	201	942	620	1,580
20	699	335	632	440	210	249	862	450	1,050
21	678	305	558	590	420	669	1,050	1,240	s 3,960
22	678	285	522	720	410	797	986	1,140	3,030
23	734	295	585	755	560	1,140	934	440	1,110
24	644	270	469	692	495	925	942	330	839
25	590	285	454	748	340	687	950	320	821
26	542	215	315	769	665	1,380	878	210	498
27	530	195	279	790	575	1,230	460	115	143
28	536	180	260	1,010	4,300	11,700	536	140	203
29	515	185	257	886	2,460	5,880	505	105	143
30	505	160	218	1,110	2,170	6,500	455	85	104
31	--	--	--	692	1,300	2,430	--	--	--
Total	25,437	--	16,150	15,838	--	35,665	19,534	--	26,106
	July			August			September		
1	460	85	106	596	200	322	1,460	575	2,270
2	500	75	101	590	180	287	1,480	575	2,300
3	536	340	492	590	165	263	1,480	555	2,220
4	530	165	236	572	130	201	1,500	395	1,600
5	530	100	143	572	120	185	1,500	405	1,640
6	500	80	108	572	125	193	1,550	425	1,780
7	475	80	103	560	100	151	1,540	445	1,850
8	480	85	110	572	320	494	1,550	455	1,900
9	480	85	110	638	655	1,130	1,560	415	1,750
10	475	90	115	608	230	378	1,560	380	1,600
11	475	85	109	584	120	189	1,550	340	1,420
12	510	95	131	608	1,150	1,890	1,530	390	1,610
13	548	135	200	584	290	457	1,670	4,260	19,200
14	530	140	200	584	150	237	1,530	2,200	9,090
15	505	120	164	578	135	211	1,510	710	2,890
16	530	130	186	560	110	166	1,510	510	2,080
17	510	110	151	572	105	162	1,520	485	1,990
18	505	105	143	584	105	166	1,520	420	1,720
19	505	100	136	602	95	154	1,480	315	1,260
20	520	105	147	620	100	167	1,080	318	s 1,030
21	542	105	154	614	100	166	1,480	420	1,680
22	572	110	170	608	100	164	1,510	350	1,430
23	602	120	195	602	95	154	1,560	315	1,330
24	572	125	193	578	95	148	1,560	464	1,950
25	554	100	150	578	90	140	1,440	275	1,070
26	554	115	172	608	95	156	1,520	305	1,250
27	548	105	155	760	1,800	s 4,930	1,530	325	1,340
28	584	115	181	1,210	5,960	19,500	1,570	530	2,250
29	678	640	1,170	1,360	1,300	4,770	1,610	560	2,430
30	626	520	879	1,440	660	2,570	1,670	585	2,640
31	602	290	471	1,440	580	2,560	--	--	--
Total	16,538	--	7,081	21,544	--	42,661	45,530	--	78,570

Total discharge for year (cfs-days) 441,067

Total load for year (tons) 1,095,526

s Computed by subdividing day.

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER NEAR MANDERSON, WYO.--Continued

Particle-size analyses of suspended sediment, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet ; 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. 14, 1955....	1:50 p.m.	1,230	--	1,750	860		13		17		27	87	99		100	--	VPWCM
Nov. 3.....	2:30 p.m.	2,220	42	3,240	1,850		2		8		16	81	95		99	100	VPN
Nov. 3.....	2:30 p.m.	2,220	42	3,240	2,040		9		16		16	81	95		99	100	VPWCM
Nov. 22.....	3:15 p.m.	2,030	--	4,560	7,150		18		24		50	75	83		85	99	VPWCM
Jan. 24, 1956....	3:00 p.m.	2,130	33	556	1,580		4		8		19	31	86		99	100	VPWCM
Feb. 24.....	2:00 a.m.	4,940	--	8,340	5,220		34		51		80	88	98		100	--	VPWCM
Feb. 24.....	12:25 p.m.	3,330	--	5,840	3,190		40		55		68	76	89		100	--	VPWCM
Apr. 6.....	3:40 p.m.	1,070	45	92	1,030		17		31		51	58	72		95	--	BWCM
May 24.....	9:15 p.m.	650	69	310	844		58		67		90	97	100		--	--	VPWCM
July 30.....	7:40 a.m.	620	71	655	1,350		70		96		98	--	--		--	--	PWCM
Aug. 7.....	2:40 p.m.	560	76	125	1,120		29		42		54	58	59		66	93	VBWCM
Aug. 12.....	6:05 a.m.	620	65	1,020	3,280		82		98		99	--	--		--	--	PWCM
Aug. 12.....	8:15 a.m.	626	65	3,000	4,920		83		99		100	--	--		--	--	PWCM
Sept. 13.....	3:30 p.m.	2,040	68	1,060	1,850		29		44		74	87	96		99	100	VBWCM
Oct. 1.....	4:20 p.m.	1,670	68	293	1,510		20		28		48	63	85		97	--	BWCM

Particle-size analyses of bed material, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet ; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed; V, visual accumulation tube)

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										
						0.031	0.062	0.125	0.250	0.500	1.000	2.000	4.000	8.000	16.000	32.000	
Jan. 24, 1956....	8	2,130					0	2	24	69	82	83	84	86	90	100	SV
Apr. 6.....	8	1,070					--	0	12	67	86	89	91	92	100	--	SV
Aug. 7.....	8	560					4	9	27	65	79	84	86	87	89	100	SV

GREYBULL RIVER AT MEETEETSE, WYO.

LOCATION.--At gaging station, at cableway at Meeteetse, Park County, 1,800 feet upstream from bridge on State Highway 120 and 3 miles upstream from Meeteetse Creek.
DRAINAGE AREA.--690 square miles, approximately.
RECORDS AVAILABLE.--Water temperatures: August 1954 to September 1956 (discontinued).
Sediment records: August 1954 to September 1956 (discontinued).
EXTREMES, 1955-56.--Water temperatures: Maximum, 69°F July 23; minimum, freezing point Dec. 8, Jan. 9, 30, Feb. 6.
Sediment concentrations: Maximum daily, 5,390 ppm May 28; minimum daily, not determined.
Sediment loads: Maximum daily, 17,000 tons May 28; minimum daily, not determined.
EXTREMES, 1954-56.--Water temperatures: Maximum, 74°F July 17, Aug. 2, 1955; minimum, freezing point on many days during winter months.
Sediment concentrations: Maximum daily, 16,800 ppm July 24, 1955; minimum daily, not determined.
Sediment loads: Maximum daily, 45,800 tons July 24, 1955; minimum daily, not determined.
REMARKS.--Flow affected by ice Nov. 2, 3, Nov.12 to Mar. 28. Records of discharge for water year October 1955 to September 1956 given in WSP 1439.

Temperature (° F) of water, water year October 1955 to September 1956

/Twice-daily measurements between 6 a.m. and 8 a.m., and between 5 p.m. and 6 p.m./

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

a Measurement between 9 a.m. and 4 p.m.

YELLOWSTONE RIVER BASIN--Continued

GREYBULL RIVER AT MEETEETSE, WYO.--Continued

Suspended sediment, water year October 1955 to September 1956

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	76			68			50		
2	78			50			55		
3	80			60			55		
4	80			68			50		
5	78	7	1	57			45		
6	76			55			40		
7	78			60			50		
8	74			57	16	2	50	10	1
9	74			58			50		
10	73			60			50		
11	69			61			50		
12	71			50			50		
13	73			45			50		
14	71			40			50		
15	69	3	1	40			45		
16	68			40			50		
17	68			40			50		
18	66			40			50		
19	68			45			50		
20	68			50			55		
21	69			55			60		
22	69			60			70		
23	76			55	18	2	75	10	2
24	73			55			75		
25	66			55			70		
26	68	2	(t)	55			65		
27	73			55			65		
28	69			50			65		
29	69			50			65		
30	76			50			60		
31	83			--	--	--	55		
Total	2,249	--	24	1,584	--	60	1,720	--	47

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	55			40			40		
2	60			35			40		
3	60			30			40		
4	55			35			45		
5	55			35			45		
6	55			35			45		
7	55			45			45		
8	55	8	1	50	7	1	45		
9	50			50			50	14	2
10	50			45			50		
11	55			45			45		
12	55			45			40		
13	55			45			35		
14	50			45			40		
15	50			45			50		
16	50			45			60		
17	50			45			70	--	e 30
18	50			45			100	--	e 150
19	50			40			130	--	e 500
20	55			40			130	940	330
21	55			40			140	620	234
22	55			40	12	1	150	498	202
23	55	14	2	40			160	499	216
24	50			40			160	510	220
25	50			40			160	450	194
26	50			40			160	375	162
27	50			40			120	--	e 110
28	50			40			90	355	86
29	45			40			76	260	53
30	45			--	--	--	76	230	47
31	45			--	--	--	80	140	30
Total	1,620	--	47	1,200	--	29	2,517	--	2,596

e Estimated.
t Less than 0.50 ton.

YELLOWSTONE RIVER BASIN--Continued

GREYBULL RIVER AT MEETEETSE, WYO.--Continued

Suspended sediment, water year October 1955 to September 1956--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.....	74	90	18	141	38	14	1,180	2,750	8,760
2.....	65	85	15	137	28	10	1,270	3,000	10,300
3.....	55	80	12	156	38	16	1,150	2,700	8,380
4.....	50	80	11	152	22	9	1,240	1,870	s 6,590
5.....	60	75	12	210	182	103	1,320	2,380	s 9,570
6.....	55	22	3	218	170	100	784	1,190	2,520
7.....	52	64	9	198	137	73	610	510	840
8.....	60	80	13	224	286	s 183	728	660	1,300
9.....	52	50	7	239	233	150	744	670	1,350
10.....	74	165	33	224	155	94	856	1,200	2,770
11.....	86	270	63	198	60	32	864	1,150	2,680
12.....	63	58	10	188	40	20	938	1,620	s 4,510
13.....	80	68	15	181	30	15	938	1,900	s 5,220
14.....	85	72	17	174	50	23	784	1,730	s 3,870
15.....	101	78	21	183	71	35	965	1,900	s 5,370
16.....	108	157	46	202	100	55	832	1,280	s 3,410
17.....	83	50	11	275	520	386	624	420	708
18.....	61	28	5	373	840	846	652	407	716
19.....	73	40	8	546	1,270	1,870	696	456	857
20.....	92	49	12	719	1,710	3,320	728	744	1,460
21.....	152	351	s 155	852	2,240	s 5,590	744	432	868
22.....	188	278	141	740	2,420	4,840	645	252	439
23.....	167	93	42	860	3,200	7,430	554	180	269
24.....	160	59	25	876	2,000	4,730	696	420	789
25.....	169	57	26	852	2,710	6,230	776	600	1,260
26.....	160	30	13	776	2,120	4,440	666	450	809
27.....	158	23	10	760	3,210	6,590	624	558	940
28.....	147	18	7	1,080	5,390	s 17,000	666	456	820
29.....	147	48	19	1,120	2,960	8,950	659	348	619
30.....	141	41	16	760	1,300	2,670	704	312	593
31.....	--	--	--	840	2,000	4,540	--	--	--
Total.	3,018	--	795	14,454	--	80,364	24,637	--	88,587

Day	July			August			September		
1.....	645	192	334	645	620	1,080	289	100	78
2.....	680	216	397	638	450	775	268		
3.....	624	156	263	624	480	809	264		
4.....	610	144	237	568	300	460	264		
5.....	652	216	380	589	320	509	274		
6.....	645	192	334	659	630	1,120	278		
7.....	673	192	349	659	660	1,170	246	50	35
8.....	659	216	384	645	720	1,250	240		
9.....	666	924	1,660	561	550	833	243		
10.....	704	576	1,090	534	820	1,180	246		
11.....	704	408	776	534	900	1,300	264		
12.....	736	420	835	528	800	1,140	309	429	358
13.....	688	300	557	510	750	1,030	191	80	41
14.....	617	300	500	498	450	605	158		
15.....	582	204	321	462	399	498	148	15	6
16.....	610	220	362	462	400	499	160		
17.....	631	610	1,040	468	350	442	268		
18.....	638	650	1,120	492	350	465	268		
19.....	638	530	913	468	260	329	289		
20.....	610	450	741	426	180	207	293		
21.....	631	430	733	395	170	181	289		
22.....	624	410	691	420	200	227	285		
23.....	645	400	697	410	160	177	285		
24.....	680	700	1,290	415	130	146	274	71	54
25.....	652	490	863	456	200	246	257		
26.....	645	460	801	444	260	312	260		
27.....	680	490	900	450	240	292	274		
28.....	696	499	938	400	170	184	293		
29.....	784	780	s 1,840	343	130	120	297		
30.....	631	1,000	s 2,080	330	120	107	301		
31.....	610	800	1,320	301	120	98	--	--	--
Total.	20,290	--	24,746	15,334	--	17,791	7,775	--	1,601

Total discharge for year (cfs-days)..... 96,398

Total load for year (tons)..... 216,687

s Computed by subdividing day.

YELLOWSTONE RIVER BASIN--Continued

GREYBULL RIVER AT MEETEETSE, WYO.--Continued

Particle-size analyses of suspended sediment, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; 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. 26, 1956	12:30 p.m.	149	35	614	1,620		26	--	48	--	85	95	99		100	--	VPWCM
Apr. 5	9:20 a.m.	57	--	99	331	63	72	81	85	86	91	96	99		100	--	BWCM
May 18	11:25 a.m.	365	--	852	1,590		27	--	57	--	84	91	98		100	--	VPWCM
May 21	6:00 a.m.	1,040	46	3,300	1,440		--	--	23	--	73	90	99		100	--	VPWCM
May 23	6:00 a.m.	788	45	2,740	1,720		24	--	47	--	87	98	100		--	--	VPWCM
May 23	12:30 p.m.	868	55	7,140	2,850		8	--	18	--	63	87	99		100	--	VPWCM
May 25	6:15 p.m.	844	54	5,060	3,230		4	--	63	--	90	96	100		--	--	VPWCM
May 28	9:00 p.m.	1,490	48	6,850	3,830		25	--	44	--	77	90	98		98	100	VPWCM
June 4	8:40 p.m.	1,410	55	3,020	5,150		12	--	25	--	58	79	94		98	100	VPWCM
June 22	9:10 a.m.	728	--	453	858		6	11	17	23	38	49	65		78	--	BWCM
July 24	2:10 p.m.	680	62	642	2,340		20	28	35	44	58	73	84		94	--	BWCM
Aug. 10	7:40 a.m.	528	51	466	2,140		11	17	26	34	48	67	91		98	--	BWCM

BIGHORN RIVER AT KANE, WYO.

LOCATION.--At bridge on State Highway 14, half a mile upstream from Shoshone River, 1½ miles northeast of Kane, Big Horn County, and 12½ miles downstream from gaging station. Prior to May 17, 1956, gaging station was at sampling site.
DRAINAGE AREA.--15,900 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: December 1949 to September 1953, June 1955 to September 1956.
Water temperatures: July to September 1949, October 1950 to September 1956.
Sediment records: March 1946 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 970 ppm Nov. 14-17; minimum, 292 ppm June 6.
Hardness: Maximum, 420 ppm Nov. 14-17; minimum, 152 ppm June 6.
Specific conductance: Maximum daily, 1,440 micromhos Nov. 17; minimum daily, 460 micromhos June 6.
Water temperatures: Maximum, 77°F June 19; minimum, freezing point on many days during November to March.
Sediment concentrations: Maximum daily, 8,400 ppm Mar. 21; minimum daily, 27 ppm Dec. 16.
Sediment loads: Maximum daily, 53,900 tons May 23; minimum daily, 175 tons Dec. 16.
EXTREMES, 1946-56.--Water temperatures (1950-56): Maximum, 85°F July 14, 30, 1953, July 12, 1954; minimum, freezing point on many days during winter months.
Sediment concentrations: Maximum daily, 33,000 ppm Apr. 20, Sept. 21, 1948; minimum daily, not determined.
Sediment loads: Maximum daily, 972,000 tons June 25, 1946; minimum daily, not determined.
REMARKS.--Daily samples for chemical analysis composited by discharge. Records of specific conductance available in district office at Worland, Wyo.
Flow affected by ice Nov. 17 to Mar. 22. No appreciable inflow between gaging station and sampling point except during periods of heavy local runoff.
Records of discharge for water year October 1955 to September 1956 given in WSP 1439.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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. 1-31, 1955....	1,266	8.9	0.00	107	34	124	4.4	232	455	22	0.5	0.3	0.16	889	1.21	3,040	406	216	40	2.7	1,240	7.7	
Nov. 1-13.....	1,765	13	.09	99	31	115	3.9	214	400	21	.5	.9	.15	828	1.13	3,950	376	201	40	2.6	1,150	7.9	
Nov. 14-17.....	1,385	11	.15	111	35	139	5.4	260	465	25	.6	1.3	.18	970	1.32	3,630	420	207	41	3.0	1,320	8.0	
Nov. 18-Dec. 20...	2,203	9.3	.12	95	29	114	3.7	227	380	20	.5	.5	.13	801	1.09	4,760	356	170	41	2.6	1,110	7.9	
Dec. 21-Jan. 26, 1956	2,524	8.3	.00	86	30	108	4.0	221	345	18	.5	.6	.15	762	1.04	5,190	338	157	41	2.5	1,080	7.8	
Jan. 27-Feb. 6	2,091	9.5	.00	95	34	120	4.1	234	395	21	.5	1.1	.15	825	1.12	4,660	376	84	41	2.7	1,170	7.9	
Feb. 7-24.....	2,700	9.4	.00	83	29	107	3.6	210	355	18	.4	1.2	.13	730	.99	5,320	328	156	41	2.6	1,050	7.8	
Feb. 25-Mar. 9....	2,771	9.1	.01	83	25	100	3.6	192	320	16	.4	2.4	.11	682	.93	5,100	308	151	41	2.5	985	7.7	
Mar. 10-31.....	2,061	11	.01	96	30	100	4.0	215	370	18	.5	2.5	.16	775	1.05	4,310	364	188	37	2.3	1,090	7.9	
Apr. 1-15.....	1,552	11	.00	95	38	115	4.2	232	425	22	.5	1.3	.16	882	1.20	3,700	392	202	39	2.5	1,220	8.0	
Apr. 16-30.....	1,342	9.8	.00	92	34	107	3.9	216	380	20	.5	.8	.14	819	1.11	2,970	370	193	38	2.4	1,140	7.9	
May 1-19	889	8.4	.00	95	33	105	4.5	194	420	21	.4	.0	.16	805	1.09	1,930	372	213	38	2.4	1,140	7.6	
May 20-21.....	2,175	14	.00	92	27	87	3.3	204	318	16	.4	.2	.13	712	.97	4,180	340	173	35	2.0	990	7.8	
May 22-23.....	4,205	14	.00	74	15	42	2.5	184	176	6.0	.2	2.2	.11	438	.60	4,970	248	97	27	1.2	663	7.9	
May 24-28.....	4,576	10	.00	60	11	33	1.7	158	132	6.0	.3	.9	.09	345	.47	4,260	196	66	27	1.0	536	7.5	
May 29-June 1.....	3,948	12	.01	64	14	48	2.0	162	178	7.0	.2	.7	.09	432	.59	4,600	218	85	32	1.4	640	8.1	
June 2-6	3,952	9.2	.01	50	11	34	1.4	122	130	4.0	.2	.1	.06	326	.44	3,480	172	72	30	1.1	501	8.1	

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER AT KANE, WYO.--Continued

Chemical analyses, in parts per million, water year October 1955 to September 1956--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 6, 1956 a.....	3,730	8.6	0.01	43	11	30	1.2	116	117	5.5	0.2	1.5	0.04	292	0.40	2,940	152	57	30	1.1	460	7.8	
June 7-19.....	2,182	10	.00	63	18	58	2.2	148	215	10	.3	.0	.14	471	.64	2,770	230	109	35	1.7	701	7.9	
June 20-July 2	1,611	11	.01	80	21	77	3.0	174	273	13	.3	.7	.12	591	.80	2,570	285	142	37	2.0	875	7.6	
July 3-31.....	869	11	.01	84	28	105	3.9	186	360	18	.3	.3	.17	741	1.01	1,740	323	170	41	2.6	1,050	8.0	
July 24 a	860	8.1	.02	80	28	106	4.5	183	360	21	.4	1.5	.18	737	1.00	1,710	314	164	42	2.6	1,050	7.6	
Aug. 1-29	875	7.9	.01	88	28	106	4.3	208	365	21	.5	.4	.16	758	1.03	1,790	334	163	40	2.5	1,090	7.8	
Aug. 30-Sept. 4...	1,577	13	.01	73	25	87	3.9	193	295	16	.3	1.6	.12	638	.87	2,720	284	126	40	2.2	909	7.6	
Sept. 5-30.....	1,807	11	.01	66	26	86	3.2	180	295	15	.3	.9	.12	599	.81	2,920	272	124	40	2.3	880	7.7	
Weighted average b.....	1,851	9.9	0.02	85	27	97	3.6	203	336	17	0.4	0.9	0.14	710	0.97	3,550	324	158	39	2.3	1,010	--	

a Not included in weighted average.
b Represents 100 percent of runoff for water year October 1955 to September 1956.

BIGHORN RIVER AT KANE, WYO.--Continued

Temperature (°F) of water, water year October 1955 to September 1956
/Twice-daily measurements between 6 a.m. and 10 a.m. and between 4 p.m. and 7 p.m./

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

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER AT KANE, WYO.--Continued

Suspended sediment, water year October 1955 to September 1956

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.....	1,630	861	3,790	1,380	360	1,340	2,000	255	1,380
2.....	1,410	976	3,720	1,360	282	1,040	2,100	185	1,050
3.....	1,390	594	2,230	1,800	--	e 1,800	2,200	145	861
4.....	1,140	528	1,630	2,170	1,560	9,140	2,100	70	397
5.....	1,190	636	2,040	2,170	1,460	8,550	2,000	45	243
6.....	1,020	762	2,100	1,570	1,250	5,300	2,300	40	248
7.....	1,060	690	1,970	1,990	966	5,190	2,200	45	267
8.....	1,070	716	2,070	980	834	2,210	2,400	50	324
9.....	1,070	650	1,880	1,470	840	3,330	2,500	85	574
10.....	1,120	498	1,510	1,850	912	4,560	2,400	68	441
11.....	1,120	434	1,310	1,910	720	3,710	2,500	90	608
12.....	1,080	360	1,050	2,370	3,190	20,400	2,300	102	633
13.....	1,110	264	791	1,930	1,440	7,500	2,200	99	588
14.....	1,120	312	943	1,930	720	3,750	2,400	75	486
15.....	1,230	354	1,180	1,010	612	1,670	2,500	48	324
16.....	1,180	372	1,190	1,200	--	e 1,000	2,400	27	175
17.....	1,150	312	969	1,400	190	718	2,600	44	309
18.....	1,170	240	758	2,100	140	794	2,700	100	729
19.....	1,250	240	810	2,500	115	776	2,800	65	491
20.....	1,260	288	980	2,100	160	907	2,700	60	437
21.....	1,200	240	778	2,000	250	1,350	2,400	50	324
22.....	1,320	216	770	2,000	245	1,320	2,600	105	737
23.....	1,320	234	834	1,500	200	810	2,800	135	1,020
24.....	1,340	240	868	1,900	250	1,280	3,000	205	1,660
25.....	1,330	246	883	1,900	330	1,690	3,200	970	8,380
26.....	1,350	204	744	1,700	400	1,840	2,800	605	4,570
27.....	1,340	234	847	1,800	440	2,140	2,400	430	2,790
28.....	1,390	240	901	2,000	370	2,000	2,000	205	1,110
29.....	1,410	480	1,830	1,900	150	770	2,500	205	1,380
30.....	1,340	852	3,080	2,000	215	1,160	2,600	185	1,300
31.....	1,440	780	3,030	--	--	--	2,600	95	667
Total.	38,550	--	47,486	53,890	--	98,045	76,200	--	34,503
	January			February			March		
1.....	2,600	--	e 650	2,100	95	539	2,300	1,050	6,520
2.....	2,600	90	632	1,800	45	219	2,400	1,470	9,530
3.....	2,400	80	518	2,000	35	189	2,600	1,050	7,370
4.....	2,200	70	416	2,100	100	567	2,700	1,510	11,000
5.....	2,200	140	832	2,100	80	454	3,100	3,600	30,100
6.....	2,500	185	1,250	2,100	70	397	3,000	2,370	19,200
7.....	2,500	190	1,280	2,100	150	850	3,000	1,440	11,700
8.....	2,500	190	1,280	2,300	125	776	2,800	720	5,440
9.....	2,500	220	1,490	2,600	100	702	2,800	--	e 3,000
10.....	2,500	170	1,150	2,600	--	e 900	2,500	--	e 1,500
11.....	2,500	150	1,010	2,600	190	1,330	2,200	285	1,690
12.....	2,500	210	1,420	2,600	200	1,400	2,000	400	2,160
13.....	2,500	180	1,220	3,000	200	1,620	2,000	325	1,760
14.....	2,500	170	1,150	3,200	250	2,160	2,000	330	1,780
15.....	2,500	200	1,350	3,200	--	e 1,500	2,000	360	1,940
16.....	2,500	110	743	3,000	130	1,050	2,000	580	3,130
17.....	2,500	90	608	2,900	125	979	2,000	950	5,130
18.....	2,500	80	540	2,700	100	729	2,400	2,310	15,000
19.....	2,500	150	1,010	2,600	90	632	2,700	4,710	34,300
20.....	2,500	130	878	2,500	105	709	2,400	7,240	46,900
21.....	2,500	235	1,590	2,600	200	1,400	2,200	8,400	49,900
22.....	2,500	105	709	2,700	--	e 2,200	2,100	5,720	32,400
23.....	2,500	180	1,220	2,700	530	3,860	2,060	5,310	29,500
24.....	2,500	210	1,420	2,700	715	5,210	2,240	4,320	26,100
25.....	2,500	--	e 1,200	3,300	1,980	17,600	2,240	3,130	18,900
26.....	2,500	155	1,050	2,900	1,100	8,610	2,080	2,720	15,300
27.....	2,300	130	807	2,500	500	3,380	2,020	2,040	11,100
28.....	2,200	--	e 600	2,500	515	3,480	1,830	1,620	8,000
29.....	2,100	--	e 400	2,300	835	5,190	1,710	1,550	7,160
30.....	2,100	55	312	--	--	--	1,630	1,030	4,530
31.....	2,100	50	284	--	--	--	1,630	910	4,000
Total.	75,300	--	29,019	74,300	--	68,632	70,640	--	426,040

e Estimated.

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER AT KANE, WYO.--Continued

Suspended sediment, water year October 1955 to September 1956--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.....	1,630	--	e 3,000	1,170	234	739	3,690	1,970	19,600
2.....	1,630	442	1,950	1,120	202	611	4,270	--	e 20,000
3.....	1,620	680	2,970	986	216	575	4,180	--	e 19,000
4.....	1,590	595	2,550	884	220	525	3,820	1,850	19,100
5.....	1,560	935	3,940	860	151	351	3,760	1,690	17,200
6.....	1,550	1,000	4,190	842	134	305	3,730	1,680	16,900
7.....	1,530	697	2,880	734	155	307	2,800	1,360	10,300
8.....	1,550	893	3,740	716	151	292	2,190	1,190	7,040
9.....	1,530	1,030	4,250	716	156	302	2,120	1,190	6,810
10.....	1,560	910	3,830	764	173	357	2,190	1,130	6,680
11.....	1,540	710	2,950	1,010	279	761	2,290	1,080	6,680
12.....	1,550	707	2,960	998	326	878	2,240	960	5,810
13.....	1,510	680	2,770	914	252	622	2,140	986	5,700
14.....	1,480	536	2,140	878	258	612	1,970	824	4,380
15.....	1,450	--	e 2,000	902	269	655	1,890	842	4,300
16.....	1,400	--	e 1,900	950	296	759	2,020	978	5,330
17.....	1,400	--	e 2,000	724	371	725	2,340	1,280	8,090
18.....	1,370	575	2,130	716	246	476	2,040	952	5,240
19.....	1,400	638	2,410	1,010	262	714	2,140	1,010	5,840
20.....	1,380	554	2,060	1,570	926	s 4,120	1,900	1,360	6,980
21.....	1,350	596	2,170	2,780	3,090	23,200	1,810	1,500	7,330
22.....	1,360	491	1,800	3,990	3,990	43,000	2,240	2,330	14,100
23.....	1,390	396	1,490	4,420	4,520	53,900	2,050	1,470	8,140
24.....	1,430	486	1,880	4,450	3,380	40,600	1,820	910	4,470
25.....	1,410	413	1,570	4,310	2,900	33,700	1,780	816	3,920
26.....	1,360	479	1,760	4,630	2,840	35,500	1,840	867	4,310
27.....	1,250	513	1,730	4,720	3,180	40,500	1,700	646	2,970
28.....	1,220	368	1,210	4,770	2,910	37,500	1,260	484	1,650
29.....	1,220	292	962	4,540	2,210	27,100	1,240	493	1,650
30.....	1,190	236	758	3,930	3,100	32,900	1,150	451	1,440
31.....	--	--	--	3,630	1,310	12,800	--	--	--
Total.	43,410	--	71,950	64,634	--	395,386	70,610	--	250,960

	July			August			September		
1.....	1,090	434	1,280	844	381	868	1,540	804	3,340
2.....	1,060	391	1,120	844	321	731	1,610	822	3,570
3.....	1,080	404	1,180	869	327	767	1,640	672	2,980
4.....	1,150	438	1,360	887	360	862	1,660	696	3,120
5.....	1,140	450	1,390	860	297	690	1,720	720	3,340
6.....	1,100	421	1,250	844	231	526	1,740	--	e 3,300
7.....	959	332	860	836	225	508	1,810	672	3,280
8.....	887	304	728	804	195	423	1,810	666	3,250
9.....	869	298	699	812	195	428	1,820	606	2,980
10.....	878	302	716	860	219	509	1,840	612	3,040
11.....	836	237	535	852	306	704	1,820	660	3,240
12.....	812	213	467	828	324	724	1,840	666	3,310
13.....	914	267	659	878	309	733	1,870	636	3,210
14.....	941	2,470	6,280	820	498	1,100	2,040	1,080	5,950
15.....	836	477	1,080	780	391	823	1,820	2,580	12,700
16.....	780	291	613	780	350	737	1,820	918	4,510
17.....	788	291	619	756	--	e 700	1,810	702	3,430
18.....	756	312	637	820	357	790	1,820	558	2,740
19.....	748	303	612	860	354	822	1,820	546	2,680
20.....	748	303	612	914	360	888	1,790	504	2,440
21.....	748	301	608	932	321	808	1,490	--	e 2,100
22.....	756	300	612	887	303	726	1,780	570	2,740
23.....	788	333	708	860	273	634	1,820	507	2,490
24.....	860	402	933	852	273	628	1,840	494	2,450
25.....	796	366	787	828	234	523	1,820	480	2,360
26.....	780	339	714	836	234	528	1,720	483	2,240
27.....	772	339	707	878	282	669	1,790	453	2,190
28.....	764	336	693	1,070	636	s 2,010	1,790	540	2,610
29.....	820	390	863	1,490	2,560	10,300	1,840	720	3,580
30.....	941	435	1,110	1,500	1,970	7,980	1,900	672	3,450
31.....	950	624	1,600	1,510	1,020	4,160	--	--	--
Total.	27,347	--	32,032	28,391	--	43,299	53,430	--	102,620

Total discharge for year (cfs-days)..... 676,702

Total load for year (tons)..... 1,599,972

e Estimated.

s Computed by subdividing day.

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER AT KANE, WYO.--Continued

Particle-size analyses of suspended sediment, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; 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. 4, 1955	1:10 p.m.	2,190	--	1,620	1,570	--	8		25		68	77	94		100		VPN
Nov. 4	1:10 p.m.	2,190	--	1,620	1,510	--	18		38		68	77	94		100		VPWCM
Dec. 27	1:45 p.m.	a 2,400	--	653	1,810	--	37		43		54	58	74		87		BWCM
Mar. 19, 1956	11:05 p.m.	a 2,700	35	4,920	3,380	--	44		63		79	83	98		100		VPWCM
Apr. 5	2:30 p.m.	1,560	44	641	1,570	--	21		--		43	55	78		97		BWCM
Apr. 10	11:10 a.m.	1,580	50	638	1,700	--	24		33		55	70	94		100		VPWCM
May 25	1:20 p.m.	4,140	61	3,240	3,280	--	28		35		63	76	92		100		VPWCM
June 6	9:50 a.m.	3,880	62	1,780	2,450	--	20		32		58	78	90		100		VPWCM
June 19	2:10 p.m.	2,240	74	1,070	1,380	--	13		20		41	62	90		100		VPWCM
July 24	10:50 a.m.	836	78	329	2,210	--	18		30		44	57	69		88		BWCM
July 31	9:00 a.m.	977	73	1,100	2,410	--	49		63		71	80	90		96		BWCM
Aug. 10	3:40 p.m.	887	72	284	2,040	--	19		30		41	48	80		95		BWCM
Aug. 21	1:10 p.m.	950	70	252	1,300	--	21		33		47	62	84		100		VBWCM
Sept. 7	2:45 p.m.	1,810	65	620	931	--	18		31		52	67	90		100		VBWCM
Sept. 14	5:10 p.m.	2,150	68	1,560	3,450	--	40		54		64	76	94		100		VPWCM
Sept. 15	7:25 a.m.	1,840	60	5,350	3,900	2	4		--		91	94	99		100		VPN
Sept. 15	7:25 a.m.	1,840	60	5,350	4,180	55	71		88		91	94	99		100		VPWCM

a Daily mean discharge.

BIGHORN RIVER AT KANE, WYO.--Continued

Particle-size analyses of bed material, water years October 1954 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation: P, pipet ; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed; V, visual accumulation tube)

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									
							0.062	0.125	0.250	0.500	1.000	2.000	4.000	8.000	16.000	
Mar. 18, 1955...	4	3,200					0	1	44	90	98	98	99	100			SV
Apr. 11.....	4	3,780					0	1	22	90	98	99	99	100			SV
May 9	5	1,850					0	2	58	98	100	--	--	--			SV
June 18.....	4	6,740					0	2	53	99	100	--	--	--			SV
July 20	5	545					0	2	40	73	75	76	77	83	91		SV
July 25	5	4,780					0	3	71	100	--	--	--	--			SV
July 26	5	1,790					0	4	54	98	99	99	100	--			SV
Apr. 10, 1956...	8	1,580					0	1	50	99	100	--	--	--			SV

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BIGHORN RIVER AT BIGHORN, MONT.

LOCATION.--At gaging station at bridge on U. S. Highway 10, three-quarters of a mile upstream from mouth, 1 mile southwest of Bighorn, Treasure County, and 4 miles east of Custer. Prior to Oct. 7, 1955, gaging station at site 4 miles upstream.
RECORDS AVAILABLE.--Chemical analyses: February 1950 to September 1956.
Water temperatures: April 1949 to September 1951, August 1952 to September 1956.
Sediment records: July 1947 to September 1954, October 1955 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 1,180 ppm Nov. 18-21; minimum, 359 ppm June 7.
Hardness: Maximum, 532 ppm Nov. 18-21; minimum, 178 ppm June 7.
Specific conductance: Maximum daily, 1,640 micromhos Nov. 18; minimum daily, 544 micromhos June 5.
Water temperatures: Maximum, 79°F June 13, July 29; minimum, freezing point on many days during winter months.
Sediment concentrations: Maximum daily, 6,880 ppm Mar. 25; minimum daily, 36 ppm Feb. 3.
Sediment loads: Maximum daily, 72,700 tons May 24; minimum daily, 173 tons Nov. 18.
EXTREMES, 1947-56.--Dissolved solids (1951-56): Maximum, 1,190 ppm July 28-31, 1955; minimum, 304 ppm June 23, 1951.
Hardness (1951-56); Maximum, 544 ppm July 28-31, 1955; minimum, 151 ppm June 23, 1951.
Specific conductance (1951-56): Maximum daily, 1,640 micromhos Nov. 18, 1955; minimum daily, 384 micromhos June 20, 1951.
Water temperatures (1949-51, 1952-56): Maximum, 89°F Aug. 7, 1953; minimum, freezing point on many days during winter months.
Sediment concentrations (1947-54, 1955-56): Maximum daily, 23,200 ppm May 24, 1952; minimum daily, not determined.
Sediment loads (1947-54, 1955-56): Maximum daily, 727,000 tons May 24, 1952; minimum daily, 136 tons Dec. 11, 1949.
REMARKS.--Daily samples for chemical analysis composited by discharge. Records of specific conductance of daily samples available in district office at Worland, Wyo. Flow affected by ice Nov. 12 to Mar. 29. Records of discharge for water year October 1955 to September 1956 given in WSP 1439.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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. 1-31, 1955....	2,139	--	--	--	--	136	--	247	--	--	--	--	--	953	1.30	5,400	424	221	41	2.9	1,320	7.8	--
Nov. 1-17.....	2,191	--	--	--	--	147	--	279	--	--	--	--	--	1,050	1.43	6,210	464	235	41	3.0	1,410	7.9	--
Nov. 18-21.....	2,175	--	--	--	--	160	--	332	--	--	--	--	--	1,180	1.60	6,930	532	260	40	3.0	1,590	8.0	--
Nov. 22-Dec. 24...	2,721	9.8	0.00	118	35	131	5.6	278	480	19	0.5	0.8	0.17	967	1.32	7,100	440	212	39	2.7	1,320	8.0	5
Dec. 25-Jan. 18, 1956	3,175	--	--	--	--	118	--	247	--	--	--	--	--	847	1.15	7,260	395	192	39	2.6	1,180	7.8	--
Jan. 19-31	2,937	--	--	--	--	117	--	242	--	--	--	--	--	812	1.10	6,440	372	174	41	2.6	1,130	7.9	--
Feb. 1-24.....	2,994	--	--	--	--	104	--	244	--	--	--	--	--	782	1.06	6,320	362	162	38	2.4	1,110	7.9	--
Feb. 25-Mar. 9....	4,164	--	--	--	--	90	--	200	--	--	--	--	--	683	.93	7,680	304	140	39	2.2	948	7.8	--
Mar. 10-17.....	3,175	12	.00	95	32	102	5.4	234	375	16	.5	.9	.17	785	1.07	6,730	369	177	37	2.3	1,100	7.9	9
Mar. 18-20.....	4,333	--	--	--	--	82	--	203	--	--	--	--	--	647	.88	7,570	296	130	38	2.1	924	7.9	--
Mar. 21.....	6,000	--	--	--	--	84	--	202	--	--	--	--	--	632	.86	10,240	298	132	38	2.1	910	7.8	--
Mar. 22-25.....	4,075	--	--	--	--	78	--	199	--	--	--	--	--	618	.84	6,800	294	131	37	2.0	883	7.8	--
Mar. 26-Apr. 25...	2,874	--	--	--	--	114	--	239	--	--	--	--	--	888	1.21	6,890	384	188	39	2.5	1,170	7.7	--
Apr. 26-May 18....	2,280	--	--	--	--	106	--	221	--	--	--	--	--	805	1.09	4,960	361	180	39	2.4	1,120	7.9	--
May 19-23.....	4,396	--	--	--	--	76	--	197	--	--	--	--	--	603	.82	7,160	281	119	37	2.0	861	8.0	--
May 24-31.....	8,156	--	--	--	--	46	--	173	--	--	--	--	--	415	.56	9,140	212	70	32	1.4	612	7.9	--

June 1-6	8,045	--	--	--	--	44	--	166	--	--	--	--	--	389	.53	8,450	206	70	32	1.3	590	7.9	--
June 7 a	7,950	12	.02	49	13	44	1.9	136	151	5.5	.3	2.9	.07	359	.49	7,710	178	66	35	1.4	548	7.7	--
June 9-22	6,390	14	.00	56	17	55	1.9	159	178	6.5	.3	.3	.09	416	.57	7,180	208	78	36	1.6	637	8.0	9
June 23	7,870	--	--	--	--	72	--	190	--	--	--	--	--	563	.77	11,960	262	106	37	1.9	818	8.2	--
June 24-July 7	5,359	--	--	--	--	54	--	159	--	--	--	--	--	431	.59	6,240	208	78	36	1.6	644	7.7	--
July 8-20	2,720	--	--	--	--	80	--	176	--	--	--	--	--	592	.81	4,350	264	120	40	2.1	859	7.7	--
July 21-31	1,331	--	--	--	--	117	--	175	--	--	--	--	--	773	1.05	2,780	315	171	45	2.9	1,090	8.0	--
July 27 a	1,130	9.9	.01	74	32	122	4.2	171	415	15	.5	1.6	.17	790	1.07	2,410	316	176	45	3.0	1,120	7.5	--
Aug. 1-31	1,757	--	--	--	--	124	--	201	--	--	--	--	--	840	1.14	3,980	347	182	44	2.9	1,170	7.7	--
Sept. 1-30	2,683	12	.01	83	30	107	3.5	207	375	14	.4	1.3	.17	755	1.03	5,470	330	160	41	2.6	1,060	7.8	9
Weighted average b	3,172	--	--	--	--	97	--	214	--	--	--	--	--	720	0.98	6,170	328	152	39	2.3	1,010	--	--

a Not included in weighted average.
b Represents 100 percent of runoff for water year October 1955 to September 1956.

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER AT BIGHORN, MONT.--Continued

Temperature (°F) of water, water year October 1955 to September 1956
/Once-daily measurement between 7 a.m. and 10 a.m./

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

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER AT BIGHORN, MONT.--Continued

Suspended sediment, water year October 1955 to September 1956

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	2,580	1,610	11,200	2,070	234	1,310	2,600	176	1,240
2	2,670	972	7,010	2,050	486	2,690	2,700	103	751
3	2,690	891	6,470	2,130	567	3,260	2,700	142	1,040
4	2,620	936	6,620	2,450	504	3,330	2,700	137	999
5	2,260	720	4,390	2,480	549	3,680	2,500	90	608
6	2,220	594	3,560	2,580	684	4,760	2,400	119	771
7	2,140	450	2,600	2,500	900	6,080	2,300	135	838
8	2,050	432	2,390	2,480	774	5,180	2,300	104	646
9	2,050	396	2,190	2,280	693	4,270	2,350	149	945
10	2,050	378	2,090	2,050	459	2,540	2,500	142	958
11	2,000	369	1,990	2,430	513	3,370	2,600	129	906
12	1,920	324	1,680	2,250	144	875	2,700	158	1,150
13	1,920	396	2,050	2,100	102	578	2,800	171	1,290
14	2,040	369	2,030	2,000	69	373	2,700	146	1,060
15	2,090	459	2,590	1,900	60	308	2,600	148	1,040
16	2,130	441	2,540	1,800	47	228	2,600	97	681
17	2,180	432	2,540	1,700	54	248	2,600	106	744
18	2,240	432	2,610	1,600	40	173	2,500	122	824
19	2,140	364	2,100	1,800	158	768	2,500	99	668
20	2,040	338	1,860	2,200	167	992	2,700	207	1,510
21	1,970	315	1,680	3,100	338	2,830	2,850	207	1,590
22	1,970	333	1,770	3,200	228	1,970	3,000	207	1,680
23	2,000	360	1,940	3,400	209	1,920	3,000	288	2,330
24	2,000	441	2,380	3,400	265	2,430	3,400	110	a 1,000
25	2,000	468	2,530	3,000	241	1,950	4,200	108	1,220
26	2,050	351	1,940	2,700	--	e 1,300	4,800	396	5,130
27	2,050	315	1,740	2,600	123	863	5,000	306	4,130
28	2,050	315	1,740	2,500	112	756	4,650	427	5,360
29	2,040	279	1,540	2,700	104	758	3,000	144	1,170
30	2,050	342	1,890	2,700	102	744	2,500	108	729
31	2,110	306	1,740	--	--	--	2,300	108	671
Total	66,320	--	91,400	72,150	--	60,534	90,050	--	43,679
	January			February			March		
1	2,400	144	933	2,200	65	386	3,500	279	2,640
2	2,500	135	911	2,000	49	265	4,000	351	3,790
3	2,500	135	911	1,800	36	175	4,200	324	3,670
4	2,500	198	1,340	2,000	104	562	4,400	360	4,280
5	2,500	252	1,700	2,000	107	578	4,400	459	5,450
6	2,400	81	525	2,350	216	1,370	4,000	468	5,050
7	2,320	61	382	3,000	189	1,530	4,600	562	6,980
8	2,800	74	559	3,500	234	2,210	4,100	756	8,370
9	3,000	99	802	3,600	243	2,360	3,700	603	6,020
10	3,200	131	1,130	3,600	288	2,800	3,600	441	4,290
11	3,500	140	1,320	3,400	234	2,150	2,900	315	2,470
12	3,500	129	1,220	3,200	162	1,400	2,500	180	1,220
13	3,500	122	1,150	3,400	99	909	2,900	306	2,400
14	3,600	110	1,070	3,500	--	e 950	3,000	306	2,480
15	3,600	99	962	3,300	--	e 1,000	3,200	252	2,180
16	3,300	81	722	3,200	144	1,240	3,500	378	3,570
17	3,000	67	543	3,100	342	2,860	3,800	639	6,560
18	2,800	83	627	3,000	126	1,020	4,000	788	8,510
19	2,800	88	665	2,950	153	1,220	4,000	954	10,300
20	2,700	110	802	3,000	180	1,460	5,000	1,450	19,600
21	2,680	90	651	3,100	171	1,430	6,000	2,710	43,900
22	3,000	104	842	3,150	99	842	5,700	3,740	57,600
23	3,300	112	998	3,500	99	936	4,000	5,480	59,200
24	3,300	120	1,070	4,000	189	2,040	3,400	5,170	47,500
25	3,200	86	743	4,600	351	4,360	3,200	6,880	59,400
26	3,000	95	770	4,800	252	3,270	3,100	5,430	45,400
27	3,100	108	904	4,600	423	5,250	3,000	2,560	20,700
28	3,000	99	802	3,900	567	5,970	2,950	1,900	15,100
29	2,900	76	595	3,500	306	2,890	2,900	1,600	12,500
30	2,700	75	547	--	--	--	2,860	1,440	11,100
31	2,500	81	547	--	--	--	2,750	1,280	9,500
Total	91,100	--	26,743	93,250	--	53,433	115,160	--	491,730

e Estimated.

a Computed from estimated concentration graph.

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER AT BIGHORN, MONT.--Continued

Suspended sediment, water year October 1955 to September 1956--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.....	2,810	1,080	8,190	2,200	560	3,330	8,120	1,780	39,000
2.....	2,840	680	5,210	2,180	552	3,250	7,950	1,390	29,800
3.....	2,880	640	4,980	2,110	536	3,050	8,570	1,390	32,200
4.....	2,790	672	5,060	2,050	496	2,750	8,860	1,300	31,100
5.....	2,840	784	6,010	2,040	624	3,440	8,430	1,200	27,300
6.....	3,240	1,860	16,300	2,050	624	3,450	8,030	1,250	27,100
7.....	3,060	2,030	16,800	2,040	544	3,000	7,950	1,270	27,300
8.....	3,000	1,330	10,800	1,930	464	2,420	6,450	1,310	22,800
9.....	2,980	768	6,180	1,920	488	2,530	5,350	1,140	16,500
10.....	3,000	776	6,290	2,220	478	2,870	5,370	960	13,900
11.....	3,040	864	7,090	2,710	1,270	9,290	5,780	880	13,700
12.....	2,940	808	6,410	2,790	1,180	8,890	5,880	800	12,700
13.....	2,920	792	6,240	2,730	888	6,450	5,850	840	13,300
14.....	2,920	568	4,480	2,520	648	4,410	6,100	770	12,700
15.....	2,860	600	4,630	2,350	536	3,400	6,020	830	13,500
16.....	2,840	576	4,420	2,130	456	2,620	6,000	880	14,300
17.....	2,810	600	4,550	2,200	624	3,710	6,320	1,060	18,100
18.....	2,840	512	3,930	2,860	928	7,170	7,130	2,260	43,500
19.....	2,940	520	4,130	3,080	1,220	10,100	7,430	1,820	36,500
20.....	2,920	624	4,920	3,300	1,060	9,440	7,320	1,350	26,700
21.....	2,710	520	3,800	3,990	1,740	18,700	7,210	1,320	25,700
22.....	2,660	496	3,560	5,130	2,310	32,000	7,700	3,420	71,100
23.....	2,560	552	3,820	6,480	3,680	64,400	7,870	3,220	68,400
24.....	2,580	528	3,680	7,320	3,680	72,700	7,560	1,520	31,000
25.....	2,540	544	3,730	7,510	3,130	63,500	6,730	1,200	21,800
26.....	2,460	504	3,350	7,560	2,340	47,800	6,320	1,130	19,300
27.....	2,280	496	3,050	7,640	1,980	40,800	6,120	1,090	18,000
28.....	2,220	512	3,070	8,030	1,830	39,700	5,800	1,080	16,900
29.....	2,220	528	3,160	8,540	2,140	49,300	5,540	990	14,800
30.....	2,240	616	3,730	9,490	2,190	56,100	5,420	900	13,200
31.....	--	--	--	9,160	2,210	54,700	--	--	--
Total.	82,940	--	171,570	128,260	--	635,270	205,180	--	772,200

	July			August			September		
1.....	5,250	780	11,100	1,900	330	1,690	2,690	1,640	11,900
2.....	5,040	880	12,000	1,880	352	1,790	2,790	1,520	11,500
3.....	4,830	2,560	33,400	1,600	297	1,280	2,830	1,040	7,950
4.....	4,580	1,480	18,300	1,410	297	1,130	2,810	774	5,870
5.....	4,260	880	10,100	1,410	308	1,170	2,790	833	6,270
6.....	3,950	730	7,790	1,580	319	1,360	2,770	765	5,720
7.....	3,620	960	9,380	1,530	286	1,180	2,790	646	4,870
8.....	3,260	1,120	9,860	1,440	418	1,630	2,790	672	5,060
9.....	3,060	740	6,110	1,380	363	1,350	2,770	672	5,030
10.....	3,020	750	6,120	1,360	297	1,090	2,750	425	3,160
11.....	2,940	660	5,240	1,380	275	1,020	2,640	1,560	11,100
12.....	2,790	710	5,350	1,560	528	2,220	2,560	510	3,520
13.....	2,660	640	4,600	1,810	528	2,580	2,520	994	6,760
14.....	2,710	590	4,320	1,850	742	3,710	2,540	833	5,710
15.....	2,690	710	5,160	1,850	572	2,910	2,520	842	5,730
16.....	2,670	690	4,970	1,710	451	3,560	2,620	544	3,850
17.....	2,540	1,080	7,410	1,440	396	1,540	2,660	672	4,830
18.....	2,450	620	4,100	1,340	429	1,550	2,670	1,840	13,300
19.....	2,390	540	3,480	1,470	462	1,830	2,690	706	5,130
20.....	2,180	380	2,240	1,710	616	2,840	2,710	502	3,670
21.....	1,580	363	1,550	1,970	616	3,280	2,730	442	3,260
22.....	1,460	302	1,190	2,130	715	4,110	2,690	425	3,090
23.....	1,460	253	997	2,200	605	3,590	2,560	408	2,820
24.....	1,350	198	722	2,140	528	3,050	2,560	557	3,850
25.....	1,310	198	700	1,900	451	2,310	2,620	552	3,900
26.....	1,250	187	631	1,580	412	1,760	2,670	468	3,370
27.....	1,130	198	604	1,480	418	1,670	2,710	400	2,930
28.....	1,030	176	489	2,200	1,930	s 13,400	2,670	289	2,080
29.....	1,020	198	545	2,290	3,500	21,600	2,670	382	2,750
30.....	1,290	275	958	2,310	2,230	13,900	2,690	348	2,530
31.....	1,760	275	1,310	2,660	1,780	12,800	--	--	--
Total.	81,530	--	180,726	54,470	--	118,900	80,480	--	161,510

Total discharge for year (cfs-days)..... 1,160,890

Total load for year (tons)..... 2,807,695

s Computed by subdividing day.

BIGHORN RIVER AT BIGHORN, MONT.--Continued

Particle-size analyses of suspended sediment, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; 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. 1, 1955	3:25 p.m.	2,540	54	1,710	3,890	--	72		88		90	93	98		100		VPWCM
Apr. 17, 1956	2:25 p.m.	2,730	53	440	1,300	--	36		48		56	74	94		100		VPWCM
May 2	11:35 a.m.	2,160	48	476	820	--	56		--		65	75	100		--		VPWCM
May 14	11:45 a.m.	2,640	55	598	1,520	--	44		60		70	76	85		94		BWCM
June 1	11:45 a.m.	8,150	61	1,770	3,700	--	43		64		83	94	100		--		VPWCM
June 7	2:50 p.m.	8,010	67	1,320	2,320	--	23		36		61	88	100		--		VPWCM
June 30	11:30 a.m.	5,420	--	840	1,240	--	31		42		59	81	99		100		VPWCM
July 17	3:50 p.m.	2,520	75	1,100	2,550	2	5		78		82	89	100		--		VPN
July 17	3:50 p.m.	2,520	75	1,100	2,340	48	67		79		82	89	100		--		VPWCM
Aug. 21	1:40 p.m.	1,970	72	513	720	--	27		42		52	58	98		100		VPWCM
Sept. 4	2:25 p.m.	2,810	58	736	1,270	--	31		49		61	69	92		97		VPWCM

Particle-size analyses of bed material, water years October 1953 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed; V, visual accumulation tube)

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									
							0.062	0.125	0.250	0.500	1.000	2.000	4.000	8.000	16.000	
July 19, 1954	4	3,810					0	2	67	75	75	75	75	76	82		SV
Apr. 17, 1956	8	2,730					0	1	39	90	90	90	90	90	90		SV
June 1	6	8,150					0	12	46	50	50	50	50	50	87		SV
June 7	5	8,010					0	15	57	60	61	61	61	63	69		SV
July 17	7	2,520					0	4	80	98	98	99	100	--	--		SV
July 26	8	1,250					6	25	86	100	--	--	--	--	--		SV

YELLOWSTONE RIVER BASIN--Continued

TONGUE RIVER NEAR ACME, WYO.

LOCATION.--At gaging station at highway bridge, just upstream from Ash Creek and 3.2 miles northeast of Acme, Sheridan County.
DRAINAGE AREA.--894 square miles.
RECORDS AVAILABLE.--Chemical analyses: January 1952 to June 1956 (discontinued).
REMARKS.--Records of discharge for water year October 1955 to September 1956 given in WSP 1439.

Chemical analyses, in parts per million, November 1955 to June 1956

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 (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. 3, 1955	149	--	--	--	--	33	--	314	0	154	3.5	--	--	--	--	--		343	86	17	0.8	733	8.1
Dec. 8	a 145	11	0.00	61	40	27	1.7	290	0	128	1.5	0.2	2.6	0.11	427	0.58		315	77	16	.7	675	8.0
Jan. 6, 1956	a 210	11	.05	62	36	27	1.8	270	0	133	2.5	.1	2.1	.11	415	.56		303	82	16	.7	653	7.8
Feb. 2	a 110	13	.04	68	42	32	2.1	307	0	162	3.5	.2	3.7	.12	478	.65		344	92	17	.7	735	7.8
Mar. 8	a 160	--	--	64	34	26	--	255	0	132	4.0	--	--	--	425	.58		298	89	16	.7	655	7.8
Apr. 3	215	--	--	65	41	36	--	267	0	185	4.0	--	--	--	499	.68		330	111	19	.8	745	8.0
May 16	633	--	--	34	16	10	--	143	0	55	1.0	--	--	--	205	.28		149	32	13	.4	337	7.8
June 20	512	6.6	.03	36	18	13	1.6	152	0	65	1.5	.1	1.4	.06	221	.30		162	37	15	.4	427	7.7

a Daily mean discharge.

TONGUE RIVER AT MILES CITY, MONT.

LOCATION.--At gaging station, 4 miles south of Miles City, Custer County, and 8 miles upstream from mouth.
RECORDS AVAILABLE.--Chemical analyses: January 1951 to September 1956.
Water temperatures: April 1949 to September 1956.
Sediment records: June 1946 to September 1951.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 1,320 ppm Aug. 10; minimum, 225 ppm June 2-15.
Hardness: Maximum, 488 ppm Aug. 10; minimum, 158 ppm June 2-15.
Specific conductance: Maximum daily, 1,840 micromhos Aug. 10; minimum daily, 351 micromhos June 8.
Water temperatures: Maximum, 72°F June 11; minimum, freezing point on many days during November to March.
EXTREMES, 1949-56.--Dissolved solids (1951-56): Maximum, 1,430 ppm July 26 to Aug. 4, 1954; minimum, 200 ppm June 23-27, 1953.
Hardness (1951-56): Maximum, 556 ppm Nov. 26 to Dec. 5, 1952; minimum, 94 ppm May 4, 1955.
Specific conductance (1951-56): Maximum daily, 2,280 micromhos July 24, 1953; minimum daily, 288 micromhos June 21, 1953.
Water temperatures: Maximum, 86°F July 20, 1954; minimum, freezing point on many days during winter months.
REMARKS.--Daily samples for chemical analysis composited by discharge. Records of specific conductance of daily samples available in district office at Worland, Wyo. Records of discharge for water year October 1955 to September 1956 given in WSP 1439.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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. 1-2, 1955	5.60	--	--	--	--	228	--	478	--	--	--	--	--	1,190	1.62	18.0	440	48	53	4.7	1,680	8.0	--
Oct. 3-6	24.5	--	--	--	--	138	--	374	--	--	--	--	--	818	1.11	54.1	368	61	45	3.1	1,200	8.0	--
Oct. 7-15	48.3	--	--	--	--	88	--	308	--	--	--	--	--	680	.92	88.7	362	109	35	2.0	1,010	7.9	--
Oct. 16-24	60.2	--	--	--	--	81	--	309	--	--	--	--	--	670	.91	109	368	115	32	1.8	991	8.1	--
Oct. 25-Nov. 2	31.3	--	--	--	--	112	--	358	--	--	--	--	--	784	1.07	66.3	398	104	38	2.4	1,140	8.1	--
Nov. 3-13	143	--	--	--	--	70	--	284	--	--	--	--	--	640	.87	247	370	137	29	1.6	942	8.0	--
Nov. 14-30	133	--	--	--	--	81	--	341	--	--	--	--	--	766	1.04	275	446	166	28	1.7	1,100	7.9	--
Dec. 1-17	152	6.9	0.00	90	52	64	4.5	346	295	4.5	0.3	0.7	0.15	708	.96	291	438	154	24	1.3	1,020	8.1	8
Dec. 18	140	--	--	--	--	50	--	240	--	--	--	--	--	508	.69	192	312	115	26	1.2	770	8.0	--
Dec. 19-Jan. 22, 1956	157	--	--	--	--	63	--	350	--	--	--	--	--	690	.94	292	436	149	24	1.3	1,000	8.0	--
Jan. 23-24	160	--	--	--	--	54	--	242	--	--	--	--	--	566	.77	245	334	136	26	1.3	830	8.1	--
Jan. 25-27	160	--	--	--	--	49	--	248	--	--	--	--	--	540	.73	233	332	129	24	1.2	798	8.2	--
Jan. 28-Feb. 29	159	--	--	--	--	58	--	346	--	--	--	--	--	673	.92	289	430	146	23	1.2	974	8.0	--
Mar. 1	180	--	--	--	--	62	--	a 296	--	--	--	--	--	604	.82	294	354	111	28	1.4	887	8.3	--
Mar. 2-9	198	--	--	--	--	38	--	209	--	--	--	--	--	404	.55	216	239	68	26	1.1	619	7.5	--
Mar. 10-18	183	9.2	.00	72	49	60	5.8	314	250	4.0	.3	1.3	.14	624	.85	308	381	124	25	1.3	923	7.8	18
Mar. 19-20	260	--	--	--	--	41	--	220	--	--	--	--	--	422	.57	296	260	80	26	1.1	659	7.9	--
Mar. 21-23	917	--	--	--	--	27	--	164	--	--	--	--	--	310	.42	768	185	51	24	.9	482	7.8	--
Mar. 24	1,390	--	--	--	--	39	--	250	--	--	--	--	--	458	.62	1,720	276	71	24	1.0	684	8.2	--

a Includes equivalent of 8 ppm of carbonate (CO_3).

YELLOWSTONE RIVER BASIN--Continued

TONGUE RIVER AT MILES CITY, MONT.--Continued

Chemical analyses, in parts per million, water year October 1955 to September 1956--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					
Mar. 25-29, 1956..	1,051	--	--	--	--	32	--	195	--	--	--	--	--	354	0.48	1,000	217	57	24	0.9	559	7.7	--
Mar. 30-Apr. 21...	1,065	--	--	--	--	35	--	201	--	--	--	--	--	445	.61	1,280	271	106	22	.9	673	7.7	--
Apr. 22-25.....	621	--	--	--	--	44	--	229	--	--	--	--	--	533	.72	894	321	133	23	1.1	786	7.8	--
Apr. 26-May 20....	352	--	--	--	--	60	--	263	--	--	--	--	--	602	.82	572	352	136	27	1.4	887	7.9	--
May 21-25.....	784	--	--	--	--	44	--	240	--	--	--	--	--	506	.69	1,070	313	116	23	1.1	772	7.9	--
May 26-29.....	1,215	--	--	--	--	27	--	196	--	--	--	--	--	355	.48	1,160	232	71	20	.8	561	7.9	--
May 30-June 1.....	2,053	--	--	--	--	19	--	181	--	--	--	--	--	281	.38	1,560	188	40	18	.6	441	8.1	--
June 2-15	1,762	9.6	0.00	40	14	15	2.6	151	63	0.0	0.3	0.1	0.05	225	.31	1,070	158	34	17	.5	371	7.9	25
June 16	420	--	--	--	--	33	--	b 194	--	--	--	--	--	344	.47	390	200	41	26	1.0	536	8.5	--
June 17-July 12....	241	--	--	--	--	44	--	206	--	--	--	--	--	389	.53	253	214	45	31	1.3	600	7.8	--
July 13-15.....	45.0	--	--	--	--	105	--	328	--	--	--	--	--	725	.99	88.1	346	77	40	2.5	1,060	8.1	--
July 16-20.....	17.2	--	--	--	--	134	--	370	--	--	--	--	--	854	1.16	39.7	374	71	44	3.0	1,240	8.0	--
July 21-Aug. 2.....	11.2	--	--	--	--	170	--	392	--	--	--	--	--	973	1.32	29.4	398	77	48	3.7	1,390	7.7	--
Aug. 3-4.....	22.0	--	--	--	--	139	--	282	--	--	--	--	--	706	.96	41.9	224	0	57	4.0	1,030	8.0	--
Aug. 5-9.....	6.30	--	--	--	--	208	--	437	--	--	--	--	--	1,070	1.46	18.2	386	28	54	4.6	1,530	8.1	--
Aug. 10.....	13	--	--	--	--	244	--	c 508	--	--	--	--	--	1,320	1.80	46.3	488	71	52	4.8	1,840	8.3	--
Aug. 11-28.....	87.8	--	--	--	--	117	--	349	--	--	--	--	--	754	1.03	179	347	61	42	2.7	1,110	7.9	--
Aug. 29-Sept. 3....	393	--	--	--	--	71	--	225	--	--	--	--	--	436	.59	463	192	7	45	2.2	673	7.8	--
Sept. 4-30.....	57.5	11	.01	64	44	91	5.3	320	253	4.0	.3	.2	.17	651	.89	101	340	78	36	2.1	967	8.1	7
Weighted average d.	330	--	--	--	--	41	--	224	--	--	--	--	--	442	.60	394	269	85	25	1.1	670	--	--

b Includes equivalent of 10 ppm of carbonate (CO_3).
c Includes equivalent of 7 ppm of carbonate (CO_3).
d Represents 100 percent of runoff for water year October 1955 to September 1956.

YELLOWSTONE RIVER BASIN--Continued

TONGUE RIVER AT MILES CITY, MONT.--Continued

Temperature (° F) of water, water year October 1955 to September 1956
/Once-daily measurement between 6 a.m. and 9 a.m./

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

YELLOWSTONE RIVER BASIN--Continued

POWDER RIVER AT ARVADA, WYO.

LOCATION.--At county highway bridge, 0.1 mile south of Arvada, Sheridan County, a quarter of a mile upstream from Wildhorse Creek, and half a mile downstream from gaging station.

DRAINAGE AREA.--6,050 square miles, approximately.

RECORDS AVAILABLE.--Chemical analyses: December 1949 to July 1952, May to August 1953.
Water temperatures: March 1949 to September 1956.
Sediment records: April 1946 to September 1956.

EXTREMES, 1955-56.--Water temperatures: Minimum, freezing point probably on many days during winter months.
Sediment concentrations: Maximum daily, 72,000 ppm Aug. 1; minimum daily, no flow on many days during August and September.
Sediment loads: Maximum daily, 913,000 tons June 16; minimum daily, 0 tons on many days during winter months.

EXTREMES, 1946-56.--Water temperatures: Maximum (1949-54), 90°F July 16, 1954; minimum (1949-56), freezing point on many days during winter months.
Sediment concentrations: Maximum daily, 105,000 ppm July 19, 1954; minimum daily, no flow on many days each year.
Sediment loads: Maximum daily, 2,340,000 tons May 24, 1952; minimum daily, 0 tons on many days each year.

REMARKS.--No appreciable inflow between gaging station and sampling point except during periods of intense local rainfall. Flow affected by ice Nov. 1, 2, Nov. 12 to Mar. 21. Records of discharge for water year October 1955 to September 1956 given in WSP 1439.

Temperature (°F) of water, water year October 1955 to September 1956

(Twice-daily measurements between 7 a.m. and 10 a.m. and between 4 p.m. and 7 p.m.)

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

a Measurement between 11 a.m. and 3 p.m.

YELLOWSTONE RIVER BASIN--Continued

POWDER RIVER AT ARVADA, WYO.--Continued

Suspended sediment, water year October 1955 to September 1956

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	66	--	e 2,100	25	--		39	--	
2	54	--	e 1,300	23	647	e 75	35	--	
3	40	--	e 900	80	--		40	--	
4	33	--	e 550	102	--		45	--	
5	30	--	e 360	76	--		50	--	
6	23	--	e 240	56	2,910		55	--	
7	21	--	e 120	73	--		58	486	
8	20	--	e 70	81	3,320	e 650	64	--	
9	17	--		81	--		70	--	
10	13	--		84	--		73	--	
									e 100
11	13	--		84	--		76	--	
12	12	469		50	--		78	676	
13	9.6	--		25	--		76	--	
14	11	--		15	427		74	--	
15	11	--		12	--		74	--	
16	11	753		10	--		74	--	
17	14	--		8	--		74	--	
18	17	--		9	--		73	--	
19	20	--		10	--		72	560	
20	21	601	e 38	10	--		90	--	
21	22	394		11	280	e 26	200	--	
22	22	--		15	--		400	--	
23	23	--		20	--		600	--	
24	23	--		30	--		800	--	
25	25	--		35	--		700	--	e 13,000
26	24	1,130		40	--		800	--	
27	24	--		40	--		1,000	7,960	
28	25	--		38	--		300	--	
29	30	--		36	492		100	--	
30	32	1,040		40	--		50	--	e 110
31	34	--		--	--	--	55	--	
Total	740.6	--	6,514	1,219	--	5,919	6,295	--	106,330

	January			February			March		
1	60	--		50	699		210	--	e 500
2	65	--		54	--		225	--	e 750
3	70	386		58	--		240	--	e 1,100
4	68	591		62	--		250	2,300	a 1,600
5	65	--	e 110	64	400		265	1,800	a 1,300
6	70	--		67	--		250	--	e 1,000
7	80	--		69	--		225	1,100	a 650
8	100	792		71	577		320	950	a 800
9	120	--		72	--		375	2,100	a 2,100
10	148	1,520		74	--		250	--	e 1,000
11	160	--	e 600	76	--		150	--	e 300
12	170	--		78	--	e 100	100	--	e 70
13	125	--		80	--		110	--	e 80
14	98	--		82	--		115	290	90
15	80	--		84	--		100	--	e 80
16	70	--		84	--		150	552	224
17	60	--		84	--		250	--	e 700
18	70	--		84	--		500	1,730	2,340
19	86	682		83	--		1,200	4,180	13,500
20	80	--		83	--		4,500	11,100	135,000
21	90	--		82	--		3,100	18,300	153,000
22	100	--	e 160	81	426		1,750	24,900	118,000
23	110	--		81	508		1,040	24,700	69,400
24	120	--		200	410	221	668	17,200	31,000
25	132	672		570	485	746	536	12,900	18,700
26	130	--		450	--	e 500	439	9,460	11,200
27	110	--		300	488	395	378	7,590	7,750
28	90	--		200	768	415	330	5,500	4,900
29	74	--		205	--	e 440	295	5,830	4,640
30	60	--		--	--	--	282	5,610	4,270
31	55	--		--	--	--	222	4,710	2,820
Total	2,916	--	6,760	3,628	--	5,017	18,825	--	588,864

e Estimated.

a Computed from partly estimated concentration graph.

YELLOWSTONE RIVER BASIN--Continued

POWDER RIVER AT ARVADA, WYO.--Continued

Suspended sediment, water year October 1955 to September 1956--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	191	3,940	2,030	276	5,470	4,080	483	23,300	30,400
2	206	3,670	2,040	255	4,680	3,220	380	15,400	15,800
3	232	4,660	2,920	255	4,290	2,950	338	--	e 8,000
4	266	5,610	4,030	242	--	e 2,600	294	8,640	6,860
5	250	4,650	3,140	211	4,070	2,320	267	7,130	5,140
6	250	--	e 3,000	199	4,120	2,210	218	5,450	3,210
7	254	4,510	3,090	199	4,510	2,420	180	4,320	2,100
8	246	4,680	3,110	222	4,900	2,940	152	2,680	1,100
9	236	5,010	3,190	246	5,310	3,530	130	--	e 1,000
10	243	5,620	3,690	276	6,490	4,840	130	2,460	863
11	250	5,430	3,670	294	6,100	4,840	114	--	e 600
12	368	9,820	9,760	327	--	e 5,000	88	1,620	385
13	468	14,400	18,200	327	--	e 5,000	61	1,110	183
14	395	16,000	17,100	272	5,220	3,830	43	864	100
15	325	14,400	12,600	267	5,210	3,760	42	1,620	s 518
16	263	11,400	8,100	263	5,000	3,550	3,650	69,500	s 913,000
17	226	8,520	5,200	215	4,680	2,720	411	27,300	s 32,900
18	211	6,980	3,980	188	4,180	2,120	194	6,800	3,560
19	218	6,160	3,630	162	3,220	1,410	132	1,850	659
20	207	5,720	3,200	159	5,100	sb 4,700	89	1,050	252
21	184	4,950	2,460	204	19,400	s 13,400	67	--	e 200
22	188	4,760	2,420	203	6,910	3,790	54	1,000	146
23	218	6,020	3,540	560	53,400	s 107,000	53	500	
24	251	6,850	4,640	614	56,000	a 96,000	48	--	
25	272	6,980	5,130	549	54,000	a 83,000	38	--	
26	238	5,500	3,530	531	44,300	65,900	31	--	e 32
27	218	--	e 2,800	396	38,500	42,700	28	--	
28	234	4,780	3,020	648	37,800	68,600	26	211	
29	263	4,820	3,420	867	57,300	139,000	25	--	
30	280	5,830	4,410	876	60,600	149,000	35	225	
31	--	--	--	634	41,900	74,400	--	--	--
Total	7,651	--	151,050	10,937	--	910,830	7,801	--	1,027,232

Day	July			August			September		
1	31	--	e 32	412	72,000	sc 90,000	0	--	0
2	100	15,900	s 14,400	180	53,000	c 27,000	0	--	0
3	1,560	68,200	s 389,000	362	54,000	sc 60,000	0	--	0
4	175	32,200	s 17,200	162	33,000	sc 16,000	0	--	0
5	86	11,500	2,670	107	22,000	c 6,400	0	--	0
6	60	2,500	b 400	83	20,000	a 4,500	0	--	0
7	45	500	61	68	16,000	b 2,900	0	--	0
8	35	--		43	9,000	b 1,000	0	--	0
9	27	--		160	48,000	sa 25,000	0	--	0
10	21	--		68	26,000	sc 5,200	0	--	0
11	17	308		75	38,000	sc 8,700	0	--	0
12	15	--	e 12	42	31,000	b 3,500	0	--	0
13	12	201		25	21,000	b 1,400	11	24,000	sb 1,800
14	9.6	--		20	18,000	sb 1,300	20	46,000	a 2,600
15	7.3	--		67	40,000	b 7,500	1.9	34,000	b 180
16	6.0	--		42	33,000	3,880	.2	27,000	b 15
17	25	--		27	30,000	b 2,200	0	--	0
18	18	212	e 11	22	26,000	b 1,500	0	--	0
19	22	--		16	22,000	b 950	0	--	0
20	11	--		12	20,000	b 650	0	--	0
21	7.3	--		8.2	16,000	b 360	0	--	0
22	4.3	261		4.7	12,000	152	0	--	0
23	2.4	--		2.7			0	--	0
24	1.0	212		1.6			0	--	0
25	.8	--	e 1	.5	--	e 30	0	--	0
26	.5	--		1.0			0	--	0
27	.5	--		1.0			0	--	0
28	2.2	--		.5			0	--	0
29	15	4,600	sb 1,000	0	--	0	0	--	0
30	254	49,000	sa 38,000	0	--	0	0	--	0
31	474	60,000	sa 140,000	0	--	0	--	--	--
Total	3,044.9	--	602,923	2,013.2	--	270,272	33.1	--	4,595

Total discharge for year (cfs-days) 65,103.6

Total load for year (tons) 3,686,306

e Estimated.

s Computed by subdividing day.

a Computed from partly estimated concentration graph.

b Computed from estimated concentration graph.

c Computed from concentration graph based on discharge-concentration relationship.

POWDER RIVER AT ARVADA, WYO.--Continued

Particle-size analyses of suspended sediment, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; 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. 20, 1956....	5:10 p.m.	4,220	36	17,900	5,580		32		48		72	91	99		100		VPWCM
Apr. 3.....	11:30 a.m.	236	--	4,890	4,680		32		51		82	96	100		--		VPWCM
Apr. 18.....	11:50 a.m.	215	52	6,690	2,560		1		86		91	99	100		--		VPN
Apr. 18.....	11:50 a.m.	215	52	6,890	2,540	58	64		77		91	99	100		--		VPWCM
May 3	2:00 p.m.	263	44	4,160	2,800		39		58		73	96	100		--		VPWCM
May 16	5:55 p.m.	246	--	4,730	2,770		37		59		86	96	99		100		VPWCM
May 23	11:50 a.m.	746	67	76,800	5,680		48		77		94	98	100		--		VPWCM
July 3	4:35 p.m.	796	--	58,900	5,630		60		88		97	99	100		--		VPWCM
Aug. 6.....	12:25 p.m.	81	--	19,800	5,940		83		99		100	--	--		--		PWCM
Aug. 9.....	12:30 p.m.	222	70	55,600	2,960		66		94		99	100	--		--		VPWCM
Aug. 16.....	3:45 p.m.	40	81	31,400	2,640		87		--		99	100	--		--		VPWCM
Aug. 22.....	8:05 a.m.	5.6	--	12,000	4,820		96		--		100	--	--		--		PWCM

Particle-size analyses of bed material, water years October 1953 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed; V, visual accumulation tube)

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										
						0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	4.000	8.000	16.000	
June 24, 1954....	32	a 14						6	23	62	79	86	88	90	93	97	SV
June 18, 1956....	3	16						1	3	13	38	60	64	70	78	86	SV
Aug. 6.....	18	81						4	14	49	83	95	97	98	100	--	SV

a Daily mean discharge.

POWDER RIVER AT MOORHEAD, MONT.

LOCATION.--At gaging station at Moorhead, Powder River County, 6¼ miles upstream from Buffalo Creek. Prior to Mar. 22, 1956, at site three-quarters of a mile upstream; Mar. 22 to July 24, 1956, at site a quarter of a mile downstream.
RECORDS AVAILABLE.--Chemical analyses: February 1951 to September 1953, October 1955 to September 1956.
Water temperatures: February 1951 to September 1953, October 1955 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 3,440 ppm Aug. 1; minimum, 290 ppm Mar. 17.
Hardness: Maximum, 1,580 ppm Aug. 1; minimum, 160 ppm Mar. 17.
Specific conductance: Maximum daily, 3,790 micromhos Aug. 1; minimum daily, 451 micromhos Mar. 17.
Water temperatures: Maximum, 83°F July 24; minimum, freezing point on several days during November to January.
EXTREMES, 1951-53, 1955-56.--Dissolved solids: Maximum (1951, 1952-53, 1955-56), 3,460 ppm July 22-24, 1953; minimum, 290 ppm Mar. 17, 1956.
Hardness: Maximum, 1,580 ppm Aug. 1, 1956; minimum, 160 ppm Mar. 17, 1956.
Specific conductance: Maximum daily (1951, 1952-53, 1955-56), 4,100 micromhos July 22, 1953; minimum daily, 234 micromhos Oct. 7, 1952.
Water temperatures: Maximum, 90°F July 7, 1951; minimum, freezing point on many days during winter months.
REMARKS.--Daily samples for chemical analysis composited by discharge. Records of specific conductance of daily samples available in district office at Worland, Wyo. Records of discharge for water year October 1955 to September 1956 given in WSP 1439.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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: Parts per million: Residue at 180°C	Dissolved solids: Parts per million: Sum	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Per cent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
Oct. 1-2, 1955...	60.5	--	--	293	74	392	--	196	1,360	250	--	4.1	0.33	2,650	--	3.60	433	1,040	879	44	5.3	3,290	7.8	
Oct. 3-31.....	39.9	--	--	210	94	253	--	228	1,110	80	--	6.2	.25	2,090	--	2.84	225	912	725	38	3.6	2,490	7.8	
Nov. 1-15.....	103	--	--	213	87	211	--	261	988	85	--	4.7	.19	1,920	--	2.61	534	890	676	34	3.1	2,290	7.9	
Nov. 16-19.....	70.0	--	--	258	118	234	--	412	1,200	56	--	6.2	.25	2,330	--	3.17	440	1,130	792	30	3.0	2,650	7.8	
Nov. 20-30.....	82.7	--	--	213	82	160	--	336	863	44	--	4.6	.19	1,710	--	2.33	382	870	594	27	2.4	2,040	7.9	
Dec. 1-25.....	125	11	0.00	175	68	142	5.4	292	700	53	0.4	4.3	.13	1,430	1,300	1.94	483	717	478	30	2.3	1,790	7.9	
Dec. 26-29.....	675	--	--	132	42	88	--	159	495	35	--	2.9	.12	974	--	1.32	1,780	502	372	27	1.7	1,260	7.8	
Dec. 30-Jan. 3, 1956...	118	11	.02	211	64	191	8.7	230	870	80	--	6.8	.22	1,650	1,560	2.24	526	790	601	34	3.0	2,080	8.1	
Jan. 4-31.....	155	12	.03	197	56	162	6.1	272	740	59	.5	4.3	.18	1,430	1,370	1.94	598	722	499	33	2.6	1,870	8.0	
Feb. 1-25.....	129	--	--	170	67	140	--	286	660	59	--	4.6	.18	1,380	--	1.88	481	699	464	30	2.3	1,750	8.0	
Feb. 26-Mar. 8 .	354	--	--	117	33	75	--	154	400	32	--	3.2	.06	819	--	1.11	783	429	303	28	1.6	1,110	7.6	
Mar. 9-17	296	7.1	.02	141	46	150	6.2	196	625	57	.4	2.5	.14	1,200	1,130	1.63	959	543	382	37	2.8	1,590	7.7	
Mar. 17 a	300	--	--	45	12	13	--	168	70	.0	--	12	.12	290	--	.39	235	160	22	13	.5	451	7.3	
Mar. 18-20	2,333	--	--	87	25	60	--	166	283	15	--	1.5	.10	598	--	.81	3,770	318	182	29	1.5	864	7.8	
Mar. 21-25	2,200	--	--	133	33	76	--	189	440	20	--	2.7	.14	868	--	1.18	5,160	468	313	26	1.5	1,160	7.9	
Mar. 26-Apr. 10.	508	--	--	153	53	134	--	219	650	44	--	1.5	.12	1,250	--	1.70	1,710	600	420	32	2.4	1,590	7.7	
Apr. 11-23.....	394	--	--	172	62	191	--	230	810	63	--	3.0	.19	1,530	--	2.08	1,630	684	495	37	3.2	1,920	7.6	
Apr. 24-May 11..	377	9.5	.01	134	46	124	5.0	210	548	47	.5	2.2	.17	1,070	1,020	1.46	1,090	524	352	34	2.4	1,450	8.0	
May 12-23	538	12	.01	90	30	69	4.0	177	311	25	.4	1.2	.11	663	--	.90	983	347	202	30	1.6	951	7.9	
May 24-June 1...	1,786	--	--	118	27	81	--	186	390	17	--	4.5	.18	782	--	1.06	3,770	407	254	30	1.7	1,070	7.7	

June 2-4	1,173	--	--	93	19	61	--	179	265	11	--	3.2	.11	593	--	.81	1,880	312	165	30	1.5	853	7.8
June 5-8	864	--	--	70	17	45	--	147	195	11	--	1.3	.09	451	--	.61	1,050	243	122	29	1.3	674	7.8
June 9-14	386	10	.00	91	28	74	5.0	154	335	21	.2	2.3	.11	682	--	.93	711	344	218	31	1.7	961	7.4
June 15	370	--	--	415	70	106	--	204	1,300	22	--	.3	.14	2,240	--	3.05	2,240	1,320	1,150	15	1.3	2,380	7.7
June 16-18	3,025	--	--	297	57	81	--	188	938	14	--	2.1	.14	1,630	--	2.22	13,310	976	822	15	1.1	1,880	8.1
June 19-23	300	--	--	196	44	108	--	166	663	29	--	3.4	.13	1,280	--	1.74	1,040	670	534	26	1.8	1,580	7.5
June 24-25	172	--	--	209	62	178	--	184	913	43	--	1.8	.23	1,650	--	2.24	766	778	627	33	2.8	1,990	8.1
June 26-July 1	63.3	--	--	243	87	234	--	196	1,210	62	--	.5	.21	2,130	--	2.90	364	964	803	34	3.3	2,470	7.9
July 2	528	--	--	205	61	98	--	270	700	18	--	1.1	.13	1,320	--	1.80	1,880	762	541	22	1.5	1,640	7.5
July 3-4	1,903	--	--	408	81	83	--	220	1,250	17	--	.5	.13	2,160	--	2.94	11,100	1,350	1,170	12	1.0	2,310	7.6
July 5-9	97.0	--	--	313	70	101	--	159	1,100	17	--	5.9	.13	1,890	--	2.57	495	1,070	940	17	1.3	2,070	7.6
July 10-12	41.7	--	--	340	92	176	--	156	1,390	35	--	2.0	.23	2,370	--	3.22	267	1,230	1,100	24	2.2	2,590	7.7
July 13-18	22.5	--	--	270	80	178	--	192	1,160	33	--	3.8	.17	2,000	--	2.72	122	1,000	843	27	2.4	2,310	7.6
July 19-27	12.5	--	--	353	121	288	--	198	1,700	80	--	.4	.29	2,950	--	4.01	99.6	1,380	1,220	31	3.4	3,230	7.6
July 28-31	92.3	--	--	343	89	180	--	214	1,340	31	--	3.9	.25	2,330	--	3.17	581	1,220	1,050	24	2.2	2,540	7.6
Aug. 1	878	--	--	450	111	360	--	274	1,840	146	--	.3	.30	3,440	--	4.68	8,150	1,580	1,360	33	3.9	3,790	7.4
Aug. 2-27	71.1	--	--	343	69	255	--	229	1,350	71	--	2.2	.27	2,440	--	3.32	468	1,140	952	33	3.3	2,750	7.5
Aug. 28	15	--	--	140	49	95	--	140	605	13	--	8.7	.10	1,070	--	1.46	43.3	550	435	27	1.8	1,380	8.0
Aug. 29-Sept. 30	9.54	1.5	.01	218	134	253	10	202	1,460	23	.5	2.5	.26	2,450	2,200	3.33	63.1	1,090	924	33	3.3	2,690	8.0
Weighted average b	314	--	--	165	46	109	--	202	604	33	--	2.8	0.15	1,160	--	1.58	983	600	434	28	1.9	1,460	--

a Not included in weighted average.
b Represents 100 percent of runoff for water year October 1955 to September 1956.

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YELLOWSTONE RIVER BASIN--Continued

POWDER RIVER AT MOORHEAD, MONT.--Continued

Temperature (° F) of water, water year October 1955 to September 1956
[Once-daily measurement between 4 p.m. and 8 p.m.]

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

a Measurement between 11 a.m. and 3 p.m.

POWDER RIVER NEAR LOCATE, MONT.

LOCATION.--At gaging station at bridge on U. S. Highway 12, at present site of Locate (5 miles west of former site of Locate), Custer County, 3 miles upstream from Locate Creek and 25 miles east of Miles City.
RECORDS AVAILABLE.--Chemical analyses: December 1949 to September 1956.
Water temperatures: February 1951 to May 1954, October 1954 to September 1956.
Sediment records: March 1950 to September 1953.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 5,430 ppm Dec. 15-17; minimum, 511 ppm Mar. 8-9.
Hardness: Maximum, 2,120 ppm Dec. 15-17; minimum, 198 ppm Aug. 28 to Sept. 2.
Specific conductance: Maximum daily, 9,270 micromhos Dec. 16; minimum daily, 715 micromhos July 15.
Water temperatures: Maximum, 81°F July 24, Aug. 3; minimum, freezing point on many days during November to March.
EXTREMES, 1951-56.--Dissolved solids: Maximum, 5,430 ppm Dec. 15-17, 1955; minimum, 278 ppm Mar. 29, 1952.
Hardness: Maximum, 2,120 ppm Dec. 15-17, 1955; minimum, 62 ppm Oct. 22-24, 1953.
Specific conductance: Maximum daily, 9,270 micromhos Dec. 16, 1955; minimum daily, 407 micromhos Feb. 14, 1952.
Water temperatures: Maximum (1951-53, 1954-56), 85°F on several days during July 1952, 1953; minimum, freezing point on many days during winter months each year.
REMARKS.--Daily samples for chemical analysis composited by discharge. Records of specific conductance of daily samples available in district office at Worland, Wyo. Records of discharge for water year October 1955 to September 1956 given in WSP 1439.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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: Parts per million: Residue at 180°C	Dissolved solids: Parts per million: Sum	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Per cent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
Oct. 1-31, 1955..	13.7	--	--	--	--	357	--	272	1,200	--	--	--	--	2,150	--	2.92	79.5	762	539	50	5.6	2,670	7.8	--
Nov. 1-12.....	41.7	--	--	--	--	310	--	276	1,310	--	--	--	--	2,290	--	3.11	258	940	714	42	4.4	2,720	7.8	--
Nov. 13-16.....	45.0	--	--	--	--	399	--	350	1,610	--	--	--	--	2,990	--	4.07	363	1,260	973	41	4.9	3,400	7.9	--
Nov. 17-19.....	25.0	--	--	--	--	472	--	411	1,850	--	--	--	--	3,450	--	4.69	233	1,430	1,090	42	5.4	3,880	7.8	--
Nov. 20-Dec. 4..	45.3	--	--	--	--	376	--	445	1,550	--	--	--	--	2,920	--	3.97	357	1,230	865	40	4.7	3,290	7.8	--
Dec. 5-12.....	62.5	--	--	--	--	280	--	435	1,210	--	--	--	--	2,410	--	3.28	407	1,100	743	36	3.7	2,800	8.0	--
Dec. 13-14.....	70.0	--	--	--	--	330	--	419	1,400	--	--	--	--	2,700	--	3.67	510	1,110	766	39	4.6	3,100	7.6	--
Dec. 15-17.....	70.0	--	--	--	--	796	--	722	2,830	--	--	--	--	5,430	--	7.38	1,030	2,120	1,530	45	7.5	5,760	7.7	--
Dec. 18-28.....	89.5	12	0.00	219	80	213	7.5	364	963	65	0.4	4.2	0.20	1,860	1,740	2.53	449	876	578	34	3.1	2,240	8.0	15
Dec. 29.....	110	--	--	--	--	328	--	282	1,300	--	--	--	--	2,520	--	3.43	748	1,040	809	41	4.4	2,920	8.1	--
Dec. 30-Jan. 20, 1956..	119	--	--	--	--	208	--	312	938	--	--	--	--	1,800	--	2.45	578	860	604	34	3.1	2,210	7.8	--
Jan. 21-23.....	120	--	--	--	--	299	--	384	1,310	--	--	--	--	2,560	--	3.48	829	1,150	835	36	3.8	2,960	7.8	--
Jan. 24-Feb. 6..	93.6	--	--	--	--	197	--	311	750	--	--	--	--	1,710	--	2.33	433	800	545	35	3.0	2,100	8.0	--
Feb. 7-28.....	96.8	--	--	--	--	175	--	320	775	--	--	--	--	1,590	--	2.16	416	750	488	34	2.8	1,960	7.9	--
Feb. 29-Mar. 4.	240	--	--	--	--	120	--	206	470	--	--	--	--	976	--	1.33	632	448	279	37	2.5	1,300	7.7	--
Mar. 5-7.....	733	--	--	--	--	65	--	147	325	--	--	--	--	639	--	.87	1,260	330	209	30	1.6	901	7.8	--
Mar. 8-9.....	800	--	--	--	--	53	--	135	243	--	--	--	--	511	--	.69	1,100	261	150	31	1.4	744	7.7	--
Mar. 10-16.....	457	8.0	.02	103	34	90	7.5	156	410	33	.2	1.5	.12	807	--	1.10	996	398	270	32	2.0	1,110	7.6	6
Mar. 17-20.....	425	--	--	--	--	105	--	153	460	--	--	--	--	915	--	1.24	1,050	419	294	35	2.2	1,210	7.8	--

YELLOWSTONE RIVER BASIN--Continued

POWDER RIVER NEAR LOCATE, MONT.--Continued

Chemical analyses, in parts per million, water year October 1955 to September 1956--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				Hardness as $CaCO_3$		Per cent 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					
														Residue at 180°C	Sum									
Mar. 21-22, 1956	700	--	--	--	--	69	--	169	268	--	--	--	--	581	--	0.79	1,100	270	131	36	1.8	817	7.8	--
Mar. 23-27.....	4,364	--	--	--	--	85	--	178	440	--	--	--	--	852	--	1.16	10,040	436	290	30	1.8	1,150	7.7	--
Mar. 28-Apr. 1.	1,272	--	--	--	--	121	--	193	595	--	--	--	--	1,080	--	1.47	3,710	501	343	34	2.4	1,390	7.8	--
Apr. 2-17.....	591	--	--	--	--	167	--	241	720	--	--	--	--	1,400	--	1.90	2,230	633	435	36	2.9	1,760	7.8	--
Apr. 18-26.....	398	--	--	--	--	220	--	247	913	--	--	--	--	1,670	--	2.27	1,790	705	502	40	3.6	2,060	7.8	--
Apr. 27-May 9..	365	--	--	--	--	159	--	239	670	--	--	--	--	1,330	--	1.81	1,310	581	385	37	2.9	1,720	7.8	--
May 10-15.....	559	--	--	--	--	149	--	238	530	--	--	--	--	1,130	--	1.54	1,710	489	294	40	2.9	1,530	7.8	--
May 16-24.....	528	--	--	--	--	116	--	203	395	--	--	--	--	936	--	1.27	1,330	411	245	38	2.5	1,280	7.9	--
May 25-30.....	1,702	--	--	--	--	87	--	207	335	--	--	--	--	762	--	1.04	3,500	346	176	35	2.0	1,070	7.7	--
May 31-June 6..	1,847	--	--	--	--	99	--	196	420	--	--	--	--	861	--	1.17	4,290	412	251	34	2.1	1,160	7.6	--
June 7-13	831	11	0.00	82	21	74	4.1	154	290	13	0.4	1.3	0.11	606	--	.82	1,360	290	164	35	1.9	860	8.0	25
June 14-17	354	--	--	--	--	105	--	164	435	--	--	--	--	850	--	1.16	812	383	249	37	2.3	1,150	7.7	--
June 18-21	1,151	--	--	--	--	116	--	234	1,010	--	--	--	--	1,630	--	2.49	5,690	1,030	838	20	1.6	2,050	7.8	--
June 22-28	275	--	--	--	--	114	--	173	838	--	--	--	--	1,480	--	2.01	1,100	765	623	24	1.8	1,740	7.5	--
June 29-July 5..	85.6	--	--	--	--	192	--	236	838	--	--	--	--	1,520	--	2.07	351	653	459	39	3.3	1,910	7.8	--
July 6-13.....	285	--	--	--	--	136	--	212	1,050	--	--	--	--	1,830	--	2.49	1,410	959	785	23	1.9	2,090	7.7	--
July 14.....	272	--	--	--	--	86	--	260	380	--	--	--	--	812	--	1.10	596	428	215	30	1.8	1,110	8.0	--
July 15-16.....	233	--	--	--	--	81	--	182	240	--	--	--	--	536	--	.73	337	224	75	44	2.3	787	8.2	--
July 17-19.....	97.3	--	--	--	--	139	--	170	590	--	--	--	--	1,080	--	1.47	284	452	313	40	2.9	1,420	8.1	--
July 20-28.....	28.0	--	--	--	--	221	--	238	900	--	--	--	--	1,600	--	2.18	121	642	447	42	3.8	2,010	8.0	--
July 29.....	76	--	--	--	--	121	--	228	265	--	--	--	--	644	--	.88	132	208	21	56	3.6	935	7.6	--
July 30.....	61	--	--	--	--	150	--	196	500	--	--	--	--	954	--	1.30	157	352	191	48	3.5	1,320	7.7	--
July 31.....	65	--	--	--	--	217	--	250	780	--	--	--	--	1,370	--	1.86	240	512	307	46	4.2	1,810	7.8	--
Aug. 1-3.....	38.7	--	--	--	--	170	--	216	555	--	--	--	--	1,050	--	1.43	110	378	201	49	3.8	1,430	7.8	--
Aug. 4.....	114	--	--	--	--	228	--	310	980	--	--	--	--	1,750	--	2.38	539	738	484	39	3.6	2,160	7.7	--
Aug. 5-6.....	182	--	--	--	--	267	--	290	1,730	--	--	--	--	3,010	--	4.09	1,480	1,470	1,230	30	3.3	3,300	7.7	--
Aug. 7-18.....	94.7	--	--	--	--	267	--	275	1,230	--	--	--	--	2,180	--	2.96	557	938	712	38	3.8	2,600	7.4	--
Aug. 19-21.....	87.7	--	--	--	--	213	--	242	770	--	--	--	--	1,380	--	1.88	327	524	326	46	4.0	1,820	7.7	--
Aug. 22-27.....	63.0	--	--	--	--	269	--	216	1,200	--	--	--	--	2,020	--	2.75	344	814	637	41	4.1	2,460	7.6	--
Aug. 28-Sept. 2.	450	--	--	--	--	126	--	242	268	--	--	--	--	635	--	.86	772	198	0	57	3.9	935	7.8	--
Sept. 3-7.....	81.6	--	--	--	--	231	--	249	780	--	--	--	--	1,450	--	1.97	241	528	324	49	4.4	1,890	7.8	--
Sept. 8-30.....	14.7	13	.01	163	62	300	9.3	275	1,040	41	.5	.2	.20	1,870	1,760	2.54	74.2	660	434	49	5.1	2,360	8.0	25
Weighted average a....	335	--	--	--	--	127	--	212	574	--	--	--	--	1,120	--	1.52	1,010	527	353	34	2.4	1,440	--	--

a Represents 100 percent of runoff for water year October 1955 to September 1956.

YELLOWSTONE RIVER BASIN--Continued

POWDER RIVER NEAR LOCATE, MONT.--Continued

Temperature (° F) of water, water year October 1955 to September 1956
/Once-daily measurement between 1 p.m. and 6 p.m./

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

a Measurement between 7 a.m. and 12 m.

YELLOWSTONE RIVER BASIN--Continued

YELLOWSTONE RIVER NEAR SIDNEY, MONT.

LOCATION.--At bridge on State Highway 23, 2 miles south of Sidney, Richland County, 4½ miles downstream from gaging station, 2 miles downstream from Fox Creek, and 30 miles upstream from mouth.
DRAINAGE AREA.--69,450 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1956.
Water temperatures: January 1951 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 770 ppm Nov. 22 to Dec. 26; minimum, 173 ppm June 5-16.
Hardness: Maximum, 364 ppm Nov. 22 to Dec. 26; minimum, 102 ppm June 5-16.
Specific conductance: Maximum daily, 1,310 micromhos Dec. 1; minimum daily, 257 micromhos June 15.
Water temperatures: Maximum, 79°F July 26; minimum, freezing point on many days during November to March.
EXTREMES, 1951-56.--Dissolved solids: Maximum, 1,370 ppm Jan. 2-3, 1954; minimum, 173 ppm June 5-16, 1956.
Hardness: Maximum, 649 ppm Jan. 2-3, 1954; minimum, 102 ppm June 5-16, 1956.
Specific conductance: Maximum daily, 2,780 micromhos Jan. 14, 1951; minimum daily, 257 micromhos June 15, 1956.
Water temperatures: Maximum, 82°F July 14, 15, 1953; minimum, freezing point on many days during winter months.
REMARKS.--Daily samples for chemical analysis composited by discharge. Records of specific conductance of daily samples available in district office at Worland, Wyo. No appreciable inflow between gaging station and sampling station. Discharge records for gaging station near Sidney for water year October 1955 to September 1956 given in WSP 1439.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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. 1-31, 1955....	5,453	--	--	--	--	96	--	214	--	--	--	--	--	648	0.88	9,540	293	118	42	2.4	935	7.9	--
Nov. 1-21.....	4,556	--	--	--	--	100	--	242	--	--	--	--	--	704	.96	8,660	328	130	40	2.4	1,010	8.0	--
Nov. 22-Dec. 26...	5,160	15	0.00	89	35	104	5.2	268	338	15	0.5	2.6	0.25	770	1.05	10,730	364	144	38	2.4	1,090	7.9	4
Dec. 27-Jan. 18, 1956	7,161	--	--	--	--	83	--	222	--	--	--	--	--	628	.85	12,140	303	121	37	2.1	910	7.8	--
Jan. 19-Feb. 11 ...	5,554	--	--	--	--	89	--	234	--	--	--	--	--	676	.92	10,140	326	134	37	2.1	974	8.0	--
Feb. 12-21.....	6,660	--	--	--	--	77	--	206	--	--	--	--	--	603	.82	10,840	295	126	36	2.0	888	7.8	--
Feb. 22-29.....	6,388	--	--	--	--	86	--	220	--	--	--	--	--	664	.90	11,450	322	142	37	2.1	961	8.1	--
Mar. 1-8.....	10,690	--	--	--	--	59	--	164	--	--	--	--	--	474	.64	13,680	225	91	36	1.7	698	7.7	--
Mar. 9-31.....	13,430	11	.01	69	22	65	4.4	184	220	11	.4	2.1	.12	535	.73	19,400	262	111	35	1.8	786	7.8	--
Apr. 1-16.....	10,010	--	--	--	--	76	--	202	--	--	--	--	--	602	.82	16,270	290	124	36	1.9	876	7.8	--
Apr. 17.....	9,240	--	--	--	--	92	--	288	--	--	--	--	--	708	.96	17,660	360	124	36	2.1	1,040	7.9	--
Apr. 18-25.....	9,648	--	--	--	--	70	--	198	--	--	--	--	--	549	.75	14,300	270	108	36	1.9	816	7.9	--
Apr. 26-May 20....	10,740	--	--	--	--	52	--	171	--	--	--	--	--	425	.58	12,320	211	71	35	1.6	646	8.0	--
May 21-27.....	29,740	--	--	--	--	22	--	171	--	--	--	--	--	278	.38	22,320	170	30	22	.7	430	7.6	--
May 28-June 4.....	55,790	--	--	--	--	19	--	149	--	--	--	--	--	239	.33	36,000	148	26	22	.7	377	7.2	--
June 5-16	47,530	12	.00	32	5.4	16	1.7	108	41	1.5	.2	.2	.05	173	.24	22,200	102	13	25	.7	289	7.9	10
June 17-July 1.....	33,240	--	--	--	--	21	--	118	--	--	--	--	--	229	.31	20,550	128	31	26	.8	360	7.7	--
July 2-5.....	23,850	--	--	--	--	23	--	107	--	--	--	--	--	206	.28	13,270	106	18	32	1.0	330	7.6	--
July 6-21.....	16,040	--	--	--	--	33	--	123	--	--	--	--	--	277	.38	12,000	139	38	34	1.2	433	7.6	--
July 22-31.....	8,909	--	--	--	--	45	--	136	--	--	--	--	--	310	.42	7,460	145	33	40	1.6	486	7.8	--
Aug. 1-21.....	7,010	--	--	--	--	61	--	165	--	--	--	--	--	432	.59	8,180	203	68	39	1.9	663	7.8	--
Aug. 22-Sept. 30...	6,394	13	.01	56	24	79	3.8	189	228	9.5	.4	1.0	.23	530	.72	9,150	238	83	41	2.2	796	7.7	8
Weighted average a	11,850	--	--	--	--	49	--	165	--	--	--	--	--	402	0.55	12,860	202	67	35	1.5	603	--	--

a Represents 100 percent of runoff for water year October 1955 to September 1956.

YELLOWSTONE RIVER BASIN--Continued

YELLOWSTONE RIVER NEAR SIDNEY, MONT.--Continued

Temperature (° F) of water, water year October 1955 to September 1956
/Once-daily measurement between 3 p.m. and 8 p.m./

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

a Measurement between 8 a.m. and 12 m.

MISSOURI RIVER MAIN STEM

MISSOURI RIVER NEAR WILLISTON, N. DAK.

LOCATION.--At gaging station at Lewis and Clark Highway bridge, 5 miles southwest of Williston, Williams County, and 25 miles downstream from Yellowstone River.
DRAINAGE AREA.--164,500 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: December 1950 to September 1956.
Water temperatures: May 1951 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 579 ppm Jan. 9 to Feb. 8; minimum, 206 ppm June 3.
Hardness: Maximum, 291 ppm Dec. 20-31, Jan. 9 to Feb. 8; minimum, 122 ppm June 3.
Specific conductance: Maximum daily, 890 micromhos Dec. 29; minimum daily, 323 micromhos June 3.
Water temperatures: Maximum, 76°F July 24, Aug. 4.
EXTREMES, 1950-56.--Dissolved solids: Maximum, 604 ppm Mar. 9, 1955; minimum, 206 ppm June 3, 1956.
Hardness: Maximum, 308 ppm Mar. 9, 1955; minimum, 122 ppm June 3, 1956.
Specific conductance: Maximum daily, 919 micromhos Jan. 9, 1955; minimum daily, 320 micromhos June 24, 1951.
Water temperatures (1951-56): Maximum, 79°F July 2, 1954; minimum (1954-55), 33°F on many days during winter months.
REMARKS.--Daily samples for chemical analysis composited by discharge. Records of specific conductance of daily samples available in district office at Lincoln, Nebr. Records of discharge for water year October 1955 to September 1956 given in WSP 1439.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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. 1-31, 1955...	34,910	--	--	--	--	60	--	198	--	--	--	--	--	475	0.65	44,770	243	81	35	1.7	720	7.9	
Nov. 1-14.....	23,140	--	--	--	--	66	--	208	--	--	--	--	--	516	.70	32,240	258	87	36	1.8	765	7.9	
Dec. 20-31.....	12,480	15	0.06	74	26	75	4.6	231	238	12	0.7	4.3	0.17	574	.78	19,340	291	102	35	1.9	858	7.8	
Jan. 1-8, 1956....	14,690	--	--	--	--	69	--	214	--	--	--	--	--	535	.73	21,220	270	95	36	1.8	800	7.6	
Jan. 9-Feb. 8	12,910	--	--	--	--	75	--	224	--	--	--	--	--	579	.79	20,180	291	107	36	1.9	854	7.7	
Feb. 9-29.....	11,970	--	--	--	--	73	--	222	--	--	--	--	--	560	.76	18,100	287	105	36	1.9	841	7.9	
Mar. 1-22.....	15,830	--	--	--	--	63	--	195	--	--	--	--	--	514	.70	21,970	254	94	35	1.7	756	7.9	
Apr. 1-27.....	17,510	--	--	--	--	67	--	204	--	--	--	--	--	551	.75	26,050	260	93	36	1.8	788	8.1	
Apr. 28-May 12...	16,590	--	--	--	--	56	--	188	--	--	--	--	--	453	.62	20,290	228	74	35	1.6	680	7.9	
May 13-23.....	21,010	--	--	--	--	57	--	180	--	--	--	--	--	434	.59	24,620	216	68	36	1.7	665	7.9	
May 24-25.....	33,800	--	--	--	--	35	--	151	--	--	--	--	--	307	.42	28,020	163	39	32	1.2	479	7.9	
May 26.....	42,700	--	--	--	--	62	--	174	--	--	--	--	--	482	.66	55,570	226	83	37	1.8	710	7.8	
May 27-June 2....	56,960	20	.01	45	11	24	2.1	152	76	3.5	.3	3.5	.10	265	.36	40,750	158	33	24	.8	411	7.9	14
June 3	66,800	--	--	--	--	19	--	128	--	--	--	--	--	206	.28	37,150	122	17	25	.8	323	7.8	
June 4-18	53,110	--	--	--	--	23	--	130	--	--	--	--	--	236	.32	33,840	128	21	28	.9	359	7.6	
June 19-July 2....	38,240	--	--	--	--	30	--	132	--	--	--	--	--	276	.38	28,500	142	34	32	1.1	420	7.6	
July 3-14	28,710	--	--	--	--	38	--	146	--	--	--	--	--	325	.44	25,190	163	43	34	1.3	494	7.7	
July 15-Aug. 8....	20,920	--	--	--	--	45	--	163	--	--	--	--	--	353	.48	19,940	183	49	35	1.4	552	7.6	
Aug. 9-31.....	16,950	--	--	--	--	57	--	185	--	--	--	--	--	424	.58	19,400	216	64	36	1.7	659	7.9	
Sept. 1-30.....	13,820	15	.06	57	22	64	4.6	196	198	11	.6	1.2	.16	475	.65	17,720	232	71	37	1.8	721	7.9	
Weighted average a	22,380	--	--	--	--	51	--	179	--	--	--	--	--	418	0.57	25,260	212	65	34	1.5	629	--	
Weighted average b	21,490	--	--	--	--	52	--	181	--	--	--	--	--	424	0.58	24,600	215	67	34	1.5	638	--	

a Represents 92 percent of runoff for water year October 1955 to September 1956.
b Includes estimated data for missing periods. Represents 100 percent of runoff for water year October 1955 to September 1956.

MISSOURI RIVER MAIN STEM--Continued

MISSOURI RIVER NEAR WILLISTON, N. DAK.--Continued

Temperature (° F) of water, water year October 1955 to September 1956
/Once-daily measurement between 5 p.m. and 6 p.m. October to March and between 7 p.m. and 8 p.m. April to September/

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

a Measurement between 5 p.m. and 6 p.m.

MISSOURI RIVER MAIN STEM--Continued

MISSOURI RIVER BELOW GARRISON DAM, N. DAK.

LOCATION.--Temperature recorder at gaging station, 4.3 miles north of Stanton, Mercer County, 5 miles upstream from Knife River, and 9 miles downstream from Garrison Dam.
DRAINAGE AREA.--181,400 square miles, approximately.
RECORDS AVAILABLE.--Water temperatures: June 1952 to September 1956.
EXTREMES, 1955-56.--Water temperatures: Maximum, 68°F July 24-27, Aug. 6, 7, 14; minimum, freezing point on several days during November to January.
EXTREMES, 1952, 1954-56.--Water temperatures: Maximum, 76°F July 27, 28, 1954; minimum (1954-56), freezing point on several days during winter months.
REMARKS.--Records of discharge for water year October 1955 to September 1956 given in WSP 1439.

Temperature (° F) of water, water year October 1955 to September 1956
/Recorder with temperature attachment, continuous ethyl alcohol-actuated thermograph/

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

GRAND RIVER NEAR SHADEHILL, S. DAK.

LOCATION.--At spillway and irrigation outlets of Shadehill Reservoir, 1 mile upstream from gaging station, three-quarters of a mile west of Shadehill, Perkins County, and 4 miles downstream from confluence of North and South Forks of Grand River.
DRAINAGE AREA.--3,120 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: April to October 1952, March 1953 to September 1956.
Water temperatures: August 1954 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 950 ppm Mar. 1-27 (irrigation outlet); minimum, 510 ppm Mar. 27 (spillway outlet).
Hardness: Maximum, 163 ppm Feb. 1 to Mar. 27 (irrigation outlet); minimum, 104 ppm Mar. 27 (spillway outlet).
Specific conductance: Maximum daily, 1,420 micromhos Mar. 5 (irrigation outlet); minimum daily, 790 micromhos Mar. 27 (spillway outlet).
Water temperatures: Maximum, 74°F on several days during August; minimum, freezing point on several days during November and December.
EXTREMES, 1954-56.--Dissolved solids: Maximum, 950 ppm Mar. 1-27, 1956; (irrigation outlet); minimum, 510 ppm Mar. 27, 1956 (spillway outlet).
Hardness: Maximum, 167 ppm Apr. 4-7, 1955 (irrigation outlet); minimum, 104 ppm Mar. 27, 1956 (spillway outlet).
Specific conductance: Maximum daily, 1,420 micromhos Mar. 5, 1956 (irrigation outlet); minimum daily, 790 micromhos Mar. 27, 1956 (spillway outlet).
Water temperatures: Maximum, 78°F Aug. 3, 1955; minimum (1955-56), freezing point on several days during November and December.
REMARKS.--Records of specific conductance of daily samples available in district office at Lincoln, Neb. Flow is regulated by an ungated spillway and by a regulated irrigation outlet. No water released from reservoir during most of April through most of June. Discharge records for gaging station at Shadehill for water year October 1955 to September 1956 given in WSP 1439.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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, 1955	13.5	--	--	--	--	234	--	354	8	353	--	--	--	0.33	861	1.17	31.4	145	0	76	8.5	1,280	8.3
Nov. 1-30	15.6	--	--	--	--	231	--	365	6	363	--	--	--	.34	865	1.18	36.4	150	0	77	8.2	1,300	8.2
Dec. 1-31	14.9	0.7	0.01	29	20	241	7.5	370	11	373	4.5	0.4	0.2	.38	910	1.24	36.6	156	0	76	8.4	1,340	8.4
Jan. 1-7, 1956	14.0	--	--	--	--	245	--	395	0	380	--	--	--	.36	928	1.26	35.1	160	0	74	8.4	1,380	8.0
Jan. 8-31	14.0	--	--	--	--	248	--	378	12	385	--	--	--	.41	938	1.28	35.5	162	0	74	8.5	1,390	8.4
Feb. 1-29	14.9	--	--	--	--	266	--	384	12	395	--	--	--	.37	942	1.28	37.9	163	0	78	9.1	1,410	8.4
Mar. 1-27	31.0	--	--	36	18	262	--	390	10	390	5.0	--	.1	.40	950	1.29	79.5	163	0	76	8.9	1,410	8.4
Mar. 26 a b	150	--	--	27	14	151	--	240	0	233	1.0	--	2.5	--	590	.80	239	124	0	73	5.9	887	7.8
Mar. 27 a b	155	--	--	23	11	132	--	216	0	206	1.0	--	1.0	.22	510	.69	214	104	0	73	5.6	790	7.8
Mar. 28-Apr. 5	159	--	--	30	17	240	--	364	0	345	4.5	--	.2	.36	856	1.16	367	146	0	78	8.6	1,280	8.2
Mar. 28-Apr. 5 a b	159	--	--	29	15	199	--	318	0	298	3.5	--	.3	.30	734	1.00	315	134	0	75	7.5	1,120	7.9
Apr. 6-7	128	--	--	28	14	191	--	318	0	293	4.0	--	.3	.28	732	1.00	253	128	0	73	7.3	1,120	8.0
Apr. 6-7 a b	128	--	--	30	13	181	--	318	0	300	2.0	--	.4	.29	732	1.00	253	130	0	68	6.9	1,130	7.9
Apr. 8-10 a	112	--	--	30	15	212	--	318	10	310	2.0	--	.3	.31	791	1.08	239	136	0	77	7.9	1,190	8.4
Apr. 8-14 b	97.9	--	--	28	16	204	--	328	0	315	4.0	--	.4	.35	782	1.06	207	134	0	74	7.7	1,160	8.1
Apr. 15-22 b	52.5	--	--	29	16	214	--	337	0	320	3.0	--	.3	.29	792	1.08	112	137	0	76	8.0	1,200	8.1
Apr. 23-24 b	39.0	--	--	30	16	221	--	340	6	328	5.0	--	.3	.31	817	1.11	86.0	142	0	75	8.1	1,230	8.3
Apr. 25-May 15 b	44.9	--	--	--	--	223	--	353	0	343	--	--	--	.33	832	1.13	101	144	0	75	8.1	1,260	8.1
May 16-31 b	29.9	--	--	--	--	224	--	352	0	325	--	--	--	.34	831	1.13	67.1	142	0	77	8.2	1,260	8.1
June 1-23 b	25.7	--	--	--	--	225	--	356	0	323	--	--	--	.31	835	1.14	57.9	140	0	78	8.3	1,270	8.2

a Not included in weighted average.
b Samples collected at spillway outlet. All others collected at irrigation outlet.

GRAND RIVER BASIN--Continued

GRAND RIVER NEAR SHADEHILL, S. DAK.--Continued

Chemical analyses, in parts per million, water year October 1955 to September 1956--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 24-30, 1956.....	7.3	1.8	0.00	29	17	228	6.8	360	0	340	4.5	0.3	0.4	0.34	830	1.13	16.4	143	0	77	8.3	1,260	8.2
July 1-30.....	20.8	--	--	--	--	223	--	355	5	350	--	--	--	.37	846	1.15	47.5	144	0	74	8.1	1,270	8.3
July 31-Aug. 29.....	13.3	--	--	--	--	222	--	370	0	315	--	--	--	.35	852	1.16	30.6	143	0	77	8.1	1,280	8.2
Aug. 30-Sept. 30.....	10.8	.9	.02	30	16	232	7.4	374	0	345	4.0	.3	.2	.32	860	1.17	25.1	142	0	77	8.5	1,300	8.2
Weighted average c .	25.6	--	--	--	--	232	--	d 367	--	347	--	--	--	0.35	858	1.17	59.3	147	0	76	8.3	1,290	--

c Represents 100 percent of runoff for water year October 1955 to September 1956.
d Includes carbonate as bicarbonate.

GRAND RIVER BASIN--Continued

GRAND RIVER NEAR SHADEHILL, S. DAK.--Continued

Temperature (° F) of water, water year October 1955 to September 1956
/Once-daily measurement between 8 a.m. and 11 a.m./

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

a Measurement between 1 p.m. and 6 p.m.
b Measurement between 6 a.m. and 7 a.m.

GRAND RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS AND LAKES IN THE GRAND RIVER BASIN IN SOUTH DAKOTA

Chemical analyses, in parts per million, water year October 1955 to September 1956

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Selenium (Se)	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, Residue at 180°C	Dissolved solids: Parts per million, Sum	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Calcium, magnesium	Noncarbonate	Per cent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
SOUTH FORK GRAND RIVER AT BUFFALO																									
Apr. 26, 1949..	4.53	12	0.05		14	7.2	394		681	36	276	9.5	0.2	0.6	0.22	1,080	1,090	1.47	13.2	65	0	93	21	1,620	8.6
Aug. 1, 1950...	--	--	--		--	--	466	6.6	--	--	--	--	--	--	--	1,350	--	1.84	--	46	--	95	30	1,920	--
Oct. 14, 1955..	1.7	16	--		13	1.8	430	3.9	760	51	283	7.0	.6	1.0	.33	1,200	1,180	1.63	5.51	40	0	95	30	1,820	8.8
July 25, 1956..	1.8	14	.08		13	3.0	402	5.5	745	30	280	6.5	.4	2.6	.36	1,180	1,120	1.60	5.73	45	0	94	26	1,780	8.6
SAND CREEK NEAR BUFFALO																									
Oct. 14, 1955..	a 2	34		0.02	10	1.2	436	3.3	712	79	285	7.0	0.7	0.8	0.29	1,200	1,210	1.63	6.48	30	0	97	35	1,840	9.0
July 25, 1956..	.35	9.3	0.08	.00	10	2.2	438	4.8	748	63	285	6.0	.4	10	.38	1,250	1,200	1.70	1.18	34	0	96	33	1,900	8.9
BULL CREEK NEAR LUDLOW																									
Oct. 14, 1955..	a 0.5	18		0.00	20	8.3	588	5.2	730	35	710	5.0	0.7	1.5	0.76	1,760	1,750	2.39	2.38	84	0	93	28	2,540	8.6
July 25, 1956..	.20	12	0.23	.00	23	5.5	214	5.5	336	0	270	.0	.2	2.3	.30	734		1.00	2.40	80	0	84	10	1,110	8.1
SOUTH FORK GRAND RIVER NEAR PRAIRIE CITY																									
Oct. 14, 1955..	a 10						558	5.2	730	94	513	11	0.8	1.9	0.50	1,620		2.20	43.7	48	0	96	35	2,360	8.8
July 25, 1956..	6.0	12	0.08		21	5.5	360	7.7	514	13	425	6.5	.4	3.0	.42	1,160	1,110	1.58	18.8	75	0	90	18	1,740	8.5
SOUTH FORK GRAND RIVER NEAR BISON																									
Oct. 17, 1955..	a 18	12		0.01	13	7.7	594	6.6	730	79	620	11	0.8	1.1	0.52	1,740	1,700	2.37	84.6	64	0	95	32	2,530	8.8
July 26, 1956..	6.6	12	0.11	.00	22	5.1	283	6.7	406	12	350	4.0	.4	2.1	.37	944		1.28	16.8	76	0	88	14	1,420	8.4
GRAND RIVER AT SHADEHILL																									
Oct. 17, 1955..	15.0	1.3	0.02		17	26	241	7.5	366	5	360	5.5	0.5	0.9	0.34	867		1.18		149	0	77	8.6	1,300	8.3
July 20, 1956..	21.9	1.3	.03		28	16	232	7.4	358	0	350	5.0	.4	.6	.32	844		1.15		136	0	78	8.7	1,280	8.2
FLAT CREEK LAKE NEAR SHADEHILL																									
Nov. 18, 1947..		1.0	0.05		67	51	198	10	326	0	514	8.0	0.3	1.0	--	1,030	1,010	1.40		377	110	52	4.4	1,520	8.0
Oct. 17, 1955..		5.8	--		44	42	247	12	290	0	555	8.5	.4	3.7	0.31	1,070	1,060	1.46		282	44	64	6.4	1,550	7.6
July 20, 1956..		2.2	.02		31	31	174	12	216	0	405	6.0	.4	5.1	.24	807		1.10		205	28	63	5.3	1,190	7.5
GRAND RIVER NEAR ATHBOY																									
Oct. 13, 1955..	a 25	2.3	0.02		24	22	263	7.8	390	6	393	8.0	0.5	0.6	0.42	937		1.27	63.2	149	0	78	9.4	1,400	8.3
July 26, 1956..	10.6	3.2	.04		20	16	274	8.8	385	0	405	7.5	.5	.7	.42	972		1.32	27.8	117	0	82	11	1,460	8.3
GRAND RIVER NEAR MORRISTOWN																									
Aug. 7, 1948...	--	6.0	0.02		14	18	674		754	47	808	25	0.7	1.0	0.65	2,070	1,970	2.82	--	109	0	93	28	2,680	8.8
Oct. 13, 1955..	a 20	2.3	.02		24	22	283	8.2	405	9	415	8.5	.5	1.0	.42	988		1.34	53.4	152	0	79	10	1,480	8.3
July 19, 1956..	19.5	4.1	.04		22	15	274	8.8	374	7	400	7.5	.4	1.1	.46	959		1.30	50.5	118	0	82	11	1,450	8.4

GRAND RIVER NEAR McINTOSH

Oct. 12, 1955..	a 20	3.2	0.02		28	16	310	8.8	422	0	470	10	0.5	0.8	0.39	1,070	1,060	1.46	57.8	136	0	82	12	1,580	8.1
July 19, 1956 ..	15.0	7.2	.06		28	9.2	278	8.0	331	0	445	8.0	.1	1.7	.44	995		1.35	40.3	108	0	84	12	1,490	8.1

HUMP CREEK NEAR McINTOSH

Oct. 12, 1955..	a 1		8.1				58	3.6	130	0	101	2.0		3.1	0.05					86	0	58	2.7	415	7.6
July 19, 1956 ..	b 0	26	.77		11	2.1	146	4.2	192	0	190	1.0	0.2	4.7	.15	532		0.72		36	0	88	11	739	7.8

STINK CREEK NEAR BULLHEAD

Oct. 12, 1955..	a 0.50	10	0.05		42	19	169	8.9	338	0	273	6.0	0.5	1.9	0.25	709		0.96	0.96	182	0	66	5.4	1,050	7.6
July 19, 1956 ..	.2	14	.18		27	7.2	115	5.3	292	0	115	.5	.0	2.0	.24	453		.62	.24	97	0	71	5.1	696	7.8

GRAND RIVER AT LITTLE EAGLE

Oct. 11, 1955..	a 8	9.0	0.03		42	16	302	8.3	404	0	490	11	0.5	1.3	0.30	1,100	1,080	1.50	23.8	170	0	78	10	1,590	8.0
July 18, 1956 ..	18	11	.07		41	10	259	8.2	344	0	415	8.5	.3	1.5	.33	961		1.31	46.7	145	0	78	9.4	1,410	8.0

GRAND RIVER NEAR WAKPALA

Oct. 12, 1955..	7.3	13	0.05		35	20	298	8.4	410	0	485	11	0.6	1.5	0.30	1,110	1,070	1.51		171	0	78	9.9	1,610	7.9
July 18, 1956 ..	20	12	.09		43	10	253	8.2	353	0	405	8.5	.2	5.6	.30	934		1.27		149	0	78	9.0	1,380	7.8

a Estimated.
b Practically no flow.

CHEYENNE RIVER BASIN

BEAVER CREEK NEAR NEWCASTLE, WYO.

LOCATION.--At gaging station at bridge on county road, 1 mile downstream from Sheep Creek and 23 miles south of Newcastle, Weston County.
DRAINAGE AREA.--1,320 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: December 1949 to September 1952, December 1952 to August 1953.
Sediment records: March 1950 to September 1956.
EXTREMES, 1955-56.--Sediment concentrations: Maximum daily, 13,600 ppm July 6; minimum daily, no flow July 15, Aug. 22 to Sept. 30.
Sediment loads: Maximum daily, 6,280 tons May 28; minimum daily, 0 tons July 15, Aug. 22 to Sept. 30.
EXTREMES, 1950-56.--Sediment concentrations: Maximum daily, not determined; minimum daily, no flow on many days during 1950, 1952-56.
Sediment loads: Maximum daily, 56,000 tons (estimated) May 30, 1953; minimum daily, 0 tons on many days during 1950, 1952-56.
REMARKS.--Flow affected by ice Nov. 13 to Mar. 24. Records of discharge for water year October 1955 to September 1956 given in WSP 1439.

Suspended sediment, water year October 1955 to September 1956

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	8.5			1.3			6.3		
2	4.3			1.2			5.5		
3	3.1			1.1			5.0		
4	1.8			1.0			5.3		
5	1.6			1.1			5.7		
		212	2		24	(t)			
6	1.8			1.1			6.0		
7	1.6			1.1			6.3		
8	1.5			1.0			6.2		
9	1.3			.9			6.0		
10	1.3			3.0			6.2		
11	1.3			7.2			6.0	84	1
12	1.3			6.0			6.5		
13	1.5			5.5			6.2		
14	1.6			4.5			5.9		
15	1.8			4.0			5.6		
16	1.8			4.5			5.9		
17	1.8			5.0			5.5		
18	2.0			5.5			5.0		
19	2.0			5.7			4.5		
20	2.2			6.0	202	3	5.0		
21	2.2	16	(t)	6.2			6.0		
22	2.2			6.1			10	--	e 10
23	2.6			6.0			20	734	40
24	2.6			5.8			40	--	e 80
25	2.9			6.1			100	--	e 200
26	3.1			5.5			200	614	332
27	2.2			5.0			100	--	e 200
28	3.7			5.4			35	1,030	97
29	4.3			5.8			11	--	e 30
30	2.2			6.0			10	958	26
31	1.5			--	--	--	11	--	e 10
Total	73.6	--	22	124.6	--	64	657.6	--	1,046

e Estimated.
t Less than 0.50 ton.

CHEYENNE RIVER BASIN--Continued

BEAVER CREEK NEAR NEWCASTLE, WYO.--Continued

Suspended sediment, water year October 1955 to September 1956--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.....	13			8.0			80	--	
2.....	14			10			90	240	
3.....	15			12			100	--	
4.....	15			14			110	--	
5.....	16			16			100	266	e 90
6.....	15			18			95	--	
7.....	14			20			85	586	
8.....	12			22			90	--	
9.....	11			23			40	397	43
10.....	9.5			25			25	--	e 26
11.....	8.7			25			10	--	e 10
12.....	8.5			25	283	16	4.0		
13.....	8.0			24			4.5		
14.....	7.5			20			5.0	338	4
15.....	6.0			17			5.2		
16.....	5.0	229	7	15			15	353	
17.....	7.0			13			15	--	e 20
18.....	8.3			15			20	--	
19.....	9.0			20			190	2,130	1,090
20.....	10			25			380	2,510	2,580
21.....	11			30			175	2,340	1,110
22.....	12			38			140	2,510	949
23.....	13			50			150	2,350	952
24.....	14			250	1,580	1,070	100	1,700	a 459
25.....	15			370	613	612	71	1,000	a 190
26.....	16			480	--	e 650	63	595	101
27.....	17			450	470	571	56	360	a 55
28.....	16			200	--	e 190	34	290	27
29.....	15			125	304	103	18	310	15
30.....	13			--	--	--	18	206	10
31.....	11			--	--	--	15	180	a 7
Total.	365.5	--	217	2,360.0	--	3,564	2,303.7	--	8,420

Day	April			May			June		
1.....	12	160	a 5	4.3	124	1	53	3,140	s 583
2.....	7.9	143	3	1.8			15	460	sa 20
3.....	7.6	130	a 3	1.3			7.6	135	3
4.....	5.7	126	2	1.1	140	(t)	4.8	120	a 2
5.....	1.5	90	(t)	1.0			2.6		
6.....	1.6	108	(t)	2.0	190	a 1	3.7		
7.....	1.8	130	a 1	1.8	132	1	3.7		
8.....	25	320	sa 24	.9			3.7		
9.....	17	170	8	.8			3.4		
10.....	11	120	a 4	.8	110	(t)	2.6		
11.....	6.6	95	2	.7			2.0	150	b 1
12.....	5.4			1.0	140	sa 1	1.5		
13.....	5.4			32	360	a 32	1.3		
14.....	4.8			6.9	87	2	1.1		
15.....	3.4			1.5			.8		
16.....	3.1			.9			1.8		
17.....	2.4			1.6			2.9		
18.....	1.8			1.2	70	(t)	4.6	200	2
19.....	1.8		*	1.2			5.7	200	a 3
20.....	1.3			.8			4.3	200	a 2
21.....	1.1	100	b 1	.6			19	300	sa 16
22.....	.9			4.5	98	s 2	14	90	3
23.....	1.0			10	150	s 5	5.7		
24.....	.9			2.0	140	a 1	2.4		
25.....	.9			.7	150	(t)	1.6	50	(t)
26.....	.8			1.5	420	sa 4	1.3		
27.....	.7			15	2,100	sa 120	54	371	s 91
28.....	1.0			232	8,490	s 6,280	32	300	a 26
29.....	1.2			87	3,990	s 1,230	12	130	4
30.....	2.4	166	1	25	295	s 22	5.4	85	a 1
31.....	--	--	--	38	1,540	s 474	--	--	--
Total.	138.0	--	72	479.9	--	8,180	273.5	--	771

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

CHEYENNE RIVER BASIN--Continued

BEAVER CREEK NEAR NEWCASTLE, WYO.--Continued

Suspended sediment, water year October 1955 to September 1956--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.....	2.0			1.8	117	s 3			
2.....	1.5	57	(t)	8.2	480	a 11			
3.....	1.2			3.7	254	3			
4.....	1.8	110	a 1	2.0	110	1			
5.....	111	5,040	s 1,560	.9					
6.....	50	13,600	s 2,230	.4	162	(t)			
7.....	15	2,300	a 95	.3					
8.....	7.2	600	a 12	8.6	564	s 24			
9.....	2.2	165	1	1.2					
10.....	.9			.7	--	(t)			
11.....	.2			.5					
12.....	.3	89	(t)	49	2,900	s 1,120			
13.....	.1			62	4,680	s 976			
14.....	.1			11	700	a 20			
15.....	0	--	0	3.4	140	1			
16.....	15	800	s 44	.9					
17.....	18	354	s 30	.6					
18.....	126	2,640	s 928	.7					
19.....	42	1,800	sa 220	.4	60	(t)			
20.....	11	457	s 15	.2					
21.....	4.6	200	a 2	.1					
22.....	1.1			0	--	0			
23.....	1.0			0	--	0			
24.....	.6			0	--	0			
25.....	.6			0	--	0			
26.....	.8	63	(t)	0	--	0			
27.....	.5			0	--	0			
28.....	.2			0	--	0			
29.....	.3			0	--	0			
30.....	.3			0	--	0			
31.....	.7			0	--	0			
Total.	416.2	--	5,140	156.6	--	2,161	0		0

Total discharge for year (cfs-days)..... 7,349.2
Total load for year (tons)..... 29,657

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

BEAVER CREEK NEAR NEWCASTLE, WYO.--Continued

Particle-size analyses of suspended sediment, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; 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	
Feb. 25, 1956....	12:10 p.m.	308	33	638	1,350		91		96		98	99	100				BWCM
Feb. 29.....	1:15 p.m.	120	--	380	806		85		94		97	99	100				BWCM
Mar. 19.....	3:25 p.m.	290	37	2,280	5,500		78		93		99	100	--				VPWCM
Mar. 20.....	2:15 p.m.	378	36	2,520	5,370		77		93		99	100	--				VPWCM
Mar. 22.....	2:50 p.m.	a 140	36	2,600	5,270		76		95		99	100	--				VPWCM
Mar. 23.....	5:20 p.m.	132	35	2,270	5,050		74		97		99	100	--				VPWCM
May 29.....	2:30 p.m.	56	64	2,790	3,150		88		98		--	--	100				VPWCM
July 5.....	10:05 a.m.	166	--	3,370	2,620		87		98		100	--	--				SPWCM
July 6.....	10:10 a.m.	44	--	15,000	6,750		88		--		100	--	--				SPWCM
Aug. 13.....	12:00 m.	52	67	4,300	6,560		87		--		100	--	--				SPWCM

a Daily mean discharge.

CHEYENNE RIVER BASIN--Continued

CHEYENNE RIVER NEAR HOT SPRINGS, S. DAK.

LOCATION.--At gaging station at bridge on State Highway 87, a quarter of a mile downstream from Cascade Creek and 10 miles southwest of Hot Springs, Fall River County.
DRAINAGE AREA.--8,710 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: April 1947 to September 1951.
Water temperatures: July 1947 to September 1949, April 1951 to September 1956.
Sediment records: April 1946 to September 1956.
EXTREMES, 1955-56.--Water temperatures: Minimum, freezing point Mar. 6.
Sediment concentrations: Maximum daily, 33,700 ppm June 19; minimum daily, not determined.
Sediment loads: Maximum daily, 219,000 tons June 19; minimum daily, less than 0.50 ton Apr. 14-30, May 19-25.
EXTREMES, 1946-56.--Water temperatures: Maximum (1947-49, 1951-55), 89°F June 12, 1952; minimum (1947-49, 1951-56), freezing point on many days during winter months.
Sediment concentrations: Maximum daily, 55,000 ppm June 19, 1950; minimum daily not determined.
Sediment loads: Maximum daily, 612,000 tons June 28, 1952; minimum daily, 0.1 ton or less on several days during some years.
REMARKS.--Maximum observed sediment concentration during water year, 44,500 ppm Aug. 3. Flow affected by ice Mar. 12-15. Records of discharge for water year October 1955 to September 1956 given in WSP 1439.

Temperature (° F) of water, water year October 1955 to September 1956
(Once-daily measurement between 1 p.m. and 7 p.m.)

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

a Measurement between 6 a.m. and 11 a.m.

CHEYENNE RIVER BASIN--Continued

CHEYENNE RIVER NEAR HOT SPRINGS, S. DAK.--Continued

Suspended sediment, water year October 1955 to September 1956

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	81	915	200	26			26		
2	62	340	57	26			26		
3	58	220	35	24			24		
4	50	150	20	26			24		
5	40	75	8	21			26		
6	36	45	4	18			26		
7	34	70	6	19			26		
8	36	60	6	20			26		
9	31	27	2	21			26		
10	30			23			26		
11	29			24			26		
12	29			22			24	12	1
13	28			27			26		
14	28			26			24		
15	27			26	19	1	24		
16	24			24			23		
17	24			22			23		
18	24			23			23		
19	24			26			23		
20	24	16	1	27			23		
21	23			30			23		
22	23			31			24		
23	26			26			28		
24	26			24			250	756	s 1,190
25	26			24			351	1,570	s 1,560
26	26			27			127	890	305
27	26			26			175	631	s 388
28	27			24			248	430	288
29	27			24			85	242	56
30	27			24			42	90	10
31	26			--		--	58	120	19
Total	1,002	--	360	731		30	1,906	--	3,839

	January			February			March		
1	59			24			221	876	s 645
2	61			24			197	803	s 476
3	57	134	21	24			151	714	s 350
4	54			22			198	858	s 545
5	56			24			283	1,550	s 1,270
6	52			25			203	1,160	s 715
7	52			27			113	556	s 231
8	52			28			152	911	s 523
9	47			28			265	1,250	s 1,060
10	44			30			122	700	231
11	41	83	10	38			41	126	s 18
12	41			44	12	1	40	135	15
13	44			44			40	102	11
14	42			44			45	90	11
15	40			35			55	83	12
16	42			44			83	215	48
17	35			44			85	295	68
18	32			44			79	180	39
19	26			36			75	235	48
20	26			38			113	690	211
21	26			36			385	4,450	s 5,530
22	26			36			390	4,450	s 4,930
23	26			41			272	4,000	2,940
24	25	15	1	47			218	1,960	1,150
25	24			49	37	5	166	1,590	713
26	24			49			130	1,200	421
27	24			193	1,160	s 1,200	89	820	197
28	24			555	1,690	s 2,620	41	390	43
29	25			273	948	s 756	67	500	91
30	25			--	--	--	106	880	252
31	25			--	--	--	74	345	69
Total	1,177	--	230	1,946	--	4,618	4,499	--	22,863

s Computed by subdividing day.

CHEYENNE RIVER BASIN--Continued

CHEYENNE RIVER NEAR HOT SPRINGS, S. DAK.--Continued

Suspended sediment, water year October 1955 to September 1956--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	56	157	24	36			413	13,800	s 16,000
2	49	135	18	38			240	9,200	5,960
3	50	105	14	56			151	4,200	1,710
4	46	110	14	42			103	2,450	682
5	46	109	14	36			87	1,260	296
6	42	100	11	38			68	660	121
7	34	63	6	42			52	420	59
8	34	30	3	40	14	1	36	200	19
9	35	17	2	31			28	110	8
10	41	28	3	27			22		
11	59	65	19	22			20		
12	49	30	4	19			23	30	2
13	41	21	2	30			21		
14	35			40			22		
15	31			76	411	s 90	24		
16	27			55	215	32	34	80	7
17	25			36	75	7	50	110	15
18	25			27	20	1	567	14,600	s 31,500
19	24			19			2,320	33,700	219,000
20	22			15			1,090	23,200	68,300
21	19			15			498	14,500	19,500
22	20	7	(t)	17	6	(t)	225	8,200	4,980
23	25			16			133	4,600	1,650
24	27			14			102	1,950	537
25	24			12			77	730	152
26	22			18	24	1	74	375	75
27	21			66	542	s 123	59	150	24
28	24			609	14,700	s 26,700	47	120	a 15
29	31			1,240	27,700	s 103,000	41	140	sa 17
30	35			1,120	27,900	s 87,500	54	218	32
31	--	--	--	618	17,500	s 29,400	--	--	--
Total	1,019	--	133	4,470	--	246,870	6,681	--	370,671

Day	July			August			September		
1	35			10	45	1	16		
2	31	60	a 5	11			15		
3	27			419	28,700	s 37,200	15		
4	24			221	10,400	s 6,700	15		
5	25	37	3	76	3,370	s 736	15		
6	25	28	2	36	800	78	14		
7	40	114	s 16	30	320	26	14		
8	52	145	20	27	300	22	15		
9	47	80	10	25	200	14	16		
10	28	55	4	16	110	5	15		
11	18			74	13,600	s 2,880	16		
12	16			50	10,400	s 1,510	17		
13	14			42	4,780	s 571	17		
14	12	21	1	36	1,160	s 126	17		
15	11			53	1,550	222	17		
16	12			24	350	23	21	40	2
17	24	62	s 6	20	193	10	21		
18	22	110	7	26	230	16	21		
19	13	85	a 3	24	127	8	20		
20	43	765	s 116	20	145	8	17		
21	38	225	23	18	140	7	14		
22	22	130	8	16			13		
23	16	140	6	14			15		
24	12	97	3	14			15		
25	10			15			15		
26	10			15	70	3	16		
27	10			14			16		
28	10	46	1	15			16		
29	10			16			17		
30	10			15			18		
31	10			15			--		--
Total	677	--	260	1,407	--	50,194	489		60

Total discharge for year (cfs-days) 26,004

Total load for year (tons) 700,128

s Computed by subdividing day.

t Less than 0.50 ton.

a Computed from estimated concentration graph.

CHEYENNE RIVER NEAR HOT SPRINGS, S. DAK.--Continued

Particle-size analyses of suspended sediment, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet ; 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. 2, 1956.....	2:15 p.m.	212	39	716	1,640		54		71		80	85	100		--		VPWCM
May 28	6:00 a.m.	793	61	7,740	4,770		60		87		93	96	99		100		VPWCM
May 28	6:30 p.m.	452	--	15,600	3,010		91		--		94	96	100		--		VPWCM
May 29	7:30 p.m.	1,780	--	33,000	5,720		65		87		95	97	99		100		VPWCM
May 30	5:10 p.m.	937	71	25,300	8,190		69		91		98	99	100		--		VPWCM
June 19.....	6:45 a.m.	2,360	--	38,200	8,150		55		80		95	97	100		--		VPWCM

CHEYENNE RIVER BASIN--Continued

CHEYENNE RIVER AT ANGOSTURA RESERVOIR OUTLET, S. DAK.

LOCATION.--At outlet to powerplant, below Angostura Dam, 800 feet upstream from gaging station, 4¾ miles upstream from Fall River, and 6½ miles southeast of Hot Springs, Fall River County.
DRAINAGE AREA.--9,100 square miles, approximately.
RECORDS AVAILABLE.--Sediment records: October 1951 to September 1953, October 1954 to September 1956.
REMARKS.--Discharge records for gaging station below Angostura Dam for water year October 1955 to September 1956 given in WSP 1439.

Monthly and annual summary of water and suspended-sediment discharge, water year October 1955 to September 1956

Month	Discharge (cfs-days)	Runoff (acre-feet)	Suspended sediment					
			Load (tons)	Daily load (tons)			Concentration (ppm)	
				Mean	Maximum	Minimum	Weighted mean	Maximum observed
October	1,738.4	3,450	24.8	0.8			5	
November	2,667.7	5,290	93.0	3.1			13	
December	2,637.3	5,230	71.3	2.3			10	
January	2,608.9	5,170	55.8	1.8			8	
February	2,605.2	5,170	63.8	2.2			9	
March	2,743.0	5,440	80.6	2.6			11	
April	2,676.8	5,310	252.0	8.4			35	
May	2,807.8	5,570	52.7	1.7			7	
June	1,145.3	2,270	69.0	2.3			22	
July	1,183.3	2,350	105.4	3.4			33	
August	759.7	1,510	80.6	2.6			39	
September	599.9	1,190	15.0	.5			10	
Water year	24,173.3	48,000	964.0	2.6			15	

RAPID CREEK NEAR FARMINGDALE, S. DAK.

LOCATION.--At gaging station at highway bridge, 2 miles southeast of Farmingdale, Pennington County, and 3¼ miles downstream from Antelope Creek.
DRAINAGE AREA.--602 square miles.
RECORDS AVAILABLE.--Chemical analyses: February to September 1953, October 1955 to September 1956.
Water temperatures: October 1955 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 1,010 ppm July 7-29; minimum, 390 ppm Mar. 27-31.
Hardness: Maximum, 564 ppm May 28-29; minimum, 236 ppm July 3-6.
Specific conductance: Maximum daily, 1,520 micromhos July 25; minimum daily, 529 micromhos Mar. 27.
Water temperatures: Maximum, 93°F June 12; minimum, freezing point on several days during November and December.
REMARKS.--Daily samples for chemical analysis composited by discharge. Records of specific conductance of daily samples available in district office at Lincoln, Nebr. Records of discharge for water year October 1955 to September 1956 given in WSP 1439.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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: Parts per million: Residue at 180°C	Dissolved solids: Parts per million: Sum	Dissolved solids: Tons per acre-foot	Dissolved solids: 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. 1-23, 1955	25.9	15	0.00	102	46	39	4.8	279	268	16	0.4	5.2	0.19	665		0.90	46.5	442	213	16	0.8	942	7.7	
Oct. 24-Nov. 20	30.3	4.9	.00	115	46	43	5.2	300	295	17	.3	5.4	.19	714		.97	58.4	476	230	16	.9	1,020	7.9	
Nov. 21-25	36.4	8.2	.00	99	37	34	4.7	257	245	13	--	6.0	.00	590		.80	58.0	401	190	15	.7	868	7.9	
Nov. 26-Dec. 27	33.7	11	.12	101	42	36	4.5	274	245	16	.5	5.4	.14	629		.86	57.2	426	201	15	.8	914	7.9	
Dec. 28-Jan. 16, 1956	39.5	9.8	.01	93	37	31	4.1	252	215	12	.3	7.6	.13	561		.76	59.8	385	178	15	.7	828	7.8	
Jan. 17-31	35.1	10	.01	99	42	31	4.2	274	220	13	.2	11	.15	606		.82	57.4	418	193	14	.7	881	7.7	
Feb. 1-18	34.6	8.5	.02	93	42	32	4.3	257	215	14	.3	10	.10	578		.79	54.0	404	193	15	.7	859	7.8	
Feb. 19-23	42.4	9.3	.02	94	44	29	5.2	272	208	16	.3	11	.14	578		.79	66.2	416	193	13	.6	868	8.0	
Feb. 24	42	8.6	.01	88	23	24	3.8	222	163	12	--	7.0	.09	446		.61	50.6	316	134	14	.6	688	8.0	
Feb. 25-Mar. 17	35.6	6.8	.00	85	34	31	4.9	225	213	14	.3	1.4	.13	523		.71	50.3	353	168	16	.7	782	7.7	
Mar. 18-26	92.6	8.5	.00	73	28	30	6.7	188	193	9.5	.3	4.6	.11	457		.62	114	299	145	18	.8	691	7.6	
Mar. 27-31	87.0	13	.04	63	25	16	4.3	176	136	7.0	.2	3.3	.07	390		.53	91.6	258	114	12	.4	560	7.9	
Apr. 1-19	53.1	3.7	.00	84	35	28	4.0	224	213	12	.4	2.5	.10	529		.72	75.8	352	168	15	.7	763	7.7	
Apr. 20-30	26.3	2.7	.00	86	43	39	4.3	237	263	15	.4	.7	.14	611		.83	43.4	390	196	18	.9	865	7.6	
May 1-22	20.8	4.7	.01	99	48	57	5.6	246	330	14	.4	.5	.24	744		1.01	41.8	446	244	21	1.2	1,030	7.9	
May 23-27	4.06	7.4	.00	119	58	73	6.9	a 298	415	15	.4	.5	.28	896		1.22	9.82	534	290	23	1.4	1,260	8.4	
May 28-29	7.75	10	.00	133	56	82	7.8	a 314	440	16	--	.7	.31	984		1.34	20.6	564	307	24	1.5	1,320	8.3	
May 30-June 6	27.3	15	.00	101	41	37	6.3	234	285	10	.4	3.7	.20	647		.88	47.7	420	228	16	.8	925	8.1	
June 7-30	6.51	12	.00	111	56	68	8.7	256	420	13	.4	1.8	.33	881		1.20	15.5	506	296	22	1.3	1,190	8.0	

a Includes equivalent of 12 ppm of carbonate (CO_3).

CHEYENNE RIVER BASIN--Continued

RAPID CREEK NEAR FARMINGDALE, S. DAK.--Continued

Chemical analyses, in parts per million, water year October 1955 to September 1956--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				Hardness as $CaCO_3$		Per cent 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					
														Residue at 180°C	Sum									
July 1-2, 1956 ..	1.85	17	--	123	44	69	8.7	230	420	12	0.3	0.6	0.33	848		1.15	4.24	488	299	23	1.4	1,150	7.8	
July 3-6.....	123	19	--	66	17	36	8.1	148	183	4.5	.2	6.0	.15	426		.58	141	236	115	24	1.0	629	7.7	
July 7-29.....	3.24	11	0.01	122	61	86	9.4	258	475	14	.3	.8	.36	1,010	907	1.37	8.84	556	344	25	1.6	1,310	7.8	
Aug. 7-13.....	50.1	17	.05	93	45	45	9.1	224	310	12	.4	4.8	.26	674		.92	91.2	415	231	19	1.0	942	8.0	
Aug. 14-24.....	27.2	14	.04	113	52	44	6.3	284	320	16	.5	6.6	.28	775		1.05	56.9	495	262	16	.9	1,060	7.9	
Aug. 25-Sept. 17, 19, 26, 27, 30..	5.73	5.7	.01	98	52	51	6.0	234	345	17	.5	1.9	.25	753		1.02	11.6	460	268	19	1.0	1,040	8.0	
Weighted average b....	28.7	9.4	0.02	92	39	36	5.3	243	243	13	0.3	5.0	0.15	596		0.81	46.2	391	192	16	0.8	859	--	

b Includes estimates where data are missing. Represents 100 percent of runoff for water year October 1955 to September 1956.

CHEYENNE RIVER BASIN--Continued

RAPID CREEK NEAR FARMINGDALE, S. DAK.--Continued

Temperature (° F) of water, water year October 1955 to September 1956
(Once-daily measurement between 3 p.m. and 6 p.m.)

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

a Measurement between 9 a.m. and 12 m.
b Measurement between 1 p.m. and 2 p.m.

CHEYENNE RIVER BASIN--Continued

CHEYENNE RIVER NEAR WASTA, S. DAK.

LOCATION.--At gaging station at bridge on U. S. Highway 16, 200 feet downstream from Chicago and North Western Railway bridge, 3 miles east of Wasta, Pennington County, and 7 miles downstream from Box Elder Creek.
DRAINAGE AREA.--12,800 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: October 1955 to September 1956.
Water temperatures: October 1955 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 1,670 ppm Nov. 15-21; minimum, 608 ppm Dec. 24-26.
Hardness: Maximum, 832 ppm Nov. 15-21; minimum, 70 ppm Aug. 7.
Specific conductance: Maximum daily, 2,280 micromhos June 14; minimum, 758 ppm Aug. 7.
Water temperatures: Maximum, 85°F July 10, 24, Aug. 5; minimum, freezing point on many days during November to March.
REMARKS.--Daily samples for chemical analysis composited by discharge. Records of specific conductance of daily samples available in district office at Lincoln, Nebr. Records of discharge for water year October 1955 to September 1956 given in WSP 1439.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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: Parts per million: Residue at 180°C	Dissolved solids: Parts per million: Sum	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Per cent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
Oct. 1-31, 1955..	135	14	0.00	177	47	145	8.6	168	740	55	0.6	0.8	0.24	1,330	1,270	1.81	485	636	498	33	2.5	1,690	7.5	
Nov. 1-14.....	118	8.6	.00	181	49	137	8.7	190	688	57	.6	1.5	.20	1,350	1,230	1.84	430	654	498	31	2.3	1,700	7.9	
Nov. 15-21.....	71.4	11	.00	235	60	165	11	260	863	69	.6	1.6	.25	1,670	1,540	2.27	322	832	619	30	2.5	2,060	7.9	
Nov. 22-24.....	81.7	16	.00	138	34	125	8.8	186	515	39	--	1.2	.18	1,010	969	1.37	223	484	331	35	2.5	1,380	7.9	
Nov. 25-Dec. 10.	76.9	13	.12	210	55	144	8.2	236	770	60	.7	.9	.19	1,480	1,380	2.01	307	752	558	29	2.3	1,830	7.7	
Dec. 11-23.....	134	13	.01	234	32	137	9.4	229	725	58	.7	1.9	.21	1,420	1,320	1.93	514	716	528	29	2.2	1,770	7.6	
Dec. 24-26.....	759	20	.04	68	12	109	7.1	175	260	24	--	31	.14	608	--	.83	1,250	218	74	51	3.2	912	8.1	
Dec. 27-31.....	371	13	.02	126	30	120	7.9	182	475	31	--	1.0	.16	948	--	1.29	950	436	287	37	2.5	1,290	8.0	
Jan. 1-17, 1956 .	191	12	.00	177	46	126	7.7	204	635	47	.5	1.6	.22	1,250	1,150	1.70	645	629	462	30	2.2	1,590	7.4	
Jan. 18-24.....	87.1	13	.00	239	55	155	9.4	250	835	66	.6	2.4	.25	1,610	1,500	2.19	379	822	617	29	2.4	1,980	7.5	
Jan. 25-Feb. 6..	85.4	12	.05	204	51	131	9.8	228	690	56	.6	2.2	.19	1,390	1,270	1.89	321	720	533	28	2.1	1,750	7.7	
Feb. 7-15.....	152	9.5	.03	173	45	112	9.0	188	600	47	.6	3.2	.18	1,190	1,090	1.62	488	616	462	28	2.0	1,530	7.7	
Feb. 16-25.....	139	9.4	.03	192	53	126	8.9	211	680	55	.6	1.9	.21	1,350	1,230	1.84	507	698	525	28	2.1	1,710	7.7	
Feb. 26-Mar. 1.	180	9.8	.01	127	31	103	7.0	158	500	32	.4	.5	.14	937	--	1.27	455	445	315	33	2.1	1,260	7.8	
Mar. 2-6	248	12	.01	101	26	88	6.0	149	385	26	.3	.4	.12	756	--	1.03	506	360	238	34	2.0	1,050	7.5	
Mar. 7-11	200	9.5	.01	137	36	102	6.8	167	525	37	.4	1.1	.16	971	--	1.32	524	488	351	31	2.0	1,310	7.7	
Mar. 12-17	128	9.5	.05	174	49	122	8.0	195	685	49	.4	1.2	.19	1,250	1,190	1.70	432	637	477	29	2.1	1,600	7.9	
Mar. 18-22	752	14	.07	86	18	104	7.1	151	355	20	.3	1.2	.15	710	--	.97	1,440	288	164	43	2.7	1,010	7.7	
Mar. 23-31	266	10	.03	150	39	110	8.5	188	565	40	.5	.5	.16	1,070	1,020	1.46	769	536	382	30	2.1	1,390	7.8	
Apr. 1-5.....	243	12	.02	161	51	120	8.6	188	645	52	.6	.5	.16	1,210	1,140	1.65	794	610	456	30	2.1	1,550	7.6	
Apr. 6-7.....	405	20	.05	105	26	131	9.7	184	460	35	.6	2.0	.16	896	--	1.22	980	370	219	43	3.0	1,250	7.9	
Apr. 8-30.....	206	12	.01	141	64	140	9.0	178	700	55	.5	.5	.20	1,290	1,210	1.75	718	616	470	33	2.5	1,650	7.7	
May 1-2	1,190	33	--	--	--	147	9.4	218	243	15	--	2.7	.24	638	--	.87	2,050	130	0	69	5.6	932	8.2	
May 3-6	227	18	.07	153	35	157	10	182	650	48	.5	.8	.23	1,220	1,160	1.66	748	524	375	39	3.0	1,610	7.9	

May 7.....	496	18	--	--	--	170	12	222	340	24	--	3.6	.25	786	--	1.07	1,050	166	0	67	5.7	1,130	8.2
May 8-13.....	189	17	.07	163	44	155	10	165	710	57	.5	.7	.21	1,320	1,240	1.79	674	588	453	36	2.8	1,720	7.8
May 14-15.....	483	--	--	--	--	160	10	a 184	343	28	--	3.6	.35	750	--	1.02	978	164	13	66	5.4	1,100	8.3
May 16-27.....	166	12	.07	178	52	147	11	155	750	66	.5	.3	.22	1,400	1,290	1.90	628	656	529	32	2.5	1,790	7.7
May 28.....	1,690	32	--	153	28	188	16	216	660	46	--	.9	.30	1,290	1,230	1.75	5,890	496	319	44	3.7	1,690	8.1
May 29.....	794	44	--	--	--	173	11	b 202	325	16	--	4.8	.21	762	--	1.04	1,630	120	0	74	6.9	1,080	8.4
May 30-June 5..	252	19	.06	151	38	162	12	170	675	49	.7	.9	.25	1,250	1,190	1.70	851	532	393	39	3.1	1,620	7.7
June 6-18	99.7	15	.06	193	53	200	13	138	910	77	.7	.8	.33	1,610	1,530	2.19	433	700	587	38	3.3	2,020	7.7
June 19	216	39	--	58	13	215	13	212	430	32	.6	3.0	.30	906	--	1.23	528	200	26	68	6.6	1,300	7.9
June 20-July 1..	98.6	13	.00	198	48	166	13	148	800	72	.7	.2	.29	1,520	1,380	2.07	405	690	569	34	2.7	1,890	7.6
July 9-16.....	63.9	13	.05	185	47	172	14	142	788	74	.6	.3	.28	1,470	1,360	2.00	254	655	539	36	2.9	1,870	7.8
July 17-18.....	145	63	--	63	9.2	205	13	c 250	390	30	.8	3.0	.39	936	--	1.27	366	195	0	68	6.4	1,290	8.3
July 19-29.....	83.9	12	.00	195	49	176	13	141	825	76	.7	.2	.29	1,540	1,420	2.09	349	690	574	35	2.9	1,930	7.7
July 30-Aug. 6..	128	26	.08	140	21	200	12	174	670	54	.6	2.0	.29	1,250	1,210	1.70	432	436	293	49	4.2	1,660	7.9
Aug. 7.....	1,210	33	.11	25	1.8	175	5.8	280	238	8.0	--	9.0	.27	656	--	.89	2,140	70	0	83	9.1	940	7.8
Aug. 8-14.....	407	31	.07	91	11	160	11	214	420	28	.5	3.7	.26	874	--	1.19	961	274	99	55	4.2	1,240	7.9
Aug. 15-16.....	193	31	.08	115	20	165	8.5	178	530	43	--	3.6	.28	1,050	1,000	1.43	547	370	224	49	3.7	1,420	7.9
Aug. 17-25.....	154	15	.00	165	46	155	10	154	725	60	.6	.6	.31	1,320	1,250	1.80	549	600	474	35	2.8	1,690	7.8
Aug. 26-Sept. 30	88.1	9.7	.03	185	60	186	12	130	875	81	.7	.2	.30	1,590	1,470	2.16	378	710	603	36	3.0	1,980	7.7
Weighted average d....	181	16	0.04	147	36	143	9.5	184	600	46	0.6	2.5	0.22	1,160	--	1.58	567	513	362	37	2.7	1,510	--
Weighted average e....	182	17	0.04	146	35	143	9.6	184	596	46	0.6	2.6	0.22	1,150	--	1.56	565	507	356	37	2.8	1,500	--

a Includes equivalent of 4 ppm of carbonate (CO_3).
b Includes equivalent of 8 ppm of carbonate (CO_3).
c Includes equivalent of 6 ppm of carbonate (CO_3).
d Includes estimates where data are missing. Represents 98 percent of runoff for water year October 1955 to September 1956.
e Includes estimated data for missing period. Represents 100 percent of runoff for water year October 1955 to September 1956.

CHEYENNE RIVER BASIN--Continued

CHEYENNE RIVER NEAR WASTA, S. DAK.--Continued

Temperature (° F) of water, water year October 1955 to September 1956
(Once-daily measurement between 4 p.m. and 7 p.m.)

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

a Measurement between 7 a.m. and 11 a.m.
b Measurement between 12 m. and 3 p.m.

BELLE FOURCHE RIVER BELOW MOORCROFT, WYO.

LOCATION.--At gaging station, 100 feet upstream from Trail Creek, three-quarters of a mile downstream from Donkey Creek, and 2.8 miles northwest of Moorcroft, Crook County.
DRAINAGE AREA.--1,670 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: December 1949 to September 1950, October 1954 to September 1956.
Water temperatures: November 1950 to September 1951.
Sediment records: May 1950 to September 1951.
REMARKS.--Practically no flow during October and September. Records of discharge for water year October 1955 to September 1956 given in WSP 1439.

Chemical analyses, in parts per million, November 1955 to August 1956

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: Parts per million: Residue at 180°C	Dissolved solids: Parts per million: Sum	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Per cent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
Nov. 22, 1955...	3.83	--	--	95	39	143	--	320	410	6.0	--	--	--	914	--	1.24		398	136	44	3.1	1,290	7.6	
Dec. 21.....	a .3	6.8	0.07	131	113	648	11	756	1,530	14	1.6	0.8	0.18	2,910	2,830	3.78		790	170	64	10	3,700	7.8	
Dec. 29.....	5.61	5.8	.33	26	11	45	7.3	101	122	1.0	.4	1.9	.06	297	--	.40		110	27	45	1.9	441	6.9	
Feb. 3, 1956....	.45	--	--	--	--	406	--	630	1,030	11	--	--	--	--	--	--		768	251	53	6.4	2,780	7.5	
Feb. 24	101	--	--	36	24	98	--	168	245	.0	--	--	.04	534	--	.73		188	50	53	3.3	804	7.1	
Mar. 8.....	24	--	--	32	13	49	--	114	151	2.0	--	--	--	335	--	.46		135	42	42	1.8	511	7.2	
Mar. 21.....	278	--	--	27	11	19	--	78	90	.5	--	--	--	231	--	.31		113	49	26	.8	330	6.6	
Apr. 12	26	--	--	63	31	113	--	202	365	3.0	--	--	--	710	--	.97		284	118	45	2.9	1,020	7.4	
May 9.....	.39	--	--	102	55	244	--	377	685	7.0	--	--	--	1,330	--	1.81		480	171	51	4.8	1,820	7.8	
May 31.....	.55	--	--	97	62	284	--	362	815	8.0	--	--	--	1,500	--	2.04		495	198	53	5.6	2,040	8.0	
June 27.....	5.36	--	.05	50	17	47	--	128	185	3.0	--	--	--	403	--	.55		194	89	34	1.5	595	7.0	
July 4.....	51	3.0	.05	57	62	384	9.8	301	975	5.5	.7	4.2	.13	1,750	1,650	2.38		398	151	67	8.4	2,360	7.6	
Aug. 12	704	13	--	14	17	26	6.7	109	73	3.5	.5	1.5	.06	248	--	.34		105	16	33	1.1	365	7.3	

a Daily mean discharge.

CHEYENNE RIVER BASIN--Continued

BELLE FOURCHE RIVER NEAR STURGIS, S. DAK.

LOCATION.--At gaging station at bridge on State Highway 24, half a mile upstream from Bear Butte Creek and 20 miles northeast of Sturgis, Meade County.
DRAINAGE AREA.--5,870 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: August 1954 to September 1956.
Water temperatures: August 1954 to September 1956.
Sediment records: October 1955 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 3,850 ppm Nov. 16-17; minimum, 966 ppm July 5-8.
Hardness: Maximum, 1,960 ppm Nov. 16-17; minimum, 505 ppm July 5-8.
Specific conductance: Maximum daily, 4,110 micromhos Nov. 17; minimum daily, 1,120 micromhos July 5.
Water temperatures: Maximum, 84°F July 12, Aug. 5; minimum, freezing point on several days during November to February.
Sediment concentrations: Maximum daily, 19,000 ppm July 4; minimum daily, not determined.
Sediment loads: Maximum daily, 93,000 tons July 4; minimum daily, not determined.
EXTREMES, 1954-56.--Dissolved solids: Maximum, 5,170 ppm May 22, 1955; minimum, 966 ppm July 5-8, 1956.
Hardness: Maximum, 1,960 ppm Nov. 16-17, 1955; minimum, 505 ppm July 5-8, 1956.
Specific conductance: Maximum daily, 5,440 micromhos May 22, 1955; minimum daily, 1,120 micromhos July 5, 1956.
Water temperatures: Maximum, 84°F Aug. 29, 1954, July 12, Aug. 5, 1956; minimum, freezing point on several days during winter months each year.
REMARKS.--Daily samples for chemical analysis composited by discharge. Records of specific conductance of daily samples available in district office at Lincoln, Nebr. Flow affected by ice Nov. 2-8, Nov. 13 to Mar. 23, Mar. 28-30. Records of discharge for water year October 1955 to September 1956 given in WSP 1439.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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 $CaCO_3$		Per cent 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					
														Residue at 180°C	Sum									
Oct. 1-14, 1955..	84.6	9.6	0.00	243	107	134	12	220	1,060	21	0.5	10	0.35	1,970	1,710	2.68	450	1,050	866	22	1.8	2,190	7.7	
Oct. 15-Nov. 13.	62.2	10	.00	268	129	177	15	275	1,300	26	.6	14	.44	2,310	2,080	3.14	388	1,200	974	24	2.2	2,510	7.8	
Nov. 14-15.....	37.5	10	.00	333	168	234	18	353	1,650	35	.8	16	.55	2,900	2,640	3.94	294	1,520	1,230	25	2.6	3,090	8.0	
Nov. 16-17.....	30.0	13	.03	423	219	335	22	424	2,180	49	.8	14	.74	3,850	3,470	5.24	312	1,960	1,610	27	3.4	3,930	7.9	
Nov. 18-21.....	56.3	--	--	393	170	256	--	400	1,780	36	--	17	.55	3,240	--	4.41	493	1,680	1,350	25	2.7	3,360	7.9	
Nov. 22-28.....	38.6	--	--	295	150	243	--	316	1,520	39	--	20	.41	2,730	--	3.71	285	1,350	1,090	28	2.9	2,930	7.8	
Nov. 29-Dec. 8..	20.0	--	--	320	153	206	--	370	1,480	29	--	8.5	.44	2,660	--	3.62	144	1,430	1,130	24	2.4	2,860	7.7	
Dec. 9-26.....	22.5	11	.01	308	165	245	12	344	1,550	36	.7	21	.49	2,830	2,520	3.85	172	1,450	1,170	27	2.8	3,060	7.7	
Dec. 27-31.....	23.0	--	--	263	123	168	--	298	1,160	23	--	17	.42	2,170	--	2.95	135	1,160	916	24	2.1	2,430	7.8	
Jan. 1-16, 1956..	21.3	--	--	275	150	246	--	303	1,480	37	--	23	.43	2,650	--	3.60	152	1,340	1,090	29	3.0	2,910	7.8	
Jan. 17-31.....	19.3	--	--	318	185	284	--	363	1,680	43	--	25	.52	3,120	--	4.24	163	1,550	1,250	28	3.1	3,300	7.7	
Feb. 1-29.....	29.7	--	--	278	177	260	--	312	1,550	44	--	24	.42	2,850	--	3.88	229	1,420	1,160	28	3.0	3,070	8.0	
Mar. 1-3	80.0	--	--	225	121	197	--	235	1,190	31	--	25	.33	2,190	--	2.98	473	1,060	867	29	2.6	2,430	7.9	
Mar. 4-19	143	6.5	.00	145	91	196	12	168	925	32	.4	31	.23	1,700	1,520	2.31	656	736	598	36	3.1	2,040	7.7	
Mar. 20-27	433	--	--	123	56	131	--	180	635	19	--	8.6	.19	1,180	--	1.60	1,380	539	391	34	2.5	1,500	7.8	
Mar. 28-Apr. 4.	98.9	--	--	143	106	150	--	196	938	26	--	8.0	.22	1,660	--	2.26	443	792	631	28	2.3	1,930	7.8	
Apr. 5-15.....	78.5	--	--	225	140	261	--	217	1,450	44	--	14	.32	2,540	--	3.45	538	1,140	962	32	3.4	2,790	7.8	
Apr. 16-30.....	44.9	--	--	220	122	166	--	204	1,200	30	--	7.3	.29	2,090	--	2.84	253	1,050	883	25	2.2	2,310	7.9	
May 1-13	50.5	--	--	228	140	196	--	207	1,310	44	--	17	.34	2,360	--	3.21	322	1,150	980	27	2.5	2,630	7.1	

May 14-23.....	42.7	--	--	208	121	164	--	192	1,160	33	--	15	.31	2,050	--	2.79	236	1,020	863	25	2.2	2,330	7.6
May 24-29.....	180	--	--	228	102	154	--	204	1,100	27	--	.9	.29	1,940	--	2.64	943	990	823	25	2.1	2,240	7.9
May 30-31.....	244	--	--	233	131	260	--	242	1,430	43	--	6.6	.37	2,460	--	3.35	1,620	1,120	922	32	3.4	2,770	8.0
June 1-18	193	--	--	210	90	122	--	182	988	19	--	5.8	.31	1,710	--	2.33	891	895	746	22	1.8	1,980	7.8
June 5:																							
Sta. 40 a b....	141	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sta. 57 a c....	141	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
June 19-July 3..	192	6.1	.00	213	79	106	19	173	875	15	.6	2.4	.27	1,580	1,400	2.15	819	855	713	21	1.6	1,830	7.7
July 4.....	1,650	8.1	.00	165	56	104	19	227	660	15	.6	.0	.27	1,240	1,140	1.69	5,520	640	454	25	1.8	1,540	7.7
July 5-8.....	754	7.9	.03	135	41	77	15	164	525	11	.4	.9	.25	966	--	1.31	1,970	505	371	24	1.5	1,240	8.2
July 9-31.....	195	7.1	.00	223	84	108	15	175	938	17	.6	4.9	.72	1,650	1,480	2.24	869	900	756	20	1.6	1,890	7.9
Aug. 1-31.....	159	--	--	244	93	124	--	180	1,090	17	--	6.2	.36	1,830	--	2.49	786	993	845	21	1.7	2,090	8.1
Sept. 1-30.....	120	5.3	.03	302	82	138	15	192	1,150	21	.7	7.9	.36	2,020	1,820	2.75	654	1,090	933	21	1.8	2,250	7.7
Weighted average d.....	112	--	--	216	92	142	--	200	1,010	22	--	8.8	0.36	1,790	--	2.43	541	918	754	25	2.0	2,050	--

a Not included in weighted average.
b Lead (Pb), 0.03 ppm; zinc (Zn), 0.15 ppm; sulfide (S), 0.00 ppm; cyanide (CN), 0.03 ppm.
c Lead (Pb), 0.07 ppm; zinc (Zn), 0.25 ppm; sulfide (S), 0.00 ppm; cyanide (CN), 0.03 ppm.
d Represents 100 percent of runoff for water year October 1955 to September 1956.

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CHEYENNE RIVER BASIN--Continued

BELLE FOURCHE RIVER NEAR STURGIS, S. DAK.--Continued

Temperature (° F) of water, water year October 1955 to September 1956
/Once-daily measurement between 6 a.m. and 9 a.m./

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

a Measurement between 10 a.m. and 12 m.
b Measurement between 1 p.m. and 4 p.m.

CHEYENNE RIVER BASIN--Continued

BELLE FOURCHE RIVER NEAR STURGIS, S. DAK.--Continued

Suspended sediment, water year October 1955 to September 1956

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	141	680	260	60	560	91	20	220	12
2	141	690	260	35	420	40	20	53	
3	120	610	200	50	450	61	20	--	
4	111	420	130	80	890	190	20	--	
5	83	300	67	60	1,000	160	20	--	e 2
6	76	330	68	55	540	80	20	--	
7	70	260	49	55	580	86	20	--	
8	64	200	35	60	650	110	20	32	
9	65	140	25	64	710	120	15		
10	59	100	16	60	650	110	20		
11	57	94	14	54	580	85	25		
12	56	170	26	40	250	27	25		
13	60	150	24	40	540	58	25		
14	82	300	66	40	690	75	25		
15	78	310	65	35	390	37	25		
16	67	200	36	30	420	34	25		
17	67	280	51	30	480	39	20		
18	64	330	57	35	280	26	20		
19	64	300	52	50	340	46	20	30	2
20	65	280	49	70	180		25		
21	67	270	49	70	--	e 30	25		
22	68	360	66	60	--		25		
23	68	450	83	50	170		25		
24	72	510	99	40			20		
25	67	400	72	30			20		
26	65	360	63	40			20		
27	68	490	90	30	130	10	30		
28	74	600	120	20			25		
29	70	570	110	20			20		
30	65	530	93	20			20	--	e 2
31	65	670	120	--	--	--	20		
Total	2,339	--	2,515	1,383	--	1,665	680	--	72

Day	January			February			March		
1	20			15			70	210	40
2	20			20			80	170	37
3	20			20			90	220	53
4	25			20			100	170	46
5	25			25			110	660	200
6	20			25			110	170	50
7	20			25			115	15	5
8	25			25			120	14	5
9	25			25			120	--	e 22
10	20			25			120	140	45
11	20			25			110	32	10
12	20			25	25	2	100	32	9
13	20			25			110	17	5
14	20			25			120	220	71
15	20			20			120	38	12
16	20	24	1	20			150	130	53
17	20			20			200	280	150
18	20			20			260	3,000	2,100
19	20			25			320	1,100	950
20	20			25			400	2,000	2,200
21	15			25			600	2,300	3,700
22	15			30			650	2,500	4,400
23	20			35	20	2	500	4,800	6,500
24	20			40	33	4	487	17,000	22,000
25	20			45	14	2	320	9,200	7,900
26	20			50	12	2	275	6,500	4,800
27	20			55	25	4	232	6,300	3,900
28	20			60	7	1	100	4,200	1,100
29	20			65	17	3	55	1,400	s 320
30	20			--	--	--	150	3,000	1,200
31	20			--	--	--	133	2,200	790
Total	630		31	860	--	62	6,427	--	62,673

e Estimated.
s Computed by subdividing day.

CHEYENNE RIVER BASIN--Continued

BELLE FOURCHE RIVER NEAR STURGIS, S. DAK.--Continued

Suspended sediment, water year October 1955 to September 1956--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	97	1,700	450	50	480	65	213	11,000	6,300
2	82	890	200	49	600	79	197	3,700	2,000
3	90	1,500	360	64	1,000	170	182	3,300	1,600
4	84	1,500	340	60	1,200	190	160	3,600	1,600
5	99	1,500	400	53	1,100	160	141	2,800	1,100
6	118	3,000	960	51	880	120	130	2,400	840
7	108	2,900	850	51	960	130	141	2,700	1,000
8	88	1,200	290	48	930	120	162	3,900	1,700
9	76	730	150	46	700	87	141	6,300	2,400
10	68	650	120	42	740	84	130	1,600	560
11	68	750	140	48	910	120	162	2,500	1,100
12	67	850	150	44	840	100	180	4,900	2,400
13	62	1,000	170	51	1,200	170	180	3,500	1,700
14	58	820	130	52	1,500	210	239	2,800	1,800
15	52	770	110	48	1,300	170	245	4,900	3,200
16	47	690	88	51	1,300	180	278	12,000	9,000
17	47	600	76	44	830	99	267	2,400	1,700
18	46	560	70	42	400	45	325	12,000	11,000
19	45	460	56	37	470	47	267	8,700	6,300
20	42	360	41	39	320	34	203	8,900	4,900
21	41	350	39	38	350	36	188	3,500	1,800
22	42	370	42	38	480	49	154	1,600	670
23	42	650	74	38	540	55	141	1,200	460
24	41	640	71	109	4,300	1,300	157	1,400	590
25	43	560	65	184	3,600	1,600	203	4,100	2,200
26	45	460	56	118	4,000	1,300	278	7,500	5,600
27	44	420	50	131	2,400	850	210	4,600	2,600
28	48	470	61	239	6,200	4,000	188	2,400	1,200
29	51	550	76	320	16,000	14,000	191	2,600	1,300
30	50	540	73	259	7,000	4,900	182	2,100	1,000
31	--	--	--	228	8,700	5,400	--	--	--
Total	1,891	--	5,758	2,652	--	35,870	5,835	--	79,620

	July			August			September		
1	180	2,200	1,100	162	600	260	162	2,000	870
2	162	1,600	700	165	760	340	174	2,100	990
3	171	1,800	830	160	810	350	180	1,900	920
4	1,650	19,000	s 93,000	152	690	280	162	1,400	610
5	1,520	12,000	49,000	143	670	260	185	1,900	950
6	702	9,200	17,000	154	710	300	177	2,100	1,000
7	480	7,500	9,700	165	770	340	136	1,400	510
8	312	3,800	3,200	194	1,000	520	102	670	180
9	225	2,600	1,600	177	830	400	76	370	76
10	210	1,300	740	188	650	330	61	290	48
11	210	850	480	168	700	320	39	190	20
12	194	620	320	152	830	340	59	240	38
13	191	510	260	152	910	370	76	320	66
14	216	1,400	s 900	149	730	290	87	360	s 96
15	228	2,000	1,200	141	950	360	138	1,900	710
16	210	820	460	149	1,100	440	126	1,400	480
17	200	750	410	152	1,100	450	113	1,100	340
18	203	770	420	168	1,600	730	116	1,300	410
19	219	650	380	213	1,900	1,100	111	1,200	360
20	206	550	310	219	1,700	1,000	118	1,600	510
21	194	570	300	197	1,400	740	120	2,000	650
22	194	630	330	180	1,500	730	123	2,000	660
23	200	740	400	162	1,400	610	113	1,400	430
24	203	750	410	168	1,100	500	116	1,600	500
25	197	700	370	138	880	330	118	1,700	540
26	177	800	380	133	780	280	104	1,500	420
27	168	440	200	130	710	250	106	1,300	370
28	143	490	190	123	700	230	102	1,300	360
29	157	700	300	118	1,000	320	164	2,200	970
30	168	950	430	126	1,400	480	149	1,600	640
31	168	640	290	146	2,100	830	--	--	--
Total	9,658	--	185,610	4,944	--	14,080	3,613	--	14,724

Total discharge for year (cfs-days) 40,912
Total load for year (tons) 402,680

s Computed by subdividing day.

BELLE FOURCHE RIVER NEAR STURGIS, S. DAK.--Continued

Particle-size analyses of suspended sediment, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; 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, 1955	11:00 a.m.	68	43	750	1,260	--	55		96		99	100	--		--		BWCM
Mar. 24, 1956	2:35 p.m.	512	41	21,500	3,320	--	29		57		95	99	100		--		VPWCM
Apr. 5	1:05 p.m.	97	44	1,310	2,060	--	34		92		--	--	--		--		PWCM
Apr. 25	2:05 p.m.	41	54	561	1,430	--	45		86		--	--	--		--		PWCM
May 5	3:50 p.m.	57	56	941	2,580	--	46		--		--	--	--		--		PWCM
May 22	4:30 p.m.	37	78	338	986	--	48		--		--	--	--		--		PWCM
June 5	2:05 p.m.	136	83	2,290	5,130	--	13		45		98	100	--		--		VPWCM
June 20	12:00 m.	188	76	8,140	4,690	5	5		--		86	89	95		100		VPN
June 20	12:00 m.	188	76	8,140	6,390	37	46		--		86	89	95		100		VPWCM
July 3	1:20 p.m.	165	75	2,190	4,730	--	9		34		87	99	100		--		VPWCM
July 4	5:30 a.m.	421	--	12,800	5,240	--	6		27		99	100	--		--		VPWCM
July 4	8:00 a.m.	1,210	--	42,000	9,410	--	20		51		99	100	--		--		VPWCM
July 4	10:00 a.m.	1,660	--	15,200	7,940	--	54		91		100	--	--		--		SPWCM
July 4	1:30 p.m.	2,220	--	22,100	7,030	--	56		82		100	--	--		--		SPWCM
July 4	4:00 p.m.	2,360	--	24,800	7,470	--	39		62		98	100	--		--		VPWCM
July 4	7:45 p.m.	2,500	--	19,900	7,440	--	36		58		98	100	--		--		VPWCM
Aug. 9	1:15 p.m.	171	79	868	1,990	--	18	35	61	87	93	96	99		100		BWCM
Aug. 17	12:05 p.m.	149	--	983	4,730	--	22		73		98	--	--		--		SPWCM
Sept. 6	2:45 p.m.	174	66	1,920	3,910	--	15		56		96	98	100		--		VPWCM

CHEYENNE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN THE CHEYENNE RIVER BASIN IN SOUTH DAKOTA

Chemical analyses, in parts per million, water year October 1955 to September 1956

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Manganese (Mn)	Copper (Cu)	Lead (Pb)	Zinc (Zn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Cyanides as CN	Boron (B)	Dissolved solids: Parts per million: Residue at 180°C	Dissolved solids: Parts per million: Sum	Dissolved solids: Tons per acre-foot	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Sulfides as H_2S
BELLE FOURCHE RIVER NEAR ELM SPRINGS																												
July 29, 1956.	157	6.6				--	--	218	87	117	14	126	975	16	0.6	7.4	--	0.34	1,680	1,500	2.28	902	799	22	1.7	1,930	8.0	--
Aug. 9.....	203	--				0.03	0.19	--	--	--	--	--	--	--	--	--	0.01	--	--	--	--	--	--	--	--	--	--	0.0
Sept. 6	181	6.1	0.11	0.00	0.09	.00	.15	235	99	125	13	168	1,090	17	.7	4.9	.01	.32	1,850	1,670	2.52	995	857	21	1.7	2,090	7.9	.0

MISSOURI RIVER AT PIERRE, S. DAK.

LOCATION (revised).--At gaging station at Chicago and North Western Railway bridge at Pierre, Hughes County, and 1.2 miles upstream from Bad River.
DRAINAGE AREA.--243,500 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1956.
Water temperatures: March 1951 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 558 ppm May 14-27; minimum, 322 ppm Apr. 1.
Hardness: Maximum, 276 ppm Feb. 3-14; minimum, 150 ppm Apr. 1.
Specific conductance: Maximum daily, 851 micromhos May 12; minimum daily, 488 micromhos Mar. 29.
Water temperatures: Maximum, 78°F June 20; minimum, freezing point on many days during November to February.
EXTREMES, 1951-56.--Dissolved solids: Maximum, 704 ppm May 1-3, 1953; minimum, 264 ppm June 18-26, 1952.
Hardness: Maximum, 338 ppm Jan. 1 to Feb. 2, 1954; minimum, 134 ppm July 9, 1951.
Specific conductance: Maximum daily, 1,040 micromhos Jan. 23, 1954; minimum daily, 394 micromhos July 3, 1951.
Water temperatures: Maximum, 80°F Aug. 2, 1952; minimum, freezing point on many days during winter months.
REMARKS.--Daily samples for chemical analysis composited by discharge. Records of specific conductance of daily samples available in district office at Lincoln, Nebr. Records of discharge for water year October 1955 to September 1956 given in WSP 1439.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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. 1-26, 1955	31,980	--	--	--	--	54	--	179	0	--	--	--	--	--	409	0.56	35,320	205	58	36	1.6	633	7.8
Oct. 27-Nov. 10	31,890	--	--	--	--	57	--	194	0	--	--	--	--	--	438	.60	37,710	225	66	36	1.7	679	7.9
Nov. 11-17	18,960	--	--	--	--	66	--	223	0	--	--	--	--	--	496	.67	25,390	260	71	36	1.8	758	7.8
Nov. 18-27	11,140	--	--	--	--	67	--	225	0	--	--	--	--	--	521	.71	15,670	268	83	35	1.8	788	8.0
Nov. 28-Dec. 31	8,700	6.0	0.00	69	23	64	4.4	223	0	218	9.5	0.6	0.9	0.13	524	.71	12,310	268	85	34	1.7	786	8.0
Jan. 1-Feb. 2, 1956	8,770	--	--	--	--	67	--	218	0	--	--	--	--	--	517	.70	12,240	269	90	35	1.8	789	7.9
Feb. 3-14	7,233	--	--	--	--	69	--	222	0	--	--	--	--	--	538	.73	10,500	276	94	35	1.8	804	7.8
Mar. 17-23	21,470	--	--	--	--	70	--	167	0	--	--	--	--	--	519	.71	30,090	236	99	39	2.0	776	8.2
Mar. 24-31	36,750	--	--	--	--	47	--	157	0	--	--	--	--	--	360	.49	35,720	173	44	37	1.6	552	7.9
Apr. 1	25,300	--	--	--	--	43	--	140	0	--	--	--	--	--	322	.44	22,000	150	35	38	1.5	499	8.0
Apr. 2-5	28,680	--	--	--	--	51	--	161	0	--	--	--	--	--	393	.53	30,430	192	60	37	1.6	608	8.0
Apr. 6-30	28,620	--	--	--	--	66	--	208	0	--	--	--	--	--	502	.68	38,790	252	81	36	1.8	768	8.0
May 1-13	27,660	--	--	--	--	71	--	219	0	--	--	--	--	--	547	.74	40,850	268	88	37	1.9	813	8.0
May 14-27	28,370	--	--	--	--	72	--	222	0	--	--	--	--	--	558	.76	42,740	272	90	37	1.9	835	7.9
May 28-June 30	33,560	10	.10	62	24	66	5.0	202	0	223	9.5	.5	.5	.16	507	.69	45,940	252	86	36	1.8	781	7.8
July 1-22	32,420	--	--	--	--	62	--	187	0	--	--	--	--	--	479	.65	41,930	234	81	37	1.8	729	7.7
July 23-Aug. 14	30,370	--	--	--	--	57	--	175	0	--	--	--	--	--	431	.59	35,340	212	68	37	1.7	660	7.7
Aug. 15-Sept. 6	25,790	--	--	--	--	52	--	165	0	--	--	--	--	--	379	.52	26,390	190	55	37	1.6	596	7.6
Sept. 7-30	20,730	8.9	.03	45	14	43	3.7	154	0	130	6.5	.4	.2	.10	343	.47	19,200	172	46	35	1.4	529	7.6
Weighted average a	23,660	--	--	--	--	60	--	191	--	--	--	--	--	--	461	0.63	29,450	230	73	36	1.7	706	--
Weighted average b	22,200	--	--	--	--	61	--	192	--	--	--	--	--	--	465	0.63	27,870	231	74	36	1.7	710	--

a Represents 98 percent of runoff for water year October 1955 to September 1956.
b Includes estimated data for missing period. Represents 100 percent of runoff for water year October 1955 to September 1956.

MISSOURI RIVER MAIN STEM--Continued

MISSOURI RIVER AT PIERRE, S. DAK.--Continued

Temperature (° F) of water, water year October 1955 to September 1956
/Once-daily measurement at 7 a.m./

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

a Measurement between 4 p.m. and 5 p.m.
b Measurement between 11 a.m. and 12 m.

BAD RIVER NEAR MIDLAND, S. DAK.

LOCATION (revised).--At gaging station at highway bridge, three-fifths of a mile downstream from Ash Creek, 1¼ miles east of Midland, Haakon County, and 2½ miles downstream from Mitchell Creek.
DRAINAGE AREA.--1,500 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: March 1950 to December 1953, October 1955 to September 1956.
Water temperatures: October 1955 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 1,340 ppm Apr. 26 to May 2; minimum, 228 ppm Aug. 9.
Hardness: Maximum, 480 ppm Apr. 26 to May 2; minimum, 80 ppm Oct. 1-4.
Specific conductance: Maximum daily, 1,830 micromhos Apr. 29-30; minimum daily, 332 micromhos Aug. 11.
Water temperatures: Maximum, 66°F July 17.
REMARKS.--Daily samples for chemical analysis composited by discharge. Records of specific conductance of daily samples available in district office at Lincoln, Nebr. No flow during November to February and September. Records of discharge for water year October 1955 to September 1956 given in WSP 1439.

Chemical analyses, in parts per million, October 1955 to August 1956

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: Parts per million: Residue at 180°C	Dissolved solids: Parts per million: Sum	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Per cent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
Oct. 1-4, 1955..	3.93	20	0.00	27	3.0	100	3.1	197	133	7.0	0.8	1.5	0.20	398	--	0.54	4.22	80	0	72	4.9	589	7.5	
Oct. 6-8.....	.13	17	.05	39	4.5	122	3.7	196	195	11	.5	1.0	.22	500	--	.68	.18	116	0	69	4.9	744	7.6	
Mar. 1-10, 1956.	207	9.5	.01	58	8.1	42	5.8	119	170	5.0	.1	2.0	.15	370	--	.50	207	178	80	33	1.4	551	7.5	
Mar. 11-18.....	77.5	9.0	.01	62	11	81	6.1	122	255	11	.2	1.9	.13	517	--	.70	108	200	100	46	2.5	755	7.4	
Mar. 19-20.....	1,410	11	.01	60	7.9	40	4.6	148	146	3.0	.4	1.3	.22	360	--	.49	1,370	182	61	32	1.3	530	7.8	
Mar. 21-29.....	346	9.9	.01	51	8.5	39	4.4	125	146	3.0	.3	.8	.13	332	--	.45	310	162	59	34	1.3	502	7.7	
Mar. 30-Apr. 5.	29.7	9.9	.05	71	16	75	5.2	128	283	9.0	.1	.4	.54	560	--	.76	44.9	241	136	40	2.1	810	7.7	
Apr. 6-12.....	7.56	9.6	.04	93	22	108	6.0	151	410	16	.1	.3	.25	781	--	1.06	15.9	321	197	42	2.6	1,090	7.8	
Apr. 13-15.....	4.07	8.7	.04	115	28	153	6.8	194	540	26	.2	.5	.31	1,030	975	1.40	11.3	404	245	45	3.3	1,400	8.2	
Apr. 16-19.....	.53	8.9	.04	130	23	164	6.8	204	550	27	.2	.3	.32	1,080	1,010	1.47	1.55	418	251	46	3.5	1,470	8.1	
Apr. 22-24.....	.17	8.9	.04	130	35	190	7.7	226	655	34	.2	.4	.34	1,210	1,170	1.65	.56	468	283	46	3.8	1,650	8.1	
Apr. 26-May 2..	3.94	7.3	.03	143	30	228	7.0	234	705	42	.2	.2	.39	1,340	1,280	1.82	14.3	480	288	50	4.5	1,810	8.1	
May 3-6.....	89.8	25	.08	43	5.0	114	5.2	a 244	168	5.0	.2	3.6	.38	499	--	.68	121	128	0	65	4.4	753	8.4	
May 7-15.....	4.86	16	.05	55	11	145	4.9	212	290	16	.2	3.2	.34	685	--	.93	8.99	184	10	62	4.7	1,020	8.2	
May 16-19.....	6.25	11	.03	102	24	207	6.4	194	595	33	.4	.7	.32	1,130	1,080	1.54	19.1	355	196	55	4.8	1,560	8.1	
May 20-23.....	2.20	11	.03	43	8.9	170	4.6	204	320	18	.4	.4	.39	692	--	.94	4.11	144	0	71	6.2	1,070	8.2	
May 25-31.....	.84	12	.06	71	13	195	5.9	232	415	23	.2	1.2	.45	900	--	1.22	2.04	230	40	64	5.6	1,320	8.1	
June 1-7.....	1.10	6.7	.00	72	17	224	6.1	b 194	525	27	.8	.3	.44	1,020	975	1.39	3.03	248	89	66	6.2	1,500	8.3	
July 3-5.....	599	17	.04	52	4.0	83	5.7	220	145	3.0	--	1.7	.19	420	--	.57	679	146	0	54	3.0	644	8.1	
July 6-8.....	431	11	.05	48	5.4	44	5.8	122	138	5.0	1.2	1.2	.13	328	--	.45	382	142	42	39	1.6	500	7.9	

a Includes equivalent of 10 ppm of carbonate (CO_3).
b Includes equivalent of 4 ppm of carbonate (CO_3).

BAD RIVER BASIN--Continued

BAD RIVER NEAR MIDLAND, S. DAK.--Continued

Chemical analyses, in parts per million, October 1955 to August 1956--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				Hardness as $CaCO_3$		Per cent 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					
														Residue at 180°C	Sum									
July 9-19, 1956	14.1	12	0.01	41	4.3	63	5.1	128	145	10	0.2	0.8	0.18	362	--	0.49	13.8	120	15	52	2.5	538	7.8	
Aug. 7-8	42.8	10	.04	69	11	148	7.0	164	365	28	--	4.8	.32	732	--	1.00	84.6	216	82	59	4.4	1,090	8.2	
Aug. 9	150	--	.05	36	.5	44	2.3	180	33	1.0	--	--	.27	228	--	.31	92.4	92	0	50	2.0	370	8.2	
Aug. 10-13	45.5	24	.07	37	2.8	81	3.9	b 228	83	2.0	--	5.9	.19	358	--	.49	44.0	104	0	62	3.5	545	8.3	
Aug. 18, 20, 22-24, 26	.25	18	.01	31	3.0	106	3.4	190	145	11	.7	1.7	.28	424	--	.58	.29	90	0	71	4.9	653	7.9	
Weighted average c	35.7	12	0.02	55	7.3	54	5.1	148	161	4.6	0.5	1.5	0.18	383	--	0.52	36.9	167	46	40	1.8	574	--	

b Includes equivalent of 4 ppm of carbonate (CO_3).

c Includes estimates where data are missing. Represents 100 percent of runoff for water year October 1955 to September 1956.

BAD RIVER BASIN--Continued

BAD RIVER NEAR MIDLAND, S. DAK.--Continued

Temperature (° F) of water, water year October 1955 to September 1956
/Once-daily measurement between 12 m. and 3 p.m. Many days of no flow/

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

a Measurement between 8 a.m. and 11 a.m.
b Measurement between 4 p.m. and 8 p.m.

WHITE RIVER BASIN

SOUTH FORK WHITE RIVER BELOW WHITE RIVER, S. DAK.

LOCATION.--At gaging station, 1 mile upstream from small tributary, 2 miles downstream from Pine Creek, and 2½ miles northeast of town of White River, Mellette County.
DRAINAGE AREA.--1,570 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: December 1950 to September 1956.
Water temperatures: February 1951 to September 1954, August 1955 to September 1956.
Sediment records: December 1950 to September 1954, October 1955 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 402 ppm Aug. 7-8; minimum, 226 ppm Aug. 9-31.
Hardness: Maximum, 216 ppm Aug. 7-8; minimum, 102 ppm Aug. 9-31.
Specific conductance: Maximum daily, 639 micromhos Aug. 7; minimum daily, 243 micromhos Aug. 14.
Water temperatures: Maximum, 89°F July 12; minimun, freezing point on Nov. 17.
Sediment concentrations: Maximum daily, 12,000 ppm Aug. 7; minimum daily, not determined.
Sediment loads: Maximum daily, 20,000 tons Aug. 7; minimum daily, 2 tons Nov. 17.
EXTREMES, 1950-56.--Dissolved solids (1952-54, 1955-56): Maximum, 948 ppm Aug. 3, 1953; minimum, 226 ppm Aug. 9-31, 1956.
Hardness (1952-54, 1955-56): Maximum, 435 ppm June 15, 1953; minimum, 102 ppm Aug. 9-31, 1956.
Specific conductance (1952-54, 1955-56): Maximum daily, 1,200 micromhos Aug. 3, 1953; minimum daily, 243 micromhos Aug. 14, 1956.
Water temperatures (1951-54, 1955-56): Maximum, 97°F June 18, 1953; minimum, freezing point on many days during winter months.
Sediment concentrations (1950-54, 1955-56): Maximum daily, 19,300 ppm May 29, 1951; minimum daily, not determined.
Sediment loads (1950-54, 1955-56): Maximum daily, 99,600 tons Mar. 29, 1952; minimum daily, not determined.
REMARKS.--Daily samples for chemical analysis composited by discharge. Records of specific conductance of daily samples available in district office at Lincoln, Nebr. Flow affected by ice Nov. 12 to Mar. 21. Flow partly regulated by small powerplant reservoir 3 miles upstream. Records of discharge for water year October 1955 to September 1956 given in WSP 1439.

Chemical analyses, in parts per million, water year October 1955 to September 1956

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Selenium (Se)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_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. 1-24, 1955.....	66.5	71	0.00	0.00	40	4.9	23	8.5	a 198	19	1.0	0.4	0.7	0.08	264	0.36	47.4	120	0	28	0.9	326	8.6
Oct. 10 b.....	55	--	--	.08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Oct. 18 b.....	68	--	--	.02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Oct. 25-26	98.0	5.4	--	--	61	6.8	22	9.1	243	28	2.0	--	2.6	.18	298	.41	78.9	180	0	20	.7	440	7.3
Oct. 27-Nov. 15	74.4	52	.00	.02	39	4.0	20	7.6	177	20	1.0	.3	1.1	.05	235	.32	47.2	114	0	26	.8	310	7.9
Nov. 16-20.....	57.6	72	.00	.03	52	6.0	26	9.1	230	29	1.0	.4	2.4	.05	316	.43	49.1	154	0	25	.9	430	8.0
Nov. 21-Dec. 2.....	86.2	64	.01	.03	43	5.0	22	8.4	193	23	1.0	.4	1.7	.05	269	.37	62.6	128	0	23	.7	347	8.0
Dec. 3-31.....	72.4	57	.00	.00	38	4.9	20	7.8	177	19	1.0	.3	1.9	.04	244	.33	49.4	115	0	26	.8	313	7.9
Jan. 1-15, 1956.....	84.0	59	.04	.00	40	5.1	24	8.2	192	18	.5	.5	2.9	.06	248	.33	56.2	121	0	28	.9	346	7.9
Jan. 16-31	81.6	63	.05	.00	46	7.1	29	10	235	18	.5	.5	2.4	.09	293	.40	64.6	144	0	29	1.0	409	8.0
Feb. 1-29.....	109	55	.12	.00	40	6.1	24	9.0	200	19	.5	.5	2.2	.06	270	.37	79.5	125	0	28	.9	361	7.8
Mar. 1-19.....	196	45	.07	--	37	5.7	23	8.6	173	24	.0	.5	2.1	.06	231	.31	122	116	0	28	.9	337	7.8
Mar. 20-27.....	304	40	.07	--	44	5.4	22	9.0	179	34	.0	.2	1.6	.05	256	.35	210	132	0	25	.8	362	7.8
Mar. 28-Apr. 14.....	171	49	.05	--	39	6.4	22	9.7	187	22	.0	.4	1.7	.07	262	.36	121	124	0	26	.9	346	8.0
Apr. 15-30.....	114	57	.02	--	42	5.6	24	9.4	199	23	.5	.4	1.3	.09	272	.37	83.7	128	0	27	.9	358	8.2

May 1-31	143	53	.47	--	41	6.2	28	9.7	200	28	.0	.4	1.3	.10	291	.40	112	128	0	30	1.1	385	8.1
May 23 b	100	--	--	.00	--	--	27	--	204	--	--	--	--	--	--	--	--	126	0	--	--	360	8.2
June 1-14	83.4	58	.01	--	41	5.2	23	9.8	195	26	.0	.6	.8	.07	264	.36	59.4	124	0	27	.9	364	8.2
June 7 b	98	--	--	.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
June 15-30	59.4	70	.01	--	41	4.7	24	9.4	194	20	.0	.4	.9	.08	267	.36	42.8	122	0	28	.9	356	8.2
June 20 b	69	--	--	.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
July 1-31	53.8	80	.01	.00	41	4.7	27	8.8	c 203	28	.5	.4	2.4	.14	305	.41	44.3	122	0	30	1.1	372	8.3
July 5 b	63	--	--	.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aug. 1-6	95.0	57	.07	.00	39	4.3	26	8.1	178	34	.5	.3	1.2	.11	271	.37	69.5	115	0	31	1.1	355	8.0
Aug. 7-8	378	35	.10	.00	76	6.4	26	8.4	144	160	.0	--	.8	.10	402	.55	410	216	98	20	.8	548	7.9
Aug. 9-31	90.0	54	.05	.00	36	2.9	18	8.5	158	20	.0	.3	2.9	.09	226	.31	54.9	102	0	26	.8	297	8.0
Sept. 1-30	52.8	63	.02	.00	39	3.0	20	7.9	d 178	16	1.0	.3	.4	.09	241	.33	34.4	110	0	27	.8	313	8.3
Weighted average e	100	55	0.10	--	41	5.3	23	8.9	189	26	0.4	0.4	1.7	0.08	265	0.36	71.6	124	0	27	0.9	354	--

a Includes equivalent of 21 ppm of carbonate (CO_3).
b Not included in weighted average.
c Includes equivalent of 4 ppm of carbonate (CO_3).
d Includes equivalent of 2 ppm of carbonate (CO_3).
e Includes estimates where data are missing. Represents 100 percent of runoff for water year October 1955 to September 1956.

WHITE RIVER BASIN--Continued

SOUTH FORK WHITE RIVER BELOW WHITE RIVER, S. DAK.--Continued

Temperature (° F) of water, water year October 1955 to September 1956
/Once-daily measurement between 7 a.m. and 11 a.m./

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

a Measurement between 1 p.m. and 6 p.m.

WHITE RIVER BASIN--Continued

SOUTH FORK WHITE RIVER BELOW WHITE RIVER, S. DAK.--Continued

Suspended sediment, water year October 1955 to September 1956

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	57	150	23	136	--	e 130	85	64	
2	52	210	29	102	--	e 65	80	--	
3	59	300	48	102	240	66	80	--	
4	54	200	29	75	180	36	80	--	
5	57	160	25	64	130	22	80	--	
6	50	130	18	65	150	26	80	--	
7	52	100	14	62	190	32	80	--	
8	64	120	21	59	620	99	75	--	e 20
9	64	130	22	50	440	59	75	--	
10	55	130	19	62	260	44	80	--	
11	68	120	22	38	100	10	80	--	
12	71	110	21	32	110	9	75	--	
13	62	80	13	24	180	12	75	130	
14	75	120	24	32	60	5	75	36	
15	76	130	27	36	200	19	70		
16	82	130	29	26	--	e 12	60		
17	76	220	46	22	42	2	60		
18	68	160	29	60	170		70		
19	79	160	34	90	--		65	93	16
20	62	100	17	90	33		55		
21	68			85	37		65		
22	64			85	140		65		
23	75			90	63		75		
24	104			90	63	a 14	75		
25	102			90	34		60		
26	94	--	e 50	90	38		75		
27	106			90	--		75	200	39
28	114			85	37		75		
29	109			80	73		75		
30	125			85	--		60		
31	95			--	--	--	65		
Total	2,341	--	1,060	2,097	--	830	2,265	--	736

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	70			75			145		
2	70			75			210		
3	75	140	27	75			220		
4	70			85			220		
5	75			95	110	24	200		
6	80			90			180		
7	90			75			180		
8	75			85			180		
9	70			110			180	270	140
10	100	200	49	90			200		
11	90			100			180		
12	100			115			145		
13	95			115	210	58	130		
14	100			120			180		
15	100			115			230		
16	75			95			220		
17	95			85			230	400	250
18	90	430	100	80			240		
19	100			115			250	1,400	940
20	80			120			420	3,700	4,200
21	80			120	170	55	450	2,800	3,400
22	75			120			394	3,200	3,400
23	75			125			258	2,900	2,000
24	80			145			240	1,500	970
25	85	140	30	170			228	950	580
26	85			160	260	110	227	1,000	610
27	85			135			217	960	560
28	80			140			209	480	270
29	75			145			193	1,200	630
30	75			--	--	--	201	1,100	600
31	70			--	--	--	194	1,400	730
Total	2,565	--	1,385	3,175	--	1,707	6,951	--	21,630

e Estimated.

a Computed from partly estimated concentration data.

WHITE RIVER BASIN--Continued

SOUTH FORK WHITE RIVER BELOW WHITE RIVER, S. DAK.--Continued

Suspended sediment, water year October 1955 to September 1956--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.....	209	1,200	680	158	980	420	108	470	140
2.....	201	590	320	153	1,300	540	93	390	98
3.....	193	560	290	149	970	390	90	320	78
4.....	193	910	470	142	710	270	93	360	90
5.....	201	870	470	146	480	190	72	280	54
6.....	207	600	340	116	610	190	93	510	130
7.....	162	920	400	125	760	260	98	370	98
8.....	162	840	370	170	590	270	70	280	53
9.....	152	730	300	178	390	190	75	260	53
10.....	131	860	300	174	380	180	79	220	47
11.....	132	590	210	183	330	180	84	240	54
12.....	117	540	170	170	300	140	65	220	39
13.....	111	610	180	207	470	260	72	200	39
14.....	103	800	220	249	780	520	75	170	34
15.....	100	710	190	207	570	320	66	170	30
16.....	98	350	93	174	290	140	61	190	31
17.....	96	490	130	166	290	130	77	270	56
18.....	105	700	s 270	138	330	120	76	230	47
19.....	126	700	240	114	250	77	67	220	40
20.....	116	790	250	106	230	66	69	250	47
21.....	123	450	150	100	120	32	57	150	23
22.....	113	690	210	100	210	57	60	220	36
23.....	119	400	130	100	190	51	56	180	27
24.....	119	290	93	93	160	40	60	200	32
25.....	126	450	150	80	180	39	53	230	33
26.....	126	410	140	133	2,700	970	57	330	51
27.....	126	450	150	106	320	92	51	220	30
28.....	126	380	130	155	4,500	1,900	48	170	22
29.....	101	470	130	127	3,000	1,000	46	220	27
30.....	109	780	230	104	1,200	340	46	200	25
31.....	--	--	--	111	630	190	--	--	--
Total.	4,103	--	7,406	4,434	--	9,544	2,117	--	1,564

Day	July			August			September		
1.....	49	250	33	45	260	32	57	240	37
2.....	90	380	s 160	55	270	s 53	58	230	36
3.....	67	1,100	200	75	8,100	s 3,400	56	250	38
4.....	80	560	120	88	2,600	s 710	55	220	33
5.....	63	540	92	127	5,600	s 2,800	54	190	28
6.....	62	450	75	180	5,000	s 5,500	65	240	42
7.....	65	300	53	621	12,000	20,000	62	200	33
8.....	57	220	34	136	5,200	s 2,200	62	200	33
9.....	64	670	120	104	1,500	420	60	190	31
10.....	59	560	89	78	1,300	270	64	250	43
11.....	52	320	45	138	1,400	520	51	180	25
12.....	55	360	53	174	1,300	610	52	150	21
13.....	53	200	29	186	1,000	500	58	200	31
14.....	57	180	28	119	730	230	57	160	25
15.....	57	160	25	108	620	180	54	170	25
16.....	49	230	30	87	820	190	54	180	26
17.....	49	220	29	82	1,100	240	53	170	24
18.....	54	280	41	104	1,500	420	50	130	18
19.....	48	150	19	112	1,200	360	45	120	15
20.....	57	170	26	78	650	140	48	130	17
21.....	49	160	21	72	490	95	41	130	14
22.....	47	190	24	64	370	64	44	110	13
23.....	47	180	23	70	320	60	46	130	16
24.....	46	190	24	68	320	59	46	200	25
25.....	40	360	s 44	67	300	54	49	320	s 55
26.....	42	180	20	55	270	40	45	270	s 39
27.....	38	140	14	76	260	53	50	120	16
28.....	37	90	9	59	230	37	44	110	13
29.....	38	110	11	59	210	33	53	180	26
30.....	54	500	73	55	210	31	52	170	24
31.....	44	470	56	55	250	37	--	--	--
Total.	1,669	--	1,620	3,397	--	39,338	1,585	--	822

Total discharge for year (cfs-days)..... 36,699

Total load for year (tons)..... 87,642

s Computed by subdividing day.

SOUTH FORK WHITE RIVER BELOW WHITE RIVER, S. DAK.--Continued

Particle-size analyses of suspended sediment, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; 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. 3, 1955	5:25 p.m.	64	69	487	863		26		34		54	63	82	96	99	100	BWM
Oct. 18	2:00 p.m.	66	--	125	--		--		--		33	47	87	100	--	--	V
Nov. 3	12:30 p.m.	64	35	265	727		29		38		49	65	84	92	100	--	BWCM
Mar. 26, 1956	4:40 p.m.	193	60	1,070	2,130		26		36		48	68	96	100	--	--	VPWCM
Apr. 6	5:30 p.m.	191	--	588	1,450		22		31		42	48	73	93	98	100	BWCM
Apr. 19	1:15 p.m.	108	55	562	2,350		15		22		54	75	98	100	--	--	BWCM
May 7	5:15 p.m.	162	54	229	1,290		37		48		57	65	74	93	100	--	BWCM
May 17	2:10 p.m.	153	--	413	1,040		35		42		59	65	77	96	100	--	BWCM
May 23	7:05 p.m.	93	--	165	545		50		53		68	69	82	88	94	100	BWCM
May 29	1:45 p.m.	119	--	3,380	5,030		19		33		92	99	100	--	--	--	VPWCM
July 5	3:05 p.m.	100	--	792	1,320		43		60		84	94	99	100	--	--	VPWCM
Aug. 14	9:30 a.m.	119	--	816	1,900		62		72		75	92	98	99	100	--	VPWCM
Aug. 29	11:40 a.m.	59	75	206	747		14		17		19	30	77	97	98	100	VPWCM

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WHITE RIVER BASIN--Continued

SOUTH FORK WHITE RIVER BELOW WHITE RIVER, S. DAK.--Continued

Particle-size analyses of bed material, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed; V, visual accumulation tube)

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										
						0.062	0.125	0.250	0.500	1.000	2.000	4.000	8.000	16.000	32.000	64.000	
Oct. 3, 1955	4	64				4	11	53	89	96	97	98	99	100	--	--	SV
Oct. 18	12	66				0	2	33	83	95	97	99	100	--	--	--	SV
Nov. 3	4	64				0	2	28	75	87	90	93	96	98	100	--	SV
Mar. 26, 1956	5	193				--	0	25	86	95	96	97	99	100	--	--	SV
Apr. 19	5	108				0	1	29	72	81	83	85	89	96	100	--	SV
May 7	5	162				--	0	25	70	78	78	79	80	86	100	--	SV
May 23	5	93				--	0	11	61	79	83	87	91	95	100	--	SV
June 7	5	100				0	4	15	81	93	96	98	100	--	--	--	SV
June 20	5	57				0	1	24	88	97	99	100	--	--	--	--	SV
July 18	5	62				0	4	22	85	95	97	99	100	--	--	--	SV
Aug. 2	5	48				0	6	26	82	95	97	99	100	--	--	--	SV
Aug. 15	5	106				0	5	25	79	91	92	93	95	96	98	100	SV
Aug. 29	5	59				0	3	25	75	90	93	95	97	98	98	100	SV

MISCELLANEOUS ANALYSES OF STREAMS IN THE WHITE RIVER BASIN IN SOUTH DAKOTA

Chemical analyses, in parts per million, water year October 1955 to September 1956

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Selenium (Se)	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				
															Residue at 180°C	Sum								
SOUTH FORK WHITE RIVER NEAR ROSEBUD																								
May 7, 1956	152			0.00			22		189							215			115	0			327	7.8
July 18	56	55	0.04	.00	35	3.5	18	8.5	166	10	0.5	0.4	1.5	0.06					102	0	26	0.8	293	7.6
Aug. 2	72			.00			--		--										--	--			274	--
Aug. 14	144			.00			--		--										--	--			228	--

NIOBRARA RIVER NEAR CODY, NEBR.

LOCATION.--At Mogle Bridge, a quarter of a mile downstream from gaging station, 3 miles upstream from Medicine Creek, 5 miles downstream from Bear Creek, and 10 miles south of Cody, Cherry County.
RECORDS AVAILABLE.--Water temperatures: October 1948 to September 1954, October 1955 to September 1956.
Sediment records: April 1948 to September 1954.
EXTREMES, 1955-56.--Water temperatures: Maximum, 90°F July 14.
EXTREMES, 1948-54, 1955-56.--Water temperatures: Maximum, 94°F July 10, 1954; minimum, freezing point on many days during winter months.
REMARKS.--Flow affected by ice Nov. 27-30, Dec. 3, 4, 14, 15, 18, 19, Jan. 16-23, Feb. 3-5, 16-20, 25, 26, Mar. 12, 13. Investigations indicate that practically all the sediment load is transported in suspension at this contracted section of the river. Records of discharge for water year October 1955 to September 1956 given in WSP 1439.

Temperature (° F) of water, water year October 1955 to September 1956
/Recorder with temperature attachment, continuous ethyl alcohol-actuated thermograph/

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

NIOBRARA RIVER BASIN--Continued

NIOBRARA RIVER NEAR CODY, NEBR.--Continued

Periodic determinations of suspended-sediment discharge, October 1955 to June 1956

Date	Discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Discharge (tons per day)
Oct. 4, 1955	262	1,010	714
Oct. 18	290	946	741
Nov. 1	314	1,340	1,140
Nov. 25	314	1,580	1,340
Mar. 2, 1956	475	1,900	2,440
Mar. 20	415	1,580	1,770
Apr. 10	350	1,200	1,130
Apr. 17	310	1,280	1,070
May 1	435	1,670	1,960
May 15	314	1,300	1,100
May 29	365	2,260	2,230
June 12	242	399	261
June 26	219	427	252

NIOBRARA RIVER NEAR CODY, NEBR.--Continued

Particle-size analyses of suspended sediment, October 1955 to June 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; 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. 4, 1955	3:00 p.m.	262	--	1,010							12	24	66	97	100		V
Oct. 18	3:35 p.m.	290	57	946							12	26	66	94	100		V
Nov. 1	6:00 p.m.	314	44	1,340							10	20	64	94	100		V
Nov. 25	11:25 a.m.	314	34	1,580							9	20	61	88	100		V
Mar. 2, 1956	9:45 a.m.	475	37	1,900							18	44	80	98	100		V
Mar. 20	2:50 p.m.	415	44	1,580							16	38	76	94	100		V
Apr. 10	2:35 p.m.	350	56	1,200							12	30	67	94	100		V
Apr. 17	4:15 p.m.	310	--	1,280							10	26	68	96	100		V
May 1	4:05 p.m.	435	49	1,670							8	25	71	95	99	100	V
May 15	3:40 p.m.	314	63	1,300							12	33	71	95	100		V
May 29	4:10 p.m.	365	71	2,260							13	29	72	97	100		V
June 12	3:20 p.m.	242	83	399							25	40	75	100	--		V
June 26	3:10 p.m.	219	80	427							17	31	69	99	100		V

NIOBRARA RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN THE NIOBRARA RIVER BASIN IN NEBRASKA

Periodic determinations of suspended-sediment discharge, water year October 1955 to September 1956

Date	Discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Discharge (tons per day)
NIOBRARA RIVER NEAR HAY SPRINGS			
Oct. 6, 1955	24	82	5.3
Oct. 20	23	106	6.6
Oct. 21	25	104	7.0
Oct. 22	23	96	6.0
Oct. 23	24	183	12
Oct. 24	25	193	13
Oct. 26	27	136	9.9
Oct. 28	25	111	7.5
Oct. 29	27	95	6.9
Oct. 31	27	136	9.9
Nov. 1	a 19	103	5.3
Nov. 2	a 22	333	20
Nov. 3, 12:20 p.m.	a 27	288	21
Nov. 3, 5:00 p.m	a 27	116	8.5
Nov. 17	a 14	33	1.2
Nov. 30	a 17	18	.8
Dec. 1	a 18	68	3.3
Dec. 2	a 20	308	17
Dec. 3	a 22	222	13
Dec. 5	a 24	155	10
Dec 6, 3:00 p.m.	a 23	21	1.3
Dec. 6, 4:30 p.m.	a 23	86	5.3
Dec. 7	a 21	128	7.3
Dec. 8	a 20	115	6.2
Dec. 9	a 18	198	9.6
Dec. 10	a 18	181	8.8
Dec. 11	a 18	138	6.7
Dec. 12, 9:45 a.m.	a 18	133	6.5
Dec. 12, 6:00 p.m.	a 18	94	4.6
Dec. 15	a 14	24	.9
Jan. 4, 1956	a 26	27	1.9
Jan. 18, 11:00 a.m.	a 21	65	3.7
Jan. 18, 11:30 a.m.	a 21	58	3.3
Feb. 18	a 9.0	10	.2
Mar. 9	36	882	86
Mar. 14	a 30	266	22
Mar. 19	a 25	88	5.9
Apr. 3	36	303	29
May 3	25	78	5.3
May 15	16	48	2.1
May 25	13	92	3.2
May 31	17	84	3.9
June 5	23	172	11
June 6	27	251	18
June 14	9.9	86	2.3
June 15	15	93	3.8
July 5	31	121	10
July 16	12	80	2.6
July 27	13	82	2.9
Aug. 7	11	108	3.2
Aug. 16	9.9	53	1.4
Aug. 27	11	58	1.7
Sept. 4	12	66	2.1
Sept. 20	17	134	6.2
Sept. 26	18	36	1.7
NIOBRARA RIVER NEAR NORDEN			
Oct. 5, 1955	892	1,030	2,480
Oct. 19	906	1,560	3,820
Nov. 2	878	1,380	3,270
Nov. 25	a 877	2,000	4,740
Mar. 2, 1956	a 1,280	1,660	5,740
Mar. 20	1,310	1,820	6,440
Apr. 10	1,020	1,260	3,470

a Daily mean discharge.

NIOBRARA RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN THE NIOBRARA RIVER BASIN IN NEBRASKA --Continued

Periodic determinations of suspended-sediment discharge, water year October 1955 to September 1956--Continued

Date	Discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Discharge (tons per day)
NIOBRARA RIVER NEAR NORDEN--Continued			
Apr. 17, 1956	1,020	1,140	3,140
May 1	a 1,160	1,120	3,510
May 15	a 1,050	1,240	3,520
May 29	a 1,100	611	1,810
June 12	762	444	913
June 26	707	351	670
July 10	701	342	647
July 24	662	278	497
Aug. 21	920	526	1,310
Sept. 18	800	290	626

a Daily mean discharge.

NIOBRARA RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN THE NIOBRARA RIVER BASIN IN NEBRASKA--Continued

Particle-size analyses of suspended sediment, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; 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	
NIOBRARA RIVER NEAR HAY SPRINGS																	
Oct. 6, 1955	5:30 p.m.	24	49	82	910		22		38		60	66	85	92	94	100	BWCM
Apr. 3, 1956	4:00 p.m.	36	--	303	2,250		10		18		37	49	79	--	95	100	BWCM
June 6	8:45 a.m.	27	69	251	1,130		23		43		64	78	93	99	100	--	VPWCM
NIOBRARA RIVER NEAR NORDEN																	
Oct. 5, 1955	9:40 a.m.	892	--	1,030							22	38	82		100	--	V
Nov. 2	10:00 a.m.	878	33	1,380							10	27	82		100	--	V
Nov. 25	3:50 p.m.	a 877	--	2,000							6	27	85		100	--	V
Mar. 2, 1956	3:50 p.m.	a 1,280	33	1,660							12	19	75		97	100	V
Mar. 20	9:30 a.m.	1,310	38	1,820							33	48	80		99	100	V
Apr. 10	9:10 a.m.	1,020	45	1,260							16	37	83		100	--	V
Apr. 17	9:40 a.m.	1,020	--	1,140							20	43	83		100	--	V
May 1	9:20 a.m.	a 1,160	44	1,120							18	39	81		100	--	V
May 15	9:20 a.m.	a 1,050	--	1,240							15	34	83		100	--	V
May 29	9:30 a.m.	a 1,100	68	611							30	49	81		100	--	V
June 12	9:10 a.m.	762	75	444							22	41	92		100	--	V
June 26	9:15 a.m.	707	75	351							20	43	85		99	100	V
July 10	9:05 a.m.	701	--	342							20	38	84		100	--	V
July 24	8:50 a.m.	662	74	278							22	47	96		100	--	V
Aug. 21	9:05 a.m.	920	65	526							26	40	81		100	--	V
Sept. 18	9:00 a.m.	800	61	290							21	45	89		100	--	V

a Daily mean discharge.

MISCELLANEOUS ANALYSES OF STREAMS IN THE NIOBRARA RIVER BASIN IN NEBRASKA--Continued

Particle-size analyses of bed material, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation P, pipet; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed; V, visual accumulation tube)

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									
							0.062	0.125	0.250	0.500	1.000	2.000	4.000	8.000	16.000	
NIOBRARA RIVER NEAR HAY SPRINGS																
Oct. 6, 1955.....	4	24					0	2	26	87	95	97	99	100		SV
Mar. 9, 1956....	5	36					0	1	27	91	97	98	99	100		SV
Apr. 3.....	5	36					0	2	19	90	97	99	100	--		SV
May 3.....	5	25					0	2	31	85	92	95	97	99	100	SV
May 31.....	3	17					0	1	31	92	98	99	100	--		SV
June 6	5	27					0	1	27	85	94	96	98	100		SV
June 15	5	15					0	2	42	90	97	98	100	--		SV
July 5.....	5	31					--	0	27	87	96	98	99	100		SV

JAMES RIVER BASIN

PIPESTEM CREEK NEAR BUCHANAN, N. DAK.

LOCATION.--At gaging station at bridge on county road, 4½ miles west of Buchanan, Stutsman County.
DRAINAGE AREA.--925 square miles, of which about 450 square miles is probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: August 1955 to June 1956 (discontinued).
REMARKS.--No flow during January and February. Records of discharge for water year October 1955 to September 1956 given in WSP 1439.

Chemical analyses, in parts per million, October 1955 to June 1956

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 (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. 31, 1955	0.1	8.5	0.00	64	45	144	10	405	0	268	44	0.1	1.9	0.29	814	1.11		346	14	47	3.4	1,210	7.8
Apr. 19, 1956	91	13	.07	40	23	49	9.5	163	0	164	8.0	.0	3.4	.12	416	.57		196	62	34	1.5	610	7.1
Apr. 27	31	19	.05	41	23	58	8.0	222	0	125	9.0	.2	1.8	.12	408	.55		196	14	38	1.8	623	7.7
May 4	22	14	.03	46	23	61	8.6	244	0	136	13	.1	2.1	.13	452	.61		211	11	37	1.8	674	7.7
May 11	17	12	.03	51	27	64	9.2	271	0	150	16	.1	3.3	.13	503	.68		239	17	36	1.8	748	7.8
June 1	89	15	.15	37	18	33	7.6	159	0	111	3.5	.3	2.0	.10	328	.45		168	38	29	1.1	489	7.3
June 8	329	20	.16	35	22	35	7.9	162	0	127	3.5	.0	2.3	.13	356	.48		177	44	29	1.1	516	7.2
June 29	10	16	.02	67	36	87	7.7	378	0	179	15	.1	2.4	.20	631	.86		316	6	37	2.1	943	7.8

JAMES RIVER AT LA MOURE, N. DAK.

LOCATION.--Temperature recorder at gaging station, downstream from bridge on State Highway 13, half a mile west of La Moure, La Moure County, and 12 miles upstream from Cottonwood Creek.
DRAINAGE AREA.--5,740 square miles, approximately, of which about 2,800 square miles is probably noncontributing.
RECORDS AVAILABLE.--Water temperatures: June 1953 to September 1956.
EXTREMES, 1955-56.--Water temperatures: Maximum, 81°F June 20, Aug. 4, 6; minimum, 33°F on many days during December, January, March, and April.
EXTREMES, 1953-56.--Water temperatures: Maximum, 88°F Aug. 3, 1955; minimum, freezing point on many days during winter months.
REMARKS.--Records of discharge for water year October 1955 to September 1956 given in WSP 1439.

Temperature (° F) of water, water year October 1955 to September 1956
/Recorder with temperature attachment, continuous ethyl alcohol-actuated thermograph/

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

JAMES RIVER BASIN--Continued

JAMES RIVER NEAR COLUMBIA, S. DAK.

LOCATION.--At bridge on county road, 3.5 miles north of Columbia, Brown County, approximately 5 miles upstream from gaging station, and 0.1 mile downstream from Columbia Road Reservoir.
DRAINAGE AREA.--7,050 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: October 1951 to September 1952, November 1954 to September 1956.
REMARKS.--No flow during October to February and September. Discharge records for gaging station at Columbia for water year October 1955 to September 1956 given in WSP 1439.

Chemical analyses, in parts per million, April to August 1956

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 (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. 25, 1956	a 10	--	--	45	34	100	--	300	0	160	52	--	--	--	596	0.81		253	7	45	2.7	918	7.8
May 16, 11:00 a.m	166	--	--	45	41	118	--	330	0	193	57	--	--	--	670	.91		282	11	46	3.1	1,040	7.9
May 16, 12:30 p.m	166	--	--	52	41	119	--	340	0	203	60	--	--	--	715	.97		298	19	45	3.0	1,070	7.6
June 7	4.1	17	0.20	59	50	132	14	412	0	238	67	0.3	0.3	0.48	818	1.11		354	16	44	3.0	1,230	7.7
June 27	226	19	.09	52	44	118	13	376	0	200	57	.3	.6	.40	714	.97		310	2	44	2.9	1,090	7.7
July 20	82	26	.10	53	45	120	14	403	0	185	58	.0	.7	.42	725	.99		316	0	44	2.9	1,100	7.7
Aug. 8	1.3	26	.10	63	49	126	15	480	0	155	70	.1	1.0	.41	784	1.07		358	0	42	2.9	1,180	7.9

a Daily mean discharge.

JAMES RIVER NEAR SCOTLAND, S. DAK.

LOCATION.--Temperature recorder at gaging station, 50 feet upstream from highway bridge, 500 feet upstream from Dawson Creek, and 5 miles northeast of Scotland, Bon Homme County.
DRAINAGE AREA.--21,550 square miles, approximately.
RECORDS AVAILABLE.--Water temperatures: January 1953 to September 1956.
EXTREMES, 1955-56.--Water temperatures: Maximum, 87°F June 13, 14; minimum, freezing point on many days during November to March.
EXTREMES, 1953-56.--Water temperatures: Maximum, 89°F on several days during July 1955; minimum, freezing point on many days during winter months.
REMARKS.--Records of discharge for water year October 1955 to September 1956 given in WSP 1439.

Chemical analyses, in parts per million, June 1952 to September 1956

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 (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 26, 1952.....	905	13	0.07	73	31	58	12	261	0	184	26	0.2	4.0	--	616	0.84		308	94	28	--	810	7.6
Aug. 13, 1956	669	9.9	.01	58	28	90	13	260	0	188	48	.4	2.9	0.33	568	.77		258	45	42	2.4	903	7.6
Sept. 19.....	17	7.4	.01	90	40	94	16	280	0	308	43	.4	2.5	.43	768	1.04		390	160	33	2.1	1,130	7.7

JAMES RIVER BASIN--Continued

JAMES RIVER NEAR SCOTLAND, S. DAK.--Continued

Temperature (° F) of water, water year October 1955 to September 1956
[Recorder with temperature attachment, continuous ethyl alcohol-actuated thermograph]

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

MISCELLANEOUS ANALYSES OF STREAMS IN THE JAMES RIVER BASIN IN NORTH DAKOTA

Chemical analyses, in parts per million, water year October 1955 to September 1956

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 (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				
ROCKY RUN CREEK NEAR NEW ROCKFORD																							
Apr. 15, 1956	2	3.0	0.02	12	6.6	10	5.3	55	0	34	0.0	0.0	3.6	0.05	110	0.15		57	12	25	0.6	174	7.1
Apr. 18	42	9.2	.17	19	9.4	22	10	101	0	59	3.0	.0	.8	.11	203	.28		86	3	33	1.0	300	7.0
Apr. 27	3.7	19	.09	31	17	31	9.9	136	0	105	.0	.0	8.9	.11	296	.40		146	34	30	1.1	441	7.3

LITTLE SIOUX RIVER BASIN

LITTLE SIOUX RIVER AT CORRECTIONVILLE, IOWA

LOCATION.--At gaging station at bridge on U. S. Highway 20, 0.2 mile upstream from Bacon Creek, 0.5 mile west of Correctionville, Woodbury County, and 0.8 mile downstream from Pierson Creek.
DRAINAGE AREA.--2,500 square miles (revised).
RECORDS AVAILABLE.--Chemical analyses: November 1954 to June 1955.
Water temperatures: May 1951 to September 1956.
Sediment records: May 1950 to September 1956.
EXTREMES, 1955-56.--Water temperatures: Maximum, 82°F June 21, July 5; minimum, freezing point probably on many days during November to February.
Sediment concentrations: Maximum daily, 1,790 ppm May 31; minimum daily, not determined.
Sediment loads: Maximum daily, 1,930 tons May 31; minimum daily, not determined.
EXTREMES, 1950-56.--Water temperatures (1951-56): Maximum, 84°F July 31, 1955; minimum, freezing point on many days during winter months.
Sediment concentrations: Maximum daily, 12,200 ppm July 12, 1950; minimum daily, not determined.
Sediment loads: Maximum daily, 257,000 tons June 19, 1954; minimum daily, not determined.
REMARKS.--Flow affected by ice Nov. 29 to Mar. 20. Records of discharge for water year October 1955 to September 1956 given in WSP 1440.

Temperature (° F) of water, water year October 1955 to September 1956
(Once-daily measurement between 7 a.m. and 10 a.m.)

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

a Measurement between 1 p.m. and 4 p.m.

LITTLE SIOUX RIVER BASIN--Continued

LITTLE SIOUX RIVER AT CORRECTIONVILLE, IOWA--Continued

Suspended sediment, water year October 1955 to September 1956

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	30	130	11	34	35	e 3	24	114	
2	23	127	8	34	--		22	--	
3	22	154	9	34	21	e 2	22	--	
4	22	135	8	35	--		22	114	
5	32	147	13	38	48		22	--	e 7
6	50	145	20	38	--		22	114	
7	59	130	21	37	--		22	--	
8	64	73		33	48	e 5	22	--	
9	64	--	e 12	34	--		20	--	
10	53	--		38	48		20	114	
11	44	102	12	40	--		19		
12	41	--		41	41		18		
13	40	85	e 9	41	--		18	--	e 4
14	38	--		36	--		17		
15	36	54	e 5	34	41		17		
16	34	--		33	--	e 4	16	--	
17	32	--		31	41		16	33	
18	30	49	e 4	32	--		15	--	
19	30	--		34	41		15	--	
20	30	80		37	--		15	--	
21	30	--	e 6	40	--		15	--	
22	30	74		44	50		14	--	
23	31	--		37	--		14	--	
24	31	--		40	50		14	33	e 1
25	32	44	e 4	41	--	e 5	15	--	
26	32	--		40	50		16	--	
27	33	98	9	38	--		17	--	
28	36	--		38	--		16	--	
29	36	56		31	50		14	--	
30	36	--	e 5	28	--		14	--	
31	34	--		--	--	--	15	33	
Total	1,135	--	248	1,091	--	131	548	--	106

Day	January			February			March		
1	15			11	--	e 3	40	--	
2	15			12	--	e 6	53	--	e 4
3	15	--	e 1	13	--		53	31	
4	15			14	254		75	23	5
5	15			14	--		110	20	6
6	15	--		14	--	e 10	105	36	10
7	11	51		14	--		86	40	9
8	12	--		14	--		92	34	8
9	13	--		15	--		87	65	15
10	13	--		15	--		64	25	4
11	13	--	e 2	16	253	e 11	74		
12	13	--		16	--		68		
13	14	--		17	--		60	--	e 4
14	14	51		16	--		58		
15	13	--		14	--		53		
16	13	--		14	--		62		
17	12	--		14	--		78		
18	11	--		12	183		89	14	3
19	11	--		13	--	e 7	91		
20	11	--		14	--		100	18	5
21	11	69		14	--		139	25	9
22	11	--		14	--		104	22	6
23	11	--		17	--		150	25	10
24	11	--	e 2	21	--		143	28	11
25	11	--		21	130		194	50	26
26	11	--		21	--	e 7	197	65	35
27	12	--		19	--		238	95	61
28	12	69		18	--		270	112	82
29	11	--		21	--		260	123	86
30	10	--		--	--	--	244	133	88
31	10	--		--	--	--	310	198	166
Total	385	--	57	448	--	240	3,747	--	686

e Estimated.

LITTLE SIOUX RIVER BASIN--Continued

LITTLE SIOUX RIVER AT CORRECTIONVILLE, IOWA--Continued

Suspended sediment, water year October 1955 to September 1956--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	390	245	258	126	52	18	231	1,580	985
2	378	265	270	127	44	15	185	498	249
3	390	290	305	137	91	34	146	320	126
4	402	275	298	152	61	25	112	283	86
5	428	333	385	179	86	42	98	258	68
6	440	420	499	199	87	47	86	330	77
7	390	270	284	211	90	51	75	220	45
8	330	162	144	220	116	69	70	220	42
9	290	130	102	222	115	69	62	180	30
10	260	105	74	217	130	76	60	149	24
11	235	135	86	208	141	79	57		
12	220	170	101	202	132	72	53		
13	208	157	88	201	136	74	50	197	25
14	197	158	84	194	122	64	46		
15	176	115	55	190	111	57	41		
16	163	58	26	187			37		
17	155	45	19	176			35		
18	148	83	33	171	106	48	35	203	19
19	137	125	46	155			32		
20	129	165	57	144			30		
21	122	145	48	136			26	270	19
22	112	100	30	127			23	360	22
23	99	58	16	116	132	44	20		
24	95	45	12	107			18		
25	94	67	17	100			18	208	11
26	92	130	32	91			23		
27	103	120	33	91	99	25	22		
28	108	73	21	89			20		
29	109	45	13	90			17	171	9
30	126	36	12	270	200	sa 170	16		
31	--	--	--	400	1,790	1,930	--	--	--
Total	6,526	--	3,448	5,235	--	3,433	1,744	--	2,073

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	16			18	95	5	47	104	13
2	18			20	285	15	30		
3	24	124	7	20	143	8	26	103	8
4	25			16	107	5	31		
5	24			23	200	12	29		
6	20			77	1,200	sa 300	31	45	4
7	25			82	125	28	50		
8	24	106	7	74	116	23	48		
9	23			62	107	18	43		
10	29	120	sb 13	58	109	17	39	87	10
11	156	149	63	62	130	22	34		
12	169	195	89	61	420	sa 70	30		
13	132	195	69	54	105	15	27		
14	90	130	32	46	109	14	24	83	6
15	69	103	19	42			23		
16	57			38	102	11	20		
17	49			37			18		
18	43	87	11	91	400	sa 160	16	64	4
19	38			60	120	19	14		
20	37			59	100	16	13		
21	32			51			12		
22	31			44			13		
23	29	100	8	39	105	12	12	77	2
24	27			33			8.3		
25	26			28			8.0		
26	27			24			8.0		
27	26			21	110	6	8.0		
28	23			18			6.3	88	2
29	21	96	6	16			7.0		
30	18			19	240	sa 14	7.0	49	1
31	18			43	172	20	--	--	--
Total	1,346	--	479	1,336	--	892	682.6	--	166

Total discharge for year (cfs-days) 24,223.6

Total load for year (tons) 11,959

s Computed by subdividing day.

a Computed from partly estimated concentration graph.

b Computed from estimated concentration graph.

LITTLE SIOUX RIVER BASIN--Continued

LITTLE SIOUX RIVER NEAR KENNEBEC, IOWA

LOCATION (revised).--At gaging station at bridge on county road "A", 1.1 miles south of Kennebec, Monona County, 5.5 miles northeast of Onawa, and 6.2 miles upstream from Maple River.
DRAINAGE AREA.--2,738 square miles (revised).
RECORDS AVAILABLE.--Water temperatures: May 1951 to September 1955.
Sediment records: May 1950 to September 1956.
EXTREMES, 1955-56.--Sediment concentrations: Maximum daily, 10,800 ppm June 6; minimum daily, not determined.
Sediment loads: Maximum daily, 10,300 tons June 6; minimum daily, not determined.
EXTREMES, 1950-56.--Sediment concentrations: Maximum daily, 40,800 ppm June 18, 1950; minimum daily, not determined.
Sediment loads: Maximum daily, 520,000 tons June 18, 1950; minimum daily, not determined.
REMARKS.--Flow affected by ice Nov. 16 to Mar. 18. Records of discharge for water year October 1955 to September 1956 given in WSP 1440.

Suspended sediment, water year October 1955 to September 1956

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	44			50	216		35	--	
2	43			46	--		34	--	
3	42	--	e 10	49	--		33	--	e 24
4	41			48	--		32	--	
5	40			46	--		31	270	
						e 28			
6	45	--		48	--		31	270	
7	53	--	e 22	50	--		31	--	
8	56	168		50	216		31	--	
9	65	--		50	--		31	--	
10	71	--	e 34	49	--		31	--	
									e 24
11	62	189		51			31	--	
12	52	--		51			31	--	
13	48	--		51	--	e 30	31	270	
14	45	148	e 19	51			31	--	
15	45	--		51			31	--	
16	42	--		50	--		32		
17	44	--		48	--		33		
18	42	--		47	216	e 28	34	--	e 12
19	41	--		46	--		35		
20	41	157	e 18	45	--		35		
21	41	--		45	--		36	73	
22	41	--		45	--		36	--	
23	41	--		44	--	e 26	37	--	
24	42	280		42	--		37	--	
25	43	--	e 32	41	216		38	73	
									e 7
26	41	--	e 26	40			38	--	
27	41			39			38	--	
28	43			38	--	e 22	38	--	
29	45	--	e 30	37			38	--	
30	48			36			38	--	
31	49			--	--	--	38	--	
Total	1,437	--	674	1,384	--	810	1,056	--	497

e Estimated.

LITTLE SIOUX RIVER BASIN--Continued

LITTLE SIOUX RIVER NEAR KENNEBEC, IOWA--Continued

Suspended sediment, water year October 1955 to September 1956--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	38	--		25	--		90	--	e 1
2	38	60		26	--		100	--	e 2
3	38	--		26	--		140	--	e 4
4	38	--		27	--		160	--	e 10
5	38	--	e 6	27	--		130	--	e 9
6	37	--		27	19		120	--	e 8
7	37	--		27	--	e 1	270	--	e 50
8	36	--		27	--		250	--	e 30
9	36	--		28	--		220	--	e 20
10	35	60		28	--		210		
			e 6						
11	34	--		28	--		180		
12	33	--		28	--		150	--	e 9
13	32	--		29	--		130		
14	31			29	--		120		
15	30			29	--		100		
16	29	--	e 4	29	--		90		
17	28			29	--		90	--	e 8
18	27			29	--		90		
19	26	--		30	19		96		
20	26	--		30	--	e 2	103		
								57	16
21	26	--		31	--		106		
22	25	42		31	--		121		
23	25	--		32	--		128		
24	25	--		32	--		128	--	e 40
25	25	--	e 3	33	--		129		
26	25	--		33	--		162	195	85
27	25	--		37			169	250	118
28	25	--		50	--	e 1	201	360	a 190
29	25	--		80			235	400	a 260
30	25	42		--	--	--	237	310	198
31	25	--		--	--	--	227	280	a 170
Total	943	--	137	917	--	43	4,682	--	1,417

Day	April			May			June		
1	287	515	399	146	71	28	362	2,000	1,950
2	310	723	605	148	--	e 50	243	950	623
3	322	695	605	146	196	77	193	870	453
4	344	732	680	151	--	e 84	170	560	257
5	380	742	762	162	196	86	163	650	a 300
6	392	850	a 900	189	230	118	239	10,800	s 10,300
7	392	650	a 700	199	260	140	110	2,100	624
8	356	450	433	219	300	a 160	96	1,200	a 320
9	310	330	277	225	340	207	84	800	a 180
10	276	300	a 220	262	2,920	2,070	78	480	a 100
11	256	287	199	287	7,770	6,030	72	278	54
12	227	--	e 170	231	1,300	a 800	68	220	a 40
13	213	--	e 150	219	897	531	64	200	a 36
14	201	--	e 130	219	850	a 500	57	180	a 28
15	185	--	e 110	215	750	a 440	52	177	25
16	179	--	e 90	211	650	a 380	50		
17	167	--	e 80	213	580	334	45		
18	160	168	73	217	500	a 300	44	--	e 20
19	155	217	91	211	440	a 260	44		
20	143	243	94	193	380	a 200	41		
21	141	--	e 70	181	330	162	43		
22	134	--	e 50	165	300	a 130	37		
23	131	95	34	145	240	a 95	34	--	e 17
24	131			129	203	71	33		
25	125	--	e 30	123	180	a 60	32	--	e 15
26	121			117	158	50	68	1,200	sb 280
27	125	--	e 35	115	--	e 40	54	830	121
28	134	176	64	112	--	e 40	34	600	a 55
29	141	--	e 50	115	315	98	32	460	a 40
30	141	--	e 40	114	--	e 100	34	320	29
31	--	--	--	240	1,400	sb 1,200	--	--	--
Total	6,579	--	7,201	5,619	--	14,861	2,676	--	15,998

e Estimated.
s Computed by subdividing day.
a Computed from estimated concentration graph.
b Computed from partly estimated concentration graph.

LITTLE SIOUX RIVER BASIN--Continued

LITTLE SIOUX RIVER NEAR KENNEBEC, IOWA--Continued

Suspended sediment, water year October 1955 to September 1956--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.....	56	800	sa 170	37	--		59	145	
2.....	60	--	e 80	37	106		59	--	e 22
3.....	35	--	e 40	37	--		53	--	
4.....	34	--	e 30	48	--	e 11	42		
5.....	35	--	e 20	42	--		39	--	e 15
6.....	35	--	e 15	39	--		42		
7.....	81	4,100	sb 1,000	98	420	sb 140	38	--	
8.....	47	--	e 70	85	380	87	45	--	
9.....	46	--	e 40	75	320	a 65	52	83	
10.....	40	--	e 26	66	260	a 46	50	--	e 10
11.....	88	1,000	sa 700	60	190	31	48	--	
12.....	243	5,600	sb 4,400	61			42	--	
13.....	178	1,850	889	66	--	e 20	41	--	
14.....	155	1,300	a 550	60			37	--	
15.....	120	730	237	57			37	53	
16.....	100	430	116	52	--	e 10	33	--	e 5
17.....	81	--	e 80	54			30	--	
18.....	72	--	e 60	61	--	e 50	28	--	
19.....	62	--	e 40	85	--	e 90	26	--	
20.....	58			84	--	e 60	24	--	
21.....	53	--	e 20	73	--	e 50	23	--	e 5
22.....	49			68	--	e 40	24	79	
23.....	46	85		56	--	e 30	20	--	
24.....	44	--		53	--	e 20	20	--	
25.....	39	--	e 10	52	--		20	--	
26.....	37	--		51	117	e 16	17		
27.....	43	--	e 50	49	--		13		
28.....	72	--	e 300	44			13	--	e 2
29.....	56	--	e 80	41	--	e 12	14		
30.....	45	--	e 24	37			14		
31.....	37	--	e 11	39	--	e 15	--	--	--
Total.	2,147	--	9,128	1,767	--	964	1,003	--	251

Total discharge for year (cfs-days)..... 30,210
Total load for year (tons)..... 51,981

e Estimated.
s Computed by subdividing day.
a Computed from estimated concentration graph.
b Computed from partly estimated concentration graph.

LITTLE SIOUX RIVER BASIN--Continued

LITTLE SIOUX RIVER NEAR KENNEBEC, IOWA--Continued

Particle-size analyses of suspended sediment, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; 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 11, 1956....	9:45 a.m.	298	62	19,600	3,130		45		82		97	98	99		100		SPWCM
June 6.....	5:15 p.m.	249	71	12,600	3,230		38		78		93	97	100				SPWCM
July 7.....	6:30 a.m.	128	72	11,000	4,250		31		61		100	--	--				SPWCM

NORTH PLATTE RIVER BELOW GUERNSEY RESERVOIR, WYO.

LOCATION.--At bridge on U. S. Highway 26 at Guernsey, Platte County, 0.9 mile downstream from gaging station and 2 miles downstream from Guernsey Dam.
DRAINAGE AREA.--16,200 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: December 1950 to September 1956.
Water temperatures: October 1951, April to September 1952, March to September 1953, May 1954 to September 1956.
Sediment records: April 1947 to June 1953.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 907 ppm Feb. 15-29; minimum, 341 ppm Aug. 29 to Sept. 11.
Hardness: Maximum, 432 ppm Feb. 15-29; minimum, 188 ppm Aug. 29 to Sept. 11.
Specific conductance: Maximum daily, 1,350 micromhos Feb. 17; minimum daily, 500 micromhos Sept. 4.
Water temperatures: Maximum, 80°F July 14-17; minimum, freezing point Jan. 14, 15, 19, 28, Feb. 1.
EXTREMES, 1951-56.--Dissolved solids: Maximum (1954-56), 928 ppm Feb. 1-28, 1955; minimum, 226 ppm June 27, 1955.
Hardness: Maximum (1954-56), 440 ppm Mar. 1-31, 1955; minimum, 132 ppm June 27, 1955.
Specific conductance: Maximum daily (1954-56), 1,350 micromhos Feb. 17, 1956; minimum daily, 354 micromhos June 27, 1955.
Water temperatures (1954-56): Maximum, 90°F Aug. 20, 1955; minimum, freezing point on several days during winter months.
REMARKS.--Records of specific conductance of daily samples available in district office at Worland, Wyo. No appreciable inflow between gaging station and sampling station except during periods of heavy local precipitation. Records of discharge for water year October 1955 to September 1956 given in WSP 1440.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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-Nov. 3, 1955	10.3	--	--	--	--	73	--	195	255	--	--	--	--	587	0.80	16.3	285	125	36	1.9	858	7.8	--
Nov. 4-30	14.4	--	--	--	--	88	--	214	293	--	--	--	--	665	.90	25.9	324	149	37	2.1	958	8.0	--
Dec. 1-31	265	12	0.00	102	35	108	5.9	248	380	31	0.4	1.8	0.16	868	1.18	621	400	197	37	2.4	1,200	7.9	10
Jan. 1-30, 1956	18.6	--	--	--	--	118	--	261	388	--	--	--	--	872	1.19	43.8	412	198	38	2.5	1,210	7.7	--
Jan. 31-Feb. 14	10.0	--	--	--	--	111	--	252	400	--	--	--	--	846	1.15	22.8	405	198	37	2.4	1,190	7.8	--
Feb. 15-29	12.0	--	--	--	--	120	--	266	425	--	--	--	--	907	1.23	29.4	432	214	38	2.5	1,270	8.0	--
Mar. 1-31	171	12	.00	99	40	109	5.5	242	390	34	.4	2.2	.12	873	1.19	403	413	215	36	2.3	1,200	8.0	6
Apr. 1-17	946	--	--	--	--	113	--	202	405	--	--	--	--	886	1.20	2,260	376	210	40	2.5	1,170	8.0	--
Apr. 18-30	20.5	--	--	--	--	102	--	178	360	--	--	--	--	806	1.10	44.6	333	187	40	2.4	1,070	7.7	--
May 1-17	463	--	--	--	--	104	--	181	368	--	--	--	--	753	1.02	941	336	188	40	2.5	1,080	7.7	--
May 18-20	3,283	--	--	--	--	68	--	182	260	--	--	--	--	557	.76	4,940	272	123	35	1.8	813	7.8	--
May 21-30	3,038	--	--	--	--	49	--	178	178	--	--	--	--	455	.62	3,730	240	94	31	1.4	679	8.0	--
May 31-June 18	2,535	13	.00	62	21	49	3.9	173	178	14	.3	.4	.08	442	.60	3,030	240	98	30	1.4	674	7.7	4
June 19-July 11	3,067	--	--	--	--	38	--	166	155	--	--	--	--	402	.55	3,330	257	121	24	1.0	600	8.0	--
July 12-30	4,722	--	--	--	--	39	--	167	148	--	--	--	--	399	.54	5,090	216	79	28	1.2	598	7.6	--
July 31-Aug. 28	4,124	--	--	--	--	37	--	162	148	--	--	--	--	362	.49	4,030	206	73	28	1.1	567	7.7	--
Aug. 29-Sept. 11	3,098	13	.04	50	15	34	3.3	156	123	10	.4	.3	.07	341	.46	2,850	188	60	28	1.1	516	7.7	--
Sept. 12-15	904	--	--	--	--	52	--	191	183	--	--	--	--	463	.63	1,130	250	93	31	1.4	704	7.6	--
Sept. 16-30	260	--	--	--	--	71	--	182	255	--	--	--	--	567	.77	398	284	135	35	1.8	844	7.6	--
Weighted average a	1,253	--	--	--	--	47	--	171	176	--	--	--	--	436	0.59	1,480	237	97	30	1.3	651	--	--

a Represents 100 percent of runoff for water year October 1955 to September 1956.

PLATTE RIVER BASIN--Continued

NORTH PLATTE RIVER BELOW GUERNSEY RESERVOIR, WYO.--Continued

Temperature (° F) of water, water year October 1955 to September 1956
/Once-daily measurement between 2 p.m. and 6 p.m./

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

PLATTE RIVER BASIN--Continued

LARAMIE RIVER NEAR UVA, WYO.

LOCATION.--At gaging station at private bridge, 7½ miles east of Uva, Platte County, and 9½ miles downstream from Chugwater Creek.
RECORDS AVAILABLE.--Water temperatures: October 1952 to September 1956.
Sediment records: October 1952 to September 1956.
EXTREMES, 1955-56.--Water temperatures: Minimum, freezing point on many days during November to March.
Sediment concentrations: Maximum daily, 1,530 ppm May 22; minimum daily, not determined.
Sediment loads: Maximum daily, 700 tons May 28; minimum daily, less than 0.50 ton Sept. 13-28.
EXTREMES, 1952-56.--Water temperatures: Minimum, freezing point on many days during winter months.
Sediment concentrations: Maximum daily, 7,720 ppm June 27, 1955; minimum daily, not determined.
Sediment loads: Maximum daily, 19,400 tons June 27, 1955; minimum daily, less than 0.50 ton Sept. 13-28, 1956.
REMARKS.--Flow affected by ice Nov. 15-19, 27-30, Dec. 3-20, Jan. 17-19, Jan. 21 to Feb. 3, Feb. 17-20, Mar. 13. Records of discharge for water year October 1955 to September 1956 given in WSP 1440.

Temperature (°F) of water, water year October 1955 to September 1956
/Once-daily measurement between 6 a.m. and 10 a.m./

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

a Measurement between 3 p.m. and 7 p.m.

PLATTE RIVER BASIN--Continued

LARAMIE RIVER NEAR UVA, WYO.--Continued

Suspended sediment, water year October 1955 to September 1956

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	3.4			50			64		
2	4.2			52			64		
3	6.0	66	1	52			60		
4	4.2			52			47		
5	5.5			52			52		
6	11			52			54		
7	13			52			54		
8	12			52			58		
9	13			52			60		
10	12			54			60		
11	12			60			62		
12	16			62			64		
13	15	79	3	58			60		
14	19			56			54		
15	19			37			54		
16	21			42	52	8	58	66	11
17	19			48			56		
18	21			52			56		
19	19			58			56		
20	19			66			60		
21	27			62			70		
22	27			62			72		
23	28			60			72		
24	27			58			68		
25	26			60			66		
26	30	44	4	58			64		
27	36			52			64		
28	36			53			64		
29	40			55			64		
30	48			58			62		
31	48			--		--	60		
Total	637.3	--	94	1,637		240	1,879		341

Day	January			February			March		
1	64			47			62		
2	62			52			62		
3	60			60			64		
4	60			70			64		
5	62			72			66		
6	60			74			66		
7	60			76			56		
8	60			76			54		
9	60			60			56	57	9
10	60			58			60		
11	60			60			58		
12	60			60			58		
13	62			62			60		
14	62			64			60		
15	60			62	52	9	58		
16	43	57	9	54			62		
17	45			56			66		
18	50			58			82	--	e 15
19	58			62			80	65	14
20	62			66			80	62	13
21	58			68			70	69	13
22	52			68			68	88	16
23	56			72			66	78	14
24	58			76			68	85	16
25	58			66			124	144	48
26	58			64			139	160	60
27	60			62			108	94	28
28	56			58			92	60	a 15
29	56			62			88	33	8
30	54			--		--	82	60	13
31	50			--		--	76	75	a 15
Total	1,786		279	1,845		261	2,255	--	441

e Estimated.

a Computed from estimated concentration graph.

PLATTE RIVER BASIN--Continued

LARAMIE RIVER NEAR UVA, WYO.--Continued

Suspended sediment, water year October 1955 to September 1956--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	72			52			31	180	a 15
2	68			52			26	165	12
3	70			48			23	130	8
4	72			48			15	87	4
5	68			50			12	--	e 3
6	62			50			7.0	105	2
7	60			50			4.2	--	e 2
8	60			50			3.4		
9	60			46			2.9		
10	60			42	59	7	2.7		
11	58			37			2.4		
12	56			37			2.3		
13	54			40			2.4		
14	54			43			2.4		
15	50			42			2.9		
		54	8						
16	48			38			2.4		
17	48			38			2.7		
18	48			36			3.2	101	1
19	48			22	--	e 6	2.7		
20	46			18	--	e 5	2.0		
21	46			22	99	6	2.0		
22	48			34	1,530	s 209	2.1		
23	48			28	578	s 53	2.3		
24	48			11	220	a 6	2.4		
25	46			8.5	158	4	2.4		
26	46			9.5	142	4	2.9		
27	44			45	380	sb 140	3.2		
28	43			181	1,300	sb 700	2.4		
29	44			62	274	46	6.0	213	s 5
30	48			42	190	a 22	5.0	140	a 2
31	--		--	36	180	a 17	--	--	--
Total	1,623		240	1,318.0	--	1,344	183.3	--	74

Day	July			August			September		
1	4.7	85	a 1	6.5	185	3	2.3		
2	7.0	86	2	9.5	220	sb 12	2.4		
3	76	1,000	sb 280	13	190	sb 8	2.4		
4	90	1,300	sb 360	7.5	120	a 2	2.9		
5	36	266	26	5.5	100	a 1	2.7		
6	9.0	200	sb 8	4.2	102	1	2.7	116	1
7	2.4			3.7	130	1	1.6		
8	2.4			3.7	128	1	1.7		
9	2.3			3.2	124	1	1.7		
10	2.0			5.0	118	2	1.6		
11	2.7			12	139	5	1.6		
12	2.0			9.5	127	3	1.3		
13	2.4			7.0	140	3	.9		
14	2.1			5.5	133	2	.9		
15	2.9			4.7	158	2	.7		
16	3.4			3.4	147	1	.6		
17	2.9			2.9	152	1	.6		
18	2.1	154	1	4.7	--	e 2	.8		
19	3.7			9.5			.7		
20	2.7			13			.6		
								79	(t)
21	2.0			16			.6		
22	1.8			15			.5		
23	1.8			15	149	6	.5		
24	2.0			13			.6		
25	1.8			16			.5		
26	1.8			18			.4		
27	2.0			16			.4		
28	2.3			4.2			.7		
29	6.0	180	sb 5	3.2	102	1	2.1	122	1
30	8.0	180	a 4	2.3			2.4	141	1
31	14	220	b 8	2.3			--	--	--
Total	302.2	--	716	255.0	--	109	39.4	--	16

Total discharge for year (cfs-days) 13,760.2
Total load for year (tons) 4,155

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

PLATTE RIVER BASIN--Continued

LARAMIE RIVER NEAR UVA, WYO.--Continued

Particle size analyses of suspended sediment, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet ; 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	
May 22, 1956.....	8:00 p.m.	44	60	12,500	3,470		60		100		--						PWCM
May 28.....	7:30 a.m.	251	60	1,640	1,010		66		86		96	100					VPWCM
July 3	9:30 a.m.	42	64	476	1,040		82		98		100						PWCM
July 4	6:30 a.m.	117	61	1,790	1,370		88		100		--						PWCM
July 31	11:35 a.m.	14	67	228	806		74		90		100						BWCM

Particle-size analyses of bed material, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet ; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed; V, visual accumulation tube)

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										
						0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	4.000	8.000	16.000	
July 3, 1956.....	5	42						6	8	11	50	73	80	84	87	92	SV
July 31	5	14						11	21	25	55	72	78	82	83	87	SV

SOUTH PLATTE RIVER BELOW SEWER OUTFALL AT DENVER, COLO.

LOCATION.--At York Street Bridge, 0.6 mile north of Denver, Denver County, 0.8 mile downstream from City of Denver sewer outfall, and 4.1 miles downstream from Cherry Creek.
RECORDS AVAILABLE.--Chemical analyses: September 1955 to May 1956 (discontinued).
Water temperatures: September 1955 to May 1956 (discontinued).
EXTREMES, September 1955 to May 1956.--Dissolved solids: Maximum, 768 ppm Feb. 24 to Mar. 23; minimum, 298 ppm May 9.
Hardness: Maximum, 246 ppm Dec. 1-31; minimum, 140 ppm May 22-28.
Specific conductance: Maximum daily, 1,560 micromhos Feb. 29; minimum daily, 494 micromhos May 27.
Water temperatures: Minimum, 38°F Feb. 1, 2.
REMARKS.--Discharge records at gaging station at Denver not applicable because much of the flow is diverted into Barr Lake. Records of specific conductance of daily samples available in district office at Lincoln, Nebr.

Chemical analyses, in parts per million, September 1955 to May 1956

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. 3-10, 1955		12	0.02	48	14	90	7.4	132	0	106	85	0.8	47	0.20	490	0.67		178	70	51	2.9	805	7.1
Sept. 11-18		13	.04	48	16	104	8.4	158	0	102	97	.8	64	.22	554	.75		184	54	54	3.3	897	6.9
Sept. 19-Oct. 4		15	.01	52	13	103	7.7	145	0	122	94	1.6	42	.28	531	.72		185	66	53	3.3	858	7.3
Oct. 6-31		15	.02	60	16	133	11	175	0	138	126	1.8	59	.31	648	.88		216	72	56	3.9	1,070	7.0
Nov. 1-30		16	.02	59	20	120	8.9	193	0	133	110	1.4	52	.30	616	.84		228	70	52	3.4	1,010	6.9
Dec. 1-31		19	.02	69	18	133	9.7	349	0	80	130	1.0	14	.28	654	.89		246	0	53	3.7	1,170	7.1
Jan. 1-13, 1956		19	.05	71	14	130	9.9	230	0	102	129	--	61	.37	673	.92		236	47	53	3.7	1,120	6.8
Jan. 14-31		21	.05	69	16	144	10	299	0	103	147	--	10	.38	691	.94		239	0	55	4.0	1,260	7.1
Feb. 1-23		19	.14	69	16	154	12	345	0	109	161	--	.4	.40	708	.96		237	0	57	4.4	1,310	7.0
Feb. 24-Mar. 23		18	.04	64	20	150	12	196	0	108	180	1.0	66	.35	768	1.04		241	80	56	4.2	1,310	7.3
Mar. 24-Apr. 20		15	.10	57	20	132	12	229	0	113	135	1.0	37	.36	662	.90		226	38	54	3.8	1,230	7.4
Apr. 21		14	.05	58	13	104	8.6	100	0	128	120	--	66	.24	562	.76		200	118	52	3.2	981	7.6
Apr. 22-27		18	.14	41	18	112	12	243	0	63	120	1.0	1.3	.37	559	.76		178	0	56	3.7	1,070	7.4
Apr. 28-May 8		13	.02	39	15	88	8.1	166	0	82	93	.9	23	.23	454	.62		160	24	53	3.0	805	7.4
May 9		--	--	42	10	44	3.0	120	0	69	50	--	3.8	.20	298	.41		146	48	39	1.6	506	8.0
May 10-14		12	.00	36	16	82	6.9	102	0	85	89	.8	44	.20	447	.61		155	71	52	2.9	739	7.7
May 15-21		9.5	.01	42	13	67	4.7	122	0	86	76	.7	17	.12	390	.53		160	60	47	2.3	671	7.3
May 22-28		11	.00	39	10	53	4.3	116	0	70	60	.6	12	.09	328	.45		140	45	44	2.0	554	7.4
May 29-31		12	.10	42	13	79	5.9	167	0	82	87	--	1.1	.15	422	.58		158	21	51	2.7	769	7.5

PLATTE RIVER BASIN --Continued

SOUTH PLATTE RIVER BELOW SEWER OUTFALL AT DENVER, COLO.--Continued

Temperature (° F) of water, September 1955
(Once-daily measurement between 2 p.m. and 3 p.m.)

Day	Sept.	Day	Sept.	Day	Sept.
1	--	11	a 68	21	70
2	--	12	74	22	64
3	--	13	72	23	68
4	74	14	72	24	68
5	73	15	73	25	58
6	a 73	16	73	26	64
7	74	17	69	27	66
8	74	18	71	28	66
9	72	19	--	29	66
10	72	20	a 69	30	68
Average					70

a Measurement between 10 a.m. and 1 p.m.

Temperature (° F) of water, October 1955 to May 1956
(Once-daily measurement between 2 p.m. and 4 p.m.)

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

a Measurement between 9 a.m. and 1 p.m.
b Measurement at 5 p.m.

SOUTH PLATTE RIVER AT HENDERSON, COLO.

LOCATION.--At gaging station at bridge on State Highway 22 (formerly State Highway 128) and 0.2 mile northwest of Henderson, Adams County.
DRAINAGE AREA.--4,740 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: July 1955 to September 1956.
Water temperatures: July 1955 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 801 ppm Apr. 1-10; minimum, 216 ppm June 1-10.
Hardness: Maximum, 366 ppm Dec. 4-10; minimum, 93 ppm June 1-10.
Specific conductance: Maximum daily, 1,360 micromhos Sept. 19; minimum daily, 287 micromhos June 6.
Water temperatures: Minimum, freezing point on many days during November to March.
EXTREMES, July 1955 to September 1956.--Dissolved solids: Maximum, 801 ppm Apr. 1-10, 1956; minimum, 216 ppm June 1-10, 1956.
Hardness: Maximum, 366 ppm Dec. 4-10, 1955; minimum, 93 ppm June 1-10, 1956.
Specific conductance: Maximum daily, 1,360 micromhos Sept. 19, 1956; minimum daily, 287 micromhos June 6, 1956.
Water temperatures: Maximum (July to September 1955), 80°F July 21, 22, 1955; minimum, freezing point on many days during winter months.
REMARKS.--Records of specific conductance of daily samples available in district office at Lincoln, Nebr. Records of discharge for water year October 1955 to September 1956 given in WSP 1440.

Chemical analyses, in parts per million, water year October 1955 to September 1956

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Phosphate (PO_4)	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, 1955	96.4	17	0.1	0.02	0.08	72	16	113		235	0	151	90	0.4	17	9.5	595	0.81	155	246	53	50	3.1	986	7.4
Oct. 11-20	66.2	19	.1	.06	.30	77	19	158		320	0	160	106	.4	44	12	754	1.03	135	270	8	56	4.2	1,160	7.6
Oct. 21-31	64.8	18	.1	.03	.00	85	19	114	8.4	242	0	198	82	.4	25	5.0	678	.92	119	290	92	45	2.9	1,050	8.0
Nov. 1-14	78.6	17	.1	.00	.00	90	18	106	7.4	246	0	205	68	.4	20	2.8	663	.90	141	298	95	43	2.7	1,010	7.8
Nov. 15	72	--	--	--	--	73	9.7	--	--	161	3	134	36	--	--	2.2	--	--	--	222	85	--	--	652	--
Nov. 16-21	62.7	18	.1	.02	.00	99	20	111	7.0	264	0	225	76	.4	24	2.3	719	.98	122	329	113	42	2.7	1,090	7.7
Nov. 22-Dec. 3	58.3	17	.1	.14	.00	93	18	95	5.2	214	10	212	61	1.0	22	2.9	633	.86	99.6	306	114	40	2.4	967	8.5
Dec. 4-10	45.3	21	.1	.05	.00	109	23	124	6.6	266	12	256	82	1.2	18	2.9	792	1.08	96.9	366	128	42	2.8	1,170	8.5
Dec. 11-20	53.0	19	.1	.05	.00	106	23	122	6.6	248	14	252	80	1.2	25	3.6	784	1.07	112	359	133	42	2.8	1,150	8.5
Dec. 21-31	45.6	18	.1	.03	.00	106	23	125	6.6	266	8	252	84	1.2	23	3.2	787	1.07	96.9	359	128	42	2.9	1,180	8.4
Jan. 1-10, 1956	46.4	18	.1	.07	.00	107	23	124	6.6	290	0	252	82	1.2	24	4.2	788	1.07	98.7	362	124	42	2.8	1,180	8.2
Jan. 11-20	41.0	18	.2	.03	.00	104	23	122	6.6	283	0	246	80	1.2	22	5.8	767	1.04	84.9	354	122	42	2.8	1,170	8.1
Jan. 21-31	49.4	17	.2	.18	.24	98	19	112	5.8	250	0	222	70	1.1	26	4.2	679	.92	90.6	322	117	42	2.7	1,080	8.1
Feb. 1, 3, 8-9	43.8	18	.2	.02	.00	93	18	96	5.2	232	0	215	70	.7	11	3.0	647	.88	76.5	306	116	40	2.4	1,010	8.2
Feb. 2, 4-7, 10	43.7	16	.1	.02	.00	58	9.2	41	2.4	126	0	113	33	.4	12	2.9	363	.49	42.8	182	79	32	1.3	563	8.2
Feb. 11-20	45.5	18	.2	.03	.00	91	18	95	5.2	240	0	206	64	.6	13	4.0	648	.88	79.6	301	104	40	2.4	994	8.1
Feb. 21-29	48.7	18	.1	.02	.00	104	23	125	6.8	297	0	247	82	.7	13	5.0	785	1.07	103	354	110	43	2.9	1,200	8.0
Mar. 1-10	44.9	18	.2	.03	.00	90	18	92	5.2	228	0	201	67	.6	17	5.0	628	.85	76.1	298	111	40	2.3	974	8.1
Mar. 11-20	46.0	16	.1	.00	.00	98	21	108	6.0	252	4	223	78	.7	17	4.8	688	.94	85.4	331	118	41	2.6	1,080	8.3
Mar. 21-31	52.0	19	.2	.02	.00	101	22	128	8.4	278	0	230	100	.9	26	9.5	798	1.09	112	342	114	44	3.0	1,230	7.4

PLATTE RIVER BASIN--Continued

SOUTH PLATTE RIVER AT HENDERSON, COLO.--Continued

Chemical analyses, in parts per million, water year October 1955 to September 1956--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Phosphate (PO_4)	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, 1956	31.4	20	0.1	0.02	0.00	99	23	125	8.0	270	0	221	103	0.9	29	9.0	801	1.09	67.9	342	121	44	3.0	1,240	7.1
Apr. 11-20	18.7	18	.2	.00	.00	94	21	134	8.6	252	0	206	113	1.0	31	8.5	753	1.02	38.0	321	114	47	3.3	1,210	8.0
Apr. 21-30	115	16	.2	.00	.00	62	16	111	9.0	215	0	133	95	1.0	24	11	582	.79	181	228	52	50	3.2	974	7.2
May 1-6	170	12	.1	.03	.00	54	17	85	6.2	186	0	114	83	.8	18	6.2	492	.67	226	204	52	46	2.6	822	7.3
May 7-10	298	12	.1	.02	.00	44	12	67	5.4	133	0	88	68	.6	14	4.6	390	.53	314	160	50	47	2.3	654	7.5
May 11-19	304	12	.1	.02	.00	48	12	70	5.4	135	0	107	72	.7	6.1	3.4	416	.57	341	170	59	46	2.3	684	7.9
May 20-31	829	11	.1	.05	.00	33	8.3	38	3.4	91	0	69	36	.6	4.6	1.1	260	.35	562	116	42	41	1.5	428	7.7
June 1-10	776	10	.0	.03	.00	26	6.8	34	2.8	73	0	59	31	.4	5.3	1.4	216	.29	453	93	33	43	1.5	364	7.4
June 11-20	587	10	.1	.02	.00	30	8.8	39	3.4	92	0	67	35	.4	6.1	2.3	248	.34	393	111	36	42	1.6	418	7.5
June 21-30	432	12	.1	.00	.00	33	9.2	46	3.6	74	0	75	44	.6	15	3.8	304	.41	355	116	56	44	1.9	482	8.1
July 1-5	415	12	.1	.02	.00	39	8.8	47	4.4	101	0	80	41	.6	14	3.6	321	.44	360	134	50	42	1.8	505	8.0
July 6-17	192	14	.1	.02	.00	48	13	71	5.8	138	0	102	67	.6	21	6.5	446	.61	231	174	60	46	2.3	703	8.0
July 18-28	118	17	.1	.02	.02	58	19	106	7.4	186	0	131	94	.8	24	9.0	580	.79	185	222	70	50	3.1	921	7.6
July 29-Aug. 3	1,010	15	.1	.02	.00	51	8.3	38	5.6	155	0	77	28	.6	4.0	1.0	324	.44	684	161	34	33	1.3	507	8.1
Aug. 4-16	98.4	19	.1	.03	.00	74	19	121	7.6	208	0	172	111	.8	28	8.6	704	.96	187	262	92	49	3.3	1,070	8.2
Aug. 17-21	224	16	.1	.00	.00	61	13	79	6.2	168	0	134	67	.8	15	4.0	507	.69	307	206	68	45	2.4	783	8.2
Aug. 22-31	102	19	.1	.03	.00	77	20	127	7.0	211	0	167	127	1.0	24	8.6	698	.95	192	274	101	49	3.3	1,050	7.6
Sept. 1-10	89.5	19	.2	.03	.10	80	18	147	9.2	242	0	168	129	1.0	34	15	752	1.02	182	274	75	53	3.9	1,160	7.6
Sept. 11-20	86.7	19	.2	.10	.15	78	19	159	10	315	0	161	126	.8	24	16	766	1.04	179	274	14	55	4.2	1,260	7.7
Sept. 21-30	78.7	20	.3	.08	.22	74	20	157	11	316	0	161	116	.8	7.0	18	755	1.03	180	266	8	55	4.2	1,270	7.5
Weighted average a.	170	14	0.1	0.03	0.01	51	12	67	5.1	b 147	--	108	56	0.6	12	4.0	413	0.56	190	176	55	44	2.2	658	--

a Includes estimates where data are missing. Represents 100 percent of runoff for water year October 1955 to September 1956.
b Includes carbonate as bicarbonate.

PLATTE RIVER BASIN--Continued

SOUTH PLATTE RIVER AT HENDERSON, COLO.--Continued

Temperature (° F) of water, water year October 1955 to September 1956
/Once-daily measurement between 7 a.m. and 9 a.m./

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

a Measurement at 6 a.m.

PLATTE RIVER BASIN--Continued

ST. VRAIN CREEK AT MOUTH, NEAR PLATTEVILLE, COLO.

LOCATION.--At gaging station at bridge on county road, 1.3 miles upstream from mouth and 4 miles northwest of Platteville, Weld County.
DRAINAGE AREA.--1,000 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: February 1955 to August 1956 (discontinued).
REMARKS.--Records of discharge for water year October 1955 to September 1956 given in WSP 1440.

Chemical analyses, in parts per million, October 1955 to August 1956

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				Hardness as $CaCO_3$		Per cent 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					
														Residue at 180°C	Sum									
Oct. 14, 1955...	64	19	0.06	125	78	148	9.7	384	590	31	1.1	1.6	0.34	1,280	1,190	1.74		634	319	33	2.6	1,660	7.5	
Nov. 15.....	69	16	.72	140	76	130	14	794	335	19	.8	.2	.29	1,100	1,120	1.50		663	12	29	2.2	1,670	7.7	
Jan. 4, 1956....	50	12	.02	122	82	143	4.4	400	585	25	1.2	6.9	.33	1,290	1,180	1.75		640	312	33	2.5	1,640	7.7	
Jan. 31	32	--	--	143	92	170	--	393	695	34	1.4	6.7	.30	1,510	--	2.05		735	413	33	2.7	1,890	7.6	
Feb. 21.....	45	--	--	134	90	147	--	362	650	24	1.2	7.1	.29	1,400	--	1.90		705	408	31	2.4	1,750	7.6	
Mar. 19.....	68	9.6	.00	135	89	161	5.0	370	675	27	1.2	8.4	.30	1,440	1,290	1.96		704	401	33	2.6	1,800	7.6	
May 1	43	--	--	99	71	126	--	294	520	25	1.1	5.1	.34	1,090	--	1.48		538	297	33	2.4	1,440	7.9	
May 31.....	131	--	--	84	48	83	--	230	360	15	.9	5.9	.19	785	--	1.07		406	217	30	1.8	1,080	7.5	
July 12.....	90	13	.01	110	73	123	5.4	298	545	21	1.2	9.5	.28	1,150	1,050	1.56		575	331	31	2.2	1,510	7.9	
Aug. 10.....	75	--	--	123	82	138	--	322	610	25	1.2	9.8	.34	1,280	--	1.74		644	380	32	2.4	1,630	7.7	

BIG THOMPSON RIVER AT MOUTH, NEAR LA SALLE, COLO.

LOCATION.--At highway bridge, 0.7 mile downstream from gaging station, 0.9 mile upstream from mouth, and about 3.5 miles west of La Salle, Weld County.
DRAINAGE AREA.--818 square miles.
RECORDS AVAILABLE.--Chemical analyses: August 1954 to July 1956 (discontinued).
REMARKS.--Records of discharge for water year October 1955 to September 1956 given in WSP 1440.

Chemical analyses, in parts per million, October 1955 to July 1956

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				Hardness as $CaCO_3$		Per cent 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					
														Residue at 180°C	Sum									
Oct. 14, 1955...	51	16	0.03	203	128	198	4.4	348	1,140	22	1.1	6.8	0.45	2,060	1,890	2.80		1,030	745	29	2.7	2,350	7.8	
Nov. 21.....	60	15	.20	196	117	166	10	400	950	21	1.0	.1	.39	1,860	1,670	2.53		970	642	27	2.3	2,190	7.7	
Dec. 19.....	45	13	.28	218	118	180	11	408	1,040	22	1.0	.1	.37	1,990	1,800	2.71		1,030	695	27	2.4	2,320	7.5	
Jan. 23, 1956...	37	--	--	--	--	206	--	405	1,230	24	--	--	.48	--	--	--		1,170	838	28	2.6	2,580	7.5	
Feb. 21.....	27	--	--	--	--	228	--	447	1,300	28	--	--	.45	--	--	--		1,210	843	29	2.9	2,750	7.5	
Mar. 19.....	39	9.2	.02	225	160	235	6.9	377	1,280	27	1.2	9.4	.45	2,440	2,140	3.32		1,220	911	29	2.9	2,720	7.3	
May 1.....	4.2	--	--	169	116	157	--	570	713	24	.8	.1	.35	1,650	--	2.24		898	431	27	2.3	2,080	8.2	
May 31.....	110	--	--	77	45	74	--	176	370	11	--	.2	.16	735	--	1.00		378	234	30	1.7	1,050	7.3	
July 12.....	132	7.5	.01	69	38	60	7.9	154	318	7.5	.5	4.8	.13	625	--	.85		328	202	28	1.4	895	7.4	

PLATTE RIVER BASIN--Continued

CACHE LA POUDRE RIVER NEAR GREELEY, COLO.

LOCATION.--At gaging station at highway bridge, 3 miles east of courthouse in Greeley, Weld County, and 3 miles upstream from mouth.
DRAINAGE AREA.--1,840 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: August 1954 to August 1956 (discontinued).
REMARKS.--Records of discharge for water year October 1955 to September 1956 given in WSP 1440.

Chemical analyses, in parts per million, October 1955 to August 1956

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				Hardness as $CaCO_3$		Per cent 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					
														Residue at 180°C	Sum									
Oct. 15, 1955...	49	23	0.13	180	88	137	11	392	715	31	1.0	0.2	0.36	1,470	1,380	2.00		810	489	27	2.1	1,880	7.5	
Nov. 12.....	66	19	.75	201	86	133	16	1,210	166	23	.8	.0	.38	1,350	1,240	1.84		854	0	25	2.0	1,980	7.5	
Dec. 19.....	64	25	1.1	198	83	126	14	1,150	199	22	.8	.2	.33	1,220	1,240	1.66		836	0	24	1.9	1,930	7.5	
Jan. 23, 1956...	58	--	--	--	--	126	--	372	700	26	--	--	--	--	--	--		795	490	26	1.9	1,800	7.5	
Feb. 21.....	49	--	--	--	--	125	--	425	630	29	--	--	--	--	--	--		780	431	26	1.9	1,780	7.2	
Mar. 19.....	65	15	.12	173	83	128	5.4	384	670	30	.7	.2	.33	1,410	1,270	1.92		772	457	26	2.0	1,770	7.3	
May 1.....	25	--	--	102	52	76	--	210	435	14	.6	5.5	.18	860	--	1.17		470	298	26	1.5	1,150	7.3	
July 12.....	9.8	16	.00	198	80	133	6.6	372	740	31	.8	12	.34	1,550	1,400	2.10		825	520	26	2.0	1,900	7.7	
Aug. 8.....	16	--	--	184	86	139	--	344	750	29	.9	12	.35	1,540	--	2.09		812	530	27	2.1	1,860	8.0	

SOUTH PLATTE RIVER NEAR KERSEY, COLO.

LOCATION.--At gaging station at bridge on State Highway 37, 1.9 miles north of railroad in Kersey, Weld County, and 2½ miles downstream from Cache la Poudre River.
DRAINAGE AREA.--9,500 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1953, August 1954 to September 1956.
Water temperatures: December 1950 to September 1953.
REMARKS.--Records of discharge for water year October 1955 to September 1956 given in WSP 1440.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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				Hardness as $CaCO_3$		Per cent 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					
														Residue at 180°C	Sum									
Oct. 17, 1955	224	--	--	170	77	149	--	372	670	36	--	--	--	1,430	--	1.94		740	435	30	2.4	1,800	7.7	
Nov. 12	404	17	0.16	158	72	142	9.7	538	515	34	1.0	0.1	0.28	1,270	1,210	1.73		690	249	31	2.4	1,720	7.6	
Dec. 19	367	17	.25	169	65	138	10	546	500	42	.8	.1	.26	1,230	1,210	1.67		690	242	30	2.3	1,720	7.6	
Jan. 23, 1956	332	--	--	--	--	142	--	354	580	53	--	--	--	--	--	--		675	385	31	2.4	1,700	7.5	
Feb. 21	285	--	--	--	--	146	--	364	570	58	--	--	--	--	--	--		665	367	32	2.5	1,750	7.4	
Mar. 19	351	13	.00	150	70	144	5.4	329	600	50	1.1	14	.27	1,320	1,210	1.80		664	394	32	2.4	1,700	7.3	
May 1	97	--	--	136	65	118	--	254	590	30	--	--	--	1,160	--	1.58		606	398	30	2.1	1,510	7.4	
May 31	1,240	--	--	60	23	41	--	137	200	15	--	--	--	452	--	.61		246	134	26	1.1	674	7.2	
July 12	202	14	.00	128	56	110	5.4	250	515	29	.9	8.7	.22	1,080	990	1.47		550	345	30	2.0	1,430	7.8	
Aug. 8	115	19	.00	167	71	136	6.0	326	665	40	1.0	11	.29	1,380	1,280	1.88		708	441	29	2.2	1,750	7.6	
Sept. 6	99	--	--	164	74	141	--	304	690	39	--	--	--	1,410	--	1.92		712	463	30	2.3	1,770	7.5	

PLATTE RIVER BASIN--Continued

KIOWA CREEK AT KIOWA, COLO.

LOCATION.--At gaging station, at cableway 0.7 mile upstream from bridge on State Highway 86 and 0.7 mile south of Kiowa, Elbert County.
DRAINAGE AREA.--111 square miles.
RECORDS AVAILABLE.--Sediment records: April to September 1956.
EXTREMES, April to September 1956.--Sediment concentrations: Maximum daily, 15,000 ppm Aug. 1; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 43,000 tons July 31; minimum daily, 0 tons on many days.
REMARKS.--Maximum observed sediment concentration during period April to September, 90,000 ppm July 31. Records of discharge for water year October 1955 to September 1956 given in WSP 1440.

Suspended sediment, April to September 1956

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	--	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				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				89	8,000	s 8,400	0	--	0
24				.2	--	(t)	0	--	0
25				.1	120	(t)	0	--	0
26				0	--	0	0	--	0
27				.1	--	(t)	.7	1,100	s 370
28				0	--	0	4.4	3,900	s 360
29				0	--	0	0	--	0
30				0	--	0	0	--	0
31				0	--	0	--	--	--
Total	0		0	89.4	--	8,401	5.1	--	730

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

PLATTE RIVER BASIN--Continued

KIOWA CREEK AT KIOWA, COLO.--Continued

Suspended sediment, April to September 1956--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	116	15,000	s 11,000			
2.....	20	3,800	s 1,600	.6		(t)			
3.....	.4	--	(t)	.3		(t)			
4.....	.2	--	(t)	.2		(t)			
5.....	.1	--	(t)	.1		(t)			
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	.1		(t)			
12.....	0	--	0	.1		(t)			
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	.1		(t)			
19.....	0	--	0	.1		(t)			
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.....	0	--	0	0		0			
26.....	0	--	0	0		0			
27.....	0	--	0	0		0			
28.....	0	--	0	0		0			
29.....	0	--	0	0		0			
30.....	0	--	0	0		0			
31.....	264	11,000	s 43,000	0		0			
Total.	284.7	--	44,601	117.6		11,001	0		0

Total discharge for period Apr. 1 to Sept. 30, 1956 (cfs-days)..... 496.8
Total load for period Apr. 1 to Sept. 30, 1956 (tons)..... 64,733

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

PLATTE RIVER BASIN--Continued

KIOWA CREEK AT KIOWA, COLO.--Continued

Particle-size analyses of suspended sediment, April to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; 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	
May 23, 1956....	1:40 a.m.	0.6	50	42,900	5,780	46	57	70	82	92	96	98	100	--	--	--	SPWCM
May 23.....	2:14 a.m.	848	48	51,800	4,000	--	33	--	52	--	75	80	89	99	100	--	SPWCM
May 23.....	2:15 a.m.	757	--	51,600	4,550	--	34	--	54	--	78	84	93	99	100	--	SPWCM
May 23.....	2:55 a.m.	718	--	41,600	2,660	--	35	--	52	--	70	73	82	95	99	100	SPWCM
May 23.....	4:55 a.m.	42	--	20,900	3,730	--	50	--	67	--	83	86	93	98	99	100	SPWCM
May 23.....	8:30 a.m.	24	55	6,860	1,360	--	63	--	80	--	91	93	96	99	100	--	SPWCM
May 23.....	1:45 p.m.	8.2	74	2,060	2,470	49	62	74	83	91	96	97	99	100	--	--	SPNM
June 27.....	11:40 p.m.	170	--	65,500	2,210	--	37	--	53	--	79	85	93	100	--	--	SPWCM
June 27.....	11:55 p.m.	163	--	50,600	7,690	--	45	--	69	--	93	96	99	100	--	--	VPWCM
June 28.....	12:45 a.m.	24	55	24,800	5,270	--	54	--	78	--	94	96	98	100	--	--	VPWCM
June 28.....	4:15 a.m.	.3	53	6,380	3,000	--	71	--	92	--	100	--	--	--	--	--	SPWCM
July 2	2:25 p.m.	366	--	54,900	7,050	--	35	--	51	--	80	88	97	99	100	--	VPWCM
July 2	5:05 p.m.	5.8	52	8,480	4,720	--	62	--	82	--	96	97	98	100	--	--	SPWCM
July 31	6:25 p.m.	2,520	--	90,000	3,650	--	33	--	48	--	70	78	89	96	99	100	SPWCM
July 31	8:55 p.m.	170	--	27,900	5,080	42	50	59	70	80	87	92	98	100	--	--	VPWCM
July 31	9:45 p.m.	50	--	22,800	5,540	--	58	--	76	--	90	92	94	97	99	100	SPWCM
Aug. 1.....	12:30 a.m.	848	--	52,000	3,040	--	33	--	48	--	64	68	79	95	99	100	SPWCM
Aug. 1.....	9:20 a.m.	22	--	6,350	3,060	--	71	--	89	--	97	98	99	100	--	--	SPWCM
Aug. 1.....	11:35 a.m.	333	--	57,700	3,610	--	39	--	59	--	84	88	95	99	100	--	SPWCM
Aug. 1.....	12:05 p.m.	292	--	45,800	3,630	--	36	--	50	--	66	69	72	86	97	99	SPWCM

KIOWA CREEK AT KIOWA, COLO.--Continued

Particle-size analyses of bed material, April to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet ; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed; V, visual accumulation tube)

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									
						0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	4.000	8.000	16.000	
May 23, 1956.....	4	7.0						0	1	6	44	81	93	99	100		SV
Aug. 1.....	5	9.0						0	5	39	76	90	97	99	100		SV

PLATTE RIVER BASIN--Continued

BIJOU CREEK NEAR WIGGINS, COLO.

LOCATION.--At gaging station at bridge on U. S. Highways 6 and 34, 2 miles northeast of Wiggins, Morgan County, and 5.7 miles downstream from Antelope Creek.
DRAINAGE AREA.--1,420 square miles, approximately.
RECORDS AVAILABLE.--Sediment records: April 1950 to June 1956 (discontinued).
EXTREMES, October 1955 to June 1956.--Sediment concentrations: Maximum daily, 2,320 ppm June 17; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 207 tons June 17; minimum daily, 0 tons on many days.
EXTREMES, 1950-56.--Sediment concentrations: Maximum daily, 127,000 ppm July 30, 1950; minimum daily, no flow on many days each year.
Sediment loads: Maximum daily, 2,500,000 tons Aug. 3, 1951; minimum daily, 0 tons on many days each year.
REMARKS.--Maximum observed sediment concentration during water year, 12,400 ppm June 17. No flow during period October to March; record is ommitted. Records of discharge for water year October 1955 to September 1956 given in WSP 1440.

Suspended sediment, April to June 1956

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
2							0	--	0
3							0	--	0
4							0	--	0
5							0	--	0
6							0	--	0
7							0	--	0
8							0	--	0
9							0	--	0
10							0	--	0
11							0	--	0
12							0	--	0
13							0	--	0
14							0	--	0
15							0	--	0
16							0	--	0
17							8.0	2,320	s 207
18							.5	496	s 3
19							0	--	0
20							0	--	0
21							0	--	0
22							0	--	0
23							0	--	0
24							0	--	0
25							0	--	0
26							0	--	0
27							0	--	0
28							0	--	0
29							0	--	0
30							0	--	0
31							--	--	--
Total	0		0	0		0	8.5	--	210

Total discharge for period Oct. 1, 1955, to June 30, 1956 (cfs-days) 8.5
Total load for period Oct. 1, 1955, to June 30, 1956 (tons) 210

s Computed by subdividing day.

SOUTH PLATTE RIVER AT BALZAC, COLO.

LOCATION.--At gaging station at highway bridge at Balzac siding and 2¾ miles northeast of Union, Morgan County.
DRAINAGE AREA.--17,700 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: January 1950 to September 1951, August 1954 to September 1956.
REMARKS.--Records of discharge for water year October 1955 to September 1956 given in WSP 1440.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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: Parts per million: Residue at 180°C	Dissolved solids: Parts per million: Sum	Dissolved solids: Tons per acre-foot	Dissolved solids: 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. 15, 1955...	125	--	--	183	66	161	--	322	735	51	--	--	--	1,490	--	2.03		726	462	32	2.6	1,850	7.9	
Nov. 22.....	3.5	17	0.01	189	59	150	8.2	301	715	53	0.9	1.7	0.21	1,440	1,340	1.96		713	466	31	2.4	1,820	7.9	
Dec. 20.....	2.8	14	.03	185	57	146	8.0	293	710	51	.8	1.3	.22	1,410	1,320	1.92		697	457	31	2.4	1,770	7.8	
Jan. 24, 1956...	2.6	---	--	188	56	150	--	278	685	54	--	--	--	1,410	--	1.92		700	472	32	2.5	1,780	7.8	
Feb. 22.....	4.0	--	--	--	--	146	--	236	665	53	--	--	--	--	--	--		652	458	33	2.5	1,680	7.8	
Mar. 20.....	3.5	14	.00	158	57	147	7.3	196	680	54	.6	1.9	.23	1,330	1,220	1.81		628	467	33	2.5	1,690	7.3	
May 2.....	141	--	--	191	60	157	--	303	730	54	--	--	--	1,440	--	1.96		722	474	31	2.5	1,830	8.1	
July 13.....	125	18	.01	162	65	152	8.7	260	700	56	1.0	3.7	.28	1,410	1,290	1.92		670	457	33	2.6	1,810	7.9	
Aug. 9.....	127	--	--	194	61	150	--	301	745	54	--	--	--	1,470	--	2.00		736	489	30	2.4	1,870	7.9	
Sept. 6.....	178	18	.00	175	71	170	9.0	276	765	61	1.0	4.7	.32	1,540	1,410	2.09		728	502	33	2.7	1,920	7.8	

PLATTE RIVER BASIN--Continued

SOUTH PLATTE RIVER NEAR CROOK, COLO.

LOCATION.--At gaging station, 0.4 mile upstream from bridge on State Highway 25 and 1 mile south of Crook, Logan County.
DRAINAGE AREA.--19,500 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: September 1955 to September 1956.
REMARKS.--Records of discharge for water year October 1955 to September 1956 given in WSP 1440.

Chemical analyses, in parts per million, September 1955 to September 1956

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: Parts per million, Residue at 180°C	Dissolved solids: Parts per million, Sum	Dissolved solids: Tons per acre-foot	Dissolved solids: 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
Sept. 23, 1955...	11	31	0.04	193	58	241	17	270	935	78	0.8	0.1	0.32	1,740	1,690	2.37		722	501	41	3.9	2,200	7.9	
Oct. 19.....	28	28	.00	203	61	229	17	309	890	75	.9	.5	.34	1,740	1,670	2.37		756	503	39	3.6	2,180	8.2	
Dec. 5.....	61	30	.02	220	63	210	17	367	875	67	.7	1.6	.31	1,750	1,670	2.38		810	509	35	3.2	2,190	7.4	
Jan. 5, 1956	39	34	.06	207	54	178	16	297	790	66	.6	2.6	.27	1,570	1,490	2.14		737	493	34	2.9	1,970	7.9	
Feb. 6.....	150	27	.01	208	60	202	17	319	813	65	.8	2.2	.32	1,650	1,550	2.24		765	503	36	3.2	2,090	7.8	
Mar. 19	11	27	.00	196	52	192	13	286	780	61	.5	2.3	.25	1,540	1,470	2.09		704	469	37	3.1	1,960	7.7	
May 2	6.0	23	.04	194	50	194	13	258	810	67	.6	14	.25	1,580	1,490	2.15		691	479	37	3.2	1,990	8.1	
May 30	6.8	24	.00	186	56	206	14	278	813	70	.6	.0	.30	1,600	1,510	2.18		696	468	39	3.4	2,040	8.1	
June 27.....	16	27	.00	197	55	213	14	a 284	850	73	.8	1.0	.33	1,650	1,570	2.24		716	483	39	3.5	2,110	8.2	
July 13	16	27	.01	195	58	216	16	280	838	74	.8	.7	.44	1,680	1,560	2.28		724	494	39	3.5	2,130	8.0	
Aug. 13.....	22	29	.00	205	53	224	16	305	875	73	.8	1.6	.41	1,700	1,630	2.31		728	478	39	3.6	2,170	8.0	
Sept. 28	9.0	27	.00	192	59	236	16	270	895	81	.8	.3	.35	1,720	1,640	2.34		722	501	41	3.8	2,200	7.9	

a Includes equivalent of 5 ppm of carbonate (CO_3).

PLATTE RIVER BASIN--Continued

SOUTH PLATTE RIVER AT JULESBURG, COLO.

LOCATION.--At gaging station at bridge on State Highway 51, 0.5 mile southeast of Julesburg, Sedgwick County, 3 miles (revised) upstream from Colorado-Nebraska State line, and 8 miles downstream from Lodgepole Creek.
DRAINAGE AREA.--22,800 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1956.
Water temperatures: October 1945 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 1,600 ppm Jan. 31 to Feb. 15; minimum, 429 ppm June 18.
Hardness: Maximum, 757 ppm Dec. 1-31; minimum, 202 ppm June 18.
Specific conductance: Maximum daily, 2,160 micromhos Feb. 2; minimum daily, 628 micromhos June 18.
Water temperatures: Maximum, 88°F July 14; minimum, freezing point Jan. 16, 31, Feb. 1, 2.
EXTREMES, 1945-56.--Dissolved solids: Maximum, 1,660 ppm Apr. 13, 1955; minimum, 429 ppm June 18, 1956.
Hardness: Maximum, 846 ppm Feb. 20, 1955; minimum, 173 ppm Mar. 1-12, 1947.
Specific conductance: Maximum daily, 2,350 micromhos Apr. 13, 1955; minimum daily, 617 micromhos Aug. 19, 1953.
Water temperatures: Maximum (1946-49, 1950-56), 93°F July 28, Aug. 1, 1953; minimum, freezing point on many days during winter months.
REMARKS.--Records of specific conductance of daily samples available in district office at Lincoln, Nebr. Records of discharge for water year October 1955 to September 1956 given in WSP 1440.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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: Parts per million: Residue at 180°C	Dissolved solids: Parts per million: Sum	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Per cent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
Oct. 1-31, 1955..	47.9	--	--	--	--	170	--	375	--	--	--	--	--	1,490	--	2.03	193	711	403	34	2.8	1,910	7.5	--
Nov. 1-30.....	99.9	--	--	--	--	174	--	401	--	--	--	--	--	1,540	--	2.09	415	749	420	34	2.8	1,990	7.3	--
Dec. 1-31.....	114	41	0.00	221	50	173	18	388	705	72	0.4	3.9	0.26	1,560	1,480	2.12	480	757	439	33	2.7	1,990	7.5	7
Jan. 1-30, 1956..	129	--	--	--	--	178	--	302	--	--	--	--	--	1,530	--	2.08	533	724	476	35	2.9	1,940	7.6	--
Jan. 31-Feb. 15 .	178	--	--	--	--	190	--	310	--	--	--	--	--	1,600	--	2.18	769	739	485	36	3.0	2,020	7.8	--
Feb. 16-29.....	211	--	--	--	--	183	--	303	--	--	--	--	--	1,540	--	2.09	877	726	478	35	3.0	1,970	7.8	--
Mar. 1-16	162	--	--	--	--	179	--	292	--	--	--	--	--	1,500	--	2.04	656	702	463	36	2.9	1,910	7.9	--
Mar. 17-31	113	36	.00	181	48	161	14	276	670	63	.6	3.0	.22	1,390	1,310	1.89	424	650	424	34	2.7	1,800	8.0	6
Apr. 1-15.....	71.3	--	--	--	--	154	--	277	--	--	--	--	--	1,470	--	2.00	283	650	423	34	2.6	1,770	8.0	--
Apr. 16-30.....	26.9	--	--	--	--	155	--	258	--	--	--	--	--	1,440	--	1.96	105	638	426	35	2.7	1,760	7.9	--
May 1-26	26.4	--	--	--	--	148	--	243	--	--	--	--	--	1,380	--	1.88	98.4	621	422	34	2.6	1,790	7.9	--
May 27	47	--	--	--	--	64	--	142	--	--	--	--	--	564	--	.77	71.6	257	141	35	1.7	800	7.8	--
May 28-June 17..	41.1	--	--	--	--	146	--	263	--	--	--	--	--	1,400	--	1.90	155	660	444	32	2.5	1,810	8.0	--
June 18	265	--	--	--	--	42	--	152	--	--	--	--	--	429	--	.58	307	202	77	31	1.3	628	7.4	--
June 19-July 18..	29.9	35	.00	173	44	156	17	233	638	62	.7	2.9	.24	1,320	1,240	1.80	107	612	421	35	2.7	1,730	8.1	6
July 19-31	21.1	--	--	--	--	148	--	232	--	--	--	--	--	1,360	--	1.85	77.5	623	433	34	2.6	1,750	7.7	--
Aug. 1.....	24	--	--	--	--	51	--	180	--	--	--	--	--	495	--	.67	32.1	254	106	30	1.4	738	7.6	--
Aug. 2.....	89	--	--	--	--	88	--	171	--	--	--	--	--	776	--	1.06	186	362	222	34	2.0	1,080	7.7	--
Aug. 3-31.....	29.1	--	--	--	--	150	--	256	--	--	--	--	--	1,410	--	1.92	111	650	440	33	2.6	1,800	8.0	--
Sept. 1-13.....	17.5	45	.00	183	43	154	23	228	713	65	.6	10	.24	1,370	1,350	1.86	64.7	634	447	34	2.7	1,760	8.2	10
Sept. 14-17	14.5	--	--	--	--	106	--	212	--	--	--	--	--	1,160	--	1.58	45.4	552	378	29	2.0	1,470	7.8	--
Sept. 18-27	15.1	--	--	--	--	153	--	248	--	--	--	--	--	1,440	--	1.96	58.7	661	458	34	2.6	1,840	7.9	--
Sept. 28-30	15.0	--	--	--	--	150	--	264	--	--	--	--	--	1,390	--	1.89	56.3	647	431	34	2.6	1,770	7.8	--
Weighted average a	76.3	--	--	--	--	170	--	314	--	--	--	--	--	1,490	--	2.03	307	701	444	35	2.8	1,900	--	--

a Represents 100 percent of runoff for water year October 1955 to September 1956.

PLATTE RIVER BASIN--Continued

SOUTH PLATTE RIVER AT JULESBURG, COLO.--Continued

Temperature (° F) of water, water year October 1955 to September 1956
/Once-daily measurement between 2 p.m. and 5 p.m./

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

a Measurement between 9 a.m. and 1 p.m.
b Measurement between 6 p.m. and 8 p.m.

PLATTE RIVER AT BRADY, NEBR.

LOCATION.--At gaging stations at highway bridges, half a mile and 2½ miles south of Brady, Lincoln County, and 18 miles downstream from confluence of North Platte and South Platte Rivers.
DRAINAGE AREA.--56,900 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: November 1950 to September 1956.
Water temperatures: March 1951 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 488 ppm Nov. 28 to Dec. 1; minimum, 301 ppm Jan. 13.
Hardness: Maximum, 235 ppm Nov. 28 to Dec. 1; minimum, 156 ppm Jan. 13.
Specific conductance: Maximum daily, 790 micromhos Nov. 30 (chan. 1); minimum daily, 305 micromhos Jan. 13 (chan. 1).
Water temperatures: Maximum, 77°F July 14 (chan. 1); minimum, freezing point on many days during November to March.
EXTREMES, 1951-56.--Dissolved solids: Maximum, 896 ppm Feb. 19-22, 1953; minimum, 278 ppm Nov. 26, 1952.
Hardness: Maximum, 333 ppm Feb. 19-22, 1953; minimum, 151 ppm June 8, 1951.
Specific conductance: Maximum daily, 1,070 micromhos Feb. 19, 1953 (chan. 1); minimum daily, 305 micromhos Jan. 13, 1956 (chan. 1).
Water temperatures: Maximum, 90°F July 19, 20, 1951 (chan. 1); minimum, freezing point on many days during winter months.
REMARKS.--Daily samples for chemical analysis from each of two major channels composited by discharge. Composite periods normally identical to those of Supply Canal (Tri-County Diversion) near Maxwell, Nebr. Records of specific conductance of daily samples, taken at each of the two major channels, available in district office at Lincoln, Nebr. Records of discharge for water year October 1955 to September 1956 given in WSP 1440.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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 (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. 1-31, 1955....	138	--	--	--	--	53	--	222	109	--	--	--	--	416	0.57	155	190	8	38	1.7	616	8.1	--
Nov. 1-15.....	145	--	--	--	--	52	--	221	107	--	--	--	--	413	.56	162	194	13	37	1.6	602	7.8	--
Nov. 16-19.....	151	--	--	--	--	62	--	254	131	--	--	--	--	483	.66	197	224	16	38	1.8	698	7.9	--
Nov. 20-27.....	211	--	--	--	--	51	--	212	104	--	--	--	--	396	.54	226	188	14	37	1.6	582	7.6	--
Nov. 28-Dec. 1....	132	--	--	--	--	58	--	268	120	--	--	--	--	488	.66	174	235	15	35	1.6	707	8.0	--
Dec. 2-16.....	185	47	0.00	57	15	52	9.2	231	111	14	0.4	1.8	0.11	421	.57	210	204	15	34	1.6	621	7.9	3
Dec. 17-Jan. 12, 1956.....	213	--	--	--	--	47	--	216	97	--	--	--	--	392	.53	225	192	15	35	1.5	583	7.9	--
Jan. 13	163	--	--	--	--	30	--	190	59	--	--	--	--	301	.41	132	156	0	30	1.0	446	7.8	--
Jan. 14-16	131	--	--	--	--	45	--	221	98	--	--	--	--	389	.53	138	189	8	34	1.4	579	7.9	--
Jan. 17-20	130	--	--	--	--	58	--	248	117	--	--	--	--	477	.65	167	219	16	37	1.7	685	7.8	--
Jan. 21-Feb. 13 ...	155	--	--	--	--	46	--	218	102	--	--	--	--	399	.54	167	196	17	34	1.4	587	8.1	--
Feb. 14-29.....	183	--	--	--	--	41	--	209	92	--	--	--	--	371	.50	183	185	14	32	1.3	548	8.1	--
Mar. 1-5	210	--	--	--	--	30	--	192	62	--	--	--	--	323	.44	183	163	6	29	1.0	463	8.0	--
Mar. 6-11.....	182	--	--	--	--	36	--	203	84	--	--	--	--	349	.47	171	180	14	30	1.2	518	8.0	--
Mar. 12-13.....	184	--	--	--	--	46	--	223	106	--	--	--	--	400	.54	199	204	21	33	1.4	599	8.0	--
Mar. 14-21.....	173	42	.00	50	10	32	8.0	194	72	9.5	.4	1.4	.09	323	.44	151	168	9	28	1.1	479	7.9	7
Mar. 22.....	179	--	--	--	--	47	--	202	120	--	--	--	--	408	.55	197	199	33	34	1.4	602	8.2	--
Mar. 23-28.....	140	--	--	--	--	40	--	210	89	--	--	--	--	365	.50	138	180	8	33	1.3	540	8.1	--
Mar. 29.....	161	--	--	--	--	52	--	a 230	125	--	--	--	--	452	.61	196	219	30	34	1.5	650	8.2	--

a Includes equivalent of 6 ppm of carbonate (CO_3).

PLATTE RIVER BASIN--Continued

PLATTE RIVER AT BRADY, NEBR.--Continued

Chemical analyses, in parts per million, water year October 1955 to September 1956--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					
Mar. 30-Apr. 29, 1956	167	--	--	--	--	43	--	221	106	--	--	--	--	408	0.55	184	203	22	32	1.3	600	8.0	--
Apr. 30-May 24	161	--	--	--	--	48	--	219	119	--	--	--	--	422	.57	183	202	22	34	1.5	618	7.9	--
May 25-June 16	129	--	--	--	--	52	--	222	110	--	--	--	--	428	.58	149	199	17	36	1.6	630	8.0	--
June 17-20	1,271	--	--	--	--	51	--	191	118	--	--	--	--	404	.55	1,390	180	23	38	1.7	601	7.9	--
June 21-July 3	209	46	0.00	56	14	54	11	230	103	15	0.6	0.8	0.12	423	.58	239	198	9	36	1.7	632	8.2	5
July 4-31	896	--	--	--	--	67	--	227	135	--	--	--	--	444	.60	1,070	187	1	44	2.1	671	8.1	--
Aug. 1-31	569	--	--	--	--	65	--	223	128	--	--	--	--	428	.58	658	180	0	44	2.1	648	8.1	--
Sept. 1-30	109	43	.00	43	20	61	9.1	218	131	17	.5	1.0	.16	434	.59	128	190	11	40	1.9	643	8.0	2
Weighted average b	264	--	--	--	--	56	--	220	118	--	--	--	--	419	0.57	299	189	9	39	1.8	626	--	--

b Represents 100 percent of runoff for water year October 1955 to September 1956.

PLATTE RIVER BASIN--Continued

PLATTE RIVER AT BRADY, NEBR.--Continued

CHANNEL 1

Temperature (° F) of water, water year October 1955 to September 1956
/Once-daily measurement between 8 a.m. and 9 a.m./

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

a Measurement between 10 a.m. and 12 m.
b Measurement between 1 p.m. and 3 p.m.

PLATTE RIVER BASIN--Continued

PLATTE RIVER AT BRADY, NEBR.--Continued

CHANNEL 4

Temperature (° F) of water, water year October 1955 to September 1956
/Once-daily measurement between 8 a.m. and 9 a.m./

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

a Measurement between 10 a.m. and 12 m.
b Measurement between 1 p.m. and 2 p.m.

SUPPLY CANAL (TRI-COUNTY DIVERSION) NEAR MAXWELL, NEBR.

LOCATION.--At gaging station at Parshall Flume in sec. 28, T. 13 N., R. 29 W., near Maxwell, Lincoln County.
RECORDS AVAILABLE.--Chemical analyses: March 1951 to September 1956.
Water temperatures: March 1951 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 545 ppm Mar. 12-13; minimum, 412 ppm Mar. 22.
Hardness: Maximum, 247 ppm Mar. 12-13; minimum, 177 ppm Oct. 1-31.
Specific conductance: Maximum daily, 875 micromhos Mar. 12; minimum daily, 525 micromhos June 17.
Water temperatures: Maximum, 83°F Aug. 4; minimum, freezing point Dec. 3, 5, 10.
EXTREMES, 1951-56.--Dissolved solids: Maximum, 802 ppm Mar. 27 to Apr. 14, 1952; minimum, 368 ppm May 15, 1951.
Hardness: Maximum, 373 ppm June 2-8, 1952; minimum, 171 ppm May 15, 1951.
Specific conductance: Maximum daily, 1,210 micromhos Mar. 26, Apr. 6, 14, 15, 1952; minimum daily, 499 micromhos May 15, 1951.
Water temperatures: Maximum, 85°F June 13, 15, 1952; minimum, freezing point on several days during winter months.
REMARKS.--Daily samples for chemical analysis composited by discharge. Composite periods normally identical to those of Platte River at Brady, Nebr. Records of specific conductance of daily samples available in district office in Lincoln, Neb. Records of discharge for water year October 1955 to September 1956 given in reports of State Engineer.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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. 1-31, 1955	1,152	--	--	--	--	71	--	219	135	--	--	--	--	450	0.61	1,400	177	0	47	2.3	673	8.2	--
Nov. 1-15	1,011	--	--	--	--	63	--	216	129	--	--	--	--	429	.58	1,170	180	3	43	2.0	640	7.9	--
Nov. 16-19	854	--	--	--	--	73	--	231	146	--	--	--	--	465	.63	1,070	198	9	45	2.3	708	7.7	--
Nov. 20-27	1,014	--	--	--	--	62	--	212	122	--	--	--	--	416	.57	1,140	183	9	42	2.0	626	7.9	--
Nov. 28-Dec. 1	903	--	--	--	--	69	--	238	145	--	--	--	--	467	.64	1,140	206	11	42	2.1	712	7.9	--
Dec. 2-16	917	32	0.00	55	15	71	9.6	232	144	19	0.5	2.0	0.14	473	.64	1,170	200	10	42	2.2	705	8.0	3
Dec. 17-Jan. 12, 1956	940	--	--	--	--	64	--	227	141	--	--	--	--	459	.62	1,160	204	18	41	1.9	680	8.0	--
Jan. 13	903	--	--	--	--	64	--	222	141	--	--	--	--	455	.62	1,110	202	20	41	2.0	676	8.0	--
Jan. 14-16	729	--	--	--	--	64	--	231	141	--	--	--	--	465	.63	915	212	23	40	1.9	693	8.0	--
Jan. 17-20	874	--	--	--	--	76	--	239	163	--	--	--	--	506	.69	1,190	222	26	43	2.2	762	8.0	--
Jan. 21-Feb. 13	940	--	--	--	--	70	--	229	159	--	--	--	--	490	.67	1,240	218	30	41	2.1	729	8.1	--
Feb. 14-29	889	--	--	--	--	64	--	219	156	--	--	--	--	478	.65	1,150	218	38	39	1.9	708	8.1	--
Mar. 1-5	888	--	--	--	--	59	--	214	141	--	--	--	--	450	.61	1,080	208	33	38	1.8	670	8.1	--
Mar. 6-11	824	--	--	--	--	57	--	213	139	--	--	--	--	456	.62	1,010	211	36	37	1.7	666	8.1	--
Mar. 12-13	782	--	--	--	--	74	--	230	193	--	--	--	--	545	.74	1,150	247	58	39	2.1	809	8.1	--
Mar. 14-21	788	43	.00	59	15	55	9.4	205	147	17	.4	2.5	.14	454	.62	966	208	40	35	1.6	655	8.0	5
Mar. 22	754	--	--	--	--	52	--	206	129	--	--	--	--	412	.56	839	204	35	36	1.6	632	8.1	--
Mar. 23-28	713	--	--	--	--	53	--	205	136	--	--	--	--	445	.61	857	207	39	36	1.6	648	8.1	--
Mar. 29	710	--	--	--	--	54	--	214	137	--	--	--	--	456	.62	874	215	40	35	1.6	654	8.1	--

PLATTE RIVER BASIN--Continued

SUPPLY CANAL (TRI-COUNTY DIVERSION) NEAR MAXWELL, NEBR.--Continued

Chemical analyses, in parts per million, water year October 1955 to September 1956--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					
Mar. 30-Apr. 29, 1956	1,032	--	--	--	--	70	--	208	193	--	--	--	--	531	0.72	1,480	237	66	39	2.0	780	7.9	--
Apr. 30-May 24	1,361	--	--	--	--	74	--	208	193	--	--	--	--	523	.71	1,920	223	52	42	2.1	777	7.8	--
May 25-June 16	1,415	--	--	--	--	73	--	209	166	--	--	--	--	473	.64	1,810	194	23	45	2.3	731	7.9	--
June 17-20	1,785	--	--	--	--	57	--	195	133	--	--	--	--	419	.57	2,020	186	26	40	1.8	636	7.9	--
June 21-July 3	1,732	20	0.00	51	15	72	9.8	216	148	19	0.6	1.8	0.15	451	.61	2,110	190	13	44	2.3	701	8.1	5
July 4-31	2,041	--	--	--	--	72	--	219	153	--	--	--	--	455	.62	2,510	186	6	46	2.3	707	8.0	--
Aug. 1-31	1,981	--	--	--	--	73	--	217	148	--	--	--	--	450	.61	2,410	180	2	47	2.4	690	7.8	--
Sept. 1-30	1,588	24	.00	45	17	75	9.3	214	153	21	.6	1.9	.17	449	.61	1,930	182	7	46	2.4	693	7.8	1
Weighted average [a]	1,273	--	--	--	--	70	--	217	155	--	--	--	--	466	0.63	1,600	197	19	44	2.2	706	--	--

a Represents 100 percent of runoff for water year October 1955 to September 1956.

PLATTE RIVER BASIN--Continued

SUPPLY CANAL (TRI-COUNTY DIVERSION) NEAR MAXWELL, NEBR.--Continued

Temperature (° F) of water, water year October 1955 to September 1956
Once-daily measurement at 8:30 a.m.

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

a Measurement at 4:30 p.m.

PLATTE RIVER BASIN--Continued

MIDDLE LOUP RIVER AT DUNNING, NEBR. (Total-Load Section)

LOCATION.--At downstream measuring sill of turbulence flume beneath bridge on State Highway 2, at northeast limits of Dunning, Blaine County, 1,150 feet downstream from gaging station and 1 mile upstream from Dismal River.
DRAINAGE AREA.--1,760 square miles, approximately, of which about 80 square miles contribute directly to surface runoff.
RECORDS AVAILABLE.--Water temperatures: October 1949 to September 1956 (discontinued).
Sediment records: March 1950 to September 1952, October 1953 to September 1954.
EXTREMES, 1955-56.--Water temperatures: Maximum, 93°F June 21; minimum, freezing point on many days during November to April.
EXTREMES, 1949-56.--Water temperatures: Maximum, 93°F June 21, 1956; minimum, freezing point on many days during winter months each year.
REMARKS.--Records of discharge for water year October 1955 to September 1956 given in WSP 1440.

Temperature (° F) of water, water year October 1955 to September 1956
/7-day mercury-actuated thermograph/

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	63	52	46	38			--	--	--	--	--	--	61	--	48	42	74	58	90	72	80	68	72	54
2	60	54	42	34			--	--	--	--	47	39	52	39	64	46	78	60	82	76	82	71	75	60
3	64	60	42	32			--	--	--	--	47	36	--	--	54	47	85	66	82	73	86	72	68	58
4	66	62	50	37			--	--	--	--	50	--	--	44	47	44	85	72	90	74	88	75	58	55
5	68	60	50	44			--	--	32	32	53	40	58	42	56	44	86	73	86	72	87	70	58	52
6	60	49	44	36			--	--	32	32	45	32	52	39	54	50	91	72	89	72	80	74	64	48
7	58	46	38	32			33	32	32	32	40	32	50	32	65	48	86	70	86	74	83	66	66	52
8	60	47	40	32			32	32	32	32	48	38	45	38	68	54	82	70	80	68	83	68	68	54
9	64	50	47	39			34	32	--	--	50	36	54	37	68	57	87	70	84	66	84	69	74	58
10	65	52	44	38			38	32	--	--	40	32	58	39	66	55	--	--	86	70	78	65	73	60
11	62	52	42	37			38	32	--	--	32	32	62	44	--	--	86	68	90	73	82	66	76	62
12	58	47	38	35			39	32	--	--	33	32	54	44	--	--	84	72	90	76	80	68	73	64
13	57	46	38	32			36	32	--	--	36	32	64	44	52	48	81	74	92	76	85	70	76	64
14	58	44	32	32			34	32	--	--	36	32	62	49	67	46	88	73	92	76	86	70	71	62
15	60	48	32	32			--	--	--	--	40	32	58	44	--	--	80	74	88	76	84	71	74	60
16	57	46	32	32			--	--	--	--	47	32	53	40	--	--	74	69	86	76	80	72	72	58
17	58	44	32	32			--	--	--	--	50	36	56	39	75	55	87	68	84	74	78	70	71	56
18	58	46	32	32			--	--	--	--	49	38	61	40	75	58	90	74	86	74	72	67	72	58
19	60	48	32	32			--	--	--	--	49	36	63	46	68	58	92	77	80	71	66	60	72	58
20	57	50	32	32			--	--	--	--	42	36	66	46	76	56	92	77	82	65	68	60	70	56
21	56	46	32	32			--	--	--	--	54	37	67	50	78	65	93	76	82	86	76	58	68	58
22	58	48	34	32			--	--	--	--	57	40	60	48	70	62	88	71	80	68	80	64	68	57
23	55	44	38	32			--	--	--	--	57	46	54	43	72	58	88	72	85	67	81	66	68	54
24	53	39	38	32			--	--	--	--	61	44	48	40	67	57	89	74	78	70	78	66	70	56
25	56	44	--	--			--	--	--	--	64	48	62	44	67	58	90	74	82	73	77	62	72	58
26	58	46	--	--			--	--	--	--	61	49	62	48	77	62	90	71	89	70	80	66	72	59
27	53	47	--	--			--	--	--	--	52	46	58	46	72	62	88	75	80	71	84	68	70	60
28	49	41	--	--			--	--	--	--	--	--	--	--	--	--	86	71	81	68	79	68	68	60
29	46	42	--	--			--	--	--	--	--	--	44	36	73	68	87	72	82	68	76	62	65	54
30	48	37	--	--			--	--	--	--	--	--	42	39	76	64	88	73	86	71	72	62	62	52
31	48	40	--	--			--	--	--	--	--	--	--	--	72	58	--	--	74	70	64	56	--	--
Average	58	48	39	34			--	--	--	--	48	37	56	43	66	55	86	71	85	71	79	67	70	57

MIDDLE LOUP RIVER AT DUNNING, NEBR. (Total-Load Section)--Continued

Periodic determinations of suspended-sediment discharge, November 1955 to August 1956

Date	Discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Discharge (tons per day)
Nov. 24, 1955, 10:00 a.m...	a 396	2,380	2,540
Nov. 24, 2:35 p.m	a 396	2,580	2,760
Jan. 7, 1956.....	417	2,740	3,080
Jan. 8	413	2,720	3,030
Mar. 7.....	519	2,450	3,430
Mar. 8.....	483	2,750	3,590
May 8, 9:20 a.m	424	1,700	1,950
May 8, 1:37 p.m	409	1,240	1,370
Aug. 8	357	516	497
Aug. 7.....	360	711	691

a Daily mean discharge.

Particle-size analyses of suspended sediment, November 1955 to August 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet ; 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. 24, 1955....	10:00 a.m.	a 396	32	2,380	--	--	--		--		6	19	64	91	97	100	V
Nov. 24	2:35 p.m.	a 396	38	2,580	--	--	--		--		8	22	66	92	98	100	V
Jan. 7, 1956.....	2:50 p.m.	417	32	2,740	--	--	--		--		6	20	66	84	92	100	V
Jan. 8.....	2:45 p.m.	413	32	2,720	--	--	--		--		8	20	73	96	98	100	V
Mar. 7.....	2:45 p.m.	519	38	2,450	2,660	4	4		6		13	37	73	92	98	100	VPWCM
Mar. 8.....	10:35 a.m.	483	33	2,750	2,940	2	3		4		10	33	77	95	100	--	VPWCM
May 8.....	9:20 a.m.	424	54	1,700	--	--	--		--		4	21	68	92	99	100	V
May 8.....	1:37 p.m.	409	59	1,240	--	--	--		--		6	23	64	89	98	100	V
Aug. 6	4:20 p.m.	357	80	516	--	--	--		--		17	35	70	91	100	--	V
Aug. 7	9:40 a.m.	360	69	711	--	--	--		--		12	30	70	90	99	100	V

a Daily mean discharge.

PLATTE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN THE PLATTE RIVER BASIN IN NEBRASKA

Chemical analyses, in parts per million, water year October 1955 to September 1956

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: Parts per million: Residue at 180°C	Dissolved solids: Parts per million: Sum	Dissolved solids: Tons per acre-foot	Dissolved solids: 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
NORTH LOUP RIVER AT TAYLOR																								
Nov. 15, 1955...	411	69	0.02	23	3.3	7.1	5.6	105	1.0	0.0	0.2	2.2	0.03	168		0.23		71	0	17	0.4	183	7.6	
Nov. 15, 1:15 a.m. a/ ..	401	32	--	--	--	--	--	35	--	--	--	--	--	--		--		21	0	--	--	96.4	6.8	
Nov. 15, 12:35 p.m. a/..	416	27	--	--	--	--	--	41	--	--	--	--	--	--		--		27	0	--	--	73.1	7.4	
Jan. 9, 1956....	468	58	.07	21	1.8	6.8	5.3	92	5.0	.0	.2	1.9	.04	144		.20		60	0	18	.4	165	7.5	
Apr. 18	539	55	.00	22	3.2	6.7	5.8	101	2.0	.0	.4	1.3	.03	155		.21		68	0	16	.4	172	7.7	
June 25.....	321	62	.05	23	3.1	6.5	6.3	106	2.5	.0	.4	.5	.02	166		.23		70	0	15	.3	183	7.6	
Aug. 20	142	55	.03	21	2.6	5.8	5.8	93	5.0	.0	.3	1.3	.03	148		.20		63	0	15	.3	166	7.3	
CALAMUS RIVER NEAR BURWELL																								
Sept. 9, 1952 ...	267	51	0.10	18	2.2	6.6	4.4	83	2.0	1.0	0.2	0.9	0.01	130		0.18		54	0	20	--	144	7.7	
Nov. 15, 1955...	258	58	.00	18	2.4	7.4	4.5	84	2.8	.0	.2	1.7	.03	136		.18		55	0	21	0.4	150	7.6	
Nov. 15 a	258	26	--	--	--	--	--	40	--	--	--	--	--	--		--		24	0	--	--	67.1	7.8	
Jan. 9, 1956....	286	54	.07	18	2.2	6.0	4.4	80	4.0	.0	.1	1.8	.03	130		.18		54	0	18	.4	142	7.6	
Apr. 18	250	50	.01	18	2.2	6.3	4.4	83	1.0	.0	.3	1.3	.03	139		.19		54	0	19	.4	145	7.6	
June 25.....	244	52	.04	17	2.3	5.6	4.3	80	.0	.0	.2	1.6	.02	133		.18		52	0	18	.3	143	7.5	
Aug. 21	276	50	.03	17	2.1	5.7	4.0	78	3.8	.0	.2	1.4	.02	122		.17		51	0	18	.3	142	7.6	
NORTH LOUP RIVER NEAR ST. PAUL																								
Nov. 15, 1955...	b 750	64	0.02	29	3.8	7.8	5.6	127	5.0	0.5	0.2	2.3	0.03	180		0.24		88	0	15	0.4	217	7.6	
Jan. 9, 1956....	b 1,130	60	.04	24	4.1	7.4	5.3	112	4.0	.0	.2	1.4	.03	162		.22		77	0	16	.4	195	7.7	
June 19.....	1,030	45	.02	26	5.1	6.8	8.2	114	10	.0	.2	2.4	.04	170		.23		86	0	13	.3	210	7.9	
Aug. 20	476	53	.01	30	3.9	7.3	6.3	133	7.5	.0	.2	.7	.04	173		.24		91	0	14	.3	229	7.2	
SALT CREEK AT LINCOLN																								
May 9, 1950 c...	26,500	12	0.80	12	2.7		22	54	17	17	.5	1.5	0.20	114	--	0.16		41	0	53		172	7.4	
May 9.....	b 16,700	13	.80	11	2.3		23	47	18	20	.5	1.5	.10	124	--	.17		37	0	58		170	7.4	
May 23.....	b 98	30	.04	108	32		1,080	357	245	1,560	.5	6.6	--	3,340	3,240	4.54		401	108	85		5,460	7.4	
May 23, 1951 ...	137	--	--	--	--		1,100	282	255	1,600	--	--	.32	--	--	--		366	135	87		5,560	7.2	
May 20, 1953 ...	b 78	24	.01	102	32	985	12	388	230	1,420	.1	8.0	.33	3,000	3,000	4.08		386	68	84		5,250	8.0	
May 27.....	915	--	--	36	8.5	226	7.8	--	--	--	--	--	--	764	--	1.04		125	--	78		1,390	6.9	
July 3, 1956	3,840	--	--	16	4.4	56	4.4	96	--	--	--	--	--	241	--	.33		58	0	66	3.2	428	7.1	

a Sample of frazil ice.
b Daily mean discharge.
c Half a mile north of bridge on North 27th Street.

PLATTE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN THE PLATTE RIVER BASIN IN NEBRASKA--Continued

Periodic determinations of suspended-sediment discharge, water year October 1955 to September 1956

Date	Discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Discharge (tons per day)
PLATTE RIVER NEAR OVERTON			
Oct. 19, 1955	752	42	85
Oct. 20	84	18	4.1
Nov. 16	700	101	191
Dec. 8	1,270	70	240
Dec. 9	360	16	16
Jan. 4, 1956	1,160	215	673
Jan. 5	510	48	66
Feb. 1, 4:10 p.m	950	280	718
Feb. 1, 5:15 p.m	970	114	299
Feb. 2	930	70	176
Mar. 7	1,470	125	496
Mar. 8	937	84	213
Apr. 18	1,360	91	334
Apr. 19	714	53	102
May 3	346	35	33
May 4	280	31	23
May 17	125	17	5.7
June 21, 10:10 a.m.	1,500	111	450
June 21, 1:30 p.m	1,500	86	348
July 26	196	25	13
Aug. 9	82	35	7.7
Aug. 23	99	66	18
Sept. 6	61	21	3.5
Sept. 27	80	36	7.8
WOOD RIVER NEAR RIVERDALE			
July 5, 1956, 7:45 a.m	370	4,780	4,780
July 5, 10:20 a.m	240	3,020	1,960
July 5, 1:25 p.m	213	4,260	2,450
July 5, 1:40 p.m	213	4,520	2,600
July 5, 6:40 p.m	221	5,380	3,210
July 6	32	2,100	181
DISMAL RIVER AT DUNNING			
Oct. 18, 1955	309	649	541
Nov. 1	360	658	640
Nov. 14	333	1,040	935
Jan. 8, 1956	336	1,280	1,160
Mar. 1	360	960	933
Apr. 2	336	1,040	943
Apr. 11	354	940	898
Apr. 16	312	643	542
Apr. 30	315	938	798
May 14	306	630	521
May 28	297	510	409
June 11	292	395	311
June 25	297	430	345
July 9	303	425	348
July 23	292	383	302
Aug. 6	294	401	318
Aug. 7	294	417	331
MIDDLE LOUP RIVER AT ARCADIA			
Oct. 4, 1955	771	751	1,560
Oct. 18	754	1,060	2,160
Nov. 1	910	1,380	3,390
Jan. 9, 1956	874	247	583
Mar. 8	1,110	493	1,480
Mar. 19	933	3,600	9,070
Apr. 2	882	1,160	2,760
Apr. 9	956	1,380	3,560
Apr. 16	901	898	2,180
Apr. 30	a 947	1,320	3,380

a Daily mean discharge.

PLATTE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN THE PLATTE RIVER BASIN IN NEBRASKA--Continued

Periodic determinations of suspended-sediment discharge, water year October 1955 to September 1956--Continued

Date	Discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Discharge (tons per day)
MIDDLE LOUP RIVER AT ARCADIA--Continued			
May 16, 1956	873	790	1,860
May 30	1,080	1,600	4,670
June 11	631	738	1,260
June 27	812	454	995
July 11	514	385	534
July 24	301	149	121
Aug. 22	588	417	662
Sept. 19	527	334	475
OAK CREEK NEAR LOUP CITY			
July 14, 1952, 1:10 p.m.	1.5	1,990	8.0
July 14, 1:30 p.m.	1.5	1,890	7.7
May 10, 1953, 9:15 a.m.	6.9	7,210	134
May 10, 11:15 a.m.	4.6	7,170	89
May 10, 4:45 p.m.	1.2	4,060	13
June 17, 1954	124	9,650	3,230
Mar. 3, 1956	3.1	141	1.2
June 5	77	11,700	2,430
June 17	11	67,600	2,080
June 18	28	11,600	877
June 26, 12:15 a.m	79	22,900	4,880
June 26, 9:30 a.m	4.8	9,620	125
July 4, 10:30 p.m.	29	46,600	3,780
July 4, 10:45 p.m.	54	42,400	6,410
July 4, 11:30 p.m.	86	55,600	13,400
July 5, 12:10 a.m.	168	19,500	8,850
July 5, 2:00 a.m.	276	51,400	39,700
July 5, 5:00 a.m.	379	15,000	15,300
July 5, 5:35 a.m.	524	9,570	13,500
July 5, 6:00 a.m.	593	7,960	12,700
July 5, 7:00 a.m.	649	7,480	13,100
July 5, 9:15 a.m.	622	6,380	10,700
July 5, 9:40 a.m.	613	6,220	10,300
July 5, 12:45 p.m.	217	40,900	24,900
July 5, 1:05 p.m.	470	7,480	9,490
July 5, 1:20 p.m.	453	7,360	9,000
July 5, 1:40 p.m.	417	7,370	8,300
Aug. 17, 6:15 p.m.	34	22,200	2,040
Aug. 17, 8:40 p.m.	69	14,300	2,660
Aug. 17, 10:35 p.m.	109	12,200	3,590
Aug. 18	158	9,660	4,120
SOUTH LOUP RIVER AT ST. MICHAEL			
Oct. 19, 1955	109	298	88
Nov. 2	123	324	108
Mar. 9, 1956	284	1,610	1,230
Mar. 21	214	896	518
Apr. 4	227	738	452
Apr. 9	210	716	406
Apr. 23	185	492	246
May 7	185	598	299
May 21	123	466	155
May 30	960	9,320	24,200
May 31	835	7,890	17,800
June 11	123	525	174
June 18	1,770	9,730	46,500
June 26	299	1,890	1,530
July 3	161	578	251
July 16	70	242	46
Aug. 22	111	608	182
Sept. 19	51	139	19

PLATTE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN THE PLATTE RIVER BASIN IN NEBRASKA--Continued

Periodic determinations of suspended-sediment discharge, water year October 1955 to September 1956--Continued

Date	Discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Discharge (tons per day)
MIDDLE LOUP RIVER AT ST. PAUL			
Oct. 3, 1955	591	452	721
Oct. 17	846	596	1,360
Oct. 31	1,010	1,090	2,970
Mar. 15, 1956	1,250	2,910	9,820
Mar. 19	2,030	3,580	19,600
Mar. 26	1,140	1,430	4,400
Apr. 9	1,030	1,600	4,450
Apr. 23	1,070	909	2,630
May 7	1,100	1,490	4,430
May 21	755	499	1,020
May 31, 1:50 a.m	2,500	3,080	20,800
May 31, 11:05 a.m	1,400	2,080	7,860
June 11	680	594	1,090
June 18	2,400	4,320	28,000
June 25	1,060	1,310	3,750
July 2	870	964	2,260
July 16	409	335	370
Aug. 20	690	1,060	1,970
Sept. 17	519	202	283
NORTH LOUP RIVER AT BURWELL			
Oct. 3, 1955	475	338	433
Oct. 17	441	306	364
Oct. 31	484	522	682
Mar. 8, 1956	689	1,250	2,330
Mar. 26	564	506	771
Apr. 9	546	536	790
Apr. 18	537	511	741
May 2	680	684	1,260
May 14	441	374	445
May 28	407	301	331
June 13	319	230	198
June 25	342	312	288
July 10	222	142	85
July 23	185	140	70
Aug. 21	326	243	214
Sept. 18	390	253	266
DAVIS CREEK NEAR COTESFIELD			
Oct. 17, 1955	0.3	251	0.2
Mar. 1, 1956	a 12	440	14
Mar. 3	a 8.0	372	8.0
May 23	26	12,400	870
June 18	92	17,000	4,220
June 19	6.2	5,210	87
June 22, 6:20 p.m	125	19,000	6,410
June 22, 7:10 p.m	214	27,000	15,600
June 22, 8:30 p.m	334	21,900	19,700
June 22, 10:50 p.m	315	14,500	12,300
June 23	30	5,740	465
June 26, 3:45 a.m	216	26,100	15,200
June 26, 5:30 a.m	311	26,600	22,300
June 26, 6:40 a.m	274	15,300	11,300
June 26, 12:45 p.m	78	12,400	2,610
June 26, 8:40 p.m	41	9,720	1,080
July 5, 7:15 a.m	24	8,280	537
July 5, 10:45 a.m	80	11,400	2,460
July 5, 1:35 p.m	73	11,800	2,330
July 5, 4:10 p.m	60	9,100	1,470
July 5, 6:00 p.m	94	14,300	3,630

a Daily mean discharge.

PLATTE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN THE PLATTE RIVER BASIN IN NEBRASKA--Continued

Periodic determinations of suspended-sediment discharge, water year October 1955 to September 1956--Continued

Date	Discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Discharge (tons per day)
NORTH LOUP RIVER NEAR ST. PAUL			
Oct. 3, 1955	738	272	542
Oct. 17	706	288	549
Oct. 31	848	348	797
Mar. 9, 1956	973	438	1,150
Mar. 15	1,260	875	2,980
Mar. 19	1,280	1,620	5,600
Mar. 26	992	500	1,340
Apr. 9	955	747	1,930
Apr. 23	905	399	975
May 21	748	184	372
May 30	1,690	3,940	18,000
June 11	666	208	374
June 25	727	404	793
July 2	579	301	471
July 5	1,910	5,020	25,900
July 16	233	110	69
Aug. 20	476	250	321
Sept. 17	696	303	569

MISCELLANEOUS ANALYSES OF STREAMS IN THE PLATTE RIVER BASIN IN NEBRASKA--Continued

Particle-size analyses of suspended sediment, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; 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	
PLATTE RIVER NEAR OVERTON																	
Oct. 19, 1955	5:15 p.m.	752	64	42							68	74	88	100	--		S
Oct. 20	11:00 a.m.	84	56	18							72	89	96	100	--		S
Nov. 16	2:45 p.m.	700	33	101							41	43	62	95	100		S
Dec. 8	4:40 p.m.	1,270	34	70							16	19	53	92	97	100	S
Dec. 9	10:00 a.m.	360	34	16							23	25	46	94	100		S
Jan. 4, 1956	3:50 p.m.	1,160	--	215							18	21	52	91	100		V
Jan. 5	9:50 a.m.	510	33	40							22	28	64	98	100		S
Mar. 8	11:25 a.m.	937	39	84							48	54	80	98	100		S
Apr. 18	3:50 p.m.	1,360	57	91							40	44	65	90	100		S
Apr. 19	8:20 a.m.	714	45	53							38	41	60	87	100		S
May 3	3:40 p.m.	346	51	35							36	56	81	96	100		S
May 4	10:30 a.m.	280	--	31							52	74	100	--	--		S
May 17	3:30 p.m.	125	82	17							74	95	100	--	--		S
June 21	10:10 a.m.	1,500	--	111			59		66		76	77	86	98	100		SPWCM
June 21	1:30 p.m.	1,500	--	86							81	83	91	100	--		S
July 26	11:45 a.m.	196	84	25							84	100	--	--	--		S
Aug. 9	1:50 p.m.	82	83	35							73	100	--	--	--		S
Aug. 23	1:30 p.m.	99	88	66							84	90	100	--	--		S
Sept. 6	1:25 p.m.	61	73	21							68	81	90	100	--		S
DISMAL RIVER AT DUNNING																	
Oct. 18, 1955	11:00 a.m.	309	50	649							17	49	93	100	--		V
Nov. 1	1:25 p.m.	360	46	658							15	45	88	100	--		V
Nov. 14	4:30 p.m.	333	32	1,040							14	43	89	99	100		V
Jan. 8, 1956	1:40 p.m.	336	34	1,280							21	50	84	97	100		V
Mar. 1	2:25 p.m.	360	--	960							32	66	98	100	--		V

MISCELLANEOUS ANALYSES OF STREAMS IN THE PLATTE RIVER BASIN IN NEBRASKA--Continued

Particle-size analyses of suspended sediment, water year October 1955 to September 1956--Continued
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; 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	
DISMAL RIVER AT DUNNING--Continued																	
Apr. 2, 1956	2:45 p.m.	336	42	1,040							26	56	92	100	--		V
Apr. 11	10:20 a.m.	354	51	940							26	65	96	100	--		V
Apr. 16	6:00 p.m.	312	51	643							29	62	95	100	--		V
Apr. 30	3:15 p.m.	315	44	938							18	52	96	100	--		V
May 14	3:50 p.m.	306	69	630							27	60	89	100	--		V
May 28	6:25 p.m.	297	78	510							33	64	95	100	--		V
June 11	4:00 p.m.	292	80	395							31	61	96	100	--		V
June 25	3:20 p.m.	297	85	430							34	62	88	97	100		V
July 9	2:45 p.m.	303	76	425							37	67	97	100	--		V
July 23	3:40 p.m.	292	83	383							30	64	97	100	--		V
Aug. 6	4:50 p.m.	294	--	401							35	63	95	100	--		V
Aug. 7	10:40 a.m.	294	70	417							26	60	93	100	--		V
MIDDLE LOUP RIVER AT ARCADIA																	
Oct. 4, 1955	8:45 a.m.	771	63	751							15	43	87	99	100		V
Oct. 18	8:00 a.m.	754	45	1,060							13	50	94	100	--		V
Nov. 1	8:25 a.m.	910	--	1,380							11	41	90	99	100		V
Jan. 9, 1956	e 1:30 p.m.	874	--	247							20	33	63	98	100		V
Mar. 8	3:30 p.m.	1,110	--	493							13	27	72	98	100		V
Mar. 19	4:10 p.m.	933	--	3,600							12	43	83	98	100		V
Apr. 2	11:20 a.m.	882	--	1,160							20	53	93	100	--		V
Apr. 9	11:50 a.m.	956	--	1,380							17	48	88	99	100		V
Apr. 16	2:00 p.m.	901	49	898							24	56	93	100	--		V
Apr. 30	12:00 m.	a 947	41	1,320							12	48	96	100	--		V
May 16	12:30 p.m.	873	67	790							24	61	97	100	--		V
May 30	3:50 p.m.	1,080	--	1,600	1,570	29	38	43	46	48	60	76	94	100	--		VPWCM
June 11	12:00 m.	631	--	738							14	43	95	100	--		V

June 27	1:00 p.m.	812	79	454							40	62	97	100	--		V
July 24	3:05 p.m.	301	--	149							40	59	98	100	--		V
Aug. 22	10:00 a.m.	588	68	417							24	44	86	100	--		V
Sept. 19	10:15 a.m.	527	62	334							23	52	96	100	--		V
OAK CREEK NEAR LOUP CITY																	
July 14, 1952	1:30 p.m.	1.5	62	1,890	2,480	89	94	98	99	100	--	--					PWCM
May 10, 1953	9:15 a.m.	6.9		7,210	12,600	51	72	86	91	96	100	--					SPWCM
May 10	11:15 a.m.	4.6		7,170	11,800	14	70	89	98	99	100	--					SPWCM
May 10	4:45 p.m.	1.2		4,060	6,330	61	75	82	82	87	98	100					SPWCM
June 17, 1954	10:20 a.m.	124		9,650	6,900	50	63	72	79	90	100	--					SPWCM
June 5, 1956	5:10 p.m.	77		11,700	3,400	60	78	91	96	98	100	--					PWCM
June 18	3:45 p.m.	28		11,600	8,720	46	60	73	83	91	99	100					VPWCM
June 17	5:00 a.m.	11		67,600	5,800	38	42	49	60	80	100	--					VPWCM
June 26	12:15 a.m.	79		22,900	6,300	45	50	56	66	83	99	100					VPWCM
June 26	9:30 a.m.	4.8		9,620	3,490	71	80	87	89	95	--	--					PWCM
July 4	10:30 p.m.	29		46,600	7,740	38	39	46	51	62	98	100					VPWCM
July 4	11:30 p.m.	86		55,600	7,540	26	28	32	40	63	99	100					VPWCM
July 5	2:00 a.m.	276		51,400	5,760	54	56	69	81	93	100	--					VPWCM
July 5	5:00 a.m.	379		15,000	5,530	55	59	66	76	90	99	100					SPWCM
July 5	5:35 a.m.	524		9,570	3,000	77	80	88	97	99	100	--					PWCM
July 5	6:00 a.m.	593		7,960	2,920	75	84	89	96	99	100	--					PWCM
July 5	7:00 a.m.	649		7,480	5,130	62	78	91	97	97	100	--					PWCM
July 5	9:15 a.m.	622		6,380	2,300	76	85	96	98	99	100	--					PWCM
July 5	9:40 a.m.	613		6,220	4,820	74	86	95	99	99	100	--					PWCM
July 5	1:05 p.m.	470		7,480	4,740	69	84	92	96	99	100	--					PWCM
July 5	1:20 p.m.	453		7,370	3,580	67	82	96	99	99	100	--					PWCM
July 5	1:40 p.m.	417		7,360	4,490	63	81	91	96	99	100	--					PWCM
Aug. 17	8:40 p.m.	69		14,300	5,160	41	43	51	62	80	99	100					VPWCM
Aug. 18	12:55 a.m.	158		9,660	2,680	68	71	74	88	95	100	--					PWCM
SOUTH LOUP RIVER AT ST. MICHAEL																	
Oct. 19, 1955	12:30 p.m.	109	54	298	--	--	--	--	--	--	68	77	100	--			V
Nov. 2	5:30 p.m.	123	43	324	--	--	--	--	--	--	67	82	100	--			V
Mar. 9, 1956	2:10 p.m.	284	--	1,610	3,240	7	7	9	16	19	44	68	94	100			VPWCM
Mar. 21	12:35 p.m.	214	47	896	2,750	10	19	26	32	41	54	76	98	100			VPWCM
Apr. 4	12:40 p.m.	227	45	738	2,310	12	20	29	37	44	58	77	98	100			VPWCM

e Estimated.
a Daily mean discharge.

MISCELLANEOUS ANALYSES OF STREAMS IN THE PLATTE RIVER BASIN IN NEBRASKA--Continued

Particle-size analyses of suspended sediment, water year October 1955 to September 1956--Continued
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; 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	
SOUTH LOUP RIVER AT ST. MICHAEL--Continued																	
Apr. 9, 1956	4:20 p.m.	210	--	716	--	--	--	--	--	--	63	78	100	--			V
Apr. 23	4:40 p.m.	185	49	492	--	--	--	--	--	--	63	81	100	--			V
May 7	11:00 a.m.	185	58	598	--	--	--	--	--	--	59	76	100	--			V
May 21	7:10 p.m.	123	77	466	--	--	--	--	--	--	64	86	100	--			V
May 30	1:45 p.m.	960	--	9,320	8,960	13	18	22	25	53	85	97	100	--			VPWCM
May 31	1:35 p.m.	835	67	7,890	7,100	25	30	36	42	58	85	95	100	--			VPWCM
June 11	5:20 p.m.	123	84	525	--	--	--	--	--	--	87	94	100	--			V
June 18	12:10 p.m.	1,770	--	9,730	5,390	24	31	37	42	50	69	83	98	100			VPWCM
June 26	4:40 p.m.	299	--	1,890	3,760	29	36	41	50	62	84	92	100	--			VPWCM
July 3	9:50 a.m.	161	69	578	2,490	36	46	56	64	72	87	94	100	--			VPWCM
Aug. 22	2:35 p.m.	111	81	608	2,040	54	66	76	83	88	95	98	100	--			VPWCM
Sept. 19	2:25 p.m.	51	76	139	--	--	--	--	--	--	86	94	100	--			V
MIDDLE LOUP RIVER AT ST. PAUL																	
Oct. 17, 1955	10:55 a.m.	846	--	596	--	--	--	--	--	--	18	34	84	98	100		V
Oct. 31	11:30 a.m.	1,010	45	1,090	--	--	--	--	--	--	21	40	84	99	100		V
Mar. 15, 1956	3:20 p.m.	1,250	--	2,910	--	--	--	--	--	--	20	42	79	93	100		V
Mar. 19	12:25 p.m.	2,030	--	3,580	3,310	5	6	--	8	--	21	43	78	95	100		VPWCM
Mar. 26	10:50 a.m.	1,140	50	1,430	--	8	10	--	13	--	29	56	94	99	100		VPWCM
Apr. 9	1:15 p.m.	1,030	--	1,600	--	--	--	--	--	--	20	39	82	99	100		V
Apr. 23	11:15 a.m.	1,070	--	909	--	--	--	--	--	--	23	39	74	99	100		V
May 7	11:30 a.m.	1,100	--	1,490	--	--	--	--	--	--	18	36	79	98	100		V
May 31	1:50 a.m.	2,500	--	3,080	7,530	19	24	30	38	49	73	88	97	100	--		VPWCM
May 31	11:05 a.m.	1,400	--	2,080	4,180	26	30	36	42	47	60	76	94	99	100		VPWCM
June 11	1:20 p.m.	680	--	594	--	--	--	--	--	--	33	43	79	100	--		V
June 18	6:00 p.m.	2,400	--	4,320	7,320	25	32	39	47	60	82	92	98	100	--		VPWCM
June 25	12:30 p.m.	1,060	--	1,310	7,050	48	62	70	76	80	83	89	98	100	--		VPWCM

July 2	11:20 a.m.	870	73	964	2,900	40	45	49	52	56	60	60	91	99	100		VPWCM
July 16	10:30 a.m.	409	81	335	--	--	--	--	--	--	41	53	85	100	--		V
Aug. 20	10:30 a.m.	690	--	1,060	--	32	47	56	62	66	69	76	94	100	--		VPWCM
Aug. 20	10:30 a.m.	690	--	1,060	--	26	44	56	62	65	69	76	94	100	--		VPN
Sept. 17	10:20 a.m.	519	64	202	--	--	--	--	--	--	49	75	98	100	--		V
NORTH LOUP RIVER AT BURWELL																	
Oct. 3, 1955	3:40 p.m.	475	--	338							19	49	87	100			V
Oct. 17	4:10 p.m.	441	57	306							17	47	88	100			V
Oct. 31	4:50 p.m.	484	48	522							10	31	81	100			V
Mar. 8, 1956	3:40 p.m.	689	--	1,250							22	55	91	100			V
Mar. 26	5:10 p.m.	564	--	506							22	50	87	100			V
Apr. 9	2:55 p.m.	546	--	536							20	50	90	100			V
Apr. 18	11:55 a.m.	537	--	511							18	46	89	100			V
May 2	12:45 p.m.	680	54	684							15	37	79	100			V
May 14	12:50 p.m.	441	62	374							19	40	80	100			V
May 28	3:10 p.m.	407	81	301							35	55	84	100			V
June 25	12:30 p.m.	342	84	312							58	73	98	100			V
July 10	3:10 p.m.	222	87	142							59	74	99	100			V
July 23	12:25 p.m.	185	84	140							49	63	88	100			V
Aug. 21	3:50 p.m.	326	79	243							44	63	92	100			V
Sept. 18	3:20 p.m.	390	72	253							36	57	85	100			V
DAVIS CREEK NEAR COTESFIELD																	
Mar. 1, 1956	10:55 a.m.	a 12	--	440	1,500	61	63	--	68	--	98	100					VPWCM
Mar. 3	11:40 a.m.	a 8.0	33	372	1,050	72	77	--	78	--	99	100					VPWCM
May 23	6:00 a.m.	26	--	12,400	3,990	52	71	88	95	97	100	--					VPWCM
June 18	9:05 a.m.	92	--	17,000	5,120	36	51	67	82	98	100	--					VPWCM
June 19	9:20 a.m.	6.2	73	5,210	5,450	63	82	91	93	95	100	--					VPWCM
June 22	7:10 p.m.	214	--	27,000	8,700	35	50	66	78	90	99	100					VPWCM
June 22	8:30 p.m.	334	--	21,900	8,050	40	52	64	75	88	99	100					VPWCM
June 22	10:50 p.m.	315	--	14,500	7,860	36	50	64	76	88	99	100					VPWCM
June 23	7:35 a.m.	30	--	5,740	3,780	59	73	86	93	97	100	--					VPWCM
June 26	3:45 a.m.	216	--	26,100	7,980	38	49	62	74	90	99	100					VPWCM
June 26	5:30 a.m.	311	--	26,600	7,800	46	51	60	72	88	--	--					PWCM
June 26	6:40 a.m.	274	--	15,300	9,040	36	52	69	83	94	100	--					VPWCM
June 26	12:45 p.m.	78	--	12,400	7,190	42	59	77	93	97	--	--					PWCM
June 26	8:40 p.m.	41	--	9,720	5,710	51	73	88	97	100	--	--					PWCM

a Daily mean discharge.

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PLATTE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN PLATTE RIVER BASIN IN NEBRASKA--Continued

Particle-size analyses of suspended sediment, water year October 1955 to September 1956--Continued
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; 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
DAVIS CREEK NEAR COTESFIELD--Continued																
July 5, 1956.....	7:15 a.m.	24	--	8,280	4,280	58	78	92	98	99	100	--				PWCM
July 5	1:35 p.m.	73	--	11,800	4,020	54	70	82	94	96	100	--				PWCM
July 5	4:10 p.m.	60	--	9,100	4,940	52	67	80	90	96	100	--				PWCM
July 5	6:00 p.m.	94	--	14,300	5,840	46	64	81	96	97	100	--				PWCM
NORTH LOUP RIVER NEAR ST. PAUL																
Oct. 3, 1955	12:45 p.m.	738	--	272		--	--	--	--	--	52	68	89	100	--	V
Oct. 17.....	12:45 p.m.	706	--	288		--	--	--	--	--	53	65	90	100	--	V
Oct. 31.....	1:20 p.m.	848	--	348		--	--	--	--	--	51	71	99	100	--	V
Mar. 9, 1956.....	9:55 a.m.	973	--	438		--	--	--	--	--	18	25	70	98	100	V
Mar. 19	12:15 p.m.	1,280	--	1,620		--	--	--	--	--	28	42	78	97	100	V
Mar. 26	11:55 a.m.	992	52	500		--	--	--	--	--	47	61	90	99	100	V
Apr. 9	11:20 a.m.	955	--	747		--	--	--	--	--	23	39	80	99	100	V
Apr. 23.....	1:30 p.m.	905	--	399		--	--	--	--	--	25	44	75	98	100	V
May 21	11:40 a.m.	748	--	184		--	--	--	--	--	52	70	97	100	--	V
May 30	10:15 a.m.	1,690	--	3,940	7,980	39	54	64	71	78	86	94	99	100	--	VPWCM
June 11.....	10:50 a.m.	666	--	208		--	--	--	--	--	65	80	98	100	--	V
June 25.....	4:15 p.m.	727	90	404		--	--	--	--	--	83	92	99	100	--	V
July 2	3:20 p.m.	579	--	301		--	--	--	--	--	77	86	97	100	--	V
July 5	10:00 p.m.	1,910	74	5,020		28	36	43	50	62	82	87	95	99	100	VPWCM
July 5	10:00 p.m.	1,910	74	5,020		17	28	40	50	63	82	87	95	99	100	VPN
July 16	12:50 p.m.	233	86	110		--	--	--	--	--	81	88	97	100	--	V
Aug. 20.....	12:40 p.m.	476	70	250		--	--	--	--	--	77	85	97	100	--	V
Sept. 17	11:50 a.m.	696	68	303		--	--	--	--	--	56	70	95	100	--	V

MISCELLANEOUS ANALYSES OF STREAMS IN THE PLATTE RIVER BASIN IN NEBRASKA--Continued

Particle-size analyses of bed material, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed; V, visual accumulation tube)

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									
							0.062	0.125	0.250	0.500	1.000	2.000	4.000	8.000	16.000	
PLATTE RIVER NEAR OVERTON															
Oct. 19, 1955.....	7	752						0	3	24	55	74	92	100	--	SV
May 3, 1956.....	5	346						0	3	20	41	59	84	98	100	SV
June 21	5	1,500						0	6	36	76	89	98	100	--	SV
Aug. 9.....	9	82						0	4	34	62	80	95	99	100	SV
Aug. 23.....	9	99						0	4	50	83	96	99	100	--	SV
Sept. 27.....	9	80						0	7	43	72	86	96	99	100	SV
DISMAL RIVER AT DUNNING															
Oct. 18, 1955.....	5	309					--	0	24	73	85	91	96	99	100	SV
Nov. 1.....	6	360					0	1	32	73	88	94	98	100	--	SV
Jan. 8, 1956.....	20	336					0	7	36	80	91	96	98	100	--	SV
Mar. 1.....	6	360					0	1	34	80	88	93	96	99	100	SV
Mar. 7.....	5	342					0	1	16	59	82	90	97	100	--	SV
Mar. 7.....	19	342					0	4	29	70	82	88	94	99	100	SV
Apr. 30.....	5	315					--	0	17	59	80	89	96	100	--	SV
May 28.....	5	297					0	2	42	82	91	95	98	100	--	SV
June 25	5	297					0	1	31	71	83	90	95	100	--	SV
July 23.....	9	292					2	10	38	82	91	96	98	100	--	SV
Aug. 6.....	27	294					0	1	32	72	78	86	92	100	--	SV
Aug. 7.....	31	294					1	6	53	88	94	96	98	99	100	SV
MIDDLE LOUP RIVER AT ARCADIA															
Jan. 9, 1956.....	14	874					--	0	11	68	97	99	100			SV
Apr. 2.....	5	882					0	2	37	89	98	100	--			SV
Apr. 16.....	5	901					0	2	37	81	97	99	100			SV
May 16.....	5	873					0	1	32	85	98	99	100			SV
June 11	5	631					0	3	48	96	100	--	--			V

PLATTE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN THE PLATTE RIVER BASIN IN NEBRASKA--Continued

Particle-size analyses of bed material, water year October 1955 to September 1956--Continued
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet ; S, sieve: N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed; V, visual accumulation tube)

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										
							0.062	0.125	0.250	0.500	1.000	2.000	4.000	8.000	16.000	
MIDDLE LOUP RIVER AT ARCADIA--Continued																
July 11, 1956	6	514					0	2	57	98	100	--	--			V
Aug. 22	19	588					0	5	45	90	99	100	--			SV
SOUTH LOUP RIVER AT ST. MICHAEL																
Oct. 19, 1955	6	109					2	8	58	96	99	99	100			SV
Nov. 2	6	123					0	6	47	93	99	100	--			SV
Mar. 9, 1956	--	284					2	8	54	92	98	99	100			SV
Mar. 21	5	214					0	4	61	95	99	99	100			SV
Apr. 9	4	210					2	10	70	97	100	--	--			SV
Apr. 23	5	185					1	13	60	94	98	99	100			SV
May 7	25	185					1	8	65	95	98	99	100			SV
May 21	5	123					0	4	63	96	99	100	--			SV
May 30	15	960					3	28	88	99	100	--	--			V
May 31	14	835					2	14	79	98	100	--	--			V
June 11	6	123					0	11	77	96	99	100	--			SV
June 18	6	1,770					0	4	69	97	100	--	--			V
June 26	6	299					0	11	74	90	98	98	100			SV
July 3	5	161					0	3	67	95	100	--	--			V
July 16	15	70					2	8	75	96	99	100	--			SV
Aug. 22	14	111					2	13	72	96	98	99	100			SV
Sept. 19	16	51					3	15	75	97	99	100	--			SV
MIDDLE LOUP RIVER AT ST. PAUL																
Oct. 3, 1955	5	591					0	9	54	92	98	99	100	--		SV
Mar. 15, 1956	5	1,250					0	2	35	87	98	99	100	--		SV
Mar. 19	5	2,030					0	3	40	93	100	--	--	--		V

Apr. 23	4	1,070					0	5	34	80	88	92	97	100		SV
May 7	7	1,100					0	2	34	91	98	99	100	--		SV
May 21	5	755					0	1	27	85	95	98	99	100		SV
May 31	4	1,400					0	3	46	98	100	--	--	--		V
June 18	6	2,400					0	6	64	98	100	--	--	--		V
June 25	6	1,060					--	0	27	83	99	100	--	--		SV
July 2	7	870					0	1	29	85	94	96	96	100		SV
July 16	5	409					--	0	29	91	99	100	--	--		SV
Aug. 20	17	690					1	16	57	95	100	--	--	--		V
Sept. 17	24	519					1	15	55	93	99	100	--	--		SV
NORTH LOUP RIVER AT BURWELL																
Mar. 8, 1956	5	689					0	1	26	68	82	89	96	99	100	SV
Apr. 18	5	537					--	0	18	71	87	92	97	99	100	SV
May 14	5	441					0	1	23	87	99	100	--	--	--	SV
June 13	14	319					0	4	39	82	93	96	98	100	--	SV
July 10	6	222					--	0	20	74	91	96	99	100	--	SV
Aug. 21	14	326					0	4	35	85	96	98	100	--	--	SV
NORTH LOUP RIVER NEAR ST. PAUL																
Oct. 3, 1955	5	738					0	1	20	66	91	96	99	100		SV
Oct. 17	6	706					0	1	30	73	90	95	98	100		SV
Oct. 31	6	848					0	5	42	79	95	98	99	100		SV
Mar. 15, 1956	5	1,260					0	1	19	64	92	97	99	100		SV
Mar. 26	5	992					0	3	36	76	91	95	98	100		SV
Apr. 23	5	905					0	1	11	72	99	100	--	--		V
May 7	7	980					0	1	19	81	95	98	100	--		SV
May 21	5	748					0	5	22	59	83	94	99	100		SV
May 30	6	1,690					5	24	69	92	96	98	99	100		SV
June 11	7	666					0	3	26	85	99	100	--	--		SV
June 25	6	727					0	3	25	71	88	93	97	100		SV
July 2	6	579					0	1	19	66	86	95	99	100		SV
July 5	7	1,910					0	1	29	84	98	100	--	--		V
July 16	5	233					0	2	25	72	92	96	98	100		SV
Aug. 20	21	476					0	4	28	84	96	98	100	--		SV
Sept. 17	31	696					1	8	35	81	95	98	100	--		SV

MISSOURI RIVER MAIN STEM--Continued

MISSOURI RIVER AT NEBRASKA CITY, NEBR.

LOCATION.--At gaging station at Waubonsie Highway Bridge at Nebraska City, Otoe County.
DRAINAGE AREA.--414,400 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: January 1951 to September 1956.
Water temperatures: May 1951 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 543 ppm May 29; minimum, 393 ppm Mar. 5-16.
Hardness: Maximum, 253 ppm July 20 to Aug. 16; minimum, 190 ppm Nov. 1-17.
Specific conductance: Maximum daily, 894 micromhos Dec. 4; minimum daily, 512 micromhos Mar. 8.
Water temperatures: Maximum, 79°F on several days during June and July; minimum, freezing point on many days during November to March.
EXTREMES, 1951-56.--Dissolved solids: Maximum, 600 ppm Jan. 1-10, 1952; minimum, 273 ppm June 23-25, 1954.
Hardness: Maximum, 344 ppm Jan. 1-10, 1952; minimum, 159 ppm June 23-25, 1954.
Specific conductance: Maximum daily, 936 micromhos Jan. 6, 1953; minimum daily, 361 micromhos Mar. 29, 1951.
Water temperatures: Maximum, 85°F July 25, 1952; minimum, freezing point on many days during winter months.
REMARKS.--Daily samples for chemical analysis composited by discharge. Records of specific conductance of daily samples available in district office at Lincoln, Nebr. Records of discharge for water year October 1955 to September 1956 given in WSP 1440.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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. 1-31, 1955....	35,360	--	--	--	--	59	--	182	--	--	--	--	--	424	0.58	40,480	201	52	39	1.8	655	7.6	--
Nov. 1-17.....	21,690	--	--	--	--	62	--	178	--	--	--	--	--	406	.55	23,780	190	44	42	2.0	644	7.5	--
Nov. 18-20.....	9,250	--	--	--	--	69	--	200	--	--	--	--	--	461	.63	11,510	216	52	41	2.0	707	7.8	--
Nov. 21.....	9,550	--	--	--	--	64	--	182	--	--	--	--	--	426	.58	10,980	194	45	42	2.0	647	7.8	--
Nov. 22-29.....	13,660	--	--	--	--	64	--	197	--	--	--	--	--	425	.58	15,670	203	41	41	1.9	660	7.8	--
Nov. 30-Dec. 6....	5,914	--	--	--	--	80	--	234	--	--	--	--	--	529	.72	8,450	247	55	41	2.2	816	7.9	--
Dec. 7-23.....	10,420	19	0.00	61	18	65	5.4	212	163	26	0.6	4.4	0.12	471	.64	13,250	228	54	38	1.9	719	8.0	7
Dec. 29-Jan. 25, 1956.....	12,080	--	--	--	--	58	--	196	--	--	--	--	--	433	.59	14,120	210	49	38	1.7	674	7.7	--
Feb. 19-Mar. 4....	16,150	--	--	--	--	56	--	194	--	--	--	--	--	441	.60	19,230	216	57	36	1.7	669	8.0	--
Mar. 5-16.....	21,320	19	.00	55	15	48	5.1	180	122	21	.4	2.3	.08	393	.53	22,620	198	50	34	1.5	605	7.9	9
Mar. 17-31.....	39,450	--	--	--	--	51	--	185	--	--	--	--	--	411	.56	43,780	212	60	34	1.5	631	7.9	--
Apr. 1-13.....	34,360	--	--	--	--	54	--	190	--	--	--	--	--	450	.61	41,750	228	72	34	1.5	675	7.9	--
Apr. 14-30.....	33,740	--	--	--	--	61	--	202	--	--	--	--	--	493	.67	44,910	244	78	35	1.7	735	7.9	--
May 1-28.....	33,970	--	--	--	--	60	--	176	--	--	--	--	--	451	.61	41,370	218	74	37	1.8	698	7.9	--
May 29.....	32,700	--	--	--	--	92	--	176	--	--	--	--	--	543	.74	47,940	214	70	48	2.7	858	8.1	--
May 30-June 4.....	36,230	--	--	--	--	53	--	163	--	--	--	--	--	421	.57	41,180	199	65	37	1.6	630	8.0	--
June 5-13.....	31,980	11	.06	58	17	57	5.8	174	184	16	.4	1.3	.13	443	.60	38,250	216	73	36	1.7	684	7.9	9
June 14-28.....	34,190	--	--	--	--	65	--	192	--	--	--	--	--	507	.69	46,800	236	79	37	1.8	757	7.9	--
June 29-July 10....	33,210	--	--	--	--	63	--	188	--	--	--	--	--	484	.66	43,400	235	81	37	1.8	747	8.0	--

July 11-19.....	34,940	--	--	--	--	62	--	189	--	--	--	--	--	489	.67	46,130	240	85	36	1.7	745	7.7	--
July 20-Aug. 16....	33,480	--	--	--	--	72	--	198	--	--	--	--	--	531	.72	48,000	253	91	38	2.0	799	7.8	--
Aug. 17-22.....	40,230	--	--	--	--	62	--	176	--	--	--	--	--	465	.63	50,510	217	73	38	1.8	707	7.8	--
Aug. 23-Sept. 5....	34,380	--	--	--	--	65	--	190	--	--	--	--	--	499	.68	46,320	239	83	37	1.8	757	7.8	--
Sept. 6.....	42,300	--	--	--	--	53	--	184	--	--	--	--	--	430	.58	49,110	220	69	34	1.6	660	7.9	--
Sept. 7-30.....	34,380	9.9	.03	59	20	65	5.1	184	195	16	.5	.5	.15	475	.65	44,090	228	77	38	1.9	747	7.8	--
Weighted average a.	28,250	--	--	--	--	61	--	187	--	--	--	--	--	462	0.63	35,240	223	70	37	1.8	707	--	--
Weighted average b.	27,060	--	--	--	--	61	--	187	--	--	--	--	--	461	0.63	33,680	223	70	37	1.8	706	--	--

a Represents 96 percent of runoff for water year October 1955 to September 1956.
b Includes estimated data for missing periods. Represents 100 percent of runoff for water year October 1955 to September 1956.

MISSOURI RIVER MAIN STEM--Continued

MISSOURI RIVER AT NEBRASKA CITY, NEBR.--Continued

Temperature (° F) of water, water year October 1955 to September 1956
/Once-daily measurement at 8 a.m./

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

a Measurement at 4 a.m.

MULE CREEK NEAR MALVERN, IOWA

LOCATION.--At gaging station at highway bridge, 1.8 miles upstream from mouth and 4.4 miles south of Malvern, Mills County.
DRAINAGE AREA.--10.6 square miles.
RECORDS AVAILABLE.--Sediment records: July 1954 to September 1956.
EXTREMES, 1955-56.--Sediment concentrations: Maximum daily, 9,200 ppm Aug. 1; minimum daily, no flow Jan. 20-25.
Sediment loads: Maximum daily, 16,200 tons July 15; minimum daily, 0 tons Jan. 20-25.
EXTREMES, 1954-56.--Sediment concentrations: Maximum daily, 11,000 ppm Aug. 23, 1954; minimum daily, no flow Jan. 20-25, 1956.
Sediment loads: Maximum daily, 22,000 tons Aug. 21, 1954; minimum daily, 0 tons Jan. 20-25, 1956.
REMARKS.--Flow affected by ice Nov. 16 to Mar. 20. Maximum observed sediment concentration during water year, 56,500 ppm July 11. Records of discharge for water year October 1955 to September 1956 given in WSP 1440.

Suspended sediment, water year October 1955 to September 1956

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	0.27	--	e 0.1	0.17	--	e 0.1	0.10	--	(t)
2	.17	--		.17	--		.10	--	
3	.06	120	(t)	.13	--		.10	70	
4	.10	--		.21	192		.10	--	
5	.10	--		.21	--		.10	--	
6	.10	--	(t)	.17	--	e .1	.10	70	
7	.08	--		.17	--		.10	--	
8	.06	17		.17	--		.10	--	
9	.06	--		.21	192		.10	--	
10	.06	--		.21	--		.10	--	
11	.08	17	(t)	.17	--	e .1	.10	--	(t)
12	.10	--		.13	192		.10		
13	.10	--		.17	--		.10		
14	.13	--		.13	192		.10		
15	.10	17		.17	--		.10		
16	.10	--		.30	--		.10		
17	.33	--	(t)	.25	--	e .1	.10	--	(t)
18	.13	--		.22	72		.10		
19	.10	--		.28	--		.10		
20	.17	55		.32	--		.10		
21	.27	--	(t)	.35	--	(t)	.11	--	e 0.1
22	.13	55		.30	72		.12		
23	.17	--		.25	--		.13		
24	.21	--		.22	--		.14		
25	.17	55		.20	--		.15		
26	.17	--	(t)	.17	72	(t)	.16	--	
27	.17	--		.15	--		.17		
28	.17	--		.13	--		.18		
29	.17	22		.11	--		.19		
30	.13	--		.10	--		.20		
31	.17	22		--	--	--	.21		
Total	4.33	--	0.7	5.94	--	2.6	3.76	--	0.9

e Estimated.
t Less than 0.050 ton.

NISHNABOTNA RIVER BASIN--Continued

MULE CREEK NEAR MALVERN, IOWA--Continued

Suspended sediment, water year October 1955 to September 1956--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	0.21	--		0.10	--		1.8	--	
2	.21	--		.11	--		1.6	--	
3	.21	--	e 0.1	.12	--	(t)	1.4	27	e 0.1
4	.21	225		.13	24		1.3	--	
5	.21	--		.15	--		1.2	--	
6	.21	--		.15	--		1.2	--	
7	.21	225		.15	--		1.0	--	
8	.21	--	e .1	.15	--		1.2	--	
9	.21	--		.15	--		1.0	--	
10	.21	--		.15	--		1.1	27	
11	.21	--		.15	24		1.2	--	e .1
12	.21	--		.15	--		1.2	--	
13	.21	--	e .1	.15	--		1.2	--	
14	.21	225		.15	--		1.1	--	
15	.21	--		.15	--		.90	--	
16	.18			.15	--		1.2	--	
17	.15			.15	--		.90	27	
18	.13	--	(t)	.15	24	(t)	.70	--	
19	.10			.15	--		.80	--	e .1
20	0	--	0	.15	--		.90	--	
21	0	--	0	.25			.55	--	
22	0	--	0	.25			.55	--	
23	0	--	0	.50	--	(t)	.87	--	e .1
24	0	--	0	.90			.42	27	
25	0	--	0	1.6	24		.71	--	
26	.10	--		1.5	--		.71	--	
27	.10	45		1.2	--	e .1	.55	--	
28	.10	--		1.1	--		.42	--	
29	.10	--	(t)	1.0	--		.27	--	(t)
30	.10	--		--	--	--	.42	27	
31	.10	--		--	--	--	.42	--	
Total	4.31	--	1.7	11.16	--	0.8	28.79	--	2.6

Day	April			May			June		
1	0.42	--	(t)	0.33	--		0.06	--	
2	.55	--	e 0.1	.42	--		.06	--	
3	1.2	--	e .7	.42	--		.06	12	(t)
4	.21	--		.42	38		.06	--	
5	.17	--		.42	--		.06	--	
6	.33	--		.33	--	(t)	.10	--	
7	.33	23	(t)	.27	--		.10	--	
8	.27	--		.27	--		.10	23	(t)
9	.33	--		.33	--		.08	--	
10	.17	--		.27	--		.08	--	
11	.13	--		.27	--		.08	--	
12	.17	--		.13	31		.08	--	
13	.13	--		.10	--		.08	--	
14	.13	23		.10	--		.08	--	
15	.13	--		.08	--	(t)	.08	--	
16	.13	--	(t)	.08	--		.08	23	(t)
17	.13	--		.06	--		.10	--	
18	.13	--		.08	--		.10	--	
19	.13	--		.54	90	sa 0.7	.10	--	
20	.17	--		.42	55	a .1	.13	--	
21	.17	--		.21	--		.13	--	
22	.21	28		.13	--		.17	--	
23	.21	--		.13	--		.13	17	
24	.13	--		.10	--		.13	--	(t)
25	.17	--	(t)	.08	12	(t)	.10	--	
26	.13	--		.06	--		.17	--	
27	.13	--		.06	--		.10	--	
28	1.1	110	sa .6	.06	--		.10	--	
29	.42	--	(t)	.55	--	e .7	.13	120	sb 0.3
30	.27			.55	--	e .2	.21	280	sb .6
31	--	--	--	.10	--	(t)	--	--	--
Total	8.30	--	1.8	7.37	--	2.2	3.04	--	1.1

e Estimated.
s Computed by subdividing day.
t Less than 0.050 ton.
a Computed from estimated concentration graph.
b Computed from partly estimated concentration graph.

NISHNABOTNA RIVER BASIN--Continued

MULE CREEK NEAR MALVERN, IOWA--Continued

Suspended sediment, water year October 1955 to September 1956--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	0.13	--	(t)	15	9,200	sa 440	0.55	260	e 0.4
2	.21			5.0	--	e 16	.33		
3	5.2	1,700	sa 240	1.2	--	e .2	.21	--	e .1
4	.71	--	e 5.0	.55	50	.1	.27		
5	.21	--	e .1	.33	--	(t)	3.2	480	sb 7.0
6	.13			.21			1.2	--	e .3
7	4.6	4,600	sb 120	11	2,110	s 148	.87	--	e .1
8	4.2	2,200	sa 70	29	3,000	sa 650	.55		
9	.33	--	e 4.0	22	1,800	sa 140	.42		
10	.17	--	e .1	2.7	--	e 5.0	.55	--	e .1
11	31	4,000	s 2,480	1.4	51	.2	.55		
12	6.3	2,200	sa 70	.71	--	e .1	.55		
13	1.8	--	e 10	.71			.42		
14	.55	772	1.2	.42	--	(t)	.27	--	
15	211	5,240	s 16,200	.33			.27	9	
16	98	--	e 2,000	.80	--	e .9	.27	--	
17	6.2	--	e 20	.42	--	e .1	.21	--	(t)
18	2.4	--	e 5.0	116	5,700	sb 3,400	.21	--	
19	1.5	--	e 2.0	4.0	--	e 50	.21	--	
20	13	4,000	sa 600	1.5	--	e 2.0	.21	--	
21	3.7	--	e 20	.87			.21	--	
22	.87	570	1.3	.42	--	e .1	.13	--	
23	.42	--	e .1	.55			.17	15	
24	.21	--	(t)	.33			.17	--	
25	.21			.27	11	(t)	.13	--	(t)
26	.17			.21	--		.13	--	
27	.13			.17	--		.17	--	
28	.71	241	.5	.27	--	e .5	.10	--	(t)
29	.55	--	e .1	2.2	--	e 20	.10		
30	.33			2.1	--	e 20	.17		
31	16	4,800	sb 1,100	.71	--	e 2.0	--	--	--
Total	410.94	--	22,949.8	221.38	--	4,895.8	12.80	--	8.8

Total discharge for year (cfs-days) 722.12
Total load for year (tons) 27,868.8

e Estimated.
s Computed by subdividing day.
t Less than 0.050 ton.
a Computed from estimated concentration graph.
b Computed from partly estimated concentration graph.

NISHNABOTNA RIVER BASIN--Continued

MULE CREEK NEAR MALVERN, IOWA--Continued

Particle-size analyses of suspended sediment, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; 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
July 11, 1956.....	9:15 p.m.	385	--	32,300	2,630		38		60		99	99	100				SPWCM
July 15	8:25 p.m.	1,990	75	36,100	3,300		31		52		94	98	99		100		SPWCM
July 31	8:55 p.m.	227	--	30,000	2,900		31		54		96	99	100				SPWCM

NISHNABOTNA RIVER BASIN--Continued

DAVIDS CREEK NEAR HAMLIN, IOWA

LOCATION.--At gaging station, downstream side of bridge on State Highway 64, 5.2 miles east of Hamlin, Audobon County, and 8 miles upstream from mouth and East Nishnabotna River.
DRAINAGE AREA.--26.0 square miles (revised).
RECORDS AVAILABLE.--Water temperatures: July 1952 to September 1953.
Sediment records: July 1952 to September 1956.
EXTREMES, 1955-56.--Sediment concentrations: Maximum daily, 5,900 ppm June 7; minimum daily, no flow on many days during December to March.
Sediment loads: Maximum daily, 3,000 tons June 7; minimum daily, 0 tons on many days during December to March.
EXTREMES, 1952-56.--Sediment concentrations: Maximum daily, 10,700 ppm Apr. 23, 1955; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 6,290 tons June 4, 1953; minimum daily, 0 tons on many days.
REMARKS.--Flow affected by ice Nov. 17 to Dec. 25, Dec. 27 to Jan. 1, Jan. 4 to Mar.24.
Records of discharge for water year October 1955 to September 1956 given in WSP 1440.

Suspended sediment, water year October 1955 to September 1956

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	0.06	15		0.08	--		0.06		
2	.06	--		.08	--		.05		
3	.06	--	(t)	.08	--		.04		
4	.08	--		.08	--		.03		(t)
5	.08	--		.08	85		.02		
6	.15	--		.08	--		.01		
7	.08	--		.12	--		0		0
8	.08	42		.12	--	(t)	.01		
9	.08	--		.12	--		.02		
10	.08	--		.12	--		.02		
11	.08	--		.08	--		.02		
12	.06	--		.08	85		.02		(t)
13	.04	--	(t)	.08	--		.02		
14	.06	--		.12	--		.02		
15	.08	42		.08	--		.01		
16	.08	--		.08	--		.01		
17	.06	--		.09	--		0		0
18	.08	--		.10	--		0		0
19	.08	--		.10	--		0		0
20	.08	--		.13	--		0		0
21	.18	--		.16	--		0		0
22	.12	52		.14	--		.01		
23	.12	--		.11	--	(t)	.02		
24	.08	--		.11	--		.03		
25	.12	--		.11	--		.04		
26	.15	--	(t)	.11	62		.04		(t)
27	.12	--		.10	--		.04		
28	.12	--		.09	--		.03		
29	.08	52		.08	--		.03		
30	.08	--		.07	--		.01		
31	.08	--		--	--	--	0		0
Total	2.76	--	0.3	2.98	--	0.6	0.61		0.1

t Less than 0.050 ton.

NISHNABOTNA RIVER BASIN--Continued

DAVIDS CREEK NEAR HAMLIN, IOWA--Continued

Suspended sediment, water year October 1955 to September 1956--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	0.02	--	
2	.01			0		0	.03	--	
3	.01			0		0	.04	18	(t)
4	.01			0		0	.02	--	
5	.02			0		0	.01	62	
6	.02			0		0	0	--	0
7	.02			0		0	0	--	0
8	.02			0		0	0	--	0
9	.02			0		0	0	--	0
10	.02		(t)	0		0	0	--	0
11	.02			0		0	0	--	0
12	.02			0		0	.01	--	
13	.02			0		0	.80	41	
14	.02			0		0	.45	--	
15	.01			0		0	.40	--	(t)
16	.01			0		0	.36	--	
17	.01			0		0	.30	29	
18	.01			0		0	.25	--	(t)
19	0		0	0		0	.20	--	
20	0		0	0		0	.27	--	
21	0		0	0		0	.23	--	
22	0		0	0		0	.35	24	
23	0		0	0		0	.45	--	
24	0		0	0		0	.50	14	(t)
25	0		0	0		0	.33	--	
26	0		0	0		0	.28	--	
27	0		0	0		0	.18	--	
28	0		0	0		0	.15	--	
29	0		0	.01		(t)	.15	--	(t)
30	0		0	--		--	.12	--	
31	0		0	--		--	.12	44	
Total	0.27		0.1	0.01		(t)	5.72	--	0.5

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	0.12	--		0.15	--		0.12	150	0.1
2	.15	--		.28	--		.06	47	
3	.18	--		.28	--		.18	--	(t)
4	.18	--		.15	--		.08	--	
5	.18	--	(t)	.12	81	(t)	.04	31	(t)
6	.15	--		.08	--		14	--	e 300
7	.08	43		.08	--		87	5,900	sa 3,000
8	.15	--		.06	--		1.6	800	3.5
9	.23	--		.08	--		.59	250	.4
10	.15	--		.06	--		.28	--	e .1
11	.33	--		.12	66	(t)	.18	25	
12	.15	--		.12	39	(t)	.12	--	
13	.12	--		2.4	650	b 4.4	.08	22	
14	.12	26		.33	--	e .4	.06	--	
15	.12	--	(t)	.08	--	e .1	.08	--	
16	.11	--		.08	--		.08	--	(t)
17	.10	--		.06	--		.08	--	
18	.10	--		.06	--		.06	--	
19	.09	--		.06	47		.08	25	
20	.08	--		.05	--		.08	--	
21	.06	8		.05	--	(t)	.06	--	
22	.02	--		.04	--		.12	--	
23	.04	--	(t)	.04	--		.15	71	(t)
24	.02	--		.03	--		.06	--	
25	.06	--		.03	--		.08	--	
26	.06	--		.02	77		.12	28	(t)
27	.08	--		.02	--	(t)	.23	--	
28	.18	95	.1	.02	--		.12	--	
29	.15	--		4.5	--	e 40	.12	--	
30	.12	72	(t)	7.2	3,000	sa 65	7.2	1,700	sa 38
31	--	--	--	.45	1,020	1.3	--	--	--
Total	3.68	--	0.4	17.10	--	111.6	113.11	--	3,342.5

e Estimated.
s Computed by subdividing day.
t Less than 0.050 ton.
a Computed from partly estimated concentration graph.
b Computed from estimated concentration graph.

NISHNABOTNA RIVER BASIN--Continued

DAVIDS CREEK NEAR HAMLIN, IOWA--Continued

Suspended sediment, water year October 1955 to September 1956--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.....	1.8	750	3.2	13	550	sb 28	0.52	52	0.1
2.....	.39	370	.4	1.8	220	sa 1.4	.45	36	(t)
3.....	30	1,980	s 534	.59	220	.4	1.5	56	sa .7
4.....	12	1,200	sa 48	.28	50	(t)	274	850	sa 850
5.....	1.2	450	1.5	.18	30	(t)	174	500	s 360
6.....	.52	200	b .3	94	950	sa 500	25	95	6.4
7.....	17	1,600	sa 140	8.0	100	2.2	13	49	1.7
8.....	2.6	700	4.9	142	1,600	sb1,000	8.5	37	.8
9.....	.59	300	.5	11	--	e 3.0	6.4	--	e .5
10.....	.28	100	.1	3.6	39	.4	5.3	22	
11.....	6.2	550	sb 40	2.4	34	.2	4.0	17	e .2
12.....	10	1,300	sa 40	1.6			3.6	24	
13.....	1.0	410	1.1	1.1			3.1	--	
14.....	.28	200	.2	.92	25	.1	2.6	13	
15.....	23	1,100	sb 300	.75			2.6	15	e .1
16.....	56	2,400	sb 900	169	650	sa 440	2.1	--	
17.....	2.4	200	1.3	12	210	6.8	1.6	9	
18.....	2.2	104	sb 3.0	10	165	4.5	1.6	12	
19.....	1.0	345	.9	7.2	41	.8	1.6	15	
20.....	.39	100	.1	4.0	22	.2	1.5	--	e .1
21.....	.28	30	(t)	2.6			1.4	15	
22.....	.23	--		1.8			1.2	24	
23.....	.23	12		1.5	29	.1	1.0	--	
24.....	.18	--		1.0			1.0	25	
25.....	.12	14	(t)	.83	53		1.0	30	
26.....	.08	--		.75	--		1.0	--	e .1
27.....	.08	14		.67	33		.92	--	
28.....	6.4	650	sa 16	.52	30	e .1	.75	--	
29.....	1.4	220	.8	.59	--		.75	--	
30.....	.52	85	.1	.67	25		.75	--	
31.....	1.6	160	sb 3.0	.75	30		--	--	--
Total.	179.77	--	2,039.5	495.10	--	1,989.4	542.74	--	1,222.7

Total discharge for year (cfs-days)..... 1,363.85
Total load for year (tons)..... 8,707.7

e Estimated.
s Computed by subdividing day.
t Less than 0.050 ton.
a Computed from partly estimated concentration graph.
b Computed from estimated concentration graph.

NISHNABOTNA RIVER BASIN--Continued

DAVIDS CREEK NEAR HAMLIN, IOWA--Continued

Particle-size analyses of suspended sediment, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; 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 30, 1956	9:40 a.m.	23	66	4,050	3,750		84		99		99	99	100		--		SPWCM
July 3	7:00 p.m.	160	68	10,000	2,140		40		80		95	98	99		100		SPWCM
Aug. 16	10:10 a.m.	406	69	1,040	2,880		61		82		97	98	99		100		SPWCM
Sept. 4	10:20 a.m.	435	56	763	2,770		67		77		96	97	98		100		SPWCM
Sept. 5	9:35 a.m.	392	55	833	1,740		68		77		96	96	98		100		SPWCM

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REPUBLICAN RIVER ABOVE MEDICINE CREEK, AT CAMBRIDGE, NEBR.

LOCATION (revised).--At bridge on State Highway 47, 2 miles upstream from gaging station at Cambridge, Furnas County, 1.5 miles upstream from Medicine Creek, and 3.3 miles upstream from Cambridge diversion dam.
DRAINAGE AREA.--13,200 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: December 1950 to September 1956.
Water temperatures: December 1950 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 416 ppm Nov. 17-19; minimum, 203 ppm June 19-21.
Hardness: Maximum, 251 ppm Nov. 17-19; minimum, 122 ppm June 19-21.
Specific conductance: Maximum daily, 659 micromhos Nov. 17; minimum, daily, 304 micromhos Aug. 17.
Water temperatures: Maximum, 92°F July 28, Aug. 14; minimum, freezing point on many days during November to March.
EXTREMES, 1950-56.--Dissolved solids: Maximum (1951-56), 444 ppm Nov. 26 to Dec. 3, 1952; minimum, 190 ppm Sept. 1-5, 1953.
Hardness: Maximum, 272 ppm Nov. 26 to Dec. 3, 1952; minimum, 113 ppm Sept. 1-5, 1953.
Specific conductance: Maximum daily (1951-56), 830 micromhos Aug. 21, 1952; minimum daily, 267 micromhos Aug. 17, 1954.
Water temperatures: Maximum, 97°F Aug. 19, 1952, July 28, 1953; minimum, freezing point on many days during winter months.
REMARKS.--Daily samples for chemical analysis composited by discharge. Records of specific conductance of daily samples available in district office at Lincoln, Nebr. Water discharge computed by subtracting the discharge of Medicine Creek at Cambridge from that of the Republican River at Cambridge. Discharge records for the Republican River at Cambridge and Medicine Creek at Cambridge for water year October 1955 to September 1956 given in WSP 1440.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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. 1-31, 1955	47.3	--	--	--	--	28	--	282	42	--	--	--	--	356	0.48	45.5	209	0	22	0.8	540	8.0	--
Nov. 1-16	106	--	--	--	--	28	--	a 297	33	--	--	--	--	358	.49	102	218	0	22	.8	541	8.2	--
Nov. 17-19	83.3	--	--	--	--	33	--	344	42	--	--	--	--	416	.57	93.6	251	0	22	.9	626	8.0	--
Nov. 20-27	154	--	--	--	--	25	--	282	34	--	--	--	--	365	.50	152	221	0	20	.7	545	7.9	--
Nov. 28-Dec. 21	83.9	61	0.00	68	18	29	15	328	41	9.5	0.9	5.7	0.14	399	.54	90.4	243	0	19	.8	598	8.0	8
Dec. 22-Jan. 17, 1956	138	--	--	--	--	25	--	284	31	--	--	--	--	352	.48	131	214	0	20	.7	527	7.8	--
Jan. 18-31	102	--	--	--	--	25	--	298	35	--	--	--	--	373	.51	103	230	0	19	.7	556	7.8	--
Feb. 1-13	124	--	--	--	--	26	--	285	33	--	--	--	--	352	.48	118	221	0	20	.8	541	7.9	--
Feb. 14-29	204	--	--	--	--	23	--	263	--	--	--	--	--	321	.44	177	199	0	20	.7	495	8.0	--
Mar. 1-31	165	58	.00	58	17	24	13	286	31	7.0	.9	4.2	.15	359	.49	160	214	0	18	.7	530	8.2	6
Apr. 1-19	189	--	--	--	--	26	--	289	43	--	--	--	--	362	.49	185	214	0	20	.8	539	8.2	--
Apr. 20-30	97.1	--	--	--	--	31	--	a 299	45	--	--	--	--	381	.52	99.9	225	0	23	.9	572	8.3	--
May 1-21	61.3	--	--	--	--	30	--	289	43	--	--	--	--	360	.49	59.6	212	0	23	.9	554	8.1	--
May 22-27	11.2	--	--	--	--	26	--	255	38	--	--	--	--	328	.45	9.92	187	0	23	.8	496	7.8	--
May 28-30	261	--	--	--	--	13	--	180	19	--	--	--	--	238	.32	168	134	0	17	.5	347	7.7	--
May 31-June 8	13.1	58	.00	55	16	27	17	276	36	9.0	1.2	2.3	.14	364	.50	12.9	201	0	21	.8	537	8.2	20
June 11-14	36.3	--	--	--	--	21	--	210	22	--	--	--	--	272	.37	26.7	146	0	23	.8	407	7.7	--
June 17-18	732	--	--	--	--	15	--	200	8.8	--	--	--	--	229	.31	453	136	0	19	.6	349	7.6	--

a Includes equivalent of 5 ppm of carbonate (CO_3).

KANSAS RIVER BASIN--Continued

REPUBLICAN RIVER ABOVE MEDICINE CREEK, AT CAMBRIDGE, NEBR.--Continued

Chemical analyses, in parts per million, water year October 1955 to September 1956--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 19-21, 1956...	2,016	--	--	--	--	9.2	--	168	13	--	--	--	--	203	0.28	1,100	122	0	13	0.4	309	7.4	--
June 22-July 1.....	224	--	--	--	--	21	--	234	32	--	--	--	--	305	.41	184	172	0	20	.7	456	7.7	--
July 2-5.....	358	--	--	--	--	17	--	215	10	--	--	--	--	249	.34	241	145	0	20	.6	372	7.6	--
July 6	1,790	--	--	--	--	8.9	--	182	8.0	--	--	--	--	205	.28	991	132	0	12	.3	314	7.7	--
July 7-9.....	455	--	--	--	--	12	--	190	21	--	--	--	--	234	.32	287	142	0	15	.4	363	7.8	--
July 10-27.....	73.3	--	--	--	--	29	--	238	50	--	--	--	--	325	.44	64.3	177	0	26	.9	496	7.8	--
July 31-Aug. 16....	106	--	--	--	--	20	--	204	33	--	--	--	--	258	.35	73.8	151	0	22	.7	408	7.7	--
Aug. 17-20.....	159	--	--	--	--	13	--	174	16	--	--	--	--	208	.28	89.3	126	0	18	.5	320	7.5	--
Aug. 21-30.....	34.0	51	0.00	50	13	25	15	244	35	7.5	0.7	2.8	0.13	321	.44	29.5	179	0	22	.8	478	7.9	--
Aug. 31-Sept. 20...	12.8	--	--	--	--	30	--	252	--	--	--	--	--	337	.46	11.6	188	0	26	1.0	518	7.7	--
Sept. 21-30.....	4.40	--	--	--	--	33	--	233	--	--	--	--	--	322	.44	3.83	169	0	30	1.1	504	7.9	--
Weighted average b.	133	--	--	--	--	21	--	250	29	--	--	--	--	310	0.42	111	186	0	20	0.7	468	--	--

b Includes estimates where data are missing. Represents 100 percent of runoff for water year October 1955 to September 1956.

KANSAS RIVER BASIN--Continued

REPUBLICAN RIVER ABOVE MEDICINE CREEK, AT CAMBRIDGE, NEBR.--Continued

Temperature (° F) of water, water year October 1955 to September 1956
/Once-daily measurement between 9 a.m. and 1 p.m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	--	46	33	a 35	32	35	a 62	b 43	68	77	78	84
2	60	44	--	35	33	36	48	b 43	69	80	78	a 89
3	59	42	--	34	32	36	a 36	49	68	78	78	80
4	66	a 49	a 32	--	32	a 50	45	46	85	83	81	79
5	68	a 55	32	34	a 32	42	55	55	85	76	79	60
6	--	39	a 32	35	32	40	52	52	b 79	a 77	85	68
7	a 64	a 43	32	32	32	32	46	b 72	86	77	78	a 70
8	--	38	a 33	--	32	32	a 49	61	a 69	70	a 85	67
9	a 73	48	32	35	32	40	45	b 74	91	76	82	64
10	69	46	32	34	32	40	52	66	77	73	a 83	53
11	69	44	a 33	a 35	32	a 32	56	a 76	80	79	78	82
12	a 62	40	34	33	32	32	57	64	87	79	a 79	75
13	61	a 37	33	35	34	a 36	a 68	60	90	79	a 81	75
14	a 63	a 34	33	35	32	32	65	72	a 83	83	a 92	--
15	62	a 33	a 32	a 32	32	34	49	70	86	82	78	--
16	a 60	32	32	32	32	a 49	47	a 75	82	84	81	--
17	a 61	32	33	32	32	49	44	80	66	75	73	--
18	a 62	32	a 32	32	a 32	39	a 63	a 78	75	83	72	--
19	a 62	a 36	32	32	a 32	47	47	74	73	a 83	73	--
20	a 58	a 36	32	a 32	32	44	56	a 85	78	78	64	--
21	57	38	32	32	33	57	60	a 85	76	80	64	--
22	53	40	46	a 32	33	55	a 62	a 79	74	79	69	--
23	45	34	44	32	33	57	43	73	72	--	75	--
24	a 57	33	41	32	34	56	50	73	74	84	75	--
25	46	35	a 34	32	34	48	63	63	79	86	77	--
26	44	38	--	32	35	52	67	88	81	87	a 85	--
27	47	32	32	32	32	49	70	--	a 85	90	85	--
28	43	32	33	34	34	37	44	a 81	b 73	a 92	81	--
29	43	33	32	32	35	38	38	77	83	--	75	76
30	a 50	32	32	32	--	41	b 41	73	84	79	79	67
31	49	--	32	32	--	45	--	68	--	a 86	a 73	--
Average	58	38	34	33	33	42	53	69	79	81	78	--

a Measurement between 3 p.m. and 6 p.m.
b Measurement between 5 a.m. and 7 a.m.

KANSAS RIVER BASIN--Continued

MEDICINE CREEK AT MAYWOOD, NEBR.

LOCATION.--At bridge on U. S. Highway 83, 150 feet upstream from gaging station, a quarter of a mile east of Maywood, Frontier County, and 5 miles upstream from Brushy Creek.
DRAINAGE AREA.--207 square miles, approximately, of which about 82 square miles contribute directly to surface runoff.
RECORDS AVAILABLE.--Water temperatures: April 1951 to September 1956.
Sediment records: April 1951 to September 1956.
EXTREMES, 1955-56.--Water temperatures: Maximum, 80°F Aug. 5; minimum, freezing point on several days during November to February.
Sediment concentrations: Maximum daily, 6,380 ppm June 17; minimum daily, not determined.
Sediment loads: Maximum daily, 2,310 tons July 5; minimum daily, 2 tons Sept. 1.
EXTREMES, 1951-56.--Water temperatures: Maximum, 86°F July 13, 1953; minimum, freezing point on several days during winter months.
Sediment concentrations: Maximum daily, 20,000 ppm July 12, 1951; minimum daily, not determined.
Sediment loads: Maximum daily, 22,700 tons May 20, 1951; minimum daily not determined.
REMARKS.--Maximum observed sediment concentration during water year 36,600 ppm July 18. Flow affected by ice Nov. 16-18, Nov. 28 to Dec. 25, Jan. 8, 9, 13, Jan. 15 to Feb. 7, Feb. 15-18, Mar. 12, 13. Records of discharge for water year October 1955 to September 1956 given in WSP 1440.

Temperature (° F) of water, water year October 1955 to September 1956
/Once-daily measurement between 12 m. and 5 p.m./

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

a Measurement between 7 a.m. and 11 a.m.
b Measurement between 6 p.m. and 8 p.m.

KANSAS RIVER BASIN--Continued

MEDICINE CREEK AT MAYWOOD, NEBR.--Continued

Suspended sediment, water year October 1955 to September 1956

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	18			33	280	a 24	23	106	
2	18			36	258	25	22	64	
3	19			32	240	a 20	23	--	
4	19			36	259	25	22	274	
5	19			29	200	a 16	24	--	b 9
6	19			21	118	7	25	136	
7	19	163	8	21	90	5	25	--	
8	19			21	108		25	90	
9	19			22	--		26	--	
10	18			23	--		30	128	
11	18			23	110		32	--	
12	18			24	127		30	82	
13	18	--		24	--	b 7	29	--	
14	18	98		24	100		28	176	
15	19	--		23	--		27	--	
16	19	98		21	164		28	131	
17	19	--		25	128		28	--	
18	19	65		22	87		28	121	b 9
19	19	--		23	--		28	--	
20	19	75	b 4	25	--		29	82	
21	19	--		27	--		30	--	
22	19	73		28	104		30	86	
23	20	--		26	--		31	--	
24	21	66		24	126		30	--	
25	21	--		24	--	b 8	29	290	23
26	21	70		24	85		28	166	13
27	30	190	sa 17	25	--		28	120	a 9
28	25	227	15	23	--		28	105	8
29	37	360	sa 40	25	159		27	90	7
30	22	138	8	24	111		26	83	6
31	20	90	a 5	--	--	--	26	85	6
Total	628	--	237	758	--	295	845	--	288

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	26	86		25	--		32	176	
2	27	--		23	107		32	--	
3	27	86		24	--		32	161	
4	27	--		27	130		32	--	b 15
5	27	85		30	--		32	182	
6	27	--		31	127		32	--	
7	25	70		31	--		39	--	e 60
8	24	--	b 5	30	177		32	208	18
9	23	77		28	--		30	234	19
10	23	67		28	131		30	240	a 19
11	23	67		28	--		27	209	15
12	23	--		28	119		23	200	a 12
13	23	65		29	--		33	204	18
14	23	--		30	210		28	200	a 15
15	22	--		29	--	b 12	28	184	14
16	20	--		28	142		29	--	
17	18	106		27	279		32	161	
18	16	--		27	175		32	--	
19	15	51		26	--		29	167	b 13
20	14	--		26	132		28	--	
21	16	35		26	--		29	175	
22	20	--		27	139		29	185	14
23	25	--	b 5	28	--		29	196	15
24	25	83		29	199		29	200	a 16
25	25	81		29	150		35	615	58
26	26	--		29	162		30	386	31
27	27	97		31	--		27	244	18
28	27	--		29	154		26	163	11
29	26	150		29	--		25	160	11
30	26	--		--	--	--	25	140	9
31	26	126		--	--	--	25	147	10
Total	722	--	155	812	--	348	921	--	551

e Estimated.
s Computed by subdividing day.
a Computed from estimated concentration graph.
b Computed from samples obtained 3 or 4 times a week.

KANSAS RIVER BASIN--Continued

MEDICINE CREEK AT MAYWOOD, NEBR.--Continued

Suspended sediment, water year October 1955 to September 1956--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	26	152	11	34	288	26	31	809	s 72
2	26	170	12	34	304	28	18	378	s 25
3	27	180	a 13	30	324	26	13	186	7
4	32	300	c 26	28	280	21	14	198	7
5	45	650	79	28	289	22	16	243	10
6	51	695	96	28	347	26	20	461	s 27
7	39	452	48	27	363	26	23	554	34
8	30	278	23	32	476	41	21	330	19
9	27	172	13	28	487	37	19	296	15
10	29	233	18	24	460	30	17	264	12
11	27	194	14	22	423	25	15	250	10
12	24	190	12	21	404	23	14	196	7
13	24	175	11	20	372	20	13	281	10
14	23	180	11	20	320	17	12	262	8
15	22	165	10	21	369	21	12	297	10
16	22	130	8	20	375	20	12	620	s 24
17	21	134	8	15	279	11	23	6,380	s 440
18	22	152	9	11	197	6	32	3,860	s 407
19	22	182	11	9.7	166	4	24	880	57
20	22	191	11	10	200	5	17	394	18
21	22	165	10	14	245	9	15	368	15
22	22	163	10	21	395	22	14	326	12
23	24	160	10	24	455	29	13	310	11
24	31	304	25	22	350	21	12	310	10
25	32	340	29	20	300	16	12	240	c 8
26	39	640	67	20	300	a 16	11	200	6
27	39	638	67	47	3,170	s 436	8.2	190	4
28	39	635	67	46	1,590	s 210	7.6	183	4
29	34	399	37	31	725	61	8.4	185	4
30	32	297	26	24	500	32	9.4	224	6
31	--	--	--	22	415	25	--	--	--
Total	875	--	792	753.7	--	1,312	476.6	--	1,299

	July			August			September		
1	10	206	6	13	229	8	9.4	97	2
2	11	240	7	16	327	14	9.4	110	c 3
3	12	246	8	17	288	13	9.0	114	3
4	12	254	8	15	223	9	8.6	110	3
5	94	5,180	s 2,310	14	223	8	16	950	sa 65
6	19	758	39	13	220	c 8	14	900	c 34
7	16	354	15	13	224	8	14	203	8
8	14	284	11	12	202	7	14	193	7
9	14	270	10	12	190	6	13	204	7
10	14	258	10	27	3,160	s 296	13	239	8
11	13	239	8	16	785	34	13	234	8
12	20	1,710	s 220	15	384	16	13	237	8
13	20	1,050	s 59	15	316	13	13	213	7
14	16	723	31	14	251	10	13	205	7
15	14	477	18	13	227	8	14	190	7
16	13	394	14	12	272	9	13	180	6
17	13	319	11	9.0	203	5	13	200	7
18	51	4,800	s 1,890	8.3	234	5	13	146	5
19	90	4,900	1,190	9.6	300	a 8	14	136	5
20	25	1,040	s 85	10	328	9	14	132	5
21	16	358	15	9.6	189	5	14	158	6
22	15	270	11	8.0	159	3	14	150	6
23	15	244	10	8.0	150	c 3	14	115	4
24	15	237	10	8.3	132	3	14	178	7
25	13	204	7	8.7	126	3	14	165	6
26	12	200	6	8.2	139	3	14	140	c 5
27	11	200	a 6	8.4	132	3	14	130	5
28	10	180	a 5	8.5	127	3	14	125	5
29	10	158	4	8.7	124	3	14	111	4
30	11	154	5	9.2	140	3	14	98	4
31	11	173	5	9.2	116	3	--	--	--
Total	630	--	6,034	368.7	--	529	393.4	--	257

Total discharge for year (cfs-days) 8,183.4
Total load for year (tons) 12,097

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

MEDICINE CREEK AT MAYWOOD, NEBR.--Continued

Particle-size analyses of suspended sediment, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; 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
June 17, 1956....	2:30 a.m.	18	66	3,760	4,100	53	71	83	92	97	99	--	--				SPWCM
June 17	2:30 a.m.	18	66	3,760	4,540	13	25	61	88	96	99	--	--				SPNM
June 18	4:20 a.m.	56	--	15,400	5,270	--	24	--	55	--	96	--	--				SPWCM
June 18	2:20 p.m.	26	73	1,260	3,520	--	33	--	58	--	98	--	--				SPWCM
June 22	10:00 a.m.	14	71	310	1,190	32	42	53	66	83	98	--	--				SBWCM
July 5	5:40 a.m.	272	64	19,600	3,540	--	34	--	60	--	98	100	--				SPWCM
July 5	5:20 p.m.	59	66	3,300	4,890	--	34	--	56	--	97	--	--				SPWCM
July 12.....	9:40 p.m.	45	69	5,840	3,960	--	52	--	71	--	99	--	100				SPWCM
July 18.....	11:35 p.m.	116	57	11,400	3,980	22	35	50	59	67	97	100	--				SPWCM
July 18.....	11:35 p.m.	116	57	11,400	3,940	14	25	42	58	72	97	100	--				SPNM
July 19.....	6:00 a.m.	74	65	4,440	5,670	--	28	--	50	--	95	--	100				SPWCM
Aug. 10	12:30 a.m.	50	65	10,500	3,840	24	32	42	57	80	99	100	--				SPWCM
Aug. 10	12:30 a.m.	50	65	10,500	3,880	8	16	34	53	78	99	100	--				SPNM
Aug. 11	8:05 a.m.	16	68	1,080	807	55	69	83	90	96	99	--	--				SBWCM
Sept. 15.....	9:00 a.m.	14	62	195	1,130	41	52	64	78	92	99	--	--				SBWCM

Particle-size analyses of bed material, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed; V, visual accumulation tube)

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										
						0.031	0.062	0.125	0.250	0.500	1.000	2.000	4.000	8.000	16.000	32.000
June 22, 1956....	5	14					50	72	78	81	83	86	95	100			SV
July 5.....	3	59					13	23	27	33	40	53	78	96	99	100	SV

KANSAS RIVER BASIN--Continued

BRUSHY CREEK NEAR MAYWOOD, NEBR.

LOCATION.--At bridge on U. S. Highway 83, 150 feet upstream from gaging station, 2 miles south of Maywood, Frontier County, 2½ miles upstream from Frazier Creek, and 5 miles upstream from mouth.
DRAINAGE AREA.--130 square miles, approximately, of which about 72 square miles contribute directly to surface runoff.
RECORDS AVAILABLE.--Water temperatures: April 1951 to September 1956.
Sediment records: April 1951 to September 1956.
EXTREMES, 1955-56.--Water temperatures: Maximum, 81°F May 17.
Sediment concentrations: Maximum daily, 17,400 ppm July 5: minimum daily, no flow on many days.
Sediment loads: Maximum daily, 50,400 tons July 5; minimum daily, 0 tons on many days.
EXTREMES, 1951-56.--Water temperatures: Maximum, 89°F Aug 1, 1953; minimum, freezing point on several days during winter months.
Sediment concentrations: Maximum daily, 22,700 ppm June 8, 1951; minimum daily, no flow on many days during 1951, 1953-56.
Sediment loads: Maximum daily, 58,000 tons Sept. 2, 1951; minimum daily, 0 tons on many days during 1951, 1953-56.
REMARKS.--Maximum observed sediment concentration during water year, 120,000 ppm July 12.
Records of discharge for water year October 1955 to September 1956 given in WSP 1440.

Temperature (° F) of water, water year October 1955 ot September 1956
/Once-daily measurement between 1 p.m. and 7 p.m. Many days of no flow/

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

a Measurement between 7 a.m. and 12 m.

KANSAS RIVER BASIN--Continued

BRUSHY CREEK NEAR MAYWOOD, NEBR.--Continued

Suspended sediment, water year October 1955 to September 1956

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	0.3	--		0.3	28	
2	0	--	0	.4	33		.4	3	
3	.2	--		.4	--		.4	--	
4	.2	--	(t)	.4	35		.4	--	
5	.1	51		.4	--		.3	4	
6	0	--	0	.4	23		.4	--	
7	.1	21		.4	2		.4	5	
8	.1	--		.3	17		.4	--	
9	.1	21		.4	--		.4	--	
10	.1	--		.3	4		.4	5	
11	.1	--	(t)	.4	--		.4	--	
12	.1	15		.3	22		.4	2	
13	.1	18		.3	--		.4	--	
14	.1	--		.3	8		.4	15	
15	.1	15		.2	--		.4	2	
16	0	--	0	.2	37	(t)	.4	--	(t)
17	.1	13		.2	48		.4	--	
18	.2	--		.2	34		.4	--	
19	.2	10		.3	--		.4	3	
20	.1	--		.2	45		.4	--	
21	.1	82		.2	--		.5	4	
22	.2	--		.2	6		.5	--	
23	.2	--		.2	--		.5	4	
24	.2	10	(t)	.2	--		.5	--	
25	.2	--		.2	13		.5	3	
26	.2	4		.2	--		.5	--	
27	.2	--		.2	11		.5	--	
28	.2	3		.3	--		.5	4	
29	.3	--		.3	56		.5	--	
30	.3	--		.3	--		.5	7	
31	.3	10		--	--	--	.5	--	
Total	4.4	--	0.3	8.6	--	0.6	13.3	--	0.2

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	0.5	--			--		0.5	6	
2	.4	4			5		.5	--	
3	.4	--			--		.5	--	
4	.5	3		0.4	3		.5	--	
5	.4	--			--		.6	8	(t)
6	.4	--			3		.6	--	
7	.4	4		.4	6		.2	12	
8	.4	--		.4	6		0	--	0
9	.3	7		.3	--		0	--	0
10	.3	11		.4	14		0	--	0
11	.3	6		.4	--		0	--	0
12	.3	--		.4	--		0	--	0
13	.3	--		.5	6		0	--	0
14	.4	6		.4	--		0	--	0
15	.4	--		.5	--	(t)	0	--	0
16	.4	--	(t)	.4	5		0	--	0
17	.4	5		.5	--		0	--	0
18	.5	--		.5	2		.9		
19	.4	--		.5	--		.4		
20	.4	5		.5	2		.4		
21	.4	--		.5	--		.3		
22	.4	7		.5	5		.1		
23	.4	--		.5	--		.1	--	(t)
24	.4	23		.5	4		.2		
25	.4	4		.5	5		.7		
26	.4	--		.5	3		.4		
27	.4	--		.5	--		.2		
28	.4	4		.5	10		0	--	0
29	.4	--		.5	--		1.1	--	e .6
30	.4	--		--	--	--	.8	77	.2
31	.4	--		--	--	--	.7	40	a .1
Total	12.2	--	0.2	13.0	--	0.2	9.7	--	1.1

e Estimated.
t Less than 0.050 ton.
a Computed from partly estimated concentration graph.

KANSAS RIVER BASIN--Continued

BRUSHY CREEK NEAR MAYWOOD, NEBR.--Continued

Suspended sediment, water year October 1955 to September 1956--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	0.6	26	(t)	0.7	238		0.3	--	
2	1.1	118	0.4	.6	--		.4	42	
3	1.3	120	a .4	.4	240		.4	--	
4	.8	72	.2	.5	--		.3	71	
5	.7	112	.2	.7	77	e 0.3	.2	135	
6	.4			.8	--		.3	188	e 0.1
7	.7			.7	110		.2	134	
8	.5			.6	--		.1	85	
9	.5			.6	105		.2	--	
10	.3			.7	--		.2	--	
11	.6			.6	52		.1	32	
12	.6			.6	--	e .1	0	--	0
13	.7	57	.1	.5	22		0	--	0
14	.6			.5	580	.8	0	--	0
15	.7			.5	40	.1	0	--	0
16	.7			.5	--		11	2,770	s 753
17	.7			.5	60		40	6,560	s 1,790
18	.7			.4	--	e .1	102	10,900	s 7,460
19	.6			.4	101		.5	1,390	1.9
20	.7			.4	--		.4	988	1.1
21	.7	--		.3	310	.3	..3	700	.6
22	.6	--		.3	350	.3	.3	400	.3
23	.7	--		.2	186		.3	180	.1
24	.7	--		.2	18		.3	52	(t)
25	.7	18	(t)	.2	--	e .1	.3	38	(t)
26	.7	25		.2	--		.2	34	(t)
27	.6	29		25	9,860	s 1,680	.1	--	(t)
28	.6	--		1.6	760	3.3	0	--	0
29	.6	35		.8	180	a .4	0	--	0
30	.7	--		.6	--	e .2	0	--	0
31	--	--	--	.5	71	.1	--	--	--
Total	20.1	--	3.2	41.1	--	1,689.7	158.4	--	10,008.2

Day	July			August			September		
1	0	--	0	0.1	--				
2	0	--	0	.1	51				
3	0	--	0	.1	--	(t)			
4	.1	--	(t)	.1	32				
5	505	17,400	s50,400	0	--	0			
6	2.3	1,800	s 12	0	--	0			
7	1.0	--	e .4	.1	22	(t)			
8	.5	84	.1	0	--	0			
9	.3	73	.1	.1	--	(t)			
10	.1	143	(t)	.9	4,200	sa 20			
11	.1	34	(t)	.2	268	.1			
12	13	8,960	s 1,300	.2	65				
13	4.2	3,480	s 62	.2	--				
14	1.3	--	e 1.2	.1	65	(t)			
15	1.1	--		.1	--				
16	1.0	29	e .1	.1	--				
17	1.0	--		.1	--	e .1			
18	129	7,190	s 7,020	.1	18				
19	4.2	3,310	s 96	.1	--				
20	.5	362	.5	.2	--				
21	.4	115	.1	.2	38	(t)			
22	.4	--	e .1	.2	--				
23	.4	34		.1	--				
24	.3	--		.1	--				
25	.2	35		.1	--				
26	.2	--		0	--	0			
27	.1	33	(t)	0	--	0			
28	.1	--		0	--	0			
29	.1	--		0	--	0			
30	.1	50		0	--	0			
31	.1	27		0	--	0			
Total	667.1	--	58,893.1	3.6	--	20.5	0		0

Total discharge for year (cfs-days) 951.5

Total load for year (tons) 70,617.3

e Estimated.

s Computed by subdividing day.

t Less than 0.050 ton.

a Computed from partly estimated concentration graph.

BRUSHY CREEK NEAR MAYWOOD, NEBR.--Continued

Particle-size analyses of suspended sediment, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet ; 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 27, 1956	11:40 a.m.	13	--	8,360	3,060	--	44	--	58	--	--	--	--				PWCM
May 27	12:40 p.m.	9.4	61	6,720	5,000	--	54	--	65	--	--	--	--				PWCM
June 16	11:20 p.m.	152	--	30,100	5,650	--	30	--	50	--	--	--	--				PWCM
June 17	12:30 a.m.	417	62	18,000	3,430	--	31	--	56	--	--	--	--				PWCM
June 17	4:25 a.m.	32	--	15,200	3,960	28	37	49	58	71	97	100	--				SPWCM
June 17	4:25 a.m.	32	--	15,200	4,070	15	24	41	54	70	97	100	--				SPN
June 18	4:40 a.m.	549	--	48,200	4,840	--	22	--	36	--	97	100	--				SPWCM
June 18	5:15 a.m.	760	62	35,300	5,280	--	24	--	39	--	97	--	100				SPWCM
July 5	5:15 a.m.	3,900	--	32,400	2,620	16	23	29	40	64	97	100	--				SPWCM
July 5	6:05 a.m.	1,300	--	30,900	4,490	--	23	--	41	--	97	--	100				SPWCM
July 5	3:15 p.m.	6.0	64	10,600	5,180	--	34	--	44	--	90	--	100				SPWCM
July 12	6:35 p.m.	37	69	53,100	8,140	--	26	--	40	--	--	--	--				PWCM
July 12	7:50 p.m.	143	--	51,800	5,010	--	20	--	31	--	--	--	--				PWCM
July 18	4:50 p.m.	326	55	24,000	4,270	--	23	--	40	--	96	--	--				SPWCM
July 18	7:30 p.m.	802	55	18,900	5,350	--	27	--	52	--	--	--	--				PWCM
July 19	12:02 a.m.	46	--	16,000	5,150	--	34	--	50	--	93	--	--				SPWCM

KANSAS RIVER BASIN--Continued

FOX CREEK AT CURTIS, NEBR.

LOCATION.--At bridge on State Highway 23N, 50 feet downstream from gaging station half a mile upstream from mouth, and 1 mile east of Curtis, Frontier County.
DRAINAGE AREA.--77 square miles, approximately.
RECORDS AVAILABLE.--Water temperatures: April 1951 to August 1952, October 1953 to September 1956.
Sediment records: April 1951 to September 1956.
EXTREMES, 1955-56.--Water temperatures: Maximum, 81°F July 15.
Sediment concentrations: Maximum daily, 5,570 ppm May 27; minimum daily, not determined.
Sediment loads: Maximum daily, 2,330 tons May 27; minimum daily, 0.50 ton or less on many days.
EXTREMES, 1951-56.--Water temperatures: Maximum (1951-52, 1953-56), 86°F July 18, 1954; minimum (1951-52, 1955), freezing point on several days during winter months.
Sediment concentrations: Maximum daily, 37,600 ppm June 8, 1951; minimum daily, not determined.
Sediment loads: Maximum daily, 131,000 tons May 31, 1951; minimum daily, less than 0.50 ton on many days each year.
REMARKS.--Maximum observed sediment concentration during water year, 20,100 ppm May 27.
Records of discharge for water year October 1955 to September 1956 given in WSP 1440.

Temperature (° F) of water, water year October 1955 to September 1956
/Once-daily measurement between 6 a.m. and 7 a.m./

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

a Measurement between 11 a.m. and 1 p.m.
b Measurement between 2 p.m. and 7 p.m.

KANSAS RIVER BASIN--Continued

FOX CREEK AT CURTIS, NEBR.--Continued

Suspended sediment, water year October 1955 to September 1956

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	5.0	80	a 1.1	5.7	--		6.8	22	
2	5.2	84	1.2	5.7	22		7.0	--	
3	5.4	102	1.5	5.8	--		6.4	78	
4	5.8	110	1.7	5.8	42		7.7	--	
5	5.8	139	2.2	5.8	--		7.0	17	
6	5.1	99	1.4	5.8	23		7.0	--	
7	5.4	178	2.6	5.9	22		7.0	18	
8	5.4	61	.9	5.9	24		6.6	--	
9	5.2	92	1.3	5.9	--		7.0	10	
10	5.0	83	1.1	5.8	30		7.0	--	
11	5.0	76	1.0	5.7	--		7.0	14	
12	4.8	76	1.0	6.4	32		7.0	--	
13	5.1	45	.6	6.4	--		7.0	18	
14	5.2	44	.6	6.4	22		6.8	18	
15	3.1	32	.3	6.4	--	b 0.5	6.8	22	b 0.4
16	3.1	50	a .4	6.5	45		6.8	--	
17	5.1	60	.8	6.4	24		6.5	20	
18	5.2	--		6.4	26		6.6	--	
19	3.0	24		6.5	--		6.5	16	
20	3.1	--		6.6	--		6.8	--	
21	4.5	43		7.0	23		7.0	25	
22	5.4	--		6.8	--		7.0	--	
23	5.2	30		6.6	21		7.4	24	
24	5.1	--		6.6	--		7.4	--	
25	5.5	38	b .4	6.8	22		7.4	--	
26	5.5	19		6.8	--		7.2	--	
27	5.5	23		6.5	16		7.4	28	
28	5.1	--		6.5	--		7.4	--	
29	5.4	24		6.6	23		7.2	20	
30	5.5	--		6.6	--		7.2	--	
31	5.7	25		--	--	--	7.2	21	
Total	154.4	--	25.3	188.6	--	15.0	217.1	--	12.4

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	7.4	--		7.1	23		8.3	--	
2	7.4	23		7.7	--		8.2	23	
3	7.4	--		7.7	14		8.2	--	
4	7.2	21		7.8	--		8.0	--	
5	7.2	--		7.8	14		8.0	30	
6	7.1	20		8.0	--		8.0	--	
7	7.1	--		8.2	20		8.0	23	
8	7.1	21		8.2	--		7.7	23	
9	7.1	18		8.2	14		7.8	22	
10	7.1	18		8.2	--		7.8	--	
11	7.1	--		8.3	16		7.7	19	
12	7.2	16		8.5	--		7.7	--	
13	7.4	--		8.5	20		8.0	29	
14	7.7	19		8.8	--		8.2	--	
15	7.1	--		8.5	18	b 0.4	8.2	30	b 0.7
16	7.1	21	b 0.3	8.6	--		8.3	--	
17	7.0	--		8.3	26		8.3	24	
18	7.4	16		8.6	--		8.2	--	
19	7.7	--		8.5	13		8.2	21	
20	7.6	16		8.5	--		8.2	--	
21	7.6	--		8.6	24		8.2	26	
22	7.6	15		8.6	--		8.2	--	
23	7.6	--		8.8	25		8.2	44	
24	7.6	12		8.8	--		8.2	--	
25	7.2	--		8.5	20		8.2	69	
26	7.4	13		8.5	--		8.2	--	
27	7.6	--		8.5	23		8.2	52	
28	7.7	13		8.3	--		8.0	--	
29	7.4	--		8.2	19		7.8	29	
30	7.1	13		--	--	--	8.0	--	
31	6.8	--		--	--	--	8.5	29	
Total	227.0	--	9.3	240.8	--	11.6	250.7	--	21.7

a Computed from estimated concentration graph.
b Computed from samples obtained about four times a week.

KANSAS RIVER BASIN--Continued

FOX CREEK AT CURTIS, NEBR.--Continued

Suspended sediment, water year October 1955 to September 1956--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	8.3			8.2	55	1.2	5.8	210	3.3
2	8.3			8.0	70	1.5	5.8	220	3.4
3	9.4			7.7	83	1.7	5.8	220	3.4
4	9.8			7.4	65	1.3	5.8	293	4.6
5	9.9	47	1.2	7.2	95	a 1.8	5.7	240	3.7
6	9.9			7.2	104	2.0	5.7	208	3.2
7	9.3			7.0	102	1.9	5.7	170	2.6
8	8.5			7.0	114	2.2	5.5	188	2.8
9	8.5			7.2	120	2.3	5.5	188	2.8
10	8.5			7.0	134	2.5	5.4	181	2.6
11	8.5			6.5	134	2.4	4.8	130	1.7
12	8.3			7.0	127	2.4	4.5	156	1.9
13	8.3			6.6	108	1.9	4.5	160	1.9
14	8.2			7.1	71	1.4	4.5	183	2.2
15	8.2			7.1	90	1.7	4.5	160	1.9
16	8.0			7.6	93	1.9	4.3	288	s 4.9
17	8.0			7.2	113	2.2	21	2,950	s 190
18	8.0			7.4	132	2.6	40	3,350	362
19	8.0	44	1.0	7.2	120	2.3	17	1,580	s 87
20	8.0			7.2	135	2.6	7.0	616	12
21	8.0			7.1	164	3.1	6.8	414	7.6
22	8.0			7.7	207	4.3	5.9	349	5.6
23	8.2			7.4	192	3.8	5.8	267	4.2
24	8.3			6.8	172	3.2	5.7	221	3.4
25	8.0			6.5	179	3.1	5.4	202	2.9
26	7.8			7.0	187	3.5	5.2	198	2.8
27	7.7			77	5,570	s 2,330	5.1	200	2.8
28	8.0			12	1,460	s 55	5.1	151	2.1
29	7.8			7.1	598	11	4.8	132	1.7
30	7.8			6.6	335	6.0	4.5	178	2.2
31	--	--	--	6.1	265	4.4	--	--	--
Total	251.5	--	31.4	296.1	--	2,467.2	223.1	--	733.2

	July			August			September		
1	4.8	136	1.8	5.4	210	3.1	3.8	45	0.5
2	4.7	116	1.5	6.1	205	3.4	4.1	56	.6
3	2.7	114	.8	5.0	203	2.7	4.0	69	.7
4	3.3	121	1.1	4.7	182	2.3	4.5	55	.7
5	73	4,130	s 1,010	4.7	176	2.2	4.5	60	.7
6	12	1,130	s 41	4.5	184	2.2	4.5	89	1.1
7	6.5	362	6.4	4.5	185	2.2	4.5	67	.8
8	5.9	208	3.3	4.5	178	2.2	4.1	50	.6
9	5.4	152	2.2	4.5	154	1.9	3.8	75	.8
10	5.0	175	2.4	4.7	147	1.9	3.6	76	.7
11	4.5	173	2.1	4.5	146	1.8	3.3	99	.9
12	7.8	990	s 58	4.8	157	2.0	3.1	92	.8
13	26	4,110	s 443	4.4	154	1.8	3.0	85	a .7
14	6.2	675	11	2.7	121	.9	3.0	75	a .6
15	5.4	250	3.6	2.7	110	.8	3.0	71	.6
16	5.2	240	3.4	1.5	120	.5	3.0	70	a .6
17	5.1	232	3.2	2.0	130	.7	2.6	67	.5
18	17	1,670	s 120	4.1	182	s 2.3	2.8	72	.5
19	16	1,070	s 86	2.1	163	.9	1.9	91	.5
20	5.1	344	4.7	3.7	202	2.0	2.1	106	.6
21	3.7	195	1.9	4.5	187	2.3	2.1	85	.5
22	4.0	162	1.7	4.1	141	1.6	2.2	90	.5
23	4.1	132	1.5	3.8	149	1.5	2.3	80	a .5
24	2.6	127	.9	3.7	150	1.5	2.4	66	.4
25	1.8	104	.5	3.3	117	1.0	2.3	80	.5
26	1.7	85	.4	3.3	105	.9	2.4	69	.4
27	3.0	104	.8	3.3	133	1.2	2.3	83	.5
28	2.0	103	.6	3.0	134	1.1	2.3	87	.5
29	3.7	112	1.1	3.3	118	1.1	2.0	50	.3
30	3.8	141	1.4	3.8	94	1.0	3.0	71	.6
31	4.1	158	1.7	3.8	82	.8	--	--	--
Total	256.1	--	1,818.0	121.0	--	51.8	92.5	--	18.2

Total discharge for year (cfs-days)..... 2,518.9
Total load for year (tons)..... 5,215.1

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

FOX CREEK AT CURTIS, NEBR.--Continued

Particle-size analyses of suspended sediment, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet ; 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 27, 1956.....	11:26 a.m.	265	--	10,900	3,730	--	49	--	75	--	99		100				SPWCM
May 27	3:50 p.m.	65	62	7,410	5,460	37	55	69	78	89	99						SPWCM
May 27	3:50 p.m.	65	62	7,410	5,340	5	10	60	78	--	99						SPNM
May 27	6:45 p.m.	43	61	5,230	8,160	--	56	--	79	--	99						SPWCM
June 17.....	6:40 p.m.	58	--	3,990	5,210	--	26	--	49	--	97	100					SPWCM
June 18.....	1:40 p.m.	58	72	2,650	3,850	--	62	--	88	--	100						SPWCM
July 5	4:34 a.m.	4.3	66	3,290	5,120	--	51	--	90	--	100						SPWCM
July 5	9:50 a.m.	222	80	6,340	4,980	--	47	--	85	--	100						SPWCM
July 5	2:40 p.m.	73	--	4,980	3,710	--	61	--	95	--	100						SPWCM
July 5	8:32 p.m.	28	65	3,820	3,040	42	57	71	80	91	100						SPWCM
July 5	8:32 p.m.	28	65	3,820	3,140	17	34	65	79	90	100						SPNM
July 13	1:20 p.m.	19	74	3,710	5,850	--	64	--	88	--	100						SPWCM
July 31	4:40 p.m.	3.1	74	116	614	51	78	83	92	98	99						BWCM

KANSAS RIVER BASIN--Continued

DRY CREEK NEAR CURTIS, NEBR.

LOCATION.--At gaging station at county road bridge, 2½ miles upstream from mouth and 3½ miles east of Curtis, Frontier County.
DRAINAGE AREA.--20 square miles, approximately.
RECORDS AVAILABLE.--Sediment records: April 1951 to September 1956.
EXTREMES, 1955-56.--Sediment concentrations: Maximum daily, 10,500 ppm July 5; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 13,600 tons July 5; minimum daily, 0 tons on many days.
EXTREMES, 1951-56.--Sediment concentrations: Maximum daily, not determined; minimum daily, no flow on many days each year.
Sediment loads: Maximum daily, 95,000 tons (estimated) June 8, 1951; minimum daily, 0 tons on many days each year.
REMARKS.--Maximum observed sediment concentration during water year, 40,500 ppm July 5. No flow during period October to December; record is omitted. Records of discharge for water year October 1955 to September 1956 given in WSP 1440.

Suspended sediment, January to September 1956

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		0			
2				0		0			
3				0		0			
4				0		0			
5				0		0			
6				0		0			
7				0		0			
8				.1		e .3			
9				.6		e 6.5			
10				.1		e .2			
11				.1		e .1			
12				.1		e .1			
13				.1		e .1			
14				0		0			
15				0		0			
16				0		0			
17				0		0			
18				0		0			
19				0		0			
20				0		0			
21				0		0			
22				0		0			
23				0		0			
24				0		0			
25				0		0			
26				0		0			
27				0		0			
28				0		0			
29				0		0			
30				--		--			
31				--		--			
Total	0		0	1.1		7.3	0		0

e Estimated.

KANSAS RIVER BASIN--Continued

DRY CREEK NEAR CURTIS, NEBR.--Continued

Suspended sediment, January to September 1956--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
2							0	--	0
3							0	--	0
4							0	--	0
5							0	--	0
6							0	--	0
7							0	--	0
8							0	--	0
9							0	--	0
10							0	--	0
11							0	--	0
12							0	--	0
13							0	--	0
14							0	--	0
15							0	--	0
16							.1	900	s 2.1
17							.5	3,000	sa 17
18							8.5	4,860	s 380
19							0	--	0
20							0	--	0
21							0	--	0
22							0	--	0
23							0	--	0
24							0	--	0
25							0	--	0
26							0	--	0
27							0	--	0
28							0	--	0
29							0	--	0
30							0	--	0
31							--	--	--
Total	0		0	0		0	9.1	--	399.1

	July			August			September		
1	0	--	0						
2	0	--	0						
3	0	--	0						
4	0	--	0						
5	121	10,500	s13,600						
6	.1	400	sa .3						
7	0	--	0						
8	0	--	0						
9	0	--	0						
10	0	--	0						
11	0	--	0						
12	0	--	0						
13	.7	--	e 2.6						
14	0	--	0						
15	0	--	0						
16	0	--	0						
17	0	--	0						
18	0	--	0						
19	0	--	0						
20	0	--	0						
21	0	--	0						
22	0	--	0						
23	0	--	0						
24	0	--	0						
25	0	--	0						
26	0	--	0						
27	0	--	0						
28	0	--	0						
29	0	--	0						
30	0	--	0						
31	0	--	0						
Total	121.8	--	13,602.9	0		0	0		0

Total discharge for year (cfs-days) 132.0
Total load for year (tons) 14,009.3

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

KANSAS RIVER BASIN--Continued

DRY CREEK NEAR CURTIS, NEBR.--Continued

Particle-size analyses of suspended sediment, January to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet ; 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	
June 16, 1956....	10:20 p.m.	1.1	--	9,250	6,700	43	63	86	96	98	100	--					SPWCM
June 16	10:20 p.m.	1.1	--	9,250	6,750	4	7	39	96	99	100	--					SPNM
June 18	3:50 a.m.	7.1	--	11,100	7,610	--	45	--	78	--	100	--					SPWCM
June 18	4:13 a.m.	104	63	20,300	3,300	--	43	--	69	--	99	100					SPWCM
July 5	3:57 a.m.	56	--	9,760	3,470	38	53	70	81	92	100	--					SPWCM
July 5	3:57 a.m.	56	--	9,760	3,530	16	27	56	80	92	100	--					SPNM
July 5	6:21 a.m.	649	--	40,500	4,040	--	28	--	48	--	98	100					SPWCM
July 5	7:42 a.m.	359	62	28,700	4,710	--	34	--	53	--	98	100					SPWCM
July 5	11:50 a.m.	36	65	7,980	5,810	--	60	--	87	--	100	--					SPWCM

MEDICINE CREEK ABOVE HARRY STRUNK, LAKE, NEBR.

LOCATION.--At gaging station, a third of a mile downstream from top of Harry Strunk Lake flood-control pool, Frontier County, 3¾ miles southeast of Stockville, and 13½ miles upstream from Medicine Creek Dam.
RECORDS AVAILABLE.--Water temperatures: October 1952 to September 1956.
Sediment records: April 1951 to September 1956.
EXTREMES, 1955-56.--Water temperatures: Minimum, freezing point Nov. 28, 30, Dec. 15, 18, Feb. 2.
Sediment concentrations: Maximum daily, 16,200 ppm May 27; minimum daily, not determined.
Sediment loads: Maximum daily, 22,000 tons May 27; minimum daily, not determined.
EXTREMES, 1951-56.--Water temperatures (1952-56): Minimum, freezing point on many days during winter months.
Sediment concentrations: Maximum daily, not determined; minimum daily, not determined.
Sediment loads: Maximum daily, 490,000 tons (estimated) June 22, 1951; minimum daily, not determined.
REMARKS.--Maximum observed sediment concentration during water year, 36,300 ppm May 27. Flow affected by ice Nov. 16-21, 23, Nov. 25 to Jan. 5, Jan. 8, 9, Jan. 15 to Feb. 12, Feb. 16-19, Apr. 3. Records of discharge for water year October 1955 to September 1956 given in WSP 1440.

Chemical analyses, in parts per million, August 1954 to July 1956

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 (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. 17, 1954.....	441			32	5.4	4.0	8.8								155	0.21		102		7	0.2	235	7.4
July 6, 1956.....	922			36	5.8	4.9	12								179	.24		114		8	.2	267	7.6
July 12	1,700			40	6.6	2.3	9.3								186	.25		127		3	.1	301	7.4

KANSAS RIVER BASIN--Continued

MEDICINE CREEK ABOVE HARRY STRUNK LAKE, NEBR.--Continued

Temperature (° F) of water, water year October 1955 to September 1956
/Once-daily measurement between 7 a.m. and 11 a.m./

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

a Measurement between 6 p.m. and 9 p.m.
b Measurement between 2 p.m. and 5 p.m.

KANSAS RIVER BASIN--Continued

MEDICINE CREEK ABOVE HARRY STRUNK LAKE, NEBR.--Continued

Suspended sediment, water year October 1955 to September 1956

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	37			44	195	23	31	--	
2	37			55	360	53	30	--	
3	40			59	310	a 50	31	114	e 9
4	42			55	270	40	31	--	
5	42			57	--	e 36	46	--	
6	40			53			50	265	
7	39			44	--		45	195	
8	38			43	185		46	--	
9	37			43	--		43	165	
10	36			45	195		46	--	
11	35			46	--		46	230	
12	34			48	150		49	--	
13	35			49	--	b 24	48	190	
14	35			50	--		48	--	b 22
15	35	220	23	49	220		39	120	
16	34			45	--		41	--	
17	36			50	175		42	--	
18	39			53	--		42	155	
19	40			55	205	30	40	--	
20	39			53	--	e 55	39	130	
21	40			51	900	a 120	44	145	
22	41			49	505	67	49	180	
23	43			47	390	49	52	--	
24	42			46	330	41	56	220	
25	43			44	285	34	57	--	
26	44			44	245		58	255	
27	45			41	--		55	260	b 38
28	52	--	e 46	38	110	b 22	58	285	
29	51	--	e 48	35	--		55	--	
30	54	500	a 75	35	260		55	245	
31	51	--	e 44	--	--	--	53	--	
Total	1,256	--	834	1,426	--	1,032	1,425	--	774

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	61	370	a 60	38	--		66	840	
2	60	--	e 65	40	140		67	--	
3	62	440	74	46	--		67	--	
4	63	400	a 70	49	210		67	--	
5	61	575	95	47	--	b 22	67	915	
6	59	585	a 95	47	185		67	970	
7	58	580	91	52	--		67	--	a 170
8	56	--	e 130	53	368	53	70	1,090	
9	54	860	a 120	55	464	69	69	--	
10	55	755	112	58	--	e 70	67	930	
11	53	645	92	61	710	a 120	65	--	
12	51	540	74	65	940	165	59	--	
13	51	520	72	66	935	167	58	695	109
14	48	420	54	63	840	143	73	1,140	225
15	47	340	43	63	930	158	69	940	175
16	42	--		60	--	e 150	69	780	145
17	41	56		55	--	e 140	69	820	153
18	38	--		58	--	e 170	69	865	161
19	43	140	b 13	61	--	e 160	69	810	151
20	38	--		63	--		65	710	125
21	35	--		66	780		63	670	114
22	38	140		64	685		61	725	119
23	40	170		65	--		63	715	122
24	43	275		67	--		61	695	114
25	45	--		66	--	e 140	60	670	109
26	46	--		64	850		64	835	144
27	46	270	b 26	65	--		63	770	131
28	45	--		65	--		58	725	114
29	43	330		65	--		54	650	95
30	41	--		--	--	--	53	525	75
31	39	170		--	--	--	54	580	85
Total	1,502	--	1,572	1,687	--	3,119	1,993	--	4,506

e Estimated.

a Computed from partly estimated concentration graph.

b Computed from samples obtained about 3 or 4 times a week.

KANSAS RIVER BASIN--Continued

MEDICINE CREEK ABOVE HARRY STRUNK LAKE, NEBR.--Continued

Suspended sediment, water year October 1955 to September 1956--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	55	540	80	66	500	89	49	665	88
2	57	515	79	67	470	85	52	780	110
3	62	860	144	60	530	86	44	540	64
4	64	725	125	70	1,040	197	36	390	38
5	72	840	163	59	690	110	35	400	38
6	85	1,270	291	58	660	103	35	370	35
7	85	1,080	248	57	630	97	37	385	38
8	84	780	177	52	655	92	40	510	55
9	78	645	136	67	1,280	232	37	450	45
10	67	570	103	61	915	151	35	355	34
11	61	605	100	55	810	120	32	280	24
12	60	565	92	53	670	96	31	275	23
13	57	515	79	52	690	97	28	250	19
14	55	470	70	49	600	79	27	220	16
15	55	480	71	51	530	73	25	195	13
16	53	420	60	51	495	68	25	250	17
17	52	375	53	51	540	74	84	10,500	s 2,620
18	52	340	48	44	495	59	190	13,400	s 7,680
19	52	330	46	37	355	35	141	8,060	s 4,040
20	54	335	49	34	285	26	57	1,800	277
21	53	295	42	34	550	50	42	890	101
22	54	310	45	41	620	69	37	650	65
23	58	305	48	42	540	61	35	490	46
24	59	335	53	44	615	73	33	415	37
25	64	435	75	44	515	61	30	390	32
26	64	390	67	44	730	87	31	320	27
27	71	530	102	424	16,200	s 22,000	30	270	22
28	77	685	142	123	5,800	1,930	27	190	14
29	70	555	105	80	2,200	475	23	150	9
30	67	510	92	64	1,140	197	23	110	7
31	--	--	--	50	910	123	--	--	--
Total	1,897	--	2,985	2,084	--	27,095	1,351	--	15,634

	July			August			September		
1	23	100	6	60	2,240	s 514	18	390	a 19
2	25	120	8	38	360	37	20	--	e 10
3	26	155	11	34	275	25	19	--	
4	25	160	11	32	215	19	20	--	
5	535	6,650	s 14,900	31	--	e 20	21	--	
6	483	4,130	s 7,280	29	260	20	26	48	
7	71	1,150	220	30	210	17	27	--	
8	50	500	68	27	140	10	27	--	
9	42	310	35	27	150	11	30	--	e 8
10	37	230	23	183	15,600	s 10,200	29	--	
11	34	108	10	53	1,300	a 190	29	--	
12	337	3,420	s 12,600	37	--	e 50	29	--	
13	598	10,800	s 18,500	33	350	31	28	--	
14	83	3,220	s 800	30	302	24	28	--	
15	49	1,150	152	28	164	12	28		
16	41	540	60	39	1,630	s 999	28	180	13
17	36	300	29	250	10,400	s 10,400	27		
18	69	3,870	s 1,760	33	500	45	27		
19	231	11,200	s 7,630	27	270	20	27	--	
20	110	4,350	1,290	27	180	13	30	--	
21	55	1,060	157	27	240	17	29	--	
22	42	410	46	26	130		29	--	
23	39	350	37	23	75		30	125	
24	36	--	e 30	21	--		28	140	
25	31	--		20	--		31	115	e 10
26	30	--		20	--	b 7	31	--	
27	27	120	b 10	18	--		31	--	
28	26	97		18	24		31	--	
29	25	--		18	--		30	97	
30	25	79		18	--		29	--	
31	113	3,520	s 4,700	18	270	a 13	--	--	--
Total	3,354	--	70,423	1,275	--	22,750	817	--	297

Total discharge for year (cfs-days) 20,067
Total load for year (tons) 151,021

e Estimated.
s Computed by subdividing day.
a Computed from partly estimated concentration graph.
b Computed from samples obtained about 3 or 4 times a week.

MEDICINE CREEK ABOVE HARRY STRUNK LAKE, NEBR.--Continued

Particle-size analyses of suspended sediment, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; 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 27, 1956	3:35 a.m.	165	64	30,600	3,370	--	28	--	49	--	98	100					SPWCM
May 27	7:40 a.m.	1,470	56	19,000	3,570	31	45	60	75	89	99	100					SPWCM
May 27	7:40 a.m.	1,470	56	19,000	3,380	4	8	44	76	92	99	100					SPNM
May 27	9:55 p.m.	246	63	15,300	11,700	--	36	--	55	--	98	--					SPWCM
June 17	7:02 a.m.	81	64	14,800	5,740	--	44	--	76	--	99	--					SPWCM
June 18	9:15 a.m.	309	62	21,800	3,320	--	33	--	52	--	98	--					SPWCM
June 19	9:10 a.m.	132	72	8,000	4,100	--	43	--	64	--	98	100					SPWCM
July 2	10:45 a.m.	26	75	135	666	33	42	49	60	76	93	--					BWCM
July 5	12:20 p.m.	348	69	45,400	4,640	--	35	--	53	--	97	--					SPWCM
July 5	3:05 p.m.	768	64	12,000	3,740	--	46	--	69	--	96	--					SPWCM
July 6	4:37 a.m.	1,060	63	6,600	3,870	--	56	--	74	--	98	--					SPWCM
July 7	10:30 a.m.	70	73	1,180	1,710	48	59	68	77	87	97	--					BWCM
July 12	11:15 p.m.	2,130	--	12,400	4,210	--	43	--	73	--	98	--					SPWCM
July 18	8:10 p.m.	117	--	7,800	2,920	15	21	28	36	59	98	100					SPWCM
July 18	8:10 p.m.	117	--	7,800	2,860	6	10	21	35	58	98	100					SPNM
July 18	10:30 p.m.	219	65	14,200	3,850	--	39	--	64	--	99	--					SPWCM
July 31	8:50 p.m.	652	74	19,200	2,990	--	33	--	50	--	98	100					SPWCM
Aug. 10	1:52 a.m.	285	--	17,300	3,750	--	28	--	42	--	97	100					SPWCM
Aug. 10	9:00 a.m.	375	--	30,500	4,770	--	28	--	45	--	98	100					SPWCM
Aug. 17	10:45 a.m.	246	--	14,000	4,830	--	38	--	54	--	97	99	100				SPWCM

KANSAS RIVER BASIN--Continued

MITCHELL CREEK ABOVE HARRY STRUNK LAKE, NEBR.

LOCATION.--At gaging station at top of Harry Strunk Lake flood-control pool, Frontier County, 2¼ miles southwest of Orafino, 9½ miles upstream from Medicine Creek Dam, and 14 miles northwest of Cambridge.
DRAINAGE AREA.--53 square miles, approximately.
RECORDS AVAILABLE.--Sediment records: October 1951 to September 1956.
EXTREMES, 1955-56.--Sediment concentrations: Maximum daily, 12,000 ppm June 18, Aug. 1; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 6,900 tons June 18; minimum daily, 0 tons on many days.
EXTREMES, 1951-56.--Sediment concentrations: Maximum daily, 25,000 ppm June 17, 1955; minimum daily, no flow on many days each year.
Sediment loads: Maximum daily, 20,000 tons May 16, 1954; minimum daily, 0 tons on many days each year.
REMARKS.--Maximum observed sediment concentration during water year, 74,500 ppm June 17. No flow during period October to December; record is omitted.
Records of discharge for water year October 1955 to September 1956 given in WSP 1440.

Chemical analyses, in parts per million, August 1954 to June 1956

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 (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. 14, 1954.....	13.3	--	--	29	3.5	4.4	14	--	0	--	--	--	--	--	155	0.21		87	--	8	0.2	221	7.5
May 27, 1956	.2	39	1.1	46	5.6	3.3	18	198	0	2.0	0.0	0.3	2.4	0.06	249	.34		138	0	4	.1	337	7.4
June 17.....	55.9	58	1.4	60	10	2.8	14	267	0	2.0	.0	.5	.8	.06	312	.42		192	0	3	.1	445	7.2

KANSAS RIVER BASIN--Continued

MITCHELL CREEK ABOVE HARRY STRUNK LAKE, NEBR.--Continued

Suspended sediment, January to September 1956

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		0			
2				0		0			
3				0		0			
4				0		0			
5				0		0			
6				0		0			
7				0		0			
8				0		0			
9				0		0			
10				.5		e .1			
11				.6		e .2			
12				.4		e .1			
13				.8		e .2			
14				.4		e .1			
15				.1		(t)			
16				0		0			
17				0		0			
18				0		0			
19				0		0			
20				0		0			
21				.3		e .1			
22				.1		(t)			
23				0		0			
24				.5		e .1			
25				.1		(t)			
26				0		0			
27				0		0			
28				0		0			
29				0		0			
30				--		--			
31				--		--			
Total	0		0	3.8		1.0	0		0

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				0	--	0	26	10,800	s 1,450
18				0	--	0	84	12,000	sa 6,900
19				0	--	0	2.0	--	e 13
20				0	--	0	.4	--	e 1.3
21				0	--	0	.2	--	e .4
22				0	--	0	.1	--	e .1
23				0	--	0	0	--	0
24				0	--	0	0	--	0
25				0	--	0	0	--	0
26				0	--	0	2.0	--	e 75
27				12	7,250	s 841	.4	--	e 1.5
28				1.5	5,100	sa 30	.1	--	e .1
29				.1	--	e .2	0	--	0
30				0	--	0	0	--	0
31				0	--	0	--	--	--
Total	0		0	13.6	--	871.2	115.2	--	8,441.4

e Estimated.
s Computed by subdividing day.
t Less than 0.050 ton.
a Computed from partly estimated concentration graph.

KANSAS RIVER BASIN--Continued

MITCHELL CREEK ABOVE HARRY STRUNK LAKE, NEBR.--Continued

Suspended sediment, January to September 1956--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	29	12,000	sa2,100			
2	0		0	1.3	--	e 7			
3	0		0	0	--	0			
4	0		0	0	--	0			
5	4.1		e 240	0	--	0			
6	1.2		e 19	0	--	0			
7	0		0	0	--	0			
8	0		0	0	--	0			
9	0		0	0	--	0			
10	0		0	30	11,000	sa2,000			
11	0		0	0	--	0			
12	48		e 3,400	0	--	0			
13	32		e 1,900	0	--	0			
14	.2		e 1	0	--	0			
15	0		0	0	--	0			
16	0		0	.2	--	e 2.7			
17	0		0	46	--	e 2,900			
18	.2		e 1.6	.1	--	e .1			
19	.1		e .1	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	0		0	0	--	0			
26	0		0	0	--	0			
27	0		0	0	--	0			
28	0		0	0	--	0			
29	0		0	0	--	0			
30	0		0	0	--	0			
31	0		0	0	--	0			
Total	85.8		5,561.7	106.6	--	7,009.8	0		0

Total discharge for year (cfs-days) 325.0
Total load for year (tons) 21,885.1

e Estimated.
s Computed by subdividing day.
a Computed from partly estimated concentration graph.

MITCHELL CREEK ABOVE HARRY STRUNK LAKE, NEBR.--Continued

Particle-size analyses of suspended sediment, January to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet ; 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	
May 27, 1956.....	5:10 a.m.	98	60	38,500	5,450	--	41	--	73	--	100	--					SPWCM
May 27	6:15 a.m.	102	60	24,700	4,540	--	41	--	68	--	100	--					SPWCM
May 27	4:10 p.m.	5.8	--	6,150	4,180	--	83	--	98	--	100	--					SPWCM
June 17.....	4:23 a.m.	82	--	37,500	3,910	--	37	--	60	--	100	--					SPWCM
June 17.....	5:29 a.m.	118	--	25,800	5,080	--	39	--	65	--	100	--					SPWCM
June 18.....	9:34 a.m.	102	--	45,500	4,200	23	31	38	48	69	99	100					SPWCM
June 18.....	9:34 a.m.	102	--	45,500	4,060	6	13	31	45	69	99	100					SPNM
June 18.....	10:55 a.m.	376	67	45,500	4,130	--	26	--	44	--	96	100					SPWCM
July 13	12:02 a.m.	353	68	36,500	6,040	23	34	38	47	65	97	100					SPWCM
July 13	12:02 a.m.	353	68	36,500	6,090	6	13	27	41	62	97	100					SPNM
July 13	1:25 a.m.	219	66	22,100	4,870	--	32	--	52	--	98	100					SPWCM
Aug. 10.....	6:08 a.m.	92	62	30,000	5,670	--	34	--	53	--	99	100					SPWCM
Aug. 17.....	12:50 p.m.	6.9	72	3,770	5,190	--	75	--	96	--	100	--					SPWCM

KANSAS RIVER BASIN--Continued

MEDICINE CREEK AT CAMBRIDGE, NEBR.

LOCATION.--At gaging station, 100 feet upstream from highway bridge, three-quarters of a mile north of Cambridge, Furnas County, 2½ miles upstream from mouth, and 7½ miles downstream from Harry Strunk Lake.
DRAINAGE AREA.--1,070 square miles, approximately, of which about 680 square miles contribute directly to surface runoff.
RECORDS AVAILABLE.--Water temperatures: March 1951 to September 1956.
Sediment records: November 1945 to December 1949, March 1951 to September 1956.
EXTREMES, 1955-56.--Water temperatures: Maximum, 89°F June 21, 25; minimum, freezing point on several days during November to March.
Sediment concentrations: Maximum daily, 1,490 ppm June 15; minimum daily, not determined.
Sediment loads: Maximum daily, 889 tons July 17; minimum daily, less than 0.50 ton on many days.
EXTREMES, 1945-49, 1951-56.--Water temperatures (1951-56): Maximum, 94°F June 20, 1952; minimum, freezing point on many days during winter months.
Sediment concentrations (1951-56); Maximum daily, 9,800 ppm Sept. 2, 1951; minimum daily, not determined.
Sediment loads: Maximum daily, 3,700,000 tons (estimated) June 22, 1947; minimum daily, less than 0.50 ton on many days.
REMARKS.--Since August 1949, flow partially regulated by Medicine Creek Dam. Flow affected by ice Nov. 8, 14-21, Nov. 23 to Mar. 3, Mar. 7, 8, 11-16, Apr. 3, 4. Records of discharge for water year October 1955 to September 1956 given in WSP 1440.

Temperature (° F) of water, water year October 1955 to September 1956
/Once-daily measurement between 7 a.m. and 12 m./

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

a Measurement between 1 p.m. and 7 p.m.

KANSAS RIVER BASIN--Continued

MEDICINE CREEK AT CAMBRIDGE, NEBR.--Continued

Suspended sediment, water year October 1955 to September 1956

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	8.9	8		6.5	--		5.1	17	
2	9.3	--		7.2	--		5.1	--	
3	9.7	--		5.8	21		4.0	--	
4	10	12		5.8	--		3.7	--	
5	9.3	21	e 0.3	5.4	--		5.0	--	
6	8.9	--		5.4	--		5.5	--	
7	9.3	--		5.8	--		5.7	52	
8	8.5	--		6.1	--		5.7	--	
9	8.5	--		6.1	16		5.4	--	
10	7.2	--		6.1	--		5.7	--	
11	7.6	12		6.1	--		5.5	--	
12	8.9	20		6.5	54		5.1	14	
13	9.3	--		6.1	--		5.3	--	
14	5.4	--		5.7	--		5.2	12	
15	4.1	33	e .3	5.6	--	e 0.4	4.6	--	
16	5.1	--		5.7	51		4.8	--	e 0.2
17	7.6	--		6.4	--		4.5	--	
18	7.6	9		6.8	--		4.2	--	
19	7.6	--		7.0	--		4.5	19	
20	9.7	--	e 2.6	7.2	--		4.4	--	
21	31	--	e 15	7.2	16		4.6	--	
22	27	72	5.2	6.8	9		4.4	20	
23	7.2	--	e .5	6.5	--		4.5	--	
24	7.2	--	e .3	6.0	--		5.2	--	
25	6.8	14		6.0	--		5.2	--	
26	6.8	--		5.5	--		4.9	--	
27	6.5	--		4.5	--		5.1	--	
28	6.1	--	e .2	4.6	15		5.1	4	
29	6.8	--		4.7	--		4.2	6	
30	6.5	--		4.8	--		4.9	--	
31	6.5	9		--	--	--	4.9	11	
Total	280.9	--	30.7	179.9	--	12.0	152.0	--	6.2

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	5.6	--		4.9	--		9.7	33	
2	5.4	--		6.4	26		10	--	
3	5.7	7		6.0	--		10	--	
4	5.9	--		6.4	12		9.3	--	
5	5.9	--		6.5	--		8.9	--	
6	5.7	6		6.6	15		8.9	17	e 0.7
7	5.6	--		6.7	--		8.5	--	
8	5.4	--		6.0	--		8.0	40	
9	5.9	--		5.9	10		7.6	--	
10	5.9	--		5.9	--		8.1	13	
11	5.9	23		5.7	--		8.0	--	
12	6.1	10		6.3	--		7.5	27	.5
13	6.3	--		6.4	--		14	40	1.5
14	5.9	--		6.0	--		10	46	1.2
15	4.6	--		6.0	--	e 0.2	9.0	--	e 1.0
16	4.0	--	e 0.1	6.6	8		8.0	41	.9
17	3.5	--		6.0	--		7.6	--	
18	3.6	--		6.7	5		6.8	71	
19	3.9	14		6.6	--		6.8	--	
20	4.1	--		6.5	--		7.2	16	
21	4.1	--		7.2	--		7.2	--	
22	4.1	11		7.2	4		7.2	16	e .6
23	4.1	--		7.1	--		7.2	--	
24	4.1	--		7.1	--		7.2	29	
25	4.2	8		7.4	--		7.2	--	
26	4.3	--		7.4	--		7.2	8	
27	4.3	--		8.1	--		7.2	--	
28	5.1	--		8.3	--		7.2	300	5.8
29	5.2	9		8.6	--		7.2	--	e 5.4
30	4.9	--		--	--	--	6.8	120	a 2.2
31	5.6	--		--	--	--	6.8	--	e .9
Total	154.9	--	3.1	192.5	--	5.8	252.3	--	33.7

e Estimated.
a Computed from partly estimated concentration graph.

KANSAS RIVER BASIN--Continued

MEDICINE CREEK AT CAMBRIDGE, NEBR.--Continued

Suspended sediment, water year October 1955 to September 1956--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.....	6.1	22	0.4	6.8			88	389	92
2.....	6.8	--	e .5	7.2			84	302	68
3.....	8.0	--	e 1.5	7.2			81	273	60
4.....	8.6	85	a 2.0	7.6			75	305	62
5.....	8.9	36	.9	8.1			59	204	32
6.....	8.9	39	.9	8.5			44	178	21
7.....	7.2	--		8.5			43	177	21
8.....	7.2	--		8.5	20	0.4	48	200	a 26
9.....	7.2	13		8.5			65	298	52
10.....	7.2	--		7.6			66	258	46
11.....	7.2	30		6.8			52	211	30
12.....	7.6	--		6.5			69	383	s 93
13.....	7.6	9		6.5			120	559	181
14.....	8.1	--		6.1			146	916	361
15.....	7.2	13		37	--	e 34	214	1,490	861
16.....	7.2	--		45	252	31	222	1,080	647
17.....	7.6	51		46	255	32	212	1,200	687
18.....	7.6	13		46	211	26	55	313	s 76
19.....	7.6	--	b .5	47	248	31	14	96	3.6
20.....	7.6	--		48	245	32	9.7	59	1.5
21.....	7.6	37		48	220	29	7.6	44	.9
22.....	7.2	--		68	361	66	9.3	55	a 1.4
23.....	7.2	11		68	347	64	8.1	45	1.0
24.....	7.2	13		68	328	60	8.9	44	a 1.1
25.....	7.2	23		69	300	a 55	8.5	43	1.0
26.....	6.8	--		69	242	45	12	280	a 9.0
27.....	6.8	--		73	337	66	6.5	59	1.0
28.....	8.1	23		56	269	s 44	6.5	64	1.1
29.....	7.6	--		26	220	sa 22	7.2	60	a 1.2
30.....	6.8	24		24	--	e 18	7.2	60	1.2
31.....	--	--	--	59	420	sa 70	--	--	--
Total.	223.9	--	18.2	1,001.4	--	730.6	1,848.5	--	3,440.0

	July			August			September		
1.....	8.1	60	1.3	259	768	537	162	430	188
2.....	7.6	66	1.4	211	534	304	157	404	171
3.....	9.7	83	2.2	59	173	s 35	146	340	a 130
4.....	8.5	99	2.3	180	547	266	132	297	106
5.....	9.7	49	1.3	168	418	190	113	248	76
6.....	8.9	62	1.5	181	420	205	104	283	79
7.....	8.1	61	1.3	175	379	179	81	180	a 39
8.....	8.5	55	a 1.3	140	283	107	58	95	a 15
9.....	8.1	46	1.0	133	267	96	51	75	a 10
10.....	52	480	sa 75	117	286	90	52	110	15
11.....	115	750	a 240	85	219	50	60	155	25
12.....	142	810	311	61	190	a 30	61	167	28
13.....	168	990	449	25	78	5.3	58	138	22
14.....	171	915	422	34	130	sa 19	55	130	19
15.....	173	700	327	103	361	100	55	95	14
16.....	210	926	525	102	293	81	54	100	15
17.....	272	1,210	889	108	388	113	54	104	15
18.....	286	1,110	857	22	70	4.2	51	88	12
19.....	264	1,020	727	20	70	a 3.8	46	75	9.3
20.....	249	922	620	48	135	17	48	87	11
21.....	242	808	528	26	46	3.2	51	96	13
22.....	246	790	525	17	55	2.5	51	71	9.8
23.....	242	794	519	41	130	14	51	71	9.8
24.....	238	673	432	68	242	44	50	70	9.5
25.....	240	659	427	75	229	46	51	72	9.9
26.....	240	608	394	85	228	52	51	90	12
27.....	240	578	375	102	472	130	58	141	22
28.....	276	708	528	129	478	166	59	101	16
29.....	300	765	620	157	564	239	59	95	15
30.....	297	827	663	162	542	237	52	75	a 11
31.....	292	729	575	164	488	216	--	--	--
Total.	5,032.2	--	11,041.6	3,257	--	3,582.0	2,131	--	1,127.3

Total discharge for year (cfs-days)..... 14,706.5
Total load for year (tons)..... 20,031.6

e Estimated.
s Computed by subdividing day.
a Computed from partly estimated concentration graph.
b Computed from samples obtained about four times a week.

MEDICINE CREEK AT CAMBRIDGE, NEBR.--Continued

Particle-size analyses of suspended sediment, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; 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
June 12, 1956....	10:30 a.m.	49	72	179	973	25	29	34	41	57	87	--	--				SBWCM
June 12	6:05 p.m.	114	--	774	4,460	14	18	21	30	48	90	99	100				VBWCM
June 12	7:50 p.m.	116	--	710	1,230	18	21	26	32	50	87	--	--				SBWCM
June 12	9:15 p.m.	117	77	713	1,440	17	20	24	30	49	90	--	--				SBWCM
June 15	4:00 a.m.	215	--	1,390	2,200	10	12	15	21	38	90	98	100				VBWM
June 17	8:10 a.m.	232	69	1,460	5,580	15	20	25	30	44	86	97	99	100			VBWCM
Aug. 2.....	11:10 a.m.	229	77	553	1,710	13	16	17	20	32	79	95	99				SBWCM

Particle-size analyses of bed material, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed; V, visual accumulation tube)

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										
						0.031	0.062	0.125	0.250	0.500	1.000	2.000	4.000	8.000	16.000	32.000
June 12, 1956.....	3	49					0	4	11	43	77	93	99	100			SV
June 12.....	3	117					0	4	18	74	94	98	100	--			SV
June 14.....	3	146					0	3	13	49	76	85	93	98	99	100	SV

KANSAS RIVER BASIN--Continued

REPUBLICAN RIVER AT MILFORD, KANS.

LOCATION.--At gaging station at bridge on State Highway 82, at southwest city limits of Milford, Geary County.
DRAINAGE AREA.--24,900 square miles, approximately, of which a large area does not contribute directly to surface runoff.
RECORDS AVAILABLE.--Chemical analyses: October 1955 to September 1956.
Water temperatures: October 1955 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 557 ppm May 20 to June 4; minimum, 154 ppm Oct. 1-6.
Hardness: Maximum, 342 ppm Nov. 28 to Dec. 18; minimum, 95 ppm Oct. 1-6.
Specific conductance: Maximum daily, 925 micromhos Dec. 11; minimum daily, 210 micromhos July 15.
Water temperatures: Maximum, 80°F July 7, 14, 17; minimum, freezing point on several days during November to February.
REMARKS.--Daily samples for chemical analysis composited by discharge. Records of specific conductance of daily samples available in district office at Lincoln, Nebr. Records of discharge for water year October 1955 to September 1956 given in WSP 1440.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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. 1-6, 1955	994	13	0.02	30	4.9	8.8	7.9	114	18	6.5	0.4	4.0	0.04	154	0.21	413	95	2	15	0.4	254	7.4	
Oct. 7-8	409	16	.04	35	10	15	8.3	146	36	10	.4	3.2	.06	222	.30	245	130	10	19	.6	342	7.8	
Oct. 9-16	208	21	.00	62	12	26	10	224	58	19	.5	1.4	.08	335	.46	188	202	18	21	.8	521	7.7	
Oct. 17-Nov. 15	107	29	.13	78	16	38	9.4	274	87	31	.5	1.2	.10	433	.59	125	262	37	23	1.0	670	8.0	
Nov. 16-27	103	28	.13	84	17	42	8.6	286	91	36	.4	1.8	.10	456	.62	127	278	43	24	1.1	715	8.0	
Nov. 28-Dec. 18	52.9	31	.09	101	22	50	8.4	326	122	46	.5	2.4	.12	556	.76	79.4	342	75	24	1.2	851	8.0	
Dec. 19-Jan. 5, 1956	102	25	.03	84	17	43	8.0	276	96	40	.3	2.0	.04	469	.64	129	280	54	24	1.1	735	8.0	
Jan. 6-25	77.2	21	.04	80	17	39	8.7	278	85	36	.3	1.5	.09	447	.61	93.2	270	42	23	1.0	700	8.0	
Jan. 26-Feb. 9	69.7	17	.01	69	14	35	5.8	219	83	35	.1	1.0	.10	370	.50	69.6	230	50	24	1.0	617	8.1	
Feb. 10-20	126	16	.02	75	14	38	6.5	242	85	36	.6	.9	.09	391	.53	133	244	46	25	1.1	652	8.1	
Feb. 21-Mar. 10	196	20	.01	66	12	29	8.3	231	63	23	.2	2.0	.17	347	.47	184	215	26	22	.9	553	7.9	
Mar. 11-31	144	20	.01	73	17	41	9.1	262	81	35	.3	1.1	.09	422	.57	164	250	35	25	1.1	668	8.1	
Apr. 1-4	135	25	.01	73	18	46	11	256	90	40	.4	2.3	.11	437	.59	159	258	48	27	1.2	698	7.8	
Apr. 5-6	158	21	.04	63	13	34	9.5	204	77	30	.4	4.8	.10	359	.49	153	212	45	25	1.0	580	7.8	
Apr. 7-30	117	24	.00	79	18	44	10	276	89	39	.3	2.0	.13	444	.60	140	270	44	25	1.2	718	7.7	
May 1-19	87.0	22	.01	83	19	48	11	284	107	46	.3	1.9	.10	480	.65	113	286	53	26	1.2	768	7.8	
May 20-June 4	47.2	29	.01	95	21	56	11	299	127	54	.4	2.4	.13	557	.76	71.0	325	80	26	1.4	857	7.8	
June 5	2,870	26	.11	88	12	23	7.6	250	56	27	.4	34	.06	408	.55	3,160	270	65	15	.6	640	7.2	
June 6-8	550	15	.09	32	5.8	10	6.6	96	37	8.0	.3	4.6	.06	172	.23	255	104	25	16	.4	277	7.6	
June 9-10	199	24	.09	81	14	37	10	237	104	37	.3	2.2	.12	441	.60	237	258	64	23	1.0	683	7.8	
June 11-13	303	23	.01	45	9.4	21	10	161	47	17	.3	2.5	.07	265	.36	217	151	19	22	.7	422	7.6	
June 14-17	184	24	.00	72	12	38	11	221	81	39	.4	2.8	.11	407	.55	202	227	46	26	1.1	638	7.7	
June 18-23	567	15	.03	33	5.5	12	8.3	117	27	9.5	.4	5.8	.06	181	.25	277	105	9	18	.5	302	7.4	

June 24-28.....	2,300	16	.02	40	5.4	6.6	8.8	146	11	3.5	.5	7.3	.06	188	.26	1,170	122	2	10	.3	290	8.1
June 29-July 5.....	795	20	.02	43	5.0	13	10	152	25	10	.5	5.8	.07	213	.29	457	128	3	17	.5	339	7.6
July 6-11	1,997	18	.00	41	4.7	7.3	8.6	147	12	5.0	.4	4.6	.07	179	.24	965	122	1	11	.3	288	7.8
July 12-15	859	18	.05	35	5.2	12	8.6	124	21	11	.4	5.8	.09	190	.26	441	109	7	18	.5	294	7.6
July 16-18	420	21	.03	43	6.4	16	9.0	150	33	14	.4	3.4	.11	226	.31	256	134	11	19	.6	356	7.7
July 19-24	236	27	.03	60	10	23	11	212	49	23	.4	1.7	.09	329	.45	210	192	18	20	.7	501	7.9
July 25-Aug. 8	117	35	.07	71	14	35	11	247	76	28	.5	2.8	.17	409	.56	129	236	33	23	1.0	628	7.9
Aug. 9.....	309	15	.20	49	9.6	25	9.3	176	55	20	.6	1.8	.06	276	.38	230	162	18	24	.9	453	7.4
Aug. 10-22.....	151	19	.05	61	13	30	12	225	69	21	.5	3.3	.11	350	.48	143	206	21	23	.9	556	7.7
Aug. 23-Sept. 30 ..	33.6	25	.01	82	21	41	13	267	119	34	.6	1.9	.12	483	.66	43.8	289	70	23	1.0	742	7.9
Weighted average a	227	20	0.03	55	9.7	21	9.0	190	46	18	0.4	5.0	0.08	288	0.39	177	177	21	19	0.7	455	--

a Represents 100 percent of runoff for water year October 1955 to September 1956.

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KANSAS RIVER BASIN--Continued

REPUBLICAN RIVER AT MILFORD, KANS.--Continued

Temperature (° F) of water, water year October 1955 to September 1956
(Once-daily measurement between 7 a.m. and 10 a.m.)

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

a Measurement between 11 a.m. and 1 p.m.
b Measurement between 2 p.m. and 4 p.m.

BIG CREEK NEAR OGALLAH, KANS.

LOCATION.--At gaging station at bridge on County Highway 565, 5 miles south of Ogallah, Trego County, 9.0 miles upstream from Ogallah Creek, and 10 miles west of Ellis.
DRAINAGE AREA.--347 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1955 to September 1956.
Water temperatures: October 1955 to September 1956.
Sediment records: October 1955 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 323 ppm Jan. 17-27; minimum, 148 ppm Oct. 1-3, July 7-8.
Hardness: Maximum, 236 ppm Nov. 1-22, Nov. 28 to Dec. 23, Jan. 17-27; minimum, 82 ppm July 7-8.
Specific conductance: Maximum daily, 608 micromhos June 19; minimum daily, 192 micromhos July 7.
Water temperatures: Maximum, 82°F Aug. 18; minimum, freezing point on several days during November to January.
Sediment concentrations: Maximum daily, 3,880 ppm Aug. 10; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 2,530 tons Aug. 10; minimum daily, 0 tons on many days.
REMARKS.--Daily samples for chemical analysis composited by discharge. Records of specific conductance of daily samples available in district office at Lincoln, Nebr. Flow affected by ice Dec. 5-7, 11-23, 28, Jan. 15-19, 23, 24, Jan. 28 to Feb. 13. Records of discharge for water year October 1955 to September 1956 given in WSP 1440.

Chemical analyses, in parts per million, October 1955 to August 1956

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, 1955	1.53	19	0.02	34	4.6	5.0	9.1	130	0	9.0	2.0	0.2	3.3	0.05	148	0.20	0.61	104	0	9	0.2	237	7.7
Oct. 4-31	.41	31	.02	67	9.0	12	8.3	254	0	18	9.0	.3	1.0	.05	288	.39	.32	204	0	11	.4	449	7.7
Nov. 1-22	1.01	36	.15	75	12	15	6.4	295	0	20	11	.5	1.0	.08	319	.43	.87	236	0	12	.4	501	7.6
Nov. 23-27	1.18	31	.13	64	11	13	5.2	254	0	16	9.0	.3	.5	.06	276	.38	.88	205	0	12	.4	436	8.0
Nov. 28-Dec. 23	.90	35	.14	75	12	15	5.4	291	0	19	11	.4	1.0	.07	315	.43	.77	236	0	12	.4	500	7.9
Dec. 24-Jan. 16, 1956	1.23	30	.01	55	11	13	5.0	232	0	16	8.0	.2	.5	.04	255	.35	.85	182	0	13	.4	405	7.9
Jan. 17-27	.89	36	.00	72	14	16	5.7	295	0	19	12	.3	.2	.09	323	.44	.78	236	0	13	.5	505	7.8
Jan. 28-Feb. 4	.51	31	.00	63	11	14	4.6	252	0	17	10	.3	.4	.08	285	.39	.39	204	0	13	.4	444	7.7
Feb. 5-14	.91	33	.00	73	12	16	5.4	284	0	20	12	.3	.8	.10	316	.43	.78	232	0	13	.5	502	7.7
Feb. 15-26	3.56	30	.02	62	9.6	10	5.2	239	0	13	8.0	.3	1.0	.04	254	.35	2.44	194	0	10	.3	422	7.9
Feb. 27-Mar. 11	1.65	26	.04	48	9.2	10	4.6	200	0	12	7.5	.2	.6	.06	212	.29	.94	158	0	12	.4	354	8.0
Mar. 12-Apr. 9	1.42	33	.01	61	11	13	6.2	246	0	17	11	.3	.8	.07	274	.37	1.05	198	0	12	.4	439	7.9
Apr. 10-30	.90	28	.01	64	9.8	13	6.3	248	0	16	11	.3	1.1	.06	272	.37	.66	200	0	12	.4	445	8.0
May 1-20, 23-24	.65	24	.02	63	11	13	7.0	254	0	18	11	.3	1.4	.07	282	.38	.49	204	0	12	.4	457	7.8
May 31-June 1	1.90	27	.00	62	9.4	16	12	240	0	20	12	.4	5.3	.13	282	.38	1.45	193	0	14	.5	467	8.0
June 2-10	.42	26	.01	55	9.0	13	9.3	216	0	15	9.5	.3	6.6	.08	259	.35	.29	174	0	13	.4	420	7.5
July 2-5	14.4	20	.06	34	1.3	3.9	10	116	0	7.5	1.0	--	5.5	.07	156	.21	6.07	90	0	8	.2	226	7.7
July 6	93	20	.14	47	3.5	3.0	11	174	0	2.5	.0	--	4.5	.07	210	.29	52.7	132	0	4	.1	297	7.2
July 7-8	24.7	19	.11	29	2.3	1.9	9.7	114	0	3.8	.0	.4	1.7	.05	148	.20	9.87	82	0	4	.1	200	7.5

KANSAS RIVER BASIN--Continued

BIG CREEK NEAR OGALLAH, KANS.--Continued

Chemical analyses, in parts per million, October 1955 to August 1956--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 9-16, 1956	1.48	27	0.13	49	4.7	5.0	10	180	0	6.3	2.0	0.3	5.5	0.06	218	0.30	0.87	142	0	7	0.2	325	7.6
July 17	82	20	.13	58	5.2	2.7	8.9	210	0	5.0	.0	--	8.4	.04	236	.32	52.3	166	0	3	.1	351	7.5
July 18-21	.95	23	.11	45	4.7	5.9	11	172	0	5.0	3.0	.3	5.4	.06	216	.29	.55	132	0	8	.2	312	7.5
July 22-30	.28	32	.00	71	8.5	13	14	264	0	19	11	.3	7.1	.08	311	.42	.24	212	0	11	.4	484	7.5
Aug. 9-11	84.7	25	.08	51	2.2	3.6	9.5	180	0	1.0	.0	--	4.0	.06	188	.26	43.0	136	0	5	.1	299	8.0
Aug. 12-18, 21	.91	24	.02	46	4.1	4.4	13	166	0	5.0	3.0	.4	7.4	.08	203	.28	.50	132	0	6	.2	315	7.5
Weighted average a	2.27	25	0.08	52	5.4	6.4	8.6	196	--	7.3	3.3	--	3.6	0.06	219	0.30	1.34	153	0	8	0.2	339	--

a Represents 100 percent of runoff for water year October 1955 to September 1956.

KANSAS RIVER BASIN--Continued

BIG CREEK NEAR OGALLAH, KANS.--Continued

Temperature (° F) of water, water year October 1955 to September 1956
/Once-daily measurement between 7 a.m. and 9 a.m. Many days of no flow/

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

a Measurement between 1 p.m. and 3 p.m.
b Measurement at 6 a.m.

KANSAS RIVER BASIN--Continued

BIG CREEK NEAR OGALLAH, KANS.--Continued

Suspended sediment, water year October 1955 to September 1956

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	2.3	610	3.8	0.7			1.0		
2	1.3	490	1.7	.8			1.0		
3	1.0	375	1.0	.8			1.0		
4	.7	325	.6	.9			1.0		
5	.5	275	.4	1.0			1.0		
6	.2	295	.2	.7			1.0		
7	.2			1.0			1.1		
8	.2			.7			1.1		
9	.2			1.0			1.0		
10	.2	120	.1	1.0			1.0		
11	.2			.8			1.0		
12	.2			1.0			1.0		
13	.2			1.0			1.0		
14	.2			1.0			1.0		
15	.2			1.0			1.0		
16	.2			1.3	25	0.1	.8	20	(t)
17	.3	85	.1	1.3			.7		
18	.2			1.3			.6		
19	.5			1.3			.6		
20	.6			1.2			.6		
21	.3			1.2			.6		
22	.3			1.2			.6		
23	.6			1.3			.6		
24	.6			1.2			.6		
25	.8			1.2			.7		
26	.6			1.2			1.0		
27	.6	30	.1	1.0			.9		
28	.7			1.0			.8		
29	.6			1.0			.7		
30	.6			1.0			.9		
31	.9			--		--	1.0		
Total	16.2	--	10.2	31.1		3.0	26.9		0.6

Day	January			February			March		
1	1.1			0.4			1.7		
2	1.5			.4			1.8		
3	1.5			.4			1.2		
4	1.5			.4			1.3		
5	1.6			.5			1.6		
6	1.6			.5			1.5		
7	1.6			.5			1.2		
8	1.5			.6	5	(t)	1.4		
9	1.6			.7			1.6		
10	1.5			.8			1.5		
11	1.5			1.0			1.5		
12	1.5			1.2			1.5		
13	1.4			1.4			1.8		
14	1.3			1.9			1.9		
15	1.2			4.0			1.8		
16	1.0	6	(t)	9.7	5	0.1	1.6	31	0.1
17	.9			6.0			1.9		
18	.8			3.0			1.9		
19	.8			3.1			1.6		
20	.9			3.0			1.6		
21	1.0			2.5			1.6		
22	.9			2.5			1.6		
23	.9			2.4			1.6		
24	.9			2.3	26	.2	1.5		
25	.9			2.0			1.5		
26	.9			2.2			1.6		
27	.9			3.5			1.4		
28	.9			2.0			1.5		
29	.7			1.3			1.3		
30	.5			--	--	--	1.3		
31	.4			--	--	--	1.3		
Total	35.2		0.6	60.2	--	2.8	48.1		3.1

t Less than 0.050 ton.

KANSAS RIVER BASIN--Continued

BIG CREEK NEAR OGALLAH, KANS.--Continued

Suspended sediment, water year October 1955 to September 1956--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	1.3			0.8			1.9	225	1.2
2	1.2			.9			1.1	325	1.0
3	1.2			1.0			.8	365	.8
4	1.1			1.0			.6	355	.6
5	1.0			1.0			.4	467	.5
6	1.0			1.0			.3	405	.3
7	.8			1.0			.2	313	.2
8	.9			1.0			.2	277	.2
9	.9			1.0			.1		
10	1.1			1.0			.1	203	.1
11	1.3			1.0	123	0.2	0	--	0
12	1.3			.7			0	--	0
13	1.3			.6			0	--	0
14	1.3			.4			0	--	0
15	1.0			.4			0	--	0
16	1.2	73	0.2	.4			0	--	0
17	.8			.3			0	--	0
18	.8			.3			0	--	0
19	.8			.2			0	--	0
20	.8			.1			0	--	0
21	.8			0	--	0	0	--	0
22	.8			0	--	0	0	--	0
23	.6			.2	180	.1	0	--	0
24	.7			.1	77	(t)	0	--	0
25	.6			0	--	0	0	--	0
26	.7			0	--	0	0	--	0
27	.8			0	--	0	0	--	0
28	.8			0	--	0	0	--	0
29	.7			0	--	0	0	--	0
30	.8			0	--	0	0	--	0
31	--		--	1.9	142	.7	--	--	--
Total	28.4		6.0	16.3	--	4.8	5.7	--	5.0

Day	July			August			September		
1	0	--	0	0	--	0			
2	2.7	1,500	11	0	--	0			
3	15	1,230	s 79	0	--	0			
4	18	1,530	s 81	0	--	0			
5	22	1,570	s 223	0	--	0			
6	93	3,530	886	0	--	0			
7	40	1,860	s 219	0	--	0			
8	9.3	1,570	s 41	0	--	0			
9	3.9	1,030	11	10	304	s 120			
10	2.3	730	4.5	223	3,880	s 2,530			
11	1.5	530	2.1	21	1,550	s 96			
12	1.1	420	1.2	3.3	1,120	10			
13	.9	340	.8	1.7	680	3.1			
14	.7	270	.5	1.0	395	1.1			
15	.8	260	.6	.6	285	.5			
16	.6	460	s .9	.3	260	.2			
17	82	2,980	s1,110	.2	244	.1			
18	1.5	840	s 3.6	.1	248	.1			
19	1.0	540	1.5	0	--	0			
20	.7	395	.7	0	--	0			
21	.6			.1	142	(t)			
22	.5			0	--	0			
23	.4			0	--	0			
24	.4			0	--	0			
25	.3			0	--	0			
26	.3	298	.2	0	--	0			
27	.2			0	--	0			
28	.2			0	--	0			
29	.1			0	--	0			
30	.1			0	--	0			
31	0	--	0	0	--	0			
Total	300.1	--	2,679.4	261.3	--	2,761.1	0		0

Total discharge for year (cfs-days) 829.5

Total load for year (tons) 5,476.6

s Computed by subdividing day.

t Less than 0.050 ton.

KANSAS RIVER BASIN--Continued

BIG CREEK NEAR OGALLAH, KANS.--Continued

Particle-size analyses of suspended sediment, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet ; 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	
July 2, 1956.....	1:30 p.m.	4.1		2,030	2,690	80	93	97	98	99	100						SBWCM
July 4	12:02 a.m.	47		2,010	2,270	76	83	86	90	96	100						SBWCM
July 4	2:45 a.m.	28		1,850	4,300	84	94	98	99	100	--						BWCM
July 6	5:05 p.m.	86		3,380	3,810	--	93	--	98	--	100						SPWCM
July 7	11:50 a.m.	31		1,850	5,080	--	90	--	98	--	100						SPWCM
Aug. 10.....	6:30 a.m.	262		4,840	2,990	--	66	--	94	--	100						SPWCM
Aug. 10.....	10:00 a.m.	318		3,400	2,640	64	76	87	95	98	100						SBWCM
Aug. 10.....	2:00 p.m.	275		4,170	3,130	--	75	--	98	--	100						SPWCM
Aug. 11.....	1:05 p.m.	13		1,460	3,160	--	93	--	--	--	100						SPWCM

SALINE RIVER NEAR WAKEENEY, KANS.

LOCATION.--At gaging station at bridge on U. S. Highway 283, 1 mile upstream from Trego Creek, and 5 miles north of Wakeeney, Trego County.
DRAINAGE AREA.--696 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1955 to September 1956.
Water temperatures: October 1955 to September 1956.
Sediment records: October 1955 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 475 ppm Jan. 19-27; minimum, 168 ppm Aug. 18-19.
Hardness: Maximum, 334 ppm Jan. 19-27; minimum, 106 ppm July 13-15.
Specific conductance: Maximum daily, 726 micromhos Jan. 25, 26; minimum daily, 227 micromhos May 30.
Water temperatures: Maximum, 85°F July 23; minimum, freezing point Jan. 30 and probably on several other days during winter months.
Sediment concentrations: Maximum daily, 8,400 ppm May 30; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 66,000 tons May 30; minimum daily, 0 tons on many days.
REMARKS.--Daily samples for chemical analysis composited by discharge. Records of specific conductance of daily samples available in district office at Lincoln, Nebr. Flow affected by ice Nov. 15 to Jan. 2, Jan. 12 to Feb. 29. Records of discharge for water year October 1955 to September 1956 given in WSP 1440.

Chemical analyses, in parts per million, October 1955 to August 1956

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. 1-6, 1955.....	9.45	17	0.00	41	4.3	6.2	10	146	20	3.0	0.2	2.5	0.03	184	0.25	4.69	120	0	9	0.2	283	7.8	
Oct. 7-13	1.77	23	.02	59	6.5	11	11	202	42	6.5	.3	1.7	.05	271	.37	1.30	182	16	11	.4	416	7.9	
Oct. 14-27	.34	27	.00	74	13	17	11	236	65	13	.4	.9	.08	370	.50	.34	236	42	13	.5	647	7.7	
Jan. 19-27, 1956...	.30	23	.00	107	16	23	9.5	340	91	18	.5	.2	.10	475	.65	.38	334	55	13	.5	726	7.7	
Jan. 28-Feb. 2	.28	20	.00	89	18	23	9.9	290	84	18	.4	.3	.12	430	.58	.33	294	56	14	.6	654	7.9	
Feb. 3-7.....	.36	25	.06	99	19	24	9.5	322	89	21	.4	.5	.09	465	.63	.45	324	60	13	.6	707	7.8	
Feb. 8-29.....	1.77	25	.00	75	17	22	8.9	270	64	16	.4	.2	.09	370	.50	1.77	256	35	15	.6	579	7.8	
Mar. 1-27.....	2.52	17	.02	71	18	23	11	256	77	17	.5	1.7	.10	370	.50	2.52	251	41	16	.6	588	7.8	
Mar. 28-Apr. 3....	1.66	26	.05	85	16	24	11	284	78	18	.4	.9	.10	414	.56	1.86	276	43	15	.6	630	8.0	
Apr. 4-30.....	2.13	21	.00	81	18	24	12	292	74	19	.5	1.1	.09	399	.54	2.29	274	35	15	.6	639	8.1	
May 1-16.....	1.47	22	.00	82	19	24	12	302	71	19	.5	.9	.10	410	.56	1.63	284	36	15	.6	651	8.0	
May 17-27.....	.37	25	.01	76	19	26	13	284	70	21	.5	1.0	.17	410	.56	.41	266	33	17	.7	634	8.0	
May 28-29.....	4.60	23	.29	60	8.4	19	21	188	60	17	.4	4.0	.12	334	.45	4.15	184	30	16	.6	496	7.8	
May 30-June 1.....	824	20	.00	46	4.1	3.5	9.5	161	18	.0	.4	.6	.08	186	.25	414	132	0	5	.1	300	8.1	
June 2-4	19.0	27	.04	47	6.0	7.6	13	172	23	1.0	.4	1.1	.06	214	.29	11.0	142	1	9	.3	399	8.0	
June 5-25	1.70	33	.03	73	12	13	13	270	41	10	.4	1.8	.10	341	.46	1.57	230	9	10	.4	524	8.0	
June 29-July 4.....	10.6	26	.03	55	6.1	9.9	12	190	28	6.0	.4	3.8	.09	252	.34	7.21	162	6	11	.3	384	7.9	
July 5-7	405	25	.07	44	4.4	4.1	11	162	14	.0	.3	1.1	.06	196	.27	214	128	0	6	.2	293	7.7	
July 8-12.....	28.6	23	.03	43	5.0	4.8	13	168	11	1.0	.3	.5	.08	198	.27	15.3	128	0	7	.2	304	7.9	
July 13-15.....	126	21	.09	36	3.9	3.3	8.1	136	5.0	.0	.4	2.5	.07	160	.22	54.4	106	0	6	.1	240	7.8	

KANSAS RIVER BASIN--Continued

SALINE RIVER NEAR WAKEENEY, KANS.--Continued

Chemical analyses, in parts per million, October 1955 to August 1956--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					
July 16-18, 1956..	7.63	31	0.03	54	7.2	8.0	12	196	26	4.0	0.4	1.6	0.12	250	0.34	5.15	164	3	9	0.3	379	7.9	
July 19.....	23	61	.04	75	12	19	14	292	36	10	.7	.8	.16	378	.51	23.5	238	0	14	.5	549	8.0	
July 20-24.....	4.68	30	.02	54	7.7	8.7	10	193	27	5.0	.4	1.5	.08	250	.34	3.16	166	8	10	.3	383	7.7	
July 25-Aug. 6, 10-14.....	.76	33	.02	75	14	15	12	270	49	11	.4	1.8	.09	354	.48	.73	244	23	11	.4	541	7.7	
Aug. 18-19.....	5.50	21	.13	38	3.2	4.6	11	136	10	7.5	--	4.1	.06	168	.23	2.49	108	0	8	.2	258	7.8	
Aug. 20-22.....	.47	26	.01	62	8.6	11	11	214	40	8.5	.5	2.3	.11	286	.39	.36	190	15	11	.3	436	7.6	
Weighted average a.....	13.3	22	0.03	47	4.7	5.0	10	167	19	1.2	0.4	1.0	0.07	201	0.27	11.0	137	0	7	0.2	315	--	

a Includes estimate where datum is missing. Represents 100 percent of runoff for water year October 1955 to September 1956.

KANSAS RIVER BASIN--Continued

SALINE RIVER NEAR WAKEENEY, KANS.--Continued

Temperature (° F) of water, water year October 1955 to September 1956
/Once-daily measurement between 6 a.m. and 9 a.m. Many days of no flow/

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a 61			--	--	--	--	a 53	62	72	71	
2	--			--	--	--	--	a 73	b 65	69	72	
3	b 67			--	a 33	--	--	a 65	a 78	70	72	
4	--			--	--	--	a 60	a 50	b 75	68	72	
5	--			a 42	--	--	a 60	a 75	69	69	74	
6	--			--	a 33	--	a 57	a 57	74	64	74	
7	a 64			--	b 33	b 33	a 59	a 57	b 73	69	--	
8	a 66			--	--	--	a 56	a 74	b 72	69	--	
9	a 67			--	33	--	a 45	a 78	68	67	--	
10	58			--	--	--	a 48	b 77	68	68	69	
11	56			--	--	--	a 49	a 78	70	69	69	
12	--			--	33	--	a 65	b 72	b 75	72	69	
13	b 55			--	--	--	a 69	a 66	74	68	70	
14	a 59			--	--	--	a 68	b 58	72	70	68	
15	53			--	--	--	a 66	a 65	69	71	--	
16	--			--	--	--	a 62	b 70	71	75	--	
17	--			--	a 33	a 52	a 63	a 68	68	75	--	
18	--			--	--	--	a 66	60	73	70	67	
19	--			--	--	--	a 67	72	72	71	59	
20	a 64			--	a 38	--	a 72	73	72	70	64	
21	--			--	--	--	a 75	68	73	68	58	
22	--			--	a 38	--	a 65	65	69	69	65	
23	--			--	b 33	--	--	62	70	a 85	--	
24	--			--	--	--	--	b 66	69	70	--	
25	--			b 33	--	--	--	b 62	70	77	--	
26	--			--	--	--	b 56	61	--	72	--	
27	--			--	--	--	a 77	62	--	71	--	
28	--			--	--	--	56	66	--	73	--	
29	--			--	--	--	b 51	71	71	73	--	
30	--			b 32	--	b 58	a 64	a 68	72	72	--	
31	--			--	--	--	--	b 68	--	72	--	
Average	--			--	--	--	--	66	71	71	--	

a Measurement between 2 p.m. and 6 p.m.
b Measurement between 10 a.m. and 1 p.m.

KANSAS RIVER BASIN--Continued

SALINE RIVER NEAR WAKEENEY, KANS.--Continued

Suspended sediment, water year October 1955 to September 1956

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	18	500	24	13		e 11	0.1		
2	13	400	14	12		e 7.8	.1		
3	9.4	310	7.9	8.2		e 3.8	.1		
4	7.6	250	5.1	6.8		e 2.2	.2		
5	5.3	170	2.4	6.6		e 1.6	.2		
6	3.4	100	.9	5.7		e 1.1	.2		
7	2.6	110	.8	6.6		e 2.1	.3		
8	2.4	82	.5	4.5		e 1.0	.3		
9	2.2	71	.4	4.1		e .6	.3		
10	1.8	47	.2	2.2		e .2	.3		
11	1.2	33	.1	1.5		e .1	.3		
12	1.2	28	.1	.8			.3		
13	1.0	27	.1	.4			.3		
14	.7	19	(t)	.3			.3		
15	.6	15	(t)	.2			.3		
16	.6	--		.2			.3		(t)
17	.5	--		.1			.3		
18	.4	--		.1			.3		
19	.4	--		.2			.3		
20	.3	15		.4			.3		
21	.3	--		.5		(t)	.6		
22	.2	--	(t)	.5			.9		
23	.2	--		.5			1.1		
24	.2	--		.5			1.2		
25	.1	--		.4			1.0		
26	.1	--		.3			.9		
27	.1	--		.2			.5		
28	0	--	0	.1			.2		
29	0	--	0	.1			.2		
30	0	--	0	.1			.3		
31	.1	--	(t)	--		--	.5		
Total	73.9	--	56.7	77.1		31.7	12.5		0.3

Day	January			February			March		
1	0.6	--		0.2	--		3.1	--	
2	.8	--		.2	--		3.4	--	
3	1.0	--		.2	5		3.2	--	
4	1.2	--		.2	--		3.2	36	
5	1.3	6		.3	--		3.1	18	
6	1.0	--		.5	4		3.0	--	
7	1.5	--		.6	10		3.2	19	
8	1.4	--		.4	--		3.0	27	
9	1.5	--		.4	4		2.6	--	
10	1.2	--		.4	--		1.9	27	
11	1.4	10		.5	--		1.9	--	
12	1.2	--		.5	5	(t)	2.0	31	
13	.8	--		.5	--		2.1	30	
14	.7	--		.5	--		2.2	--	
15	.7	--		.3	--		2.3	24	
16	.3	--	(t)	.3	--		2.6	28	e 0.2
17	.1	--		.5	4		2.8	32	
18	.1	--		.7	--		2.6	33	
19	.2	--		.9	--		2.5	30	
20	.3	--		1.1	3		2.4	--	
21	.3	--		1.3	--		2.3	26	
22	.3	--		1.5	6		2.3	46	
23	.3	--		2.2	30		2.2	22	
24	.3	--		3.0	--		2.2	26	
25	.3	10		4.0	--		2.1	--	
26	.3	--		6.0	--	e .3	2.0	--	
27	.4	--		5.5	--		1.9	--	
28	.4	--		4.5	--		1.8	--	
29	.4	--		4.0	--		1.7	--	
30	.3	5		--	--	--	1.6	--	
31	.2	--		--	--	--	1.6	--	
Total	20.8	--	0.3	41.2	--	2.3	74.8	--	6.2

e Estimated.
t Less than 0.050 ton.

KANSAS RIVER BASIN--Continued

SALINE RIVER NEAR WAKEENEY, KANS.--Continued

Suspended sediment, water year October 1955 to September 1956--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	1.6			1.9			71	1,400	270
2	1.5	--	e 0.1	1.9			30	760	62
3	1.8			1.4			16	350	15
4	2.0			1.4			11	140	4.2
5	1.9			1.5			7.7	130	2.7
6	1.9	46	.2	1.8	86	0.4	6.0	170	2.8
7	2.2			2.0			4.9	75	1.0
8	1.9			1.8			3.8	53	.5
9	3.4			1.5			3.1	55	.5
10	3.7			1.6			2.5	--	e .4
11	3.4			1.3			1.7	60	.3
12	3.2			1.4			1.1	170	.5
13	3.0	36	.3	1.0			.8	95	.2
14	3.0			1.0			.7	170	.3
15	2.4			1.0	81	.2	.9	210	.5
16	2.6			1.0			.6	97	.2
17	2.2			.8			.4		
18	1.8			.5			.3		
19	1.6			.5	65	.1	.3	150	.1
20	1.6			.5			.2		
21	1.4			.3			.2		
22	1.4			.2			.1		
23	1.5			.1			.1		
24	1.5	58	.3	.1	34	(t)	.1	110	(t)
25	1.5			.4			.1		
26	1.8			.4			0	--	0
27	2.4			.3	110	.1	0	--	0
28	2.0			8.2	580	s 15	0	--	0
29	1.2			1.0	110	.3	4.2	380	s 5.3
30	1.0			2,210	8,400	s 66,000	.7	250	.5
31	--	--	--	191	2,500	1,300	--	--	--
Total	62.4	--	7.9	2,437.8	--	67,321.2	168.5	--	367.5

Day	July			August			September		
1	0.2	99	0.1	0.7	320	0.6			
2	.1	83	(t)	.6	210	.3			
3	3.6	310	s 3.4	.4	190	.2			
4	55	2,000	s 450	.5	240	.3			
5	282	3,400	s 3,700	.3	240	.2			
6	770	4,100	8,500	.1	160	(t)			
7	162	1,500	660	0	--	0			
8	55	1,000	150	0	--	0			
9	30	520	42	0	--	0			
10	20	500	27	.1	550	.1			
11	14	310	12	.1	250	.1			
12	24	1,400	s 280	1.5	110	.4			
13	300	4,300	3,500	.4	300	.3			
14	61	1,700	s 330	.1	420	.1			
15	16	590	25	0	--	0			
16	9.0	240	5.8	0	--	0			
17	7.7	150	3.1	0	--	0			
18	6.2	100	1.7	10	1,200	s 39			
19	23	580	s 38	1.0	390	1.1			
20	7.0	380	7.2	.6	180	.3			
21	5.2	250	3.5	.6	310	.5			
22	4.1	170	1.9	.2	210	.1			
23	3.6	160	1.6	0	--	0			
24	3.5	94	.9	0	--	0			
25	2.7	130	.9	0	--	0			
26	1.8	150	.7	0	--	0			
27	1.4	73	.3	0	--	0			
28	1.1	120	.4	0	--	0			
29	.7	230	.4	0	--	0			
30	.7	240	.5	0	--	0			
31	.4	340	.4	0	--	0			
Total	1,871.0	--	17,746.8	17.2	--	43.6	0		0

Total discharge for year (cfs-days) 4,857.2
Total load for year (tons) 85,584.5

e Estimated.
s Computed by subdividing day.
t Less than 0.050 ton.

KANSAS RIVER BASIN--Continued

SALINE RIVER NEAR WAKEENEY, KANS.--Continued

Particle-size analyses of suspended sediment, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; 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 30, 1956	7:25 a.m.	7,080	59	11,700	3,530	--	58	--	86	--	100						SPWCM
May 30	9:20 a.m.	4,990	60	9,540	3,540	51	66	79	--	--	100						SPWCM
May 30	9:20 a.m.	4,990	60	9,540	3,630	6	12	62	--	--	100						SPNM
May 30	3:25 p.m.	957	--	7,150	4,850	--	63	--	86	--	94						SPWCM
May 31	12:40 p.m.	268	68	3,010	3,210	64	81	89	95	98	99						SPWCM
May 31	12:40 p.m.	268	68	3,010	3,330	7	11	74	94	98	99						SPNM
June 1	7:20 a.m.	85	62	1,490	2,080	--	90	--	97	--	100						SPWCM
June 2	8:50 a.m.	31	64	830	1,510	87	95	98	99	100	--						BWCM
June 29	6:15 a.m.	4.7	71	347	512	85	96	99	99	100	--						BWCM
July 4	11:30 a.m.	109	71	3,470	2,110	61	72	86	93	97	99						BWCM
July 5	1:15 p.m.	54	79	1,820	2,350	77	89	96	98	100	--						BWCM
July 5	7:10 p.m.	833	64	7,840	6,240	--	54	--	86	--	100						SPWCM
July 6	5:15 a.m.	1,280	64	4,270	3,270	--	80	--	95	--	100						SPWCM
July 7	3:05 p.m.	127	76	1,610	4,200	--	85	--	96	--	100						SPWCM
July 13	7:00 a.m.	244	68	6,210	4,570	--	73	--	95	--	99	100					SPWCM
Aug. 18	7:10 a.m.	23	67	1,840	2,980	--	79	--	95	--	100						SPWCM

SMOKY HILL RIVER AT ENTERPRISE, KANS.

LOCATION.--At gaging station at Atchison, Topeka and Santa Fe Railway bridge in Enterprise, Dickinson County, and 18.4 miles upstream from Chapman Creek.
DRAINAGE AREA.--19,200 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: October 1955 to September 1956.
Water temperatures: October 1955 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 2,320 ppm May 26 to June 3; minimum, 234 ppm July 9.
Hardness: Maximum, 508 ppm Jan. 15-31; minimum, 124 ppm Oct. 5-7.
Specific conductance: Maximum daily, 4,240 micromhos May 28; minimum daily, 352 micromhos July 9.
Water temperatures: Maximum, 88°F June 21; minimum, freezing point on many days during November to February.
REMARKS.--Daily samples for chemical analysis composited by discharge. Records of specific conductance of daily samples available in district office at Lincoln, Nebr. Records of discharge for water year October 1955 to September 1956 given in WSP 1440.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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: Parts per million: Residue at 180°C	Dissolved solids: Parts per million: Sum	Dissolved solids: Tons per acre-foot	Dissolved solids: 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. 1-4, 1955..	2,035	16	0.03	56	7.4	57	7.8	166	49	80	0.3	1.1	0.07	371	--	0.50	2,040	170	34	41	1.9	637	7.6	
Oct. 5-7.....	2,827	15	.00	40	5.8	33	5.9	124	35	47	.3	.0	.07	254	--	.35	1,940	124	22	35	1.3	433	7.8	
Oct. 8-10	936	12	.02	54	8.1	57	7.9	135	62	88	.3	1.9	.08	376	--	.51	950	168	57	41	1.9	650	7.6	
Oct. 11-19	663	11	.01	64	11	84	8.4	149	86	131	.3	1.5	.08	493	--	.67	883	204	82	46	2.5	851	7.6	
Oct. 20-24	430	9.4	.00	72	11	113	8.8	160	100	166	.3	1.9	.09	591	--	.80	686	225	94	51	3.3	1,020	7.5	
Oct. 25-Nov. 1 .	233	15	.00	88	16	194	10	215	133	278	.3	1.9	.13	858	--	1.17	540	284	108	59	5.0	1,480	7.7	
Nov. 2-12.....	192	14	.02	104	20	273	9.6	254	180	408	.3	.8	.16	1,150	1,130	1.56	596	340	132	63	6.4	1,980	7.9	
Nov. 13-Dec. 1 .	158	19	.00	115	27	368	10	294	200	530	.3	3.3	.20	1,460	1,420	1.99	623	396	155	66	8.1	2,480	7.7	
Dec. 2-24.....	138	19	.00	134	34	468	8.9	349	250	680	.3	2.5	.23	1,850	1,770	2.52	689	476	190	68	9.3	3,080	7.6	
Dec. 25-Jan. 14, 1956 .	146	16	.00	124	32	448	8.2	332	245	616	.4	2.7	.24	1,680	1,660	2.28	662	440	168	68	9.3	2,830	7.9	
Jan. 15-31	117	16	.00	140	39	530	8.3	367	305	765	.3	3.3	.25	2,050	1,990	2.79	648	508	207	69	10	3,420	7.8	
Feb. 1-21.....	140	16	.01	126	32	438	7.6	330	200	635	.2	2.9	.19	1,740	1,620	2.37	658	448	177	68	9.0	2,930	7.8	
Feb. 22-Mar. 5.	211	14	.00	106	31	370	8.4	296	245	520	.3	1.7	.19	1,460	1,440	1.99	832	390	147	67	8.2	2,480	8.0	
Mar. 6-31.....	175	14	.00	103	30	425	9.0	266	243	585	.3	1.9	.23	1,570	1,540	2.14	742	382	164	70	9.5	2,680	7.8	
Apr. 1-5.....	191	14	.05	111	33	470	11	278	265	668	.3	2.4	.23	1,750	1,720	2.38	902	414	186	70	10	3,010	8.0	
Apr. 6.....	510	11	.06	53	14	144	7.9	168	90	196	--	3.7	.08	634	--	.86	873	188	50	62	4.6	1,110	7.4	
Apr. 7.....	338	13	.05	107	33	483	11	222	290	696	--	6.7	.21	1,800	--	2.45	1,640	402	220	72	11	3,070	7.6	
Apr. 8-10.....	230	11	.04	63	15	174	8.7	174	122	247	.2	6.1	.12	766	--	1.04	476	220	77	62	5.1	1,340	7.6	
Apr. 11-15.....	180	13	.04	94	23	310	9.5	239	203	441	.2	5.7	.15	1,260	1,220	1.71	612	330	134	66	7.4	2,170	7.6	
Apr. 16-20.....	145	13	.03	108	30	438	11	260	255	622	.3	4.0	.21	1,660	1,610	2.26	650	394	181	70	9.6	2,860	7.6	
Apr. 21-30.....	130	10	.03	103	32	500	11	244	263	696	.3	4.5	.26	1,790	1,740	2.43	628	390	190	73	11	3,070	7.6	
May 1-6.....	146	8.9	.04	110	33	425	11	255	290	622	.3	4.1	.23	1,690	1,630	2.30	666	412	203	68	9.1	2,860	7.6	
May 7-15.....	114	9.2	.06	102	31	403	10	242	258	583	.3	4.0	.22	1,590	1,520	2.16	489	384	186	69	8.9	2,730	7.7	

KANSAS RIVER BASIN--Continued

SMOKY HILL RIVER AT ENTERPRISE, KANS.--Continued

Chemical analyses, in parts per million, water year October 1955 to September 1956--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			Hardness as $CaCO_3$		Per cent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million		Tons per acre-foot	Calcium, magnesium	Noncarbonate					
														Residue at 180°C	Sum								
May 16-25, 1956	79.4	7.1	0.07	114	37	605	12	280	290	863	0.3	4.9	0.26	2,110	2,070	2.87	452	436	206	74	13	3,640	7.9	
May 26-June 3	88.8	15	.00	120	36	690	12	274	315	986	.3	2.4	.29	2,320	2,310	3.16	556	448	223	76	14	4,000	7.6	
June 4-5	363	19	.06	94	23	375	9.9	250	208	538	.3	2.8	.23	1,420	1,390	1.93	1,390	330	125	70	9.0	2,440	7.6	
June 6	1,400	21	.08	76	15	238	10	228	135	339	--	4.2	.16	984	--	1.34	3,720	250	63	66	6.5	1,700	7.8	
June 7-11	919	20	.01	60	8.9	67	9.2	175	81	81	.3	2.6	.07	424	--	.58	1,050	186	42	42	2.1	708	7.6	
June 12	1,340	18	.08	64	6.9	38	8.4	206	49	43	.6	3.7	.07	334	--	.45	1,210	188	19	29	1.2	561	7.5	
June 13-14	558	16	.05	61	6.8	78	8.9	160	73	105	.3	5.2	.10	442	--	.60	666	180	49	47	2.5	761	7.9	
June 15-16	376	19	.08	85	17	254	10	234	175	349	.3	4.9	.22	1,060	1,030	1.44	1,080	280	88	65	6.6	1,810	8.2	
June 17-21	213	16	.01	71	13	142	10	189	128	194	.3	4.9	.14	688	--	.94	396	232	77	56	4.1	1,180	7.6	
June 22-27	169	16	.00	82	17	192	10	181	158	279	.3	2.3	.15	872	--	1.19	398	273	125	59	5.0	1,490	7.6	
June 28	1,550	25	.11	76	10	128	12	262	99	139	.6	2.4	.14	634	--	.86	2,650	232	17	53	3.7	1,010	7.8	
June 29	955	16	.05	58	6.0	26	10	191	31	32	--	8.2	.08	292	--	.40	753	169	12	24	.9	443	7.6	
June 30-July 3	287	20	.04	54	7.7	63	11	164	57	81	.5	4.0	.11	386	--	.52	299	166	32	43	2.1	649	7.7	
July 4-8	483	22	.05	66	9.6	106	13	204	83	143	.5	2.4	.15	564	--	.77	736	204	37	51	3.2	950	8.1	
July 9	2,360	24	.05	48	5.4	14	10	175	20	12	.6	1.6	.07	234	--	.32	1,490	142	0	16	.5	352	7.6	
July 10	2,830	15	.08	79	10	150	10	186	111	214	.6	1.4	.11	724	--	.98	5,530	240	87	56	4.2	1,150	7.7	
July 11-25	728	19	.02	57	7.1	52	10	166	60	63	.5	5.2	.09	368	--	.50	723	171	35	38	1.7	606	7.8	
July 26-31	227	23	.01	80	8.4	121	12	188	119	175	.5	4.5	.10	652	--	.89	400	234	80	51	3.4	1,090	7.7	
Aug. 1-6	116	22	.01	76	14	183	11	188	128	268	.5	4.3	.15	819	--	1.11	257	246	92	60	5.1	1,400	7.7	
Aug. 7-10	87.3	20	.04	91	17	270	12	188	178	415	.4	3.7	.18	1,140	1,100	1.55	269	298	144	65	6.8	1,930	7.7	
Aug. 11	144	21	.06	105	20	345	13	204	220	529	.5	3.8	.19	1,380	1,360	1.88	537	346	179	67	8.1	2,360	7.6	
Aug. 12-13	139	13	.05	51	9.0	121	8.6	108	88	179	.4	5.9	.11	544	--	.74	204	164	75	60	4.1	958	7.5	
Aug. 14	376	22	.05	84	17	270	11	176	173	408	.5	3.2	.16	1,090	1,080	1.48	1,110	278	134	67	7.0	1,890	7.6	
Aug. 15	1,240	20	.05	130	29	520	13	220	330	776	.6	6.3	.26	1,970	1,930	2.68	6,600	444	264	71	11	3,300	7.6	
Aug. 16	1,500	17	.07	59	5.1	52	6.5	196	45	61	.4	4.6	.06	360	--	.49	1,460	168	7	39	1.7	596	7.8	
Aug. 17	955	22	.11	57	5.4	37	7.8	186	38	39	.8	8.1	.07	312	--	.42	804	164	11	32	1.3	507	7.8	
Aug. 18	553	17	.07	57	6.3	67	8.6	160	63	93	.4	5.3	.06	402	--	.55	600	168	37	45	2.2	692	7.8	
Aug. 19	355	22	.09	72	12	200	10	188	125	280	.4	4.4	.13	838	--	1.14	803	230	76	64	5.7	1,430	8.0	
Aug. 20-23	217	20	.00	64	9.8	132	10	174	102	180	.5	5.4	.13	625	--	.85	366	200	57	57	4.1	1,080	7.6	
Aug. 24-28	123	17	.01	68	11	132	9.8	171	104	193	.5	4.8	.12	657	--	.89	218	216	76	56	3.9	1,120	7.6	
Aug. 29-Sept. 4	84.0	17	.00	83	14	226	11	180	145	338	.5	2.7	.14	953	--	1.30	216	264	116	64	6.0	1,650	7.6	
Sept. 5	122	14	.14	56	11	146	10	124	90	239	--	5.5	.11	674	--	.92	222	186	84	61	4.7	1,170	7.2	
Sept. 6-16	61.0	11	.00	95	20	341	12	174	193	545	.4	3.7	.17	1,360	1,310	1.85	224	318	175	69	8.3	2,350	7.5	
Sept. 17-30	46.1	8.3	.01	117	26	520	12	200	253	813	.4	3.8	.20	1,920	1,850	2.61	239	398	234	73	11	3,310	7.6	
Weighted average a	293	16	0.02	78	16	198	9.2	208	129	280	0.4	2.9	0.13	858	--	1.17	679	260	89	61	5.3	1,450	--	

a Includes estimates where data are missing. Represents 100 percent of runoff for water year October 1955 to September 1956.

KANSAS RIVER BASIN--Continued

SMOKY HILL RIVER AT ENTERPRISE, KANS.--Continued

Temperature (° F) of water, water year October 1955 to September 1956
(Once-daily measurement between 7 a.m. and 8 a.m.)

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

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KANSAS RIVER BASIN--Continued

LITTLE BLUE RIVER NEAR DEWEESE, NEBR.

LOCATION.--At gaging station on downstream side of bridge on State Highway 14, three-quarters of a mile upstream from Walnut Creek, 4 miles southeast of Deweese, Clay County, and 5¾ miles northwest of Angus.
RECORDS AVAILABLE.--Water temperatures: August to September 1956.
Sediment records: August to September 1956.
REMARKS.--Records of discharge for water year October 1955 to September 1956 given in WSP 1440.

Chemical analyses, in parts per million, November 1955 to September 1956

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 (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. 22, 1955.....	66.0	39	0.04	61	7.8	17	6.2	226	0	32	8.5	0.2	0.9	0.04	286	0.39		184	0	16	0.5	432	8.0
Feb. 22, 1956.....	75.6	30	.02	57	8.0	15	6.4	202	0	27	8.5	.3	4.9	.05	263	.36		175	9	15	.5	411	7.5
May 14.....	65.0	32	.00	58	10	16	6.3	221	0	33	8.0	.2	1.3	.02	282	.38		186	5	15	.5	437	7.9
Aug. 27.....	26.7	32	.00	59	8.8	14	7.1	219	0	33	9.5	.3	.8	.02	273	.37		183	3	14	.5	426	8.0
Sept. 17.....	48.2	33	.00	60	8.9	16	5.8	222	0	34	8.5	.3	1.0	.05	276	.38		186	4	15	.5	433	7.9

KANSAS RIVER BASIN--Continued

LITTLE BLUE RIVER NEAR DEWEESE, NEBR.--Continued

Temperature (° F) of water, August to September 1956
(Once-daily measurement between 6 a.m. and 9 a.m.)

Day	Aug.	Day	Aug.	Day	Sept.	Day	Sept.
2	75	17	77	1	a 78	16	67
3	--	18	72	2	62	17	58
4	--	19	73	3	67	18	58
5	--	20	63	4	60	19	59
6	a 79	21	62	5	65	20	58
7	74	22	66	6	53	21	61
8	72	23	66	7	55	22	61
9	70	24	--	8	58	23	60
10	67	25	68	9	61	24	58
11	70	26	--	10	60	25	59
12	74	27	70	11	65	26	59
13	73	28	--	12	65	27	62
14	68	29	a 76	13	65	28	63
15	74	30	a 62	14	64	29	59
16	74	31	65	15	62	30	55
Average							61

a Measurement between 4 p.m. and 6 p.m.

Periodic determinations of suspended-sediment discharge, October 1955 to July 1956

Date	Discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Discharge (tons per day)
Oct. 11, 1955	60	310	50
Nov. 1	68	187	34
Nov. 22	68	198	36
Dec. 12	a 89	93	22
Dec. 28	67	78	14
Jan. 3, 1956	70	74	14
Jan. 9	68	52	9.4
Jan. 27	a 78	42	8.8
Feb. 22	75	62	13
Mar. 9	77	66	14
Apr. 2	69	77	14
Apr. 21	67	70	13
May 14	66	85	15
June 18	77	819	170
June 25	54	225	33
June 26, 3:00 p.m.	2,180	6,530	38,400
June 26, 6:10 p.m.	1,730	6,360	29,700
June 26, 8:00 p.m.	1,360	6,650	24,400
June 26, 8:55 p.m.	1,240	7,130	23,900
July 16, 1:20 p.m	55	151	22
July 16, 3:35 p.m	54	160	23

a Daily mean discharge.

KANSAS RIVER BASIN--Continued

LITTLE BLUE RIVER NEAR DEWEESE, NEBR.--Continued

Suspended sediment, August to September 1956

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				104	2,400	a 650	29	70	5.5
2				105	1,750	b 500	31	86	7.2
3				60	1,080	175	28	79	6.0
4				49	550	73	28	63	4.8
5				44	278	33	247	4,730	s 4,230
6				46	209	26	67	1,500	s 311
7				42	159	18	52	365	51
8				40	135	15	48	229	30
9				555	3,980	s 8,490	47	197	25
10				622	4,310	7,240	46	148	18
11				348	3,350	s 3,330	45	161	20
12				140	1,720	650	42	171	19
13				95	950	244	42	141	16
14				71	420	81	45	129	16
15				61	255	42	46	127	16
16				54	202	29	49	129	17
17				51	170	23	47	128	16
18				274	3,400	s 3,210	47	127	16
19				58	825	129	46	147	18
20				47	357	45	47	127	16
21				40	191	21	47	100	13
22				39	138	15	48	112	15
23				37	125	12	48	103	13
24				34	110	10	47	90	11
25				32	90	7.8	47	80	10
26				30	77	6.2	49	107	14
27				27	71	5.2	49	111	15
28				28	73	5.5	49	92	12
29				29	81	6.3	49	96	13
30				30	78	6.3	49	116	15
31				28	78	5.9	--	--	--
Total				3,220	--	25,104.2	1,561	--	4,989.5

Total discharge for period Aug. 1 to Sept. 30, 1956 (cfs-days) 4,781
Total load for period Aug. 1 to Sept. 30, 1956 (tons) 30,093.7

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

LITTLE BLUE RIVER NEAR DEWEESE, NEBR.--Continued

Particle-size analyses of suspended sediment, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; 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	
June 26, 1956	3:00 p.m.	2,180	72	6,530	3,700	--	66	--	--	--	92	94	98		100		SPWCM
June 26	6:10 p.m.	1,730	74	6,360	4,110	--	68	--	85	--	92	93	96		100		VPWCM
June 26	8:55 p.m.	1,240	--	7,130	3,680	--	71	--	86	--	98	98	100		--		SPWCM
Aug. 2	10:30 a.m.	105	77	1,870	4,200	55	75	85	90	94	99	--	100		--		SPWCM
Aug. 2	10:30 a.m.	105	77	1,870	4,570	55	73	86	92	95	99	--	100		--		SPNM
Aug. 9	10:10 a.m.	342	71	6,110	3,870	--	70	--	88	--	98	99	99		100		SPWCM
Aug. 9	10:10 p.m.	1,270	70	4,320	3,030	--	78	--	90	--	99	--	--		--		SPWCM
Aug. 10	6:00 a.m.	693	67	4,700	2,670	--	79	--	90	--	95	96	98		100		SPWCM
Aug. 18	7:00 a.m.	609	72	5,300	2,660	--	62	--	79	--	98	99	100		--		SPWCM
Sept. 5	6:30 a.m.	588	56	6,300	3,900	--	59	--	82	--	99	--	--		--		SPWCM
Sept. 5	9:00 a.m.	436	65	6,160	4,560	--	63	--	85	--	99	--	--		--		SPWCM

Particle-size analyses of bed material, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water; W, ia distilled water; C, chemically dispersed; M, mechanically dispersed; V, visual accumulation tube)

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									
						0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	4.000	8.000	16.000	
Oct. 11, 1955	5	60							0	5	30	54	65	80	94	99	SV
Nov. 1	5	68							0	3	27	53	66	80	92	97	SV
Nov. 22	6	68							0	6	38	68	84	94	98	100	S
Nov. 22	6	68							0	4	38	71	84	94	98	100	SV
Dec. 12	5	a 89							0	3	35	75	89	97	99	100	SV
Jan. 9, 1956	5	68							0	3	31	70	85	93	98	100	SV
May 14	3	66							0	3	18	61	75	81	86	89	SV
June 25	4	54							0	5	32	76	90	94	96	98	SV
Aug. 2	10	105							0	3	33	68	80	88	95	98	SV

a Daily mean discharge.

KANSAS RIVER BASIN--Continued

BIG BLUE RIVER NEAR MANHATTAN, KANS.

LOCATION.--At gaging station at highway bridge, 4 miles north of Manhattan, Riley County, and 7.0 miles upstream from mouth.
DRAINAGE AREA.--9,560 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: October 1955 to September 1956.
Water temperatures: October 1955 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 414 ppm May 31; minimum, 112 ppm July 5-7.
Hardness: Maximum, 238 ppm Jan. 17-31; minimum, 52 ppm July 5-7.
Specific conductance: Maximum daily, 712 micromhos Dec. 6, 7; minimum daily, 138 micromhos July 5-7.
Water temperatures: Maximum, 88°F July 16, 18, 25, 27; minimum, freezing point Nov. 28.
REMARKS.--Daily samples for chemical analysis composited by discharge. Records of specific conductance of daily samples available in district office at Lincoln, Nebr. Records of discharge for water year October 1955 to September 1956 given in WSP 1440.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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, 1955	585	32	0.04	48	14	47	6.5	198	40	47	0.4	0.9	0.08	344	0.47	543	178	16	35	1.5	539	7.6	
Oct. 2-6	495	19	.00	34	6.6	28	6.2	136	24	28	.4	2.6	.06	218	.30	291	112	0	34	1.2	366	7.5	
Oct. 7-31	262	25	.02	54	11	37	6.0	217	41	34	.3	1.3	.06	319	.43	226	181	3	30	1.2	526	7.8	
Nov. 1-29	232	30	.10	62	12	41	5.9	241	43	39	.3	1.5	.06	351	.48	220	202	4	30	1.3	576	7.9	
Nov. 30-Dec. 31	269	32	.01	71	13	48	6.0	279	50	45	.3	2.2	.07	408	.55	296	230	1	31	1.4	663	7.8	
Jan. 1-16, 1956	312	32	.05	67	13	42	5.5	264	45	39	.2	2.3	.07	378	.51	318	220	4	29	1.2	620	8.0	
Jan. 17-31	277	30	.05	71	15	45	6.1	283	49	42	.2	2.6	.09	404	.55	302	238	6	28	1.3	669	8.0	
Feb. 1-15	323	26	.00	67	12	41	4.2	254	47	30	.2	3.0	.05	363	.49	317	218	10	28	1.2	606	8.0	
Feb. 16-29	408	27	.00	61	11	36	4.0	231	42	30	.2	2.6	.05	326	.44	359	196	7	28	1.1	544	7.8	
Mar. 1-24	400	21	.01	59	12	37	5.2	232	44	32	.2	1.5	.05	338	.46	365	197	7	28	1.1	545	8.2	
Mar. 25-Apr. 18	330	16	.01	52	13	37	6.4	205	44	36	.2	1.8	.07	310	.42	276	182	14	30	1.2	533	7.7	
Apr. 19-30	264	18	.01	67	13	42	6.4	260	44	39	.2	1.9	.08	362	.49	258	220	7	29	1.2	617	7.8	
May 1-15	355	16	.00	62	12	40	7.0	242	42	38	.3	2.4	.09	341	.46	327	204	6	29	1.2	586	7.7	
May 16-30	278	21	.02	67	13	43	7.0	264	42	41	.3	2.5	.09	373	.51	280	220	4	29	1.3	629	7.6	
May 31	1,370	41	.16	65	15	48	7.2	268	45	44	--	4.5	.11	414	.56	1,530	222	2	31	1.4	655	7.7	
June 1-3	1,270	18	.03	40	7.8	30	7.7	161	31	29	.4	5.0	.06	253	.34	868	132	0	32	1.1	419	7.5	
June 4-7	769	16	.07	29	6.2	16	6.6	108	26	12	.3	8.3	.06	185	.25	384	98	9	25	.7	288	7.1	
June 8-9	4,390	24	.10	34	5.6	13	5.8	134	18	11	.2	.9	.06	189	.26	2,240	108	0	20	.5	284	7.5	
June 10-13	2,040	15	.19	20	3.9	6.8	6.8	81	14	4.0	.6	3.2	.05	131	.18	722	66	0	17	.4	182	7.4	
June 14-22	1,078	17	.11	28	4.9	11	7.4	105	19	8.5	.4	7.3	.06	168	.23	489	90	4	19	.5	251	7.5	
June 23-July 3	2,015	17	.23	26	4.4	7.8	6.1	101	14	4.0	.4	2.0	.06	147	.20	800	83	0	16	.4	219	7.2	
July 4	11,800	18	.23	36	4.4	9.1	6.8	136	18	5.0	.2	.0	.05	180	.24	5,730	108	0	15	.4	267	7.2	
July 5-7	9,977	15	.36	16	2.9	3.3	4.7	70	3.8	.0	.4	.4	.05	112	.15	3,020	52	0	11	.2	138	7.4	
July 8-11	1,385	16	.16	20	3.4	5.4	6.4	78	7.5	3.5	.5	5.3	.05	130	.18	486	64	0	14	.3	173	7.3	
July 12-17	776	21	.09	30	4.4	11	6.8	111	14	8.0	.4	4.8	.06	167	.23	350	93	2	19	.5	250	7.5	

July 18-31	372	27	.01	40	7.8	19	7.4	157	24	18	.2	3.4	.06	231	.31	232	132	3	23	.7	356	7.7
Aug. 1-3	163	27	.00	51	11	25	7.5	202	29	27	.2	1.0	.06	278	.38	122	171	5	23	.8	453	7.9
Aug. 4-5	409	26	.01	59	11	30	7.7	224	35	33	.3	1.4	.05	a 313	.43	346	193	9	24	.9	523	7.8
Aug. 6	399	25	.04	46	8.0	27	7.8	180	29	26	.4	1.7	.07	266	.36	287	148	0	27	1.0	431	7.9
Aug. 7-9	338	24	.02	52	11	38	7.6	205	35	43	.3	.7	.09	321	.44	293	173	5	31	1.3	524	8.0
Aug. 10	306	22	.07	44	8.3	31	6.8	180	28	31	.3	1.3	.05	278	.38	230	144	0	31	1.1	437	7.9
Aug. 11	267	20	.04	43	8.4	29	6.8	174	28	29	.3	2.0	.05	252	.34	182	142	0	30	1.1	423	7.8
Aug. 12	199	29	.07	43	8.9	27	6.7	178	28	28	.4	2.0	.06	266	.36	143	144	0	28	1.0	425	7.8
Aug. 13-17	406	24	.00	50	10	36	7.5	199	34	38	.3	1.9	.07	304	.41	333	166	3	31	1.2	500	7.9
Aug. 18-Sept. 11	344	25	.01	37	7.4	23	7.7	150	24	23	.3	4.5	.07	230	.31	214	123	0	27	.9	367	7.7
Sept. 12-17	324	19	.03	28	5.6	15	7.2	109	20	14	.3	5.1	.03	176	.24	154	93	4	24	.7	270	7.6
Sept. 18-30	164	25	.01	52	11	39	8.0	208	35	44	.3	1.7	.07	321	.44	142	175	4	31	1.3	534	7.9
Weighted average b	567	21	0.12	40	7.8	22	6.1	159	26	19	0.3	2.4	0.06	235	0.32	360	132	2	26	0.8	371	--

a Sum.
b Includes estimates where data are missing. Represents 100 percent of runoff for water year October 1955 to September 1956.

KANSAS RIVER BASIN--Continued

BIG BLUE RIVER NEAR MANHATTAN, KANS.--Continued

Temperature (°F) of water, water year October 1955 to September 1956
/Once-daily measurement between 1 p.m. and 5 p.m./

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

a Measurement between 8 a.m. and 12 m.
b Measurement between 7 p.m. and 8 p.m.

KANSAS RIVER AT TOPEKA, KANS.

LOCATION.--At Kansas Avenue Bridge in Topeka, Shawnee County, 0.3 mile downstream from gaging station and 1.9 miles upstream from Soldier Creek. Prior to Dec. 20, 1955, at gaging station.
DRAINAGE AREA.--56,710 square miles, approximately, of which a large area does not contribute directly to surface runoff.
RECORDS AVAILABLE.--Chemical analyses: November 1955 to September 1956.
Water temperatures: November 1955 to September 1956.
EXTREMES, November 1955 to September 1956.--Dissolved solids: Maximum, 1,180 ppm Aug. 19; minimum, 139 ppm July 6-8.
Hardness: Maximum, 344 ppm Aug. 19; minimum, 86 ppm July 6-8.
Specific conductance: Maximum daily, 2,000 micromhos Aug. 19; minimum daily, 202 micromhos July 7.
Water temperatures: Maximum, 86°F July 15, 16; minimum, freezing point on several days during November to February.
REMARKS.--Daily samples for chemical analysis composited by discharge. Records of specific conductance of daily samples available in district office at Lincoln, Nebr. Records of discharge for water year October 1955 to September 1956 given in WSP 1440.

Chemical analyses, in parts per million, November 1955 to September 1956

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: Parts per million: Residue at 180°C	Dissolved solids: Parts per million: Sum	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Per cent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
Nov. 16-Dec. 2, 1955..	531	22	0.16	85	19	128	7.2	280	100	170	0.3	1.6	0.11	680		0.92	975	290	60	48	3.3	1,150	7.7	
Dec. 3-18.....	444	26	.14	94	20	144	6.7	310	108	190	.3	2.0	.12	755		1.03	905	316	62	49	3.5	1,270	7.7	
Dec. 19-Jan. 11, 1956..	565	24	.06	89	20	137	7.2	295	109	185	.2	3.8	.12	735		1.00	1,120	304	62	49	3.4	1,240	7.8	
Jan. 12-31.....	508	24	.06	93	23	141	7.8	317	116	189	.2	5.0	.13	787		1.07	1,080	325	65	48	3.4	1,300	7.9	
Feb. 1-11.....	579	21	.01	91	19	131	6.2	293	108	177	.2	5.3	.13	716		.97	1,120	306	66	48	3.3	1,220	7.8	
Feb. 12-29.....	819	19	.01	76	18	113	5.6	254	90	165	.2	2.7	.10	612		.83	1,350	262	54	48	3.1	1,040	8.0	
Mar. 1-15	838	20	.00	73	17	115	6.9	248	84	150	.2	2.3	.12	611		.83	1,380	252	49	49	3.2	1,040	7.9	
Mar. 16-Apr. 1 .	686	13	.00	72	18	117	7.2	242	103	152	.4	2.2	.09	613		.83	1,140	252	54	49	3.2	1,050	7.7	
Apr. 2-9.....	671	12	.04	69	18	105	7.6	239	93	147	.2	2.1	.12	599		.81	1,090	246	50	47	2.9	1,040	7.6	
Apr. 10-11.....	842	17	.05	83	22	202	8.2	236	147	294	.3	4.9	.15	922		1.25	2,100	298	104	59	5.1	1,590	7.9	
Apr. 12.....	770	11	.11	59	15	79	7.1	214	74	98	--	1.7	.09	452		.61	940	210	35	44	2.4	799	7.6	
Apr. 13.....	722	13	.05	69	17	140	8.0	214	109	196	--	2.7	.12	668		.91	1,300	242	67	55	3.9	1,150	7.6	
Apr. 14-17.....	650	10	.05	57	16	92	7.5	201	75	113	.0	3.2	.09	506		.69	888	207	42	48	2.8	855	7.5	
Apr. 18-30.....	595	15	.05	69	18	114	7.4	239	96	152	.1	2.7	.14	610		.83	980	248	52	49	3.1	1,050	7.6	
May 1-6	637	11	.06	71	19	123	7.1	239	102	167	.2	2.9	.11	636		.86	1,090	256	60	50	3.4	1,110	7.5	
May 7	1,930	9.9	.03	48	8.3	24	5.4	176	25	34	--	.7	.05	250		.34	1,300	154	10	24	.8	433	7.5	
May 8-20	585	10	.05	65	19	115	7.7	219	102	152	.3	2.8	.10	595		.81	940	242	62	50	3.2	1,030	7.5	
May 21-31	434	14	.04	69	20	126	8.1	247	93	167	.3	2.9	.12	634		.86	743	253	50	51	3.4	1,110	7.5	
June 1-2.....	661	19	.04	70	17	116	8.7	252	84	157	.2	4.3	.13	614		.84	1,100	246	39	50	3.2	1,060	7.8	
June 3-7.....	1,113	20	.04	57	12	76	8.0	197	64	95	.3	6.7	.10	448		.61	1,350	193	31	45	2.4	762	7.5	
June 8	2,680	25	.06	52	8.4	36	6.5	186	33	40	--	8.1	.08	306		.42	2,210	164	11	31	1.2	504	7.8	
June 9	2,220	18	.08	64	11	112	7.7	176	83	168	--	5.4	.10	604		.82	3,620	204	60	53	3.4	994	7.6	
June 10-11.....	4,870	19	.10	47	7.4	29	7.6	174	39	30	.3	.8	.09	272		.37	3,580	148	5	29	1.0	436	8.0	

KANSAS RIVER BASIN--Continued

KANSAS RIVER AT TOPEKA, KANS.--Continued

Chemical analyses, in parts per million, November 1955 to September 1956--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				Hardness as $CaCO_3$		Per cent 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					
														Residue at 180°C	Sum									
June 12-19, 1956	2,435	21	0.07	45	6.7	32	7.8	149	40	37	0.3	6.1	0.09	279		0.38	1,830	140	18	32	1.2	452	7.6	
June 20-22	1,723	18	.10	51	9.0	64	8.4	157	63	84	.3	7.4	.10	390		.53	1,810	164	35	44	2.2	665	7.7	
June 23-26	2,075	17	.05	41	6.9	29	8.2	140	34	34	.4	8.6	.08	261		.35	1,460	131	16	31	1.1	424	7.6	
June 27-30	4,420	18	.00	46	6.1	14	8.2	158	21	16	.4	9.5	.14	225		.31	2,690	140	10	17	.5	361	7.3	
July 1-2	4,265	16	.00	46	7.1	32	7.7	154	34	46	.4	4.4	.12	274		.37	3,160	144	18	31	1.2	464	7.7	
July 3-5	4,277	19	.03	41	6.2	16	8.0	147	21	16	.4	5.2	.09	213		.29	2,460	128	7	20	.6	344	7.9	
July 6-8	11,370	16	.00	28	3.9	6.2	5.6	107	9.0	5.0	.4	3.6	.10	139		.19	4,270	86	0	13	.3	215	7.5	
July 9-10	3,960	16	.02	34	4.7	9.0	7.5	121	13	9.0	.4	6.8	.12	168		.23	1,800	104	5	15	.4	268	7.6	
July 11-15	4,462	19	.03	51	5.6	37	8.4	158	31	48	.4	10	.08	297		.40	3,580	150	20	33	1.3	497	7.4	
July 16-25	1,944	20	.01	49	5.5	22	8.5	158	36	25	.5	5.9	.08	262		.36	1,380	145	15	24	.8	417	7.8	
July 26-Aug. 9	836	21	.04	59	11	57	8.5	196	61	71	.4	3.7	.11	410		.56	925	194	33	38	1.8	667	7.7	
Aug. 10	1,180	14	.05	49	7.2	41	6.0	160	43	50	.4	3.5	.04	298		.41	949	152	21	36	1.4	512	7.8	
Aug. 11-13	2,030	15	.04	52	6.0	24	5.6	172	31	30	.4	3.4	.08	258		.35	1,410	154	13	24	.8	434	7.9	
Aug. 14-15	1,065	17	.03	49	7.7	30	6.0	164	35	38	.4	5.8	.09	274		.37	788	154	20	29	1.1	464	7.9	
Aug. 16-17	921	20	.09	55	11	50	7.9	190	51	65	.4	3.9	.08	384		.52	955	184	28	36	1.6	614	7.9	
Aug. 18	1,200	26	.07	66	12	76	9.1	222	63	96	.4	3.0	.09	472		.64	1,530	212	30	43	2.3	776	7.8	
Aug. 19	1,480	17	.04	104	21	270	12	216	198	418	.4	4.8	.16	1,180	1,150	1.60	4,720	344	167	62	6.3	2,000	7.7	
Aug. 20-Sept. 8	749	18	.01	57	9.5	62	8.7	194	53	72	.4	5.7	.09	380		.52	768	181	22	41	2.0	650	7.7	
Sept. 9-17	508	16	.00	54	11	46	7.5	187	46	60	.4	5.7	.07	344		.47	472	179	26	35	1.5	589	7.8	
Sept. 18-30	295	21	.00	66	14	80	8.5	222	67	114	.4	4.2	.11	492		.67	392	224	42	43	2.3	846	7.5	
Weighted average a	1,092	18	0.04	58	11	65	7.5	194	58	85	0.3	4.8	0.10	413		0.56	1,220	189	30	42	2.1	693	--	

a Includes estimates where data are missing. Represents 84 percent of runoff for water year October 1955 to September 1956.

KANSAS RIVER BASIN--Continued

KANSAS RIVER AT TOPEKA, KANS.--Continued

Temperature (° F) of water, November 1955 to September 1956
/Once-daily measurement between 11 a.m. and 1 p.m./

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

a Measurement between 2 p.m. and 5 p.m.

KANSAS RIVER AT LAWRENCE, KANS.

LOCATION.--At bridge on U. S. Highway 40, at Lawrence, Douglas County, and 13 miles downstream from gaging station at Lecompton.
DRAINAGE AREA.--58,420 square miles, approximately, upstream from gaging station.
RECORDS AVAILABLE.--Chemical analyses: November 1955 to September 1956.
REMARKS.--Discharge records for gaging station at Lecompton, Kans., for water year October 1955 to September 1956 given in WSP 1440.

Chemical analyses, in parts per million, November 1955 to September 1956

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 (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. 16, 1955	630	12	0.02	76	18	108	8.1	252	0	91	145	0.3	2.7	0.16	593	0.81		262	55	46	2.9	1,020	7.6
Dec. 20	410	19	.01	106	22	164	8.8	333	0	133	221	.3	5.2	.11	872	1.19		354	81	49	3.8	1,470	7.5
Jan. 18, 1956	470	18	.01	103	20	150	8.0	337	0	121	187	.3	4.3	.10	789	1.07		341	65	48	3.5	1,350	7.6
Feb. 14	778	13	.01	81	17	114	6.2	254	0	98	150	.2	1.7	.08	612	.83		272	64	47	3.0	1,050	7.7
Mar. 6	812	12	.01	73	18	109	6.5	248	0	93	140	.2	.9	.09	579	.79		256	53	47	3.0	994	8.0
Apr. 11	933	5.6	.00	69	18	140	8.3	217	0	108	183	.2	3.4	.11	658	.89		244	66	54	3.9	1,130	7.4
May 21	504	3.1	.09	63	19	119	9.4	213	0	108	158	.2	3.5	.12	595	.81		234	59	51	3.4	1,050	7.3
July 10	4,250	12	.11	33	5.2	9.2	7.8	122	0	17	9.5	.3	5.0	.06	162	.22		104	4	15	.4	270	7.4
July 23	1,600	15	.06	51	4.6	25	8.9	158	0	37	31	.5	4.9	.06	256	.35		146	16	26	.9	435	7.8
Aug. 27	887	14	.12	53	7.8	53	9.0	178	0	45	65	.4	5.8	.07	356	.48		164	18	40	1.8	591	7.5
Sept. 24	332	11	.02	62	14	75	9.1	214	0	66	102	.3	4.3	.10	467	.64		212	37	42	2.2	795	7.4

MISCELLANEOUS ANALYSES OF STREAMS AND LAKES IN THE KANSAS RIVER BASIN

Chemical analyses, in parts per million, water year October 1955 to September 1956

Date of collection	Lake content (acre-feet)	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				
BONNY RESERVOIR NEAR HALE, COLO.																							
June 22, 1953.....	30,290	17	0.00	42	12	34		212	0	39	7.0	1.1	1.0	0.07	260	0.35		155	0	32	1.2	425	8.2
Nov. 25, 1955	34,580	13	.03	40	14	27	9.4	222	0	34	5.0	1.1	3.1	.11	252	.34		156	0	26	.9	430	7.9
Feb. 25, 1956	38,600	46	.00	54	13	33	8.6	287	0	21	6.5	1.0	.1	.09	330	.45		189	0	26	1.0	502	7.5
May 13.....	40,120	10	.00	40	13	26	8.4	214	0	38	5.0	1.2	1.8	.09	258	.35		155	0	25	.9	427	8.1
Aug. 1.....	40,220	5.2	.01	32	14	25	9.4	198	0	29	4.0	1.0	3.1	.13	226	.31		137	0	27	.9	394	7.5
SWANSON LAKE, NEBR.																							
Nov. 15, 1955	41,590	7.7	0.02	44	18	38	18	248	0	66	8.0	1.1	2.0	0.12	327	0.44		185	0	28	1.2	544	7.6
Feb. 18, 1956	54,750	14	.00	50	19	39	17	265	0	67	8.5	1.0	3.1	.14	351	.48		204	0	27	1.2	579	7.5
May 24.....	66,600	4.7	.03	44	18	35	14	228	0	67	7.5	1.1	6.9	.09	324	.44		182	0	28	1.1	535	8.0
Aug. 3.....	59,600	6.5	.01	37	16	34	16	212	0	68	8.0	1.0	2.2	.13	289	.39		160	0	29	1.2	496	7.7
ENDERS RESERVOIR, NEBR.																							
Nov. 15, 1955	33,780	34	0.04	38	14	16	14	217	0	20	3.5	0.9	2.8	0.09	242	0.33		152	0	17	0.6	389	7.8
Feb. 18, 1956	41,640	38	.01	41	15	16	11	220	0	16	3.5	.8	3.2	.09	250	.34		163	0	17	.5	394	7.8
May 24.....	42,630	31	.02	36	14	15	11	204	0	21	2.5	.8	1.9	.06	239	.33		146	0	17	.5	371	8.0
Aug. 3.....	41,400	30	.02	33	13	14	12	188	0	19	2.0	.8	2.9	.13	212	.29		134	0	17	.5	347	7.7
HARRY STRUNK LAKE, NEBR.																							
Nov. 15, 1955	18,120	12	0.02	44	16	16	15	242	0	19	5.0	0.5	2.0	0.11	246	0.33		176	0	15	0.5	431	7.8
Feb. 18, 1956	26,350	23	.00	54	16	16	15	265	0	20	5.5	.5	2.9	.10	281	.38		202	0	14	.5	472	7.6
May 16.....	33,880	26	.01	41	16	14	14	228	0	20	4.0	.5	2.3	.06	253	.34		170	0	14	.5	412	7.9
May 24.....	33,490	25	.00	43	16	14	14	231	0	23	4.0	.5	1.9	.06	254	.35		172	0	14	.5	409	8.0
Aug. 16.....	25,400	21	.00	38	12	14	14	198	0	15	5.0	.6	2.0	.09	217	.30		143	0	16	.5	363	7.7
Sept. 4.....	22,620	21	.01	39	12	11	13	204	0	15	4.0	.5	2.2	.05	215	.29		148	0	13	.4	363	7.7
HARLAN COUNTY RESERVOIR, NEBR.																							
Nov. 15, 1955	160,400	0.8	0.02	40	15	23	19	209	0	49	8.0	0.7	1.1	0.10	261	0.35		163	0	21	0.8	458	7.9
Feb. 22, 1956	175,200	9.5	.21	51	17	23	19	244	0	48	9.0	.7	3.5	.12	299	.41		196	0	18	.7	512	7.7
May 4	196,600	6.2	.00	45	17	22	16	222	0	53	8.0	.6	.9	.07	286	.39		182	0	19	.7	481	7.9
Aug. 2.....	172,700	.5	.01	39	18	21	18	204	0	53	8.0	.7	1.1	.11	267	.36		173	6	19	.7	452	7.6

MISCELLANEOUS ANALYSES OF STREAMS AND LAKES IN THE KANSAS RIVER BASIN--Continued

Chemical analyses, in parts per million, water year October 1955 to September 1956--Continued

Date of collection	Lake content (acre-feet)	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				
REPUBLICAN RIVER NEAR HARDY, NEBR.																							
Nov. 15, 1955	a 92	27	0.02	64	14	22	9.1	259	0	47	10	0.3	2.0	0.07	320	0.44		218	6	17	0.6	519	7.8
Feb. 2, 1956	a 70	28	.01	71	13	22	8.8	266	0	41	13	.2	4.5	.08	337	.46		229	11	17	.6	536	7.5
May 14	a 45	24	.01	62	16	25	12	266	0	53	12	.4	1.5	.07	348	.47		222	4	19	.7	554	8.0
Aug. 2-8	b 120	19	.00	51	13	23	15	222	0	49	12	.6	3.8	.12	294	.40		181	0	20	.7	486	7.6
Aug. 28	b 38	28	.03	60	15	28	16	266	0	60	12	.6	2.8	.15	344	.47		212	0	21	.8	559	7.9
Sept. 1-30	b 80.8	17	.01	49	15	24	16	224	0	54	12	.6	2.7	.10	298	.41		185	1	20	.8	492	7.8
CEDAR BLUFF RESERVOIR NEAR ELLIS, KANS.																							
Nov. 19, 1955	127,800	2.4	0.01	99	20	34	17	143	0	268	16	0.6	0.6	0.18	565	0.77		330	213	17	0.8	809	7.8
Feb. 23, 1956	127,800	.9	.01	105	22	34	18	148	0	285	18	.8	1.0	.12	583	.79		352	231	16	.8	840	7.5
May 2	125,440	.5	.00	101	26	34	18	150	0	295	18	.6	1.1	.09	597	.81		357	234	16	.8	852	7.8
Aug. 4	135,370	4.5	.01	103	23	30	18	145	0	290	16	.6	1.2	.19	585	.80		352	233	15	.7	835	7.6
KANOPOLIS RESERVOIR NEAR KANOPOLIS, KANS.																							
Nov. 19, 1955	54,400	1.7	0.02	65	10	86	9.2	135	0	86	139	0.4	1.1	0.08	486	0.66		204	93	46	2.6	863	7.7
Feb. 22, 1956	53,520	1.8	.01	79	12	110	8.9	154	0	101	185	.3	.9	.10	611	.83		246	120	48	3.1	1,050	7.5
May 1	54,590	.8	.00	81	14	120	8.8	157	0	111	210	.3	.9	.06	697	.95		261	132	49	3.2	1,140	7.9
Aug. 10	55,900	5.8	.00	72	12	112	10	128	0	108	197	.4	.7	.09	612	.83		227	122	50	3.2	1,040	7.4

a Discharge, in cubic feet per second.
b Daily mean discharge, in cubic feet per second.

KANSAS RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS AND LAKES IN THE KANSAS RIVER BASIN--Continued

Periodic determinations of suspended-sediment discharge, water year October 1955 to September 1956

Date	Discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Discharge (tons per day)
FRENCHMAN CREEK AT CULBERTSON, NEBR.			
June 17, 1956, 1:45 p.m.	646	6,810	11,900
June 17, 1:50 p.m	672	6,940	12,600
June 17, 3:00 p.m	833	9,920	22,300
June 17, 3:30 p.m	884	10,200	24,300
June 17, 4:00 p.m	930	10,700	26,900
June 18, 11:55 a.m	2,980	5,050	40,600
June 18, 12:05 p.m	2,980	4,600	37,000
June 18, 12:30 p.m	2,990	4,340	35,000
June 18, 1:00 p.m	2,980	3,990	32,100
June 18, 1:30 p.m	2,910	3,570	28,000
June 20, 12:50 p.m	618	2,120	3,540
June 20, 1:30 p.m	602	2,100	3,410
June 20, 2:30 p.m	599	2,080	3,360
MEDICINE CREEK AT CURTIS, NEBR. (Sec. 32, T. 8 N., R. 28 W.)			
June 21, 1956, 9:45 a.m.	25	468	32
June 21, 10:30 a.m	25	463	31
June 21, 11:00 a.m	25	447	30
July 5, 11:05 a.m.	e 2,600	11,800	82,800
July 5, 11:38 a.m.	e 1,900	12,200	62,600
July 5, 12:07 p.m.	e 1,700	12,200	56,000
MEDICINE CREEK BELOW HARRY STRUNK LAKE, NEBR.			
Nov. 8, 1955	6.4	32	0.6
Feb. 18, 1956	6.4	1	.02
Mar. 8	6.7	19	.3
Apr. 17	7.5	27	.5
May 24	72	33	6.4
Sept. 4	123	47	16
PRAIRIE DOG CREEK AT NORTON, KANS.			
May 30, 1956, 7:10 a.m.	345	8,200	7,640
May 30, 8:20 a.m.	397	8,180	8,770
May 30, 9:20 a.m.	421	7,830	8,900
May 30, 10:10 a.m.	378	7,140	7,290
July 6, 1:45 p.m.	1,030	6,690	18,600
July 6, 3:30 p.m.	1,080	6,190	18,100
LITTLE BLUE RIVER NEAR ENDICOTT, NEBR.			
Oct. 11, 1955	108	288	84.0
Nov. 1	112	112	33.9
Nov. 22	148	204	81.5
Jan. 5, 1956	146	82	32.3
Mar. 5	179	203	98.1
Mar. 19	137	100	37.0
Apr. 5	160	461	199
Apr. 17	129	94	32.7
May 18	124	150	50.2
May 30, 12:05 a.m.	444	11,500	13,800
May 30, 10:20 p.m.	697	10,800	20,300
June 1	227	4,430	2,720
June 6, 10:40 p.m	457	32,600	41,700
June 6, 11:30 p.m	697	10,800	20,300
June 6, 11:55 p.m	1,050	13,000	36,900
June 7, 12:20 a.m	1,400	11,300	42,700
June 7, 1:30 a.m	2,000	13,900	75,100
June 7, 11:15 a.m	334	3,800	3,430
June 7, 1:40 p.m	426	4,880	5,610
June 7, 2:00 p.m	616	5,870	9,760
June 7, 3:00 p.m	998	9,530	25,700
June 7, 4:30 p.m	1,370	12,600	46,600
June 7, 9:00 p.m	1,970	10,200	54,300
June 18	444	7,980	9,570
June 23, 3:45 a.m	502	7,450	10,100

e Estimated.

KANSAS RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS AND LAKES IN THE KANSAS RIVER BASIN--Continued

Periodic determinations of suspended-sediment discharge, water year October 1955 to September 1956--Continued

Date	Discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Discharge (tons per day)
LITTLE BLUE RIVER NEAR ENDICOTT, NEBR.--Continued			
June 23, 1956, 12:00 m.....	785	9,670	20,500
June 27, 3:00 p.m	233	1,810	1,140
June 27, 4:30 p.m	236	3,200	2,040
June 28, 12:40 a.m	422	9,120	10,400
June 28, 2:15 a.m	732	5,010	9,900
June 28, 4:55 a.m	1,030	10,100	28,100
June 28, 11:00 a.m	1,070	7,240	20,900
June 29	602	4,960	8,060
July 2, 9:20 p.m.....	736	4,640	9,220
July 2, 9:40 p.m.....	824	4,930	11,000
July 2, 10:15 p.m.....	1,120	7,370	22,300
July 2, 11:40 p.m.....	1,600	8,160	35,300
July 3, 1:40 a.m.....	2,300	9,150	56,800
July 3, 4:30 a.m.....	2,910	8,370	65,800
July 3, 5:45 a.m.....	3,170	8,540	73,100
July 3, 9:45 a.m.....	4,170	7,800	87,800
July 3, 10:30 p.m.....	3,640	4,140	40,700
July 5	1,600	3,970	17,200
July 6	670	3,270	5,920
July 23	114	169	52.0
Aug. 15.....	128	1,530	529
Sept. 4	a 41	70	7.75
Sept. 24	65	118	20.7

a Daily mean discharge.

MISCELLANEOUS ANALYSES OF STREAMS AND LAKES IN THE KANSAS RIVER BASIN--Continued

Particle-size analyses of suspended sediment, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; 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	
FRENCHMAN CREEK AT CULBERTSON, NEBR.																
June 17, 1956....	4:00 p.m.	930		10,700	5,000	--	43	--	67	--	97	99	100	--	--		SPWCM
June 18	12:05 p.m.	2,980		4,600	3,910	50	60	66	69	75	87	91	95	99	100		SPWCM
June 18	12:05 p.m.	2,980		4,600	3,830	5	9	59	69	74	87	91	95	99	100		SPNM
LITTLE BLUE RIVER NEAR ENDICOTT, NEBR.																
Oct. 11, 1955....	10:50 a.m.	108	63	288	2,690	46	60	--	94	--	99	99	100	--			VPWCM
Nov. 1.....	10:20 a.m.	112	47	112	987	--	55	--	76	--	85	100	--	--			SPWM
Nov. 22.....	9:50 a.m.	148	38	204	2,870	--	36	--	79	--	91	100	--	--			SPWM
Mar. 5, 1956	12:25 p.m.	179	49	203	2,920	35	47	--	74	--	95	96	99	100			VPWM
Mar. 19.....	11:10 a.m.	137	44	100	2,130	--	51	--	78	--	90	100	--	--			SPWM
Apr. 5.....	11:20 a.m.	160	54	461	--	69	78	80	86	92	98	98	100	--			VPWCM
Apr. 17.....	11:15 a.m.	129	45	94	3,050	--	53	--	75	--	90	100	--	--			SPWM
May 18.....	11:00 a.m.	124	69	150	2,480	--	44	--	71	--	93	100	--	--			SPWM
May 30.....	10:20 p.m.	697	--	10,800	3,190	57	59	64	77	92	98	100	--	--			SPWCM
June 1	12:45 p.m.	227	71	4,430	5,500	67	83	93	95	99	100	--	--	--			VPWCM
June 6	11:55 p.m.	1,050	--	13,000	4,550	39	41	45	58	80	95	100	--	--			SPWCM
June 7	1:30 a.m.	2,000	--	13,900	4,460	50	51	59	72	90	97	100	--	--			VPWCM
June 7	11:15 a.m.	334	73	3,800	5,970	53	62	72	78	92	99	100	--	--			VPWCM
June 7	9:00 p.m.	1,970	--	10,200	3,560	62	69	76	84	93	98	100	--	--			SPWCM
June 18	11:55 a.m.	444	--	7,980	5,650	60	74	82	90	97	99	100	--	--			VPWCM
June 27	3:00 p.m.	233	72	1,810	4,970	52	64	75	81	94	98	100	--	--			SPWCM
June 28	4:55 a.m.	1,030	--	10,100	3,370	56	68	80	86	94	99	100	--	--			SPWCM
June 28	11:00 a.m.	1,070	--	7,240	6,870	59	73	83	89	97	99	100	--	--			VPWCM
June 29	11:00 a.m.	602	--	4,960	7,300	64	78	87	92	98	99	99	100	--			VPWCM
July 2.....	11:40 p.m.	1,600	--	8,160	2,870	60	64	71	80	92	99	100	--	--			VPWCM
July 3.....	4:30 a.m.	2,910	--	8,370	2,890	58	65	70	77	89	98	100	--	--			SPWCM
July 3.....	9:45 a.m.	4,170	--	7,800	2,410	59	64	71	81	90	97	100	--	--			SPWCM
July 3.....	10:30 p.m.	3,640	72	4,140	4,860	55	63	70	76	86	91	92	95	96	99	100	VPWCM

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KANSAS RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS AND LAKES IN THE KANSAS RIVER BASIN--Continued

Particle-size analyses of suspended sediment, water year October 1955 to September 1956--Continued
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; 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	
LITTLE BLUE RIVER NEAR ENDICOTT, NEBR.--Continued																	
July 5, 1956	12:35 p.m.	1,600	70	3,970	6,790	54	68	78	88	92	99	99	100	--			VPWCM
July 6	9:55 a.m.	670	--	3,270	7,920	61	75	85	90	97	100	--	--	--			PWCM
July 23	12:40 p.m.	114	--	169	1,750	--	52	--	73	--	98	99	99	100			VPWM
Aug. 15	10:15 a.m.	128	81	1,530	--	81	93	96	97	98	100	--	--	--			PWCM
Aug. 15	10:15 a.m.	128	81	1,530	--	71	86	94	96	98	100	--	--	--			PN

MISCELLANEOUS ANALYSES OF STREAMS AND LAKES IN THE KANSAS RIVER BASIN--Continued

Particle-size analyses of bed material, water year October 1955 to September 1956
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed; V, visual accumulation tube)

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									
							0.062	0.125	0.250	0.500	1.000	2.000	4.000	8.000	16.000	
LITTLE BLUE RIVER NEAR ENDICOTT, NEBR.															
Oct. 11, 1955	5	108						0	9	43	72	86	97	100	--	SV
Nov. 1	5	112						0	6	48	74	85	94	100	--	SV
Nov. 1	5	112						0	8	44	71	85	94	99	99	S
Nov. 22	8	148						0	7	44	74	86	96	100	--	SV
Nov. 22	8	148						0	8	42	70	86	97	100	--	S
Jan. 5, 1956	5	146						0	6	39	73	91	97	100	--	SV
Jan. 5	5	146						0	4	32	73	91	97	100	--	S
Mar. 5	6	179					0	1	6	40	72	87	96	100	--	SV
Mar. 5	6	179						0	8	43	71	86	96	100	--	S
Mar. 19	5	137						0	6	40	72	86	96	99	100	SV
Mar. 19	19	137						0	4	40	73	88	93	99	99	SV
Apr. 5	16	160						0	5	39	67	80	92	99	100	SV
June 1	17	227						0	5	38	68	80	94	100	--	SV
June 7	9	334						0	2	30	61	76	92	99	100	SV
June 18	9	444						0	11	50	82	90	96	99	100	SV
Aug. 15	32	128						0	3	29	76	91	98	100	--	SV
Sept. 24	13	65						0	4	36	68	82	93	99	100	SV

CHARITON RIVER BASIN

HONEY CREEK NEAR RUSSELL, IOWA

LOCATION.--At gaging station on downstream side of highway bridge, 0.7 mile upstream from mouth and 5.5 miles southeast of Russell, Lucas County.
DRAINAGE AREA.--13.2 square miles (revised).
RECORDS AVAILABLE.--Sediment records: June 1952 to September 1956.
EXTREMES, 1955-56.--Sediment concentrations: Maximum daily, 1,600 ppm July 4; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 500 tons Aug. 1; minimum daily, 0 tons on many days.
EXTREMES, 1952-56.--Sediment concentrations: Maximum daily, 9,840 ppm June 20, 1952; minimum daily, no flow on many days each year.
Sediment loads: Maximum daily, 2,500 tons (estimated) June 21, 1952; minimum daily, 0 tons on many days each year.
REMARKS.--No flow during period October to June; record is omitted. Backwater from Chariton River Aug. 2-5, 9-11, 13-15. Records of discharge for water year October 1955 to September 1956 given in WSP 1440.

Suspended sediment, July to September 1956

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	80	1,500	sa 500			
2.....	0	--	0	65	900	sa 300			
3.....	5.0	900	sa 26	2.8	60	.5			
4.....	18	1,600	sa 110	.45	50	b .1			
5.....	1.4	420	1.6	.15	--	(t)			
6.....	.10	--	(t)	.04	41	(t)			
7.....	0	--	0	.01	--				
8.....	0	--	0	10	1,500	sa 190			
9.....	0	--	0	75	700	sa 240			
10.....	0	--	0	2.9	120	b 1.0			
11.....	0	--	0	1.1	90	b .3			
12.....	0	--	0	5.8	550	sb 60			
13.....	0	--	0	32	1,000	sa 170			
14.....	0	--	0	2.1	100	b .6			
15.....	0	--	0	.95	80	b .2			
16.....	0	--	0	2.3	300	sb 2.0			
17.....	0	--	0	3.1	310	b 2.6			
18.....	0	--	0	55	460	sa 85			
19.....	0	--	0	6.2	100	1.7			
20.....	0	--	0	2.1	80	b .5			
21.....	0	--	0	.90	70	b .2			
22.....	0	--	0	.45	55	b .1			
23.....	0	--	0	.17	--	(t)			
24.....	0	--	0	.07	--	(t)			
25.....	0	--	0	.04					
26.....	0	--	0	.02					
27.....	0	--	0	0	--	0			
28.....	0	--	0	0	--	0			
29.....	0	--	0	0	--	0			
30.....	0	--	0	0	--	0			
31.....	7.5	180	sb 110	0	--	0			
Total.	32.00	--	247.6	348.65	--	1,554.8	0		0

Total discharge for year (cfs-days)..... 380.65
Total load for year (tons)..... 1,802.4

s Computed by subdividing day.
t Less than 0.050 ton.
a Computed from partly estimated concentration graph.
b Computed from estimated concentration graph.

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