Quality of Surface Waters of the United States 1958

Parts 5 and 6. Hudson Bay and Upper Mississippi River Basins, and Missouri River Basin

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

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PREFACE

This report was prepared by the Geological Survey in cooperation with the States of Iowa, Kansas, Minnesota, South Dakota, Wisconsin, and Wyoming, and with other agencies by personnel of the Water Resources Division under the direction of L. B. Leopold, chief hydraulic engineer, and 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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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 State 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, 1957, to September 30, 1958. The records are arranged by drainage basins according to Geological Survey practice in reporting records of streamflow: Stations on tributary streams are listed between stations on the main stem in the order

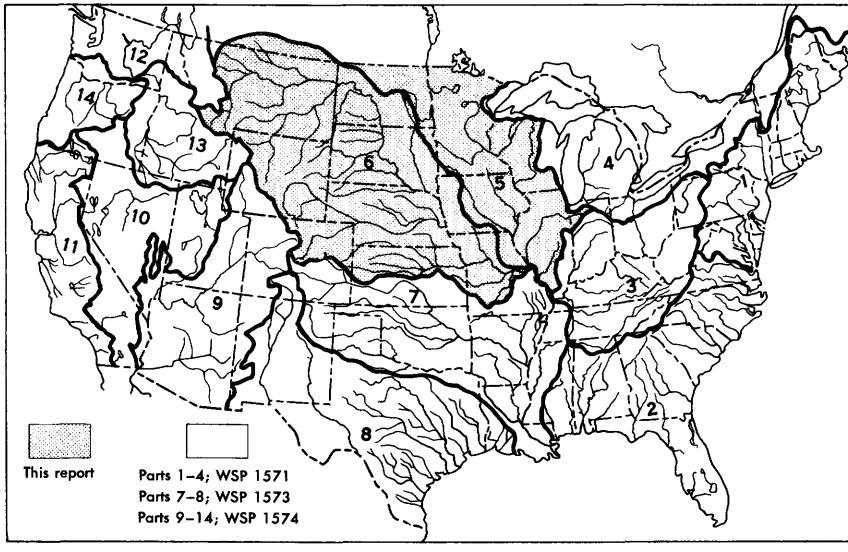

Figure 1. --Map of the United States showing basins covered by the four water-supply papers on quality of surface waters in 19 . The shaded portion represents the section of the country covered by this volume; the unshaded portion represents the section of the country covered by other water-supply papers.

in which those tributaries enter the main stem.

A station number has been assigned as an added means of identification for each stream location where regular measurements of water quantity or quality have been made. The numbers have been assigned to conform with the standard downstream order of listing gaging stations. The numbering system consists of two digits followed by a hyphen and a six digit number. The notation to the left of the hyphen identifies the Part or hydrologic region used by the Geological Survey for reporting hydrologic data. The number to the right of the hyphen represents the position of the location in the standard downstream order listing measuring stations within each of the 14 parts. The assigned numbers are in numerical order but are not consecutive. They are so selected from the complete 6 digit number scale that intervening numbers will be available for future assignments to new locations. The identification number for each station in this report is printed to the left of the station name and contains only the essential digits. For example, the number is printed as 4-100 for a station whose complete identification number is 04-0100.00.

Descriptive statements are given for each sampling station for which regular series of chemical analyses, temperature measurements, or sediment determinations have been made. These statements include the location of the station, drainage area, periods of records available, extremes of dissolved solids, hardness, specific conductance, temperature, sediment loads, and other pertinent data. Records of discharge of the streams at or near the sampling station are included in most tables of analyses.

During the water year ending September 30, 1958, the Geological Survey maintained 99 stations on 67 streams for the study of chemical and physical characteristics of surface water. Samples were collected daily or monthly at 56 of these locations for chemical-quality studies. Samples were also collected less frequently at many other points. Water temperatures were measured daily at 70 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 headings this information is available for reference at the district offices listed under Division of Work, on page 28.

Quantities of suspended sediment are reported for 48 stations during the year ending September 30, 1958. Sediment samples were collected one or more times daily during periods of significant flow at most of the continuous-record stations. Particle-size distributions of sediments were determined for 44 of the stations.

COLLECTION AND EXAMINATION OF SAMPLES

Samples for analyses are usually collected at or near points on streams where gaging stations are maintained by Surface Water Branch of U. S. Geological Survey for measurement of water discharge. The concentration of solutes and sediments at different locations in the stream-cross section may vary widely with different rates of water discharge depending on the source of the material and the turbulence and mixing of the stream. In general, the distribution of sediment in a stream section is much more variable than the distribution of solutes. It is necessary to sample some streams at several verticals across the channel and especially for sediment, to uniformly traverse the depth of flow. These measurements require special sampling equipment to adequately integrate the vertical and lateral variability of the concentration in the section. These procedures yield a velocity-weighted mean con-

centration for the section in contrast to the average spatial concentration that existed without regard to the variable velocities of the individual fluid elements.

The nearly uniform dispersed ions of the solute move with the velocity of the transporting media. The mean section concentration of solutes determined from samples is a precise measure of the solute. The mean section concentration obtained from suspended-sediment samples is a less precise measure of the total sediment load, because sediment samplers did not traverse the bottom 0.4 foot of the sampling vertical where the concentration of suspended sediment is greatest and because a significant part of the coarser particles in many streams move in essentially continuous contact with the bed and are not represented in the suspended sediment sample. Hence, the suspended sediment loads presented in this report are usually less than the total sediment loads. For most streams the difference between the suspended and total sediment loads will be small, in the order of a few percent.

CHEMICAL QUALITY

The methods of collecting and compositing water samples for chemical analysis are described in a manual by Rainwater and Thatcher (1960, 301 p.). No single method of compositing samples is applicable to all problems related to the study of water quality. Although generally holding to the principle of 10 day periods or equivalent to three composite samples per month modifications are usually made on the basis of dissolved-solids content as indicated by measurements of conductivity of daily samples, supplemented by other information such as chloride content, river stage, weather conditions and other background information of the stream.

TEMPERATURE

Daily water temperatures were measured at most of the stations at the time samples were collected for chemical quality or sediment content. 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 at two or more verticals to define more accurately the average concentration of the cross section. During periods of high or rapidly changing flow, samples were taken two or more times throughout the day at most sampling stations.

Sediment concentrations were determined by filtration-evapororation method. At many stations the daily mean concentration for some days was obtained by plotting the velocity-weighted instantaneous concentrations on the gage-height chart. The plotted concentrations, adjusted, if necessary for cross-sectional distribution were connected or averaged by continuous curves to obtain a concentration graph. This graph represented the estimated velocity-weighted concentration at any time, and for most periods daily mean concentrations were determined from the graph. The days were divided into shorter intervals when the concentration and water discharge were changing rapidly. During some periods of minor variation in concentration, the average concentration of the samples was used as the daily mean concentration. During extended periods of relatively uniform concentration and flow, samples for a number of days were composited to obtain average concentrations and average daily loads for each period.

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 in order 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.

The size of particles in stream sediments commonly range from colloidal clay (finer than 0.001 mm) to coarse sand or gravel (coarser than 1.0 mm). The common methods of particle-size analyses cannot accomodate such a wide range in particle size. Hence, it was necessary to separate most samples into two parts, one coarser than 0.062 mm and one finer than 0.062 mm. The separations were made by sieve or by a tube containing a settling medium of water. The coarse fractions were classified by sieve separation or by the visual accumulation tube (U.S. Interagency, 1957). The fine fractions were classified by the pipet method (Kilmer and Alexander, 1949) or the bottom withdrawal tube method (U.S. Interagency, 1943, p. 82-90).

EXPRESSION OF RESULTS

Quantities of water for analysis are most conveniently obtained in the laboratory by use of volumetric glassware. The analytical results thus obtained are expressed in weights of solute in a given volume of water. To express the results in parts of solute per million (ppm) of water the data must be converted. For most waters this conversion is made by assuming that the liter of water sample weighs 1 kilogram; and thus milligrams per liter are equivalent to parts per million.

Chemical equivalence in equivalents per million (epm) can be obtained by (a) dividing the concentration in parts per million by the combining weight of that ion, or (b) multiplying the concentration (in ppm) by the reciprocal of the combining weights. The following table lists the reciprocals of the combining weights of cations and anions generally reported in water analyses.

The terms "equivalents per million" is a contraction which has been generally adopted for convenience. In more exact language, these units are "milligram equivalents per kilogram" if derived from part-per million data, or "milligram equivalents per

liter" if derived from data expressed in milligrams per liter. Equivalent weights may be computed for use with any of the systems of expression of data (Hem, 1959, p. 30-34).

In an analysis expressed in equivalents per million, unit concentrations of all ions are chemically equivalent.

Conversion factors: Parts per million to equivalents per million

Ion	Multiply by	Ion	Multiply by
Aluminum (Al^{+3})	0.11119	Iron (Fe^{+3})	0.05372
Barium (Ba^{+2})	.01456	Lead (Pb^{+2})	.00965
Bicarbonate (HCO_3^{-1})	.01639	Lithium (Li^{+1})	.14409
Bromide (Br^{-1})	.01251	Magnesium (Mg^{+2})	.08224
Calcium (Ca^{+2})	.04990	Manganese (Mn^{+2})	.03640
Carbonate (CO_3^{-2})	.03333	Nitrate (NO_3^{-1})	.01613
Chloride (Cl^{-1})	.02820	Phosphate (PO_4^{-3})	.03159
Chromium (Cr^{+6})	.11536	Potassium (K^{+1})	.02558
Copper (Cu^{+2})	.03148	Sodium (Na^{+1})	.04350
Fluoride (F^{-1})	.05263	Strontium (Sr^{+2})	.02282
Hydrogen (H^{+1})	.99206	Sulfate (SO_4^{-2})	.02082
Hydroxide (OH^{-1})	.05880	Zinc (Zn^{+2})	.03059
Iodide (I^{-1})	.00788		

Results given in parts per million can be converted to grains per United States gallon by dividing by 17.12.

The hardness of water is conventionally expressed in all water analyses in terms of an equivalent quantity of calcium carbonate. Such a procedure is required because hardness is caused by several different cations, present in variable proportions. It should be remembered that hardness is an expression in conventional terms of a property of water. The actual presence of calcium carbonate in the concentration given is not to be assumed. The hardness caused by calcium and magnesium (and other cations if significant) equivalent to the carbonate and bicarbonate is called carbonate hardness; the hardness in excess of this quantity is called noncarbonate hardness. Hardness or alkalinity values expressed in parts per million as calcium carbonate may be converted to equivalents per million by dividing by 50.

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.

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. 23) and the temperature in degrees Fahrenheit. Color is expressed in units of the platinum-cobalt scale proposed by Hazen (1892, p. 427-428). A unit of color is produced by one milligram per liter of platinum in the form of the chloroplatinate ion. 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 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 mineral matter. 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 spring 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 dissolved-solids content in a river 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 calculated as sodium), alkalinity as carbonate and bicarbonate, sulfate, chloride, fluoride, nitrate, boron, pH, dissolved solids and specific conductance. 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. The constituents are arranged in the order that they appear on standard analytical statement cards which are used to process the chemical quality data in this report.

MINERAL CONSTITUENTS IN SOLUTION

Silica (SiO_2)

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

Aluminum (Al)

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

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.

Manganese (Mn)

Manganese is dissolved in appreciable quantities from rocks in some sections of the country. It resembles iron in its chemical behavior and in its occurrence in natural waters. However, manganese in rocks is less abundant than iron. As a result the concentration of manganese is much less than that of iron and is not regularly determined in many areas. 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. 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.

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.

Strontium (Sr)

Strontium is a typical alkaline-earth element and is similar chemically to calcium. Strontium may be present in natural water in amounts up to a few parts per million much more frequently than the available data indicate. In most surface water the amount of strontium is small in proportion to calcium. However, in sea water the ratio of strontium to calcium is 1:30.

Sodium and potassium (Na and K)

Sodium and potassium are dissolved from practically all rocks. sodium is the predominant cation in some of the more highly mineralized waters found in the western United States. Natural waters that contain only 3 or 4 parts per million of the two together are likely to carry almost as much potassium as sodium. As the

total quantity of these constituents increases, the proportion of sodium becomes much greater. Moderate quantities of sodium and potassium have little effect on the usefulness of the water for most purposes, but waters that carry more than 50 or 100 parts per million of the two may require careful operation of steam boilers to prevent foaming. More highly mineralized waters that contain a large proportion of sodium salts may be unsatisfactory for irrigation.

In this report, the potassium values not shown are usually calculated in with the sodium and reported as sodium.

Lithium (Li)

Data concerning the quantity of lithium in water are scarce. It is usually found in small amounts in thermal springs and saline waters. Lithium also occurs in streams where some industries dump their waste water. The scarcity of lithium in rocks is responsible more than other factors for relatively small amounts present in water.

Bicarbonate, carbonate and hydroxide (HCO_3, CO_3, OH)

Bicarbonate, carbonate, or hydroxide is sometimes reported as alkalinity. The alkalinity of a water is defined as its capacity to consume a strong acid to pH 4.5. Since the major causes of alkalinity in most natural waters are carbonate and bicarbonate ions dissolved from carbonate rocks, the results are usually reported in terms of these constituents. Although alkalinity may suggest the presence of definite amounts of carbonate, bicarbonate or hydroxide, it may not be true due to other ions that contribute to alkalinity such as silicates, phosphates, borates, possibly fluoride, and certain organic anions which may occur in colored waters. The significance of alkalinity to the domestic, agriculture, and industrial user is usually dependent upon the nature of the cations (Ca, Mg, Na, K) associated with it. However, moderate amounts of alkalinity does not adversely affect most users.

Hydroxide may occur in water that has been softened by the lime process. Its presence in streams usually can be taken as an indication of contamination and does not represent the natural chemical character of the water.

Sulfate (SO_4)

Sulfate is dissolved from many rocks and soils--in especially large quantities from gypsum and from beds of shale. It is formed also by the oxidation of sulfides of iron and is therefore present

in considerable quantities in waters from mines. Sulfate in waters that contain much calcium and magnesium causes the formation of hard scale in steam boilers and may increase the cost of softening the water.

Chloride (Cl)

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

Fluoride (F)

Fluoride has been reported as being present in some rocks to about the same extent as chloride. However, the quantity of fluoride in natural surface waters is ordinarily very small compared to that of chloride. Recent investigations indicate that the incidence of dental caries is less when there are small amounts of fluoride present in the water supply than when there is none. However, fluoride in excessive concentrations is undesirable in waters used for drinking. It is stated in a comprehensive report by the California State Water Pollution Control Board (1952, p. 257) on water-quality standards"... that water containing less than 0.9 to 1.0 ppm of fluoride will seldom cause mottled enamel in children, and for adults concentrations less than 3 or 4 ppm are not likely to cause endemic cumulative fluorosis and skeletal effects."

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 methe-

moglobinemia ("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 ppm 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.

Phosphate (PO_4)

Phosphorus is an essential element in the growth of plants and animals, and some sources that contribute nitrate, such as organic wastes and leaching of soils, may be important as sources for phosphate in water and its occurrence may add to the apparent alkalinity. The addition of phosphates in water treatment constitutes a possible source, although the dosage is usually small. In some areas, phosphate fertilizers may yield some phosphate to water. A more important source is the increasing use of phosphates in detergents. Domestic and industrial sewage effluents may therefore contain considerable amounts of phosphate.

Boron (B)

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

Dissolved solids

The reported quantity of dissolved solids--the residue on evaporation--consists mainly of the dissolved mineral constituents in the water. It may also contain some organic matter and water of crystallization. Waters with less than 500 parts per million of dissolved solids are usually satisfactory for domestic and some industrial uses. 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.

Chromium (Cr)

Few if any waters contain chromium from natural sources. Natural waters can probably contain only traces of chromium as a cation unless the pH is very low. When chromium is present in water, it is usually the result of pollution by industrial wastes. Fairly high concentrations of chromate anions are possible in waters having normal pH levels. Concentrations of more than 0.05 ppm of Cr in the hexavalent form constitutes ground for rejection of a water for domestic use on the basis of the standards of the U.S. Public Health Service (1946).

Nickel and cobalt (Ni, Co)

Nickel and cobalt are very similar in chemical behavior and also closely related to iron. Both are present in igneous rocks in small amounts and are more prevalent in silicic rocks. Any nickel in water is likely to be in small amounts and could be in a colloidal state. Cobalt may be taken into solution more readily than nickel. It may be taken into solution in small amounts through bacteriological activity similar to that causing solution of manganese. However, few data on the occurrence of either nickel or cobalt in natural water are available.

Copper (Cu)

Copper is a fairly common trace constituent of natural water. Small amounts may be introduced into water by solution of copper and brass water pipes and other copper-bearing equipment in contact with the water, or from copper salts added to control algae in open reservoirs. Copper salts such as the sulfate and chloride are highly soluble in waters with a low pH but in water of normal alkalinity these salts hydrolyze and the copper may be precipitated. In the normal pH range of natural water containing carbon dioxide, the copper might be precipitated as carbonate. The oxidized portions of sulfide-copper ore bodies contain other copper compounds. The presence of copper in mine water is common.

Copper imparts a disagreeable metallic taste to water. As little as 1.5 ppm can usually be detected, and 5 ppm can render the water unpalatable. Copper is not considered to be a cumulative systemic poison like lead and mercury; most copper ingested is excreted by the body and very little is retained. The pathological effects of copper are controversial, but it is generally believed very unlikely that humans could unknowingly ingest toxic quantities from palatable drinking water. The U.S. Public Health Service (1946) recommends that copper should not exceed 3.0 ppm

in drinking and culinary water on carriers subject to Federal quarantine regulations.

Lead (Pb)

Lead is only a minor element in most natural waters, but industrial or mine and smelter effluents may contain relatively large amounts of lead. Many of the commonly used lead salts are water soluble.

Traces of lead in water usually are the result of solution of lead pipe through which the water has passed. Amounts of lead of the order of 0.1 ppm are significant, as this concentration is the upper limit for drinking water in the standards adopted by the U. S. Public Health Service (1946). Higher concentrations may be added to water through industrial and mine-waste disposal. Lead in the form of sulfate is reported to be soluble in water to the extent of 31 ppm (Seidell, 1940, p. 1409) at 25°C. In natural water this concentration would not be approached, however, since a pH of less than 4.5 would probably be required to prevent formation of lead hydroxide and carbonate. It is reported (Pleissner, 1907) that at 18°C water free of carbon dioxide will dissolve the equivalent of 1.4 ppm of lead and the solubility is increased nearly four fold by the presence of 2.8 ppm of carbon dioxide in the solution. Presence of other ions may increase the solubility of lead.

Zinc (Zn)

Zinc is abundant in rocks and ores but is only a minor constituent in natural water because the free metal and its oxides are only sparingly soluble. In most alkaline surface waters it is present only in trace quantities, but more may be present in acid water. Chlorides and sulfates of zinc are highly soluble. Zinc is used in many commercial products, and industrial wastes may contain large amounts.

Zinc in moderate concentrations is not known to have adverse physiological effects on man or stock, but zinc salts give water an unpleasant astringent taste and form a greasy film on boiling water (Howard, 1923, p. 411). The U. S. Public Health Service (1946, p. 13) recommends that the zinc content not exceed 15 ppm in drinking and culinary water on carriers subject to Federal quarantine regulations.

Barium (Ba)

Barium may replace potassium in some of the igneous rock

minerals, especially feldspar and barium sulfate (barite) is a common barium mineral of secondary origin. Only traces of barium are present in surface water and sea water. Because natural water contains sulfate, barium will dissolve only in trace amounts. Barium sometimes occurs in brines from oil-well wastes.

The U. S. Public Health Service (1946) states that salts of barium, which have a deleterious physiological effect, must not be added to drinking and culinary water on carriers subject to Federal quarantine regulations.

Bromide (Br)

Bromine is a very minor element in the earth's crust and is normally present in surface waters in only minute quantities. Measurable amounts may be found in some streams that receive industrial wastes, and some natural brines may contain rather high concentrations. Probably trace amounts of bromide are of frequent occurrence in surface water since compounds containing bromine are generally readily soluble. It resembles chloride in that it tends to be concentrated in sea water.

Iodide (I)

Iodine, like bromine, is a minor element and is normally present in natural waters in only minute quantities. Measurable amounts may be found in some streams that receive industrial wastes, and some natural brines may contain rather high concentrations. It occurs in sea water to the extent of less than 1 ppm. Rankama and Sahama (1950, p. 767) report iodide present in rainwater to the extent of 0.001 to 0.003 ppm and in river water in about the same amount. Few waters will be found to contain over 2.0 ppm.

PROPERTIES AND CHARACTERISTICS OF WATER

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 required some softening before being used for most purposes.

Acidity (H^{+1})

The use of the terms acidity and alkalinity is widespread in the literature of water analysis and is a cause of confusion to those who are more accustomed to seeing a pH of 7.0 used as a neutral point. Acidity of a natural water represents the content of free carbon dioxide and other uncombined gases, organic 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. The presence of acidity is reported in those waters which have a pH below 4.5.

Sodium-adsorption-ratio (SAR)

The term "sodium-adsorption-ratio (SAR)" was introduced by the U.S. Salinity Laboratory Staff (1954). It is a ratio expressing the relative activity of sodium ions in exchange reaction with soil and is an index of the sodium or alkali hazard to the soil. Sodium-adsorption-ratio is expressed by the equation:

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

where the concentrations of the ions are expressed in milliequiv-

alents 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 19, 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.

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. 8). 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.

Specific conductance of most waters in the Eastern United States is less than 1,000 micromhos, but in the arid western parts of the country, a specific conductance of more than 1,000 micromhos is common.

Hydrogen-ion concentration (pH)

Hydrogen-ion concentration is expressed in terms of pH units (see p. 8). The values of pH often are used as a measure of the solvent power of water or as an indicator of the chemical behavior certain solutions may have toward rock minerals.

The degree of acidity or alkalinity of water, as indicated by the hydrogen-ion concentration, expressed as pH, is related to the corrosive properties of water and is useful in determining the proper treatment for coagulation that may be necessary at water-treatment plants. A pH 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 or organic matter usually have pH values less than 4.5.

The investigator who utilizes pH data in his interpretations of water analyses should be careful to place pH values in their proper perspective.

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.

The extent to which a water is colored by material in solution is commonly reported as a part of a water analysis because a significant color in water may indicate the presence of organic material that may have some bearing on the dissolved solids content. Color in water is expressed in terms of units between 0 and 500 or more based on the Hazen's arbitrary standard (see p. 8).

Oxygen consumed

Oxygen consumed is a measure of the amount of oxygen required to oxidize unstable materials in water and may be correlated with natural-water color or with some carbonaceous organic pollution from sewage or industrial wastes.

Tolerances for oxygen consumed in feed water for low- and high-pressure boilers are 15 and 3 ppm, respectively (Northeast Water Works Association, 1940). Wash water containing more than 8 ppm has been reported to impart a bad odor to textiles; concentrations for water used in beverages and brewing range from 0.5 to 5.0 ppm (California State Water Pollution Control Board, 1952, 1954).

Organics

Phenols.--Phenolic material in water resources is invariably the result of pollution. Phenols are widely used as disinfectants and in the synthesis of many organic compounds. Waste products from oil refineries, coke areas, and chemical plants may contain high concentrations. Fortunately, phenols decompose in the pres-

ence of oxygen and organic material, and their persistence downstream from point of entry is relatively short lived. The rate of decomposition is dependent on the environment.

Very low concentrations impart such a disagreeable taste to water that it is highly improbable that harmful amounts could be consumed unknowingly. Reported thresholds of detection of taste and odor range from 0.01 to 0.1 ppm.

Detergents (ABS). --The major type of detergents is the alkylbenzene-sulfonate group, which are highly resistant to biological degradation so that the effect of ABS in water persists over a long period of time. Waste water may carry these detergents to surface water supplies with resulting deterioration of water quality which includes unpleasant taste, odor, and foaming. Very little is known concerning the nature and the extent of occurrence and movement of detergents in waters or of the chemical and physical change that they may undergo after being added to surface waters (U.S. Geological Survey-Federal Housing, 1959).

Temperature

Temperature is an important factor in property determining the quality of water. This is very evident for such a direct use as an industrial coolant. Temperature is also important, but perhaps not so evident, for its indirect influence upon aquatic biota, concentrations of dissolved gases, and distribution of chemical solutes in lakes and reservoirs as a consequence of thermal stratification and variation.

Surface water temperatures tend to change seasonally and daily with air temperatures, except for the outflow of large springs. Superimposed upon the annual temperature cycle is a daily fluctuation of temperature which is greater in warm seasons than in cold and greater in sunny periods than with a cloud cover. Natural warming is due mainly to absorption of a solar radiation by the water and secondarily to transfer of heat from the air or from the bottom. Condensation of water vapor at the water surface is reported to furnish measurable quantities of heat. Heat loss takes place largely through radiation, with further losses through evaporation and conduction to the air and bottom. Thus the temperature of a small stream generally reaches a maximum in mid-to late afternoon due to solar heating and reaches a minimum from early to mid-morning after nocturnal radiation.

Temperature variations which commonly occur during summer in lakes and reservoirs of temperate regions results in a separation of the water volume into a circulating upper portion and a non-circulating lower portion. Separating the two is a stratum of water of variable vertical thickness in which the temperature

decreases rapidly with increasing depth. This physical division of the water mass into a circulating and a stagnant portion is the result of density differences in the water column associated with the temperature distribution. Knowledge of the stratification in a body of water may result in increased utility by locating strata of more suitable characteristics. For example, the elevation of an intake pipe may be changed to obtain water of lower temperature, higher pH, less dissolved iron, or other desirable properties.

Temperature is a major factor in determining the effect of pollution on aquatic organisms. The resistance of fish to certain toxin substances has been shown to vary widely with temperature. The quantity of dissolved oxygen which the water can contain is also temperature dependent. Oxygen is more soluble in cold water than in warm water, hence the reduction of oxygen concentrations by pollution is especially serious during periods of high temperature when oxygen levels are already low. Increased temperatures also accelerate biological activity including that of the oxygen-utilizing bacteria which decompose organic wastes. These pollutional effects may be especially serious when low flow conditions coincide with high temperatures. Summary temperature data of water are essential for planning multiple uses of water resources.

Turbidity

Turbidity is the optical property of a suspension with reference to the extent to which the penetration of light is inhibited by the presence of insoluble material. Turbidity is a function on both the concentration and particle size of the suspended material. Although it is reported in terms of parts per million of silica, it is only partly synonymous with the weight of sediment per unit volume of water.

Turbid water is abrasive in pipes, pumps, and turbine blades. In process water, turbidities much more than 1 ppm are not tolerated by several industries, but others permit up to 50 ppm higher (Rainwater, Thatcher, 1960, p. 289).

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. Much fluvial sediment results from the natural process of erosion, which in turn is part of the geologic cycle of

rock transformation. This natural process may be accelerated by agricultural practices. Sediment is also contributed by a number of industrial and construction 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, character of the soil mantle, plant cover, topography, and land use. The mode and rate of sediment erosion, transport, and deposition is determined largely by the size distribution of the particles or more precisely by the fall velocities of the particles in water. Sediment particles in the sandsize (larger than 0.062 mm) range do not appear to be affected by flocculation or dispersion resulting from the mineral constituents in solution. In contrast, 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 1941-58, are listed below:

Numbers of water-supply papers containing records for Parts 5-6, 1941-58

Year	WSP	Year	WSP	Year	WSP	Year	WSP
1941	942	1946	1050	1951	1198	1956	1451
1942	950	1947	1102	1952	1251	1957	1521
1943	970	1948	1132	1953	1291	1958	1572
1944	1022	1949	1162	1954	1351		
1945	1030	1950	1187	1955	1401		

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 water of Georgia, 1944.
*998. Suspended sediment in the Colorado River, 1925-41, 1947.
1048. Discharge and sediment loads in the Boise River drainage basin, Idaho, 1939-40, 1948.
1110-C. Quality of water of Conchas Reservoir, New Mexico, 1939-49, 1952.

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

COOPERATION

The chemical quality of water and sediment investigations in the Missouri River and Red River of the North basins in Colorado, Kansas, Montana, Nebraska, North Dakota, South Dakota, and Wyoming were begun in 1945. Most of the investigations were made as part of the program of the United States Department of the 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 of the Interior Department for some of the investigations in South Dakota; by the Soil

State	Cooperating agency	Drainage basin	District or regional office
Iowa	Iowa Geological Survey H. G. Hershey, director and State Geologist.	Hudson Bay and upper Mississippi River basins Missouri River basin	132 Nebraska Hall 901 North 17th Street, Lincoln 8, Nebr. (Chemical-quality data) 508 Hydraulic Laboratory University of Iowa Iowa City, Iowa (Sediment data)
Kansas	Kansas Water Resources Board, Robert L. Smith, executive secretary. City of Wichita, Robert H. Hess, director of water.	Missouri River basin	132 Nebraska Hall 901 North 17th Street Lincoln 8, Nebr.
Minnesota	Minnesota Iron Range Resources and Rehabilitation, Kaarlo J. Otava, commissioner.	Hudson Bay and upper Mississippi River basins	
South Dakota	South Dakota Water Resources Commission, J. W. Grimes, chief engineer.	Missouri River basin	

State	Cooperating agency	Drainage basin	District or regional office
Wisconsin	Wisconsin Conservation Department, L. P. Voigt, director, through the Committee on Water Pollution, George P. Steinmetz, chairman, Theodore F. Wisniewski, director.	Missouri River basin	2822 E. Main Street Columbus 9, Ohio (Sediment data)
Wyoming	Wyoming Natural Resources Board, Paul A. Rechard, succeeded by Edwin R. Lang, chief of Water Development. Office of State Engineer Earl Lloyd, State Engineer.		1214 Big Horn Avenue Worland, Wyo.

Conservation Service of the Department of Agriculture for some of the investigations in Colorado and Nebraska; and by the Corps of Engineers of the Department of the Army for some of the investigations in North Dakota and South Dakota.

The investigations in Minnesota and Wisconsin and some of the investigations in Iowa were made in cooperation with these States. The cooperative programs with the states of Kansas, South Dakota, and Wyoming which became effective in 1957, were continued in 1958.

The table on page 26 lists State and local agencies that cooperated in quality-of-water investigations in the drainage basins included in this volume, and the locations of quality-of-water district or regional offices responsible for the data collected.

DIVISION OF WORK

The quality-of-water program was conducted by the Water Re-Resources Division of the Geological Survey, L. B. Leopold, chief hydraulic engineer, and S. K. Love, chief of the Quality of Water Branch.

Most of the investigations were made under the direction of D. M. Culbertson, district engineer, Lincoln, Nebr., and by T. F. Hanly, district engineer, Worland, Wyo. 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 G. W. Whetstone, district chemist, Columbus, Ohio.

Additional basic data on file for the streams, lakes, and reservoirs shown in this report can be obtained by writing the responsible Survey district office.

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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

5-517. WILD RICE RIVER NEAR CAYUGA, N. DAK.

LOCATION.--At gaging station at county highway bridge, 1¼ miles downstream from unnamed tributary, 2½ miles downstream from Crooked Creek, and 3½ miles northeast of Cayuga, Sargent County. Prior to Oct. 9, 1957, gaging station at site three-quarters of a mile upstream.
RECORDS AVAILABLE.--Chemical analyses: June 1957 to September 1958 (discontinued).
Water temperatures: October 1957 to September 1958 (discontinued).
EXTREMES, 1957-58.--Dissolved solids: Maximum, 3,110 ppm Feb. 19-22; minimum, 483 ppm Feb. 26 to Mar. 1.
Hardness: Maximum, 1,080 ppm Feb. 19-22; minimum, 245 ppm Feb. 26 to Mar. 1.
Specific conductance: Maximum daily, 3,990 micromhos Feb. 22; minimum daily, 696 micromhos Feb. 26.
Water temperatures: Maximum, 86°F May 31, July 22; minimum, freezing point on many days during October 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 1957 to September 1958 given in WSP 1558.

Chemical analyses, in parts per million, June 1957 to July 1958

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
June 21, 1957 a.	36	21	0.03	77	33	53	13	204	248	22	0.4	2.4	0.22	588	--	0.80	57.2	328	161	25	1.3	847	7.5	--
Sept. 30 a.....	20	18	.02	91	51	60	18	252	331	21	.5	.9	.28	760	--	1.03	41.0	438	231	22	1.2	1,040	7.4	22
Oct. 1-6.....	17.0	18	.01	93	55	62	20	276	330	26	.3	1.2	.24	784	--	1.07	36.0	460	234	22	1.3	1,070	7.5	--
Oct. 7-27.....	10.5	17	.03	102	52	71	18	275	348	26	.4	.6	.30	816	--	1.11	23.1	470	244	24	1.4	1,120	7.5	20
Oct. 28-Nov. 26.	15.7	5.6	.03	106	59	76	16	293	395	27	.3	.3	.27	879	--	1.20	37.3	507	267	24	1.5	1,210	7.3	20
Nov. 27-Dec. 27	6.30	6.2	.01	119	72	80	17	300	470	29	.4	.2	.22	1,010	942	1.37	17.2	592	346	22	1.4	1,350	7.8	--
Dec. 28-Jan. 10, 1958.....	1.56	5.8	.03	133	84	95	19	348	535	37	.5	.3	.31	1,170	1,080	1.59	4.93	676	391	23	1.6	1,510	7.9	10
Jan. 11-21.....	.65	7.4	.03	151	96	117	23	388	623	43	.4	1.1	.35	1,350	1,250	1.84	2.37	772	454	24	1.8	1,740	7.8	15
Jan. 22-Feb. 7.	.22	9.4	.02	164	101	125	24	422	665	49	.5	.9	.35	1,470	1,350	2.00	.87	824	478	24	1.9	1,850	7.8	16
Feb. 8-14.....	.10	13	.02	196	122	169	26	502	815	68	.6	2.3	.46	1,780	1,660	2.42	.48	992	580	26	2.3	2,200	7.8	16
Feb. 15-18.....	.10	13	.02	194	117	412	27	542	1,120	192	3.6	2.6	1.3	2,450	2,350	3.33	.66	964	520	47	5.8	3,180	7.9	11
Feb. 19-22.....	.20	17	.10	223	127	592	31	608	1,450	290	5.1	3.3	1.3	3,110	3,040	4.23	1.68	1,080	581	53	7.8	3,980	8.0	9
Feb. 23-24.....	.90	14	.09	158	91	155	24	394	673	74	.6	3.7	.43	1,460	1,390	1.99	3.55	770	447	30	2.4	1,880	7.9	20
Feb. 25.....	2	8.7	.14	60	32	117	14	164	318	58	.7	5.4	.33	726	--	.99	3.92	282	148	46	3.0	1,060	7.6	25

a Not included in weighted average.

RED RIVER OF THE NORTH BASIN--Continued

5-517. WILD RICE RIVER NEAR CAYUGA, N. DAK.--Continued

Chemical analyses, in parts per million, June 1957 to July 1958--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	Non-carbonate					
														Residue at 180°C	Sum									
Feb. 26-Mar. 1, 1958	9.25	9.5	0.02	51	29	48	14	129	199	30	0.2	12	0.15	483	--	0.66	12.1	245	139	28	1.3	705	7.3	--
Mar. 2-Apr. 6	39.3	8.2	.02	77	47	47	14	216	277	21	.3	1.9	.17	656	--	.89	69.6	386	209	20	1.0	919	7.4	28
Apr. 7-25	116	8.1	.02	79	43	40	12	220	253	16	.3	.8	.16	608	--	.83	190	375	195	18	.9	864	7.4	29
Apr. 26-May 5	65.7	5.3	.03	88	48	39	13	245	276	15	.2	.8	.18	654	--	.89	116	417	216	16	.8	927	7.4	24
May 6-31	10.4	5.9	.01	102	57	45	14	288	317	17	.1	.8	.21	765	--	1.04	21.5	487	251	16	.9	1,050	7.5	24
June 1-27	1.10	32	.01	109	59	72	12	377	340	26	.5	.7	.31	854	--	1.16	2.54	515	206	23	1.4	1,180	7.5	30
June 28-July 26	.39	17	.02	101	47	70	14	251	344	28	.4	1.5	.29	786	--	1.07	.83	445	239	25	1.4	1,080	7.3	25
Weighted average b	15.5	8.1	0.02	86	49	49	14	238	292	20	0.3	1.1	0.19	686	--	0.93	28.7	414	219	20	1.0	960	--	--

b Represents 100 percent of runoff for water year October 1957 to September 1958.

RED RIVER OF THE NORTH BASIN--Continued

5-517. WILD RICE RIVER NEAR CAYUGA, N. DAK.--Continued

Temperature (° F) of water, water year October 1957 to September 1958
/Once-daily measurement between 4 p.m. and 6 p.m. No flow July 27 to Sept. 30/

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

a Measurement between 9 a.m. and 12 m.
b Measurement between 1 p.m. and 3 p.m.

5-540. 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 1958.
Water temperatures: October 1955 to September 1958.
EXTREMES, 1957-58.--Dissolved solids: Maximum, 650 ppm May 6-9;;minimum, 222 ppm July 3-8.
Hardness: Maximum, 420 ppm May 6-9; minimum, 161 ppm July 3-8.
Specific conductance: Maximum daily, 960 micromhos May 6; minimum daily, 326 micromhos July 4.
Water temperatures: Maximum, 79°F Aug. 11; minimum, 34°F Jan. 3, 4.
EXTREMES, 1955-58.--Dissolved solids: Maximum, 650 ppm May 6-9, 1958; minimum, 174 ppm Dec. 1-2, 1955.
Hardness: Maximum, 420 ppm May 6-9, 1958; minimum, 154 ppm Dec. 1-2,18-19, 1955.
Specific conductance: Maximum daily, 960 micromhos May 6, 1958; minimum daily, 275 micromhos Dec. 1, 1955.
Water temperatures: Maximum, 82°F July 15, 16, 18, 1957; minimum, 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 1957 to September 1958 given in WSP 1558.

Chemical analyses, in parts per million, water year October 1957 to September 1958

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. 1, 1957	452	12	0.02	49	30	18	5.6	256	66	7.0	0.2	0.2	0.07	315	0.43	384	246	36	13	0.5	520	7.7	10
Nov. 2-15	498	11	.01	59	40	22	6.5	260	134	7.5	.2	.0	.08	421	.57	566	312	99	13	.5	657	7.8	--
Nov. 16-21	530	11	.01	49	34	17	5.1	259	77	7.0	.3	.0	.08	338	.46	484	261	49	12	.5	546	7.7	--
Nov. 22-Dec. 8	381	12	.01	55	41	23	6.0	280	112	7.5	.2	.3	.08	415	.56	427	304	74	14	.6	646	7.6	11
Dec. 9-24	462	11	.01	44	35	13	4.7	281	48	5.9	.1	.3	.07	308	.42	384	254	24	10	.4	521	7.6	11
Dec. 25-Jan. 13, 1958	332	11	.01	51	41	20	5.2	301	80	6.6	.3	.1	.13	372	.51	333	294	47	13	.5	605	7.8	9
Jan. 14-31	326	11	.01	56	43	18	5.0	303	90	7.0	.2	.3	.08	385	.52	339	315	67	11	.4	633	7.7	10
Feb. 1-28	307	13	.02	57	42	17	5.2	313	83	6.5	.2	1.3	.09	395	.54	327	314	57	10	.4	631	7.8	6
Mar. 1-16	556	9.1	.00	51	36	20	5.4	254	98	7.5	.2	.9	.08	370	.50	555	277	69	13	.5	597	7.7	5
Mar. 17-28	552	8.7	.01	54	39	25	6.3	255	124	8.7	.2	.4	.10	410	.56	611	295	86	15	.6	640	7.8	--
Mar. 29-Apr. 11	736	7.4	.01	51	35	21	5.9	226	122	6.6	.2	.5	.09	378	.51	751	272	87	14	.6	599	7.5	6
Apr. 12-20	949	8.3	.01	64	43	31	7.9	235	191	9.6	.2	1.1	.13	503	.68	1,290	338	145	16	.7	749	7.6	12
Apr. 21-May 5	811	9.8	.00	75	48	41	9.2	255	244	12	.3	.3	.15	604	.82	1,320	384	175	18	.9	862	7.8	18
May 6-9	556	8.2	.01	82	52	43	9.2	274	267	11	.2	.2	.15	650	.88	976	420	195	18	.9	918	7.9	17
May 10-18	361	6.0	.00	74	49	37	8.4	282	220	9.0	.2	.3	.13	572	.78	558	386	155	17	.8	841	7.9	12

May 19-June 4	212	11	.00	67	45	28	14	288	167	11	.3	.2	.14	495	.67	283	354	118	14	.6	754	7.4	10
June 5-10.....	192	12	.00	56	38	24	7.6	260	125	8.8	.3	.4	.12	406	.55	210	297	84	15	.6	639	7.3	8
June 11-20.....	140	13	.00	52	34	19	7.6	246	103	6.8	.3	.5	.13	364	.50	138	270	68	13	.5	582	7.3	12
June 21-30.....	178	6.0	.01	60	41	23	6.2	272	131	7.5	.3	.3	.12	435	.59	209	320	97	13	.6	670	7.3	15
July 1-2	958	6.4	.02	54	37	23	5.8	261	102	8.0	.4	.3	.16	380	.52	983	286	72	15	.6	614	7.2	17
July 3-8	1,762	15	.02	37	17	8.1	6.6	156	49	1.1	.3	1.1	.11	222	.30	1,060	161	33	9	.3	354	7.1	30
July 9-18	755	17	.02	45	26	12	6.4	196	76	3.5	.2	.7	.10	296	.40	603	219	58	10	.4	462	7.1	32
July 19-Aug. 5	325	11	.01	48	33	10	5.6	244	73	3.5	.1	.5	.13	320	.44	281	256	56	8	.3	519	7.1	15
Aug. 6-25.....	240	14	.01	42	30	9.2	4.2	256	33	3.0	.2	.4	.08	269	.37	174	230	20	8	.3	457	7.1	14
Aug. 26-Sept. 30 ..	172	6.8	.01	39	31	9.4	3.8	250	30	2.7	.2	.2	.08	258	.35	120	223	18	8	.3	444	7.3	12
Weighted average a.....	429	11	0.01	54	36	21	6.3	253	109	6.8	0.2	0.5	0.10	384	0.52	445	283	76	14	0.5	603	--	--

a Represents 100 percent of runoff for water year October 1957 to September 1958.

RED RIVER OF THE NORTH BASIN--Continued

5-540. RED RIVER OF THE NORTH AT FARGO, N. DAK.--Continued

Temperature (° F) of water, water year October 1957 to September 1958
/Once-daily measurement at 9 a.m./

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

a Measurement between 10 a.m. and 12 m.
b Measurement between 7 a.m. and 8 a.m.

5-560. 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 1958.
Water temperatures: January 1951 to September 1958.
EXTREMES, 1957-58.--Dissolved solids: Maximum, 902 ppm Jan. 14-31; minimum, 287 ppm Apr. 4-12.
Hardness: Maximum, 472 ppm Jan. 14-31; minimum, 137 ppm Apr. 4-12.
Specific conductance: Maximum daily, 1,510 micromhos Mar. 4; minimum daily, 440 micromhos Apr. 8.
Water temperatures: Maximum, 80°F July 23; minimum, 33°F on several days during October to December, February, March.
EXTREMES, 1951-58.--Dissolved solids: Maximum, 1,230 ppm Mar. 21-23, 1955; minimum, 174 ppm Apr. 17-22, 1956.
Hardness: Maximum, 488 ppm Feb. 26 to Mar. 5, 1957; 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, 1956-58), 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 1957 to September 1958 given in WSP 1558.

Chemical analyses, in parts per million, water year October 1957 to September 1958

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. 1-18, 1957....	33.7	--	--	--	--	57	--	357	--	--	--	--	--	465	0.63	42.3	270	0	31	1.5	716	8.0	--
Oct. 19-Nov. 19 ...	23.5	--	--	--	--	73	--	414	--	--	--	--	--	548	.75	34.8	318	0	33	1.8	855	7.7	--
Nov. 20-Dec. 17 ...	11.9	--	--	--	--	82	--	450	--	--	--	--	--	604	.82	19.4	348	0	34	1.9	941	8.0	--
Dec. 18-Jan. 13, 1958	8.5	27	0.01	87	43	109	7.2	520	171	24	0.3	0.7	0.19	736	1.00	16.9	394	0	37	2.4	1,110	8.1	18
Jan. 14-31	10.3	--	--	101	54	150	--	626	--	--	--	--	--	902	1.23	25.1	472	0	41	3.0	1,360	7.5	--
Feb. 1-17.....	8.1	--	--	--	--	133	--	621	--	--	--	--	--	846	1.15	18.5	460	0	39	2.7	1,280	7.4	--
Feb. 18-23.....	4.2	--	--	--	--	82	--	466	--	--	--	--	--	612	.83	6.94	360	0	33	1.9	943	7.6	--
Feb. 24-Mar. 6....	46.2	--	--	--	--	146	--	560	--	--	--	--	--	842	1.15	105	386	0	45	3.2	1,250	7.7	--
Mar. 7-12.....	33.7	16	.00	48	26	92	12	338	122	17	.2	4.4	.19	524	.71	47.7	226	0	45	2.7	804	7.9	48
Mar. 13-Apr. 3....	38.2	--	--	--	--	55	--	245	--	--	--	--	--	354	.48	36.5	173	0	41	1.8	565	7.3	--
Apr. 4-12.....	109	--	--	--	--	44	--	193	--	--	--	--	--	287	.39	84.5	137	0	41	1.6	462	7.1	--
Apr. 13-15.....	51.3	--	--	--	--	67	--	264	--	--	--	--	--	391	.53	54.2	177	0	45	2.2	614	7.6	--
Apr. 16-May 14....	26.8	--	--	--	--	82	--	339	--	--	--	--	--	479	.65	34.7	226	0	44	2.4	755	7.5	--
May 15-June 9.....	19.7	--	--	--	--	91	--	411	--	--	--	--	--	538	.73	28.6	282	0	41	2.4	850	7.7	--
June 10-30	13.3	--	--	--	--	76	--	407	--	--	--	--	--	507	.69	18.2	281	0	37	2.0	798	7.6	--
July 1-7.....	103	19	.02	45	26	53	6.0	306	64	14	.4	1.7	.15	394	.54	110	220	0	34	1.6	629	7.5	45
July 8-17.....	79.4	--	--	--	--	127	--	426	--	--	--	--	--	647	.88	139	269	0	51	3.4	970	7.8	--
July 18-Aug. 3.....	25.5	--	--	--	--	85	--	328	--	--	--	--	--	483	.66	33.3	214	0	46	2.5	750	7.1	--
Aug. 4-24.....	4.50	--	--	--	--	70	--	324	--	--	--	--	--	435	.59	5.29	216	0	41	2.1	689	7.1	--
Aug. 25-Sept. 30...	1.59	23	.01	52	20	33	4.5	262	54	6.3	.1	1.7	.14	327	.44	1.40	210	0	25	1.0	523	7.3	12
Weighted average a	23.6	--	--	--	--	81	--	363	--	--	--	--	--	509	0.69	32.4	257	0	41	2.2	789	--	--

a Represents 100 percent of runoff for water year October 1957 to September 1958.

RED RIVER OF THE NORTH BASIN--Continued

5-560. SHEYENNE RIVER NEAR WARWICK, N. DAK.--Continued

Temperature (° F) of water, water year October 1957 to September 1958
/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	65	40	--	35	35	--	36	47	--	73	75	--
2	61	38	34	--	--	--	36	53	63	74	73	--
3	60	--	33	35	35	a 35	a 35	55	64	70	--	78
4	59	38	34	35	34	a 35	36	--	62	--	73	76
5	55	--	33	--	34	35	37	49	63	68	72	60
6	--	--	--	35	34	--	--	52	67	--	73	75
7	52	--	--	35	35	36	38	56	69	67	74	--
8	50	--	--	40	34	35	40	54	--	65	79	68
9	46	--	37	38	--	--	39	61	67	59	77	65
10	47	--	33	39	34	38	43	59	64	67	--	64
11	47	--	34	39	33	35	40	--	--	69	78	64
12	48	38	34	--	33	a 35	43	68	--	69	76	--
13	--	35	37	39	35	a 33	--	65	64	--	74	64
14	51	35	a 37	38	33	33	51	66	65	70	76	--
15	51	34	--	37	33	a 33	53	--	--	70	76	51
16	50	33	--	38	--	--	50	70	a 68	71	75	53
17	52	--	40	38	33	35	55	69	a 67	71	--	57
18	51	33	a 40	38	35	36	57	--	a 71	71	--	62
19	50	33	a 40	--	35	36	54	60	66	73	71	62
20	--	34	37	37	37	34	--	56	68	--	67	59
21	47	--	36	39	37	35	53	68	68	75	73	--
22	42	34	--	35	--	35	48	65	--	78	65	62
23	40	37	37	35	--	--	45	68	66	80	65	63
24	35	--	37	37	37	36	45	--	62	77	--	50
25	33	33	--	36	40	36	47	--	61	76	a 64	48
26	39	37	38	--	36	38	49	69	66	75	66	56
27	--	33	36	35	a 35	38	--	62	68	--	69	52
28	40	--	35	35	--	39	42	69	75	77	67	--
29	40	--	--	35	--	39	41	69	--	72	63	49
30	41	--	35	35	--	--	48	--	73	75	--	43
31	43	--	35	35	--	39	--	65	--	73	--	--
Average	48	--	--	37	--	--	45	61	--	72	--	--

a Measurement between 6 p.m. and 8 p.m.

5-564. 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 1958.
REMARKS.--No flow on many days. Records of discharge for water year October 1957 to September 1958 given in WSP 1558.

Chemical analyses, in parts per million, October 1957 to April 1958

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. 4, 1957....	0.1	3.6	0.06	78	76	298	23	314	738	113	0.3	0.3	0.54	1,520	1,480	2.07		505	248	55	5.8	2,110	8.0	22
Oct. 23	.16	6.2	.01	72	42	198	16	336	395	68	.2	1.1	.37	986		1.34		354	78	53	4.6	1,460	7.7	15
Feb. 25, 1958 ..	2.49	9.3	.19	45	16	35	20	98	175	18	.2	.6	.03	384		.52		177	97	27	1.1	568	7.1	65
Apr. 2.....	.74	--	--	--	--	121	--	233	--	--	--	--	--	--		--		440	249	37	2.5	1,310	7.6	--
Apr. 22.....	.17	--	--	131	70	188	--	a 364	623	69	--	--	--	1,370		1.86		615	317	40	3.3	1,840	8.4	--

a Includes equivalent of 20 ppm of carbonate (CO_3).

5-587. SHEYENNE RIVER AT LISBON, N. DAK.

LOCATION.--At gaging station, 150 feet downstream from dam at State fish hatchery, at north edge of city of Lisbon, Ramson County, and 3 miles upstream from Timber Coulee.
DRAINAGE AREA.--8,560 square miles, approximately (includes 3,940 square miles in closed Devils Lake basin).
RECORDS AVAILABLE.--Chemical analyses: August 1956 to September 1958.
Water temperatures: August 1956 to September 1958.
EXTREMES, 1957-58.--Dissolved solids: Maximum, 671 ppm May 2-31; minimum, 269 ppm Nov. 7-8.
Hardness: Maximum, 349 ppm May 2-31; minimum, 146 ppm Nov. 7-8.
Specific conductance: Maximum daily, 1,150 micromhos July 20; minimum daily, 349 micromhos Nov. 8.
Water temperatures: Maximum, 79°F Aug. 9, 10; minimum, freezing point on many days during October to March.
EXTREMES, 1956-58.--Dissolved solids: Maximum, 671 ppm May 2-31, 1958; minimum, 269 ppm Nov. 7-8, 1957.
Hardness: Maximum, 349 ppm May 2-31, 1958; minimum, 146 ppm Nov. 7-8, 1957.
Specific conductance: Maximum daily, 1,150 micromhos July 20, 1958; minimum daily, 349 micromhos Nov. 8, 1957.
Water temperatures: Maximum, 81°F on several days during July 1957; 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 1957 to September 1958 given in WSP 1558.

Chemical analyses, in parts per million, water year October 1957 to September 1958

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. 1-22, 1957....	80.9	17	0.02	58	28	81	11	324	135	24	0.1	0.3	0.15	518	0.70	113	258	0	39	2.2	801	7.9	10
Oct. 23-Nov. 6	171	16	.02	58	28	81	11	322	139	26	.1	1.3	.16	521	.71	241	260	0	39	2.2	805	7.8	10
Nov. 7-8.....	178	11	.01	37	13	36	5.3	176	68	12	.0	.4	.18	269	.37	129	146	2	34	1.3	445	7.6	10
Nov. 9-Dec. 7.....	118	8.6	.01	63	29	83	12	326	149	26	.2	.7	.18	533	.72	170	276	9	38	2.2	850	7.8	--
Dec. 8-31.....	74.7	11	.02	61	32	81	11	340	137	25	.3	3.3	.19	541	.74	109	282	3	37	2.1	843	7.8	--
Jan. 1-31, 1958....	70.7	14	.01	64	32	80	11	358	141	24	.3	3.5	.24	562	.76	107	290	0	36	2.0	863	7.8	18
Feb. 1-6.....	68.7	16	.02	67	28	75	9.8	348	134	22	.3	3.1	.20	531	.72	98.5	284	0	35	1.9	830	8.0	15
Feb. 7-8.....	68.0	16	.09	45	21	60	7.8	244	102	16	.2	2.5	.15	390	.53	71.6	200	0	38	1.8	622	8.0	17
Feb. 9.....	70	17	.09	51	30	76	9.8	308	135	23	.3	3.3	.18	494	.67	93.4	252	0	38	2.1	786	7.8	20
Feb. 10-12.....	70.7	17	.04	49	19	52	7.0	238	94	16	.3	2.1	.13	372	.51	71.0	200	5	35	1.6	596	7.9	11
Feb. 13-24.....	77.6	19	.04	70	31	80	12	362	144	25	.3	3.6	.20	571	.78	120	300	3	36	2.0	884	7.8	20
Feb. 25-26.....	128	18	.09	62	26	67	12	300	128	22	.3	4.8	.19	500	.68	173	262	16	34	1.8	773	8.0	30
Feb. 27-Mar. 7....	244	17	.03	47	19	48	13	210	98	18	.3	7.9	.13	387	.53	255	196	24	33	1.5	596	7.4	43
Mar. 8-15.....	86.1	16	.01	58	25	57	12	251	132	21	.4	7.2	.14	475	.65	110	246	40	32	1.6	724	7.5	41
Mar. 16-26.....	81.4	14	.02	65	31	72	11	322	143	25	.3	4.1	.18	546	.74	120	291	27	34	1.8	839	7.7	15

Mar. 27-Apr. 5....	97.7	8.6	.01	56	28	64	8.0	288	132	21	.3	.6	.14	466	.63	123	253	17	35	1.7	742	7.9	12
Apr. 6-9.....	312	10	.03	59	27	65	9.8	280	139	24	.3	2.5	.15	494	.67	416	258	28	34	1.8	756	7.9	21
Apr. 10-19.....	66.9	15	.02	60	26	64	12	252	151	29	.2	6.5	.15	508	.69	91.8	255	48	34	1.7	768	7.7	30
Apr. 20-May 1.....	50.0	7.2	.01	71	34	78	6.9	263	210	35	.2	6.6	.19	603	.82	81.4	318	102	34	1.9	933	7.6	12
May 2-31.....	37.7	4.8	.01	74	40	98	12	328	226	42	.2	3.8	.22	671	.91	68.3	349	80	37	2.3	1,040	7.5	9
June 1-26	26.7	20	.01	69	39	97	6.5	314	233	45	.4	4.3	.25	670	.91	48.3	334	77	38	2.3	1,020	7.4	12
June 27-July 18....	32.0	18	.02	65	33	83	12	258	212	48	.3	2.2	.32	614	.84	53.1	297	85	37	2.1	933	7.3	18
July 19-24.....	181	18	.02	64	38	96	11	302	209	51	.3	1.2	.27	654	.89	320	314	66	39	2.4	997	7.3	18
July 25-Aug. 6.....	61.7	14	.02	50	31	73	10	297	145	25	.3	1.6	.21	505	.69	84.1	253	9	37	2.0	788	7.3	18
Aug. 7-25.....	11.8	17	.01	53	32	79	12	326	139	26	.3	3.8	.22	530	.72	16.9	263	0	38	2.1	831	7.4	17
Aug. 26-Sept. 15...	14.0	19	.01	52	34	83	13	319	154	40	.3	1.4	.24	553	.75	20.9	269	7	39	2.2	858	7.6	18
Sept. 16-30.....	12.4	16	.01	55	35	83	12	304	172	32	.1	4.9	.24	566	.77	19.0	279	30	38	2.2	882	7.4	16
Weighted average a	72.7	14	0.02	60	30	76	11	305	148	27	0.2	3.0	0.19	529	0.72	104	271	21	37	2.0	820	--	--

a Represents 100 percent of runoff for water year October 1957 to September 1958.

RED RIVER OF THE NORTH BASIN--Continued

5-587. SHEYENNE RIVER AT LISBON, N. DAK.--Continued

Temperature (° F) of water, water year October 1957 to September 1958
/Once-daily measurement between 5 p.m. and 9 p.m./

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

a Measurement between 8 a.m. and 12 m.
b Measurement between 1 p.m. and 4 p.m.

5-825. RED RIVER OF THE NORTH AT GRAND FORKS, N. DAK.

LOCATION.--At gaging station, 500 feet downstream from dam at Riverside Park in Grand Forks, Grand Forks County, and 2 miles downstream from Red Lake River.
DRAINAGE AREA.--30,100 square miles, approximately (includes 3,940 square miles in closed Devils Lake basin).
RECORDS AVAILABLE.--Chemical analyses: September 1956 to September 1958.
Water temperatures: October 1956 to September 1958.
EXTREMES, 1957-58.--Dissolved solids: Maximum, 479 ppm Apr. 21 to May 17; minimum, 289 ppm Apr. 1-13.
Hardness: Maximum, 326 ppm Apr. 21 to May 17; minimum, 215 ppm Apr. 1-13.
Specific conductance: Maximum daily, 761 micromhos May 13; minimum daily, 430 micromhos Mar. 29.
Water temperatures: Maximum, 70°F on several days during August; minimum, 33°F Feb. 7, 8, 14, 15.
EXTREMES, 1956-58.--Dissolved solids: Maximum, 490 ppm Dec. 1-31, 1956; minimum, 246 ppm Mar. 27-31, 1957.
Hardness: Maximum, 364 ppm Dec. 1-31, 1956; minimum, 174 ppm Mar. 27-31, 1957.
Specific conductance: Maximum daily, 795 micromhos Dec. 19, 1956; minimum daily, 362 micromhos Mar. 28, 1957.
Water temperatures: Maximum, 72°F on several days during August 1957; minimum, 33°F Feb. 7, 8, 14, 15, 1958.
REMARKS.--Daily samples for chemical analysis composited by discharge. Records of specific conductance of daily samples and some records of strontium available in district office at Lincoln, Nebr. Records of discharge for water year October 1957 to September 1958 given in WSP 1558.

Chemical analyses, in parts per million, water year October 1957 to September 1958

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, 1957....	3,245	11	0.01	60	24	14	4.8	235	77	4.5	0.2	0.5	0.12	335	0.46	2,940	250	57	11	0.4	514	7.5	19
Nov. 1-26.....	2,964	11	.01	68	29	17	5.0	264	96	7.5	.3	.7	.11	381	.52	3,050	287	71	11	.4	595	7.7	20
Nov. 27-Dec. 21...	1,540	13	.02	74	34	22	5.4	319	95	11	.3	.4	.08	425	.58	1,770	323	61	13	.5	673	7.7	--
Dec. 22-Jan. 31, 1958	1,382	11	.01	59	29	18	4.9	287	59	7.7	.2	.9	.08	352	.48	1,310	267	32	12	.5	554	7.7	14
Feb. 1-28.....	1,273	12	.01	61	27	16	4.6	285	57	7.4	.2	2.2	.08	342	.47	1,180	265	31	11	.4	547	7.8	15
Mar. 1-31.....	1,928	9.3	.00	50	24	16	4.9	238	56	6.9	.3	2.7	.10	300	.41	1,560	222	27	13	.5	482	7.2	8
Apr. 1-13.....	2,973	8.0	.01	48	23	17	4.3	212	62	7.3	.2	1.2	.11	289	.39	2,320	215	41	14	.5	476	7.6	7
Apr. 14-20.....	2,754	5.8	.01	57	30	25	6.3	263	100	12	.2	1.2	.10	366	.50	2,720	264	48	17	.7	601	7.5	12
Apr. 21-May 17....	1,734	5.9	.02	69	37	30	7.1	268	152	13	.2	.9	.13	479	.65	2,240	326	106	16	.7	718	7.5	7
May 18-31.....	1,106	4.2	.03	63	38	26	6.1	280	120	13	.2	1.3	.12	435	.59	1,300	314	84	15	.6	680	7.4	7
June 1-18	1,410	8.6	.03	73	25	21	5.4	266	96	9.1	.2	2.2	.15	392	.53	1,490	286	68	13	.5	611	7.5	16
June 19-28	1,132	12	.03	81	25	21	5.5	280	102	9.3	.2	1.7	.12	418	.57	1,280	305	75	13	.5	637	7.5	22
June 29-July 5.....	1,198	17	.01	57	34	25	12	261	103	14	.3	.5	.13	388	.53	1,260	280	66	16	.7	617	7.1	17
July 6-12.....	6,319	32	.01	59	23	12	5.4	218	82	5.7	.3	.9	.14	334	.45	5,700	243	64	9	.3	505	7.2	37
July 13-30.....	3,361	35	.02	64	29	14	5.4	235	106	5.9	.3	.7	.12	389	.53	3,530	280	87	10	.4	567	7.1	45
July 31-Aug. 16....	1,033	13	.01	62	32	23	5.7	258	103	14	.2	1.4	.18	402	.55	1,120	288	76	14	.6	619	7.2	25
Aug. 17-Sept. 16...	535	7.7	.01	49	30	19	4.9	254	63	11	.2	1.3	.10	328	.45	474	245	37	14	.5	526	7.5	--
Sept. 17-30.....	460	1.8	.01	55	35	23	5.7	275	85	13	.4	5.3	.11	383	.52	476	282	56	15	.6	608	7.7	17
Weighted average a.....	1,860	14	0.01	62	28	18	5.3	256	86	8.0	0.2	1.2	0.11	365	0.50	1,830	269	59	12	0.5	568	--	--

a Represents 100 percent of runoff for water year October 1957 to September 1958.

5-825. RED RIVER OF THE NORTH AT GRAND FORKS, N. DAK.--Continued

Temperature (° F) of water, water year October 1957 to September 1958
/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	a 54	40	36	34	34	a 35	37	49	54	61	65	69
2	54	40	36	34	34	35	37	49	a 54	61	65	69
3	b 54	40	36	34	34	35	a 37	49	54	a 62	65	68
4	54	a 40	36	34	34	35	37	49	54	a 63	a 65	67
5	54	40	36	35	34	35	37	49	a 54	b 64	65	67
6	54	39	36	35	b 34	35	37	b 49	54	64	65	67
7	55	39	36	35	33	35	b 37	a 49	55	a 64	65	65
8	54	38	36	35	33	35	38	49	55	64	67	65
9	53	38	36	--	34	35	38	49	56	64	67	a 64
10	50	38	36	35	34	35	38	49	b 56	--	68	64
11	43	38	36	35	b 34	35	38	52	59	--	68	64
12	49	38	36	35	34	35	b 42	52	b 59	64	68	64
13	50	39	36	35	a 34	a 35	42	52	b 59	64	a 68	64
14	50	39	a 36	35	33	35	43	52	60	64	68	64
15	49	39	36	35	33	35	43	a 53	b 59	a 64	70	63
16	49	39	b 36	35	35	35	43	53	b 60	64	70	63
17	49	39	a 36	35	34	35	43	53	b 59	64	a 70	62
18	48	39	36	35	34	35	43	53	59	64	70	62
19	48	39	36	35	b 34	35	b 44	53	b 58	a 64	70	62
20	48	39	36	34	a 34	35	44	53	58	64	70	62
21	48	39	36	35	34	35	44	53	b 59	64	70	62
22	a 48	38	36	35	34	35	44	53	--	64	70	61
23	46	38	36	b 35	34	36	44	a 53	b 58	65	70	61
24	a 45	38	36	35	a 34	36	44	54	--	65	70	61
25	a 42	38	36	34	34	36	44	54	b 59	65	70	61
26	42	38	36	34	35	36	44	54	--	65	70	61
27	42	a 38	36	b 35	b 35	36	44	a 54	b 60	65	a 70	61
28	40	38	36	35	35	36	44	54	a 60	65	70	61
29	40	b 37	36	35	--	36	44	54	b 60	b 65	70	a 61
30	a 40	36	a 35	b 35	--	37	44	54	--	65	--	61
31	a 40	--	34	a 35	--	37	--	54	--	65	70	--
Average	48	39	36	35	34	35	41	52	57	64	68	64

a Measurement between 12 m. and 2 p.m.

b Measurement between 3 p.m. and 5 p.m.

5-920. RED RIVER OF THE NORTH AT DRAYTON, N. DAK.

LOCATION.--Temperature recorder at gaging station at interstate highway bridge, 1½ miles northeast of Drayton, Pembina County.
DRAINAGE AREA.--34,800 square miles, approximately (includes 3,940 square miles in closed Devils Lake basin).
RECORDS AVAILABLE.--Chemical analyses: June 1954 to September 1955.
Water temperatures: December 1956 to September 1958.
EXTREMES, 1957-58.--Water temperatures: Maximum, 76°F Aug. 11-12; minimum, freezing point on many days during November to March.
EXTREMES, 1956-58.--Water temperatures: Maximum, 80°F on several days during July and August 1957; minimum, freezing point on many days during winter months.
REMARKS.--Records of discharge for water year October 1957 to September 1958 given in WSP 1558.

Temperature (° F) of water, water year October 1957 to September 1958
/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	54	54	40	40	34	34	33	33	32	32	32	32	34	33	46	43	62	61	70	68	72	71	62	57
2	55	54	40	39	34	34	33	33	32	32	32	32	34	34	48	46	62	61	71	70	74	72	62	61
3	56	55	39	38	34	34	33	33	32	32	32	32	34	33	49	47	61	61	71	71	74	73	63	62
4	56	56	38	38	34	34	33	33	32	32	32	32	34	34	49	48	61	60	71	69	74	73	63	61
5	56	56	38	38	34	33	33	32	32	32	33	32	34	34	49	48	60	57	69	67	74	73	62	62
6	56	56	38	38	33	33	33	32	32	32	33	33	37	34	49	49	62	59	67	66	73	72	62	61
7	56	55	38	37	33	33	33	33	32	32	33	33	39	37	51	49	63	61	67	66	73	71	62	61
8	55	53	37	36	33	33	33	33	32	32	33	33	40	39	53	51	63	61	68	67	75	72	62	61
9	53	51	37	37	33	33	33	32	32	32	33	33	43	40	54	53	63	62	68	67	74	73	63	62
10	51	50	37	35	33	33	32	32	32	32	33	32	45	42	54	54	63	62	67	66	75	73	63	59
11	50	50	36	36	33	33	32	32	32	32	32	32	45	44	56	54	63	61	68	67	76	74	61	58
12	50	50	36	36	33	33	32	32	32	32	33	33	45	44	59	56	62	62	68	68	76	74	61	61
13	50	50	36	36	33	33	33	32	32	32	34	33	47	45	59	58	63	62	69	68	75	73	63	61
14	50	50	36	36	33	33	33	33	32	32	34	34	50	47	60	58	62	62	69	68	75	73	63	62
15	50	50	36	35	33	33	33	33	32	32	34	34	50	48	60	59	63	62	68	67	74	71	63	58
16	50	50	35	35	33	33	33	33	32	32	34	34	50	49	62	60	63	63	69	67	72	71	58	56
17	50	50	35	35	33	33	33	32	32	32	34	34	52	49	64	61	64	63	69	68	72	71	59	55
18	50	49	35	34	33	33	32	32	32	32	34	34	52	51	61	61	64	63	69	68	72	72	58	56
19	49	48	34	34	33	32	32	32	32	32	34	34	52	51	61	59	64	64	69	69	72	71	59	58
20	48	48	34	33	32	32	32	32	32	32	34	34	52	51	60	58	64	63	70	69	72	70	61	60
21	48	48	33	33	32	32	32	32	32	32	34	34	52	51	61	59	64	64	71	69	70	68	60	56
22	48	46	33	32	32	32	32	32	32	32	34	34	51	50	60	57	65	64	71	69	70	68	59	57
23	46	44	33	32	32	32	32	32	32	32	34	34	50	48	59	58	65	65	72	69	68	64	59	58
24	44	42	33	32	32	32	32	32	32	32	34	34	49	47	60	58	65	64	72	71	65	61	59	56
25	42	41	33	33	32	32	32	32	32	32	34	34	49	47	59	58	64	63	72	71	65	64	56	53
26	41	41	34	33	32	32	32	32	32	32	34	34	50	48	61	59	64	62	72	71	68	63	55	52
27	41	40	34	33	32	32	32	32	32	32	34	34	50	49	60	58	65	63	72	71	67	65	55	52
28	40	40	33	32	33	32	32	32	33	32	34	34	50	44	61	59	66	65	72	72	67	64	55	53
29	40	40	33	32	33	33	32	32	--	--	34	33	44	41	61	60	68	66	72	71	67	65	54	52
30	40	40	33	33	33	33	32	32	--	--	33	33	45	42	62	61	68	67	72	71	67	59	52	48
31	40	40	--	--	33	33	32	32	--	--	33	33	--	--	62	61	--	--	71	71	60	58	--	--
Average	49	48	36	35	33	33	32	32	32	32	33	33	45	43	57	55	64	62	70	69	71	69	60	58

RED RIVER OF THE NORTH BASIN--Continued

5-1200. 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 1958.
REMARKS.--Records of discharge for water year October 1957 to September 1958 given in WSP 1558.

Chemical analyses, in parts per million, October 1957 to August 1958

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
Oct. 4, 1957....	14.0	--	--	--	--	79	--	346	163	22	--	--	--	--		--		298	14	36	2.0	873	7.5	--
Oct. 30	36.8	14	0.01	68	39	156	13	433	195	68	0.6	11	0.22	781		1.06		328	0	50	3.7	1,220	7.2	25
Nov. 21.....	24.3	--	--	--	--	109	--	358	--	--	--	--	--	--		--		335	41	41	2.6	1,060	7.4	--
Dec. 19.....	32.6	--	--	--	--	109	--	392	--	--	--	--	--	--		--		358	37	40	2.5	1,100	7.5	--
Jan. 16, 1958...	36.9	12	.02	73	44	111	14	382	216	40	.2	15	.24	718		.98		362	49	39	2.5	1,110	7.2	25
Feb. 11.....	27.9	9.6	.02	69	43	100	13	371	207	37	.3	13	.09	714		.97		349	45	37	2.3	1,060	7.2	28
Mar. 14.....	36	--	--	--	--	100	--	360	--	--	--	--	--	653		.89		322	27	40	2.4	1,020	7.3	--
Apr. 2.....	950	8.0	.18	23	9.8	30	10	122	30	5.0	.2	7.6	.07	247		.34		98	0	37	1.3	346	7.0	10
Apr. 15.....	75.5	--	--	53	17	78	--	244	142	16	--	--	--	455		.62		200	0	46	2.4	711	7.3	--
May 7	81.4	--	--	--	--	66	--	324	--	--	--	--	--	--		--		301	35	32	1.7	828	7.5	--
July 8.....	78.8	14	.01	50	26	188	13	336	349	18	.4	4.7	.28	836		1.14		230	0	62	5.4	1,210	7.4	55
Aug. 6.....	23.3	--	--	--	--	102	--	369	177	37	--	--	--	632		.86		284	0	41	2.6	983	7.3	--

5-1240. 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 1958.
Water temperatures: October 1954 to September 1955, October 1956 to September 1958.
EXTREMES, 1957-58.--Dissolved solids: Maximum, 1,280 ppm Feb. 10 to Mar. 5; minimum, 358 ppm Mar. 26 to Apr. 4.
Hardness: Maximum, 668 ppm Feb. 10 to Mar. 5; minimum, 180 ppm Mar. 26 to Apr. 4.
Specific conductance: Maximum daily, 1,960 micromhos Mar. 5; minimum daily, 288 micromhos Mar. 26.
Water temperatures: Minimum, freezing point on several days during October to March.
EXTREMES, 1954-55, 1956-58.--Dissolved solids: Maximum, 1,280 ppm Feb. 10 to Mar. 5, 1958; minimum, 162 ppm Apr. 13-18, 1957.
Hardness: Maximum, 668 ppm Feb. 10 to Mar. 5, 1958; minimum, 85 ppm Apr. 13-18, 1957.
Specific conductance: Maximum daily (1956-58), 1,960 micromhos Mar. 5, 1958; minimum daily, 232 micromhos Apr. 18, 1957.
Water temperatures: 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 1957 to September 1958 given in WSP 1558.

Chemical analyses, in parts per million, water year October 1957 to September 1958

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. 1-30, 1957....	19.8	--	--	56	49	120	--	431	194	28	--	7.9	0.19	726	0.99	38.8	340	0	43	2.8	1,080	7.5	--
Oct. 31-Nov. 30 ...	117	--	--	65	52	118	--	418	249	28	--	2.4	.17	767	1.04	242	376	33	40	2.6	1,140	7.8	--
Dec. 1-27.....	56.6	4.4	0.03	76	64	130	15	500	271	33	0.5	1.5	.17	871	1.18	133	452	42	38	2.7	1,290	7.9	--
Dec. 28-Jan. 23, 1958	16.4	--	--	91	73	170	--	663	288	57	--	1.8	.29	1,060	1.44	46.9	528	0	40	3.2	1,570	8.0	--
Jan. 24-Feb. 9	20.6	4.5	.02	107	81	186	--	713	335	59	--	2.7	.28	1,180	1.60	65.6	602	17	40	3.3	1,720	7.9	--
Feb. 10-28.....	10.9	9.1	.02	129	84	190	--	780	342	61	--	6.9	.28	1,280	1.74	37.7	668	28	38	3.2	1,840	7.9	--
Mar. 1-5.....	.38	--	--	120	90	190	--	788	352	64	--	5.0	.25	1,280	1.74	1.31	668	22	38	3.2	1,830	8.1	--
Mar. 26-Apr. 4....	1.57	--	--	33	24	49	--	215	89	16	--	4.6	.10	358	.49	1.52	180	4	36	1.6	573	7.4	--
Apr. 5-25.....	6.59	--	--	36	29	63	--	247	110	20	--	4.5	.12	421	.57	7.49	208	5	39	1.9	670	7.6	--
Apr. 26-May 13....	33.4	--	--	39	31	60	--	250	123	17	--	2.8	.12	434	.59	39.1	223	18	36	1.7	685	7.7	--
May 14-31.....	77.2	--	--	44	35	67	--	282	139	20	--	1.9	.14	495	.67	103	253	22	36	1.8	768	7.4	--
June 1-28	89.6	11	.05	44	38	75	13	297	163	21	.3	6.1	.18	553	.75	134	268	24	36	2.0	831	7.3	18
June 29-July 31....	32.8	--	.03	29	36	88	--	246	170	24	--	--	.21	561	.76	49.7	222	20	46	2.6	819	6.8	--
Aug. 1-31.....	28.7	--	--	39	42	109	--	328	190	30	--	19	.23	663	.90	51.4	271	2	47	2.9	975	7.1	--
Sept. 1-30.....	21.3	26	.05	45	45	128	17	389	203	34	.5	16	.21	745	1.01	42.8	296	0	47	3.2	1,080	7.1	70
Weighted average a	38.4	--	--	56	48	106	--	383	209	28	--	5.7	0.18	697	0.95	72.3	335	21	40	2.5	1,040	--	--

a Includes estimate where datum is missing. Represents 100 percent of runoff for water year October 1957 to September 1958.

RED RIVER OF THE NORTH BASIN--Continued

5-1240. SOURIS RIVER NEAR WESTHOPE, N. DAK.--Continued

Temperature (° F) of water, water year October 1957 to September 1958
/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 39	34	--	--	--	35	--	b 54	74	--	60
2	62	--	--	--	--	--	40	--	58	b 68	a 73	64
3	62	b 34	b 34	--	--	--	--	--	b 59	b 71	74	56
4	58	--	35	--	--	--	40	--	--	--	70	56
5	a 53	--	34	--	32	--	b 37	--	60	--	--	--
6	50	b 33	b 34	--	--	--	--	--	--	--	--	62
7	46	b 34	b 33	--	--	--	--	--	63	60	72	b 58
8	44	b 32	b 34	--	--	--	--	--	64	--	a 72	--
9	43	b 32	--	--	--	--	--	--	--	72	--	a 58
10	44	--	31	--	--	--	--	--	--	--	a 70	55
11	--	--	--	--	--	--	--	--	--	70	a 76	--
12	46	a 36	33	--	--	--	--	--	--	--	--	--
13	53	b 35	33	--	b 32	--	--	--	60	b 70	70	--
14	53	36	b 33	b 32	--	--	--	--	--	62	63	60
15	52	b 37	b 34	--	--	--	--	60	--	a 65	a 68	a 50
16	--	35	33	--	--	--	--	--	--	70	--	--
17	50	b 35	34	--	--	--	--	b 66	a 63	72	b 72	50
18	46	a 37	--	--	--	--	--	b 64	--	72	a 60	a 54
19	--	b 36	--	--	--	--	--	61	59	--	--	a 60
20	a 46	b 37	b 35	--	31	--	--	62	62	b 72	a 70	b 56
21	45	b 34	b 33	--	32	--	--	--	--	b 70	b 67	--
22	33	36	b 34	--	b 31	--	--	63	b 63	--	60	b 56
23	--	37	b 33	--	--	--	--	b 64	60	78	70	b 53
24	--	b 35	34	--	32	--	--	b 62	64	a 72	--	50
25	35	b 36	33	--	--	--	--	b 62	b 58	a 71	58	50
26	b 32	b 34	b 34	--	--	a 33	--	63	b 64	b 72	a 58	b 45
27	b 35	36	b 35	--	--	--	--	64	b 63	a 70	--	--
28	--	b 36	b 34	40	--	36	--	64	b 65	--	65	b 48
29	--	33	--	a 40	--	b 34	--	65	--	a 67	b 66	46
30	--	b 35	--	42	--	32	--	70	76	--	58	45
31	--	--	--	--	--	35	--	63	--	a 72	b 58	--
Average	--	35	--	--	--	--	--	--	--	--	--	--

a Measurement between 6 p.m. and 8 p.m.
b Measurement between 7 a.m. and 12 m.

Periodic determinations of suspended-sediment discharge, April to September 1958

Date	Discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Discharge (tons per day)
Apr. 17, 1958, 4:20 p.m....	6.8	43	0.8
May 6, 12:15 p.m.....	11	36	1.1
June 11, 11:00 a.m.....	105	90	2.6
July 10, 9:50 a.m.....	34	47	4.3
Aug. 13, 11:45 a.m	28	32	2.4
Sept. 4, 5:20 p.m.....	26	23	1.6
Sept. 19, 5:30 p.m.....	18	40	1.9
Sept. 24, 10:10 a.m.....	13	46	1.6

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

Chemical analyses, in parts per million, water year October 1957 to September 1958

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: 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	Per cent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH	Color
BUFFALO LAKE NEAR ESMOND																								
Oct. 3, 1957	a 8.35	22	0.01	14	21	456	24	954	25	240	43	0.5	3.2	0.89	1,370	1,320	1.86	122	0	87	18	1,980	8.6	
June 21, 1958	a 7.50	27	.07	12	26	451	25	920	67	219	46	.5	.9	.90	1,420	1,330	1.93	136	0	85	17	2,030	8.6	
5-565. DEVILS LAKE NEAR DEVILS LAKE																								
Oct. 4, 1957	b220,000	6.1	0.02	68	265	1,400	167	624	0	2,940	649	0.5	6.8	1.0	5,960	5,470	8.11	1,260	749	67	17	7,520	8.0	
Jan. 13, 1958	b223,000	4.3	.03	85	284	1,500	166	580	43	3,220	740	.2	2.2	1.1	6,430	6,380	8.74	1,380	833	67	18	8,050	8.7	20
June 22	b211,000	--	.04	73	279	1,580	--	508	77	3,140	693	.2	--	--	--	--	--	1,330	785	72	19	7,850	8.8	
EAST DEVILS LAKE NEAR HAMAR																								
Apr. 29, 1957	b 8,800	11	0.04	144	2,260	10,900	1,020	1,330	360	24,800	4,400		4.3	5.6	45,500	44,500	61.9	9,660	7,970	68	48	41,500	8.8	
Oct. 4	b 9,300	13	.62	24	2,440	12,100	1,050	1,660	166	28,900	4,660		--	6.2	51,700	50,200	70.3	10,100	8,740	70	52	45,100	8.5	
June 23, 1958	b 9,000	6.5	.03	128	2,430	12,600	1,080	1,270	408	29,400	4,720	0.3	4.0	6.3	52,200	51,400	71.0	10,300	8,580	70	54	45,600	8.8	32
WESTERN STUMP LAKE NEAR LAKOTA																								
Apr. 29, 1957	b 1,500	2.8	0.00	99	777	3,730	245	213	14	8,470	2,240		1.0	2.5	16,100	15,700	21.9	3,440	3,240	68	28	18,100	8.4	
Oct. 4	b 800	29	.12	154	510	2,370	176	497	0	5,270	1,490		5.0	2.0	10,400	10,300	14.1	2,480	2,070	66	21	12,500	7.9	
June 23, 1958	b 600	23	.03	116	856	4,070	143	404	50	8,910	2,550	0.3	5.1	3.1	17,800	16,900	24.2	3,810	3,400	69	29	19,500	8.6	45
EASTERN STUMP LAKE NEAR LAKOTA																								
Apr. 29, 1957	b 9,000	10	0.08	326	6,410	16,600	1,330	1,060	132	45,100	11,500		2.5	13	91,100	82,000	124	27,200	26,100	56	44	65,300	8.4	
Oct. 4	b 8,600	16	2.1	198	6,690	30,600	1,500	1,260	0	73,000	11,800		--	13	129,000	124,000	175	28,000	27,000	69	80	83,500	7.8	
June 23, 1958	b 7,800	5.8	.11	308	7,080	30,100	1,460	1,090	186	75,800	12,600	0.3	5.4	13	134,300	128,100	183	29,900	28,700	67	76	85,000	8.4	90
5-575. LAKE ASTABULA AT BALDHILL DAM																								
Sept. 26, 1956	c 1,265.72	9.6	0.01	44	19	55	9.2	259	0	89	9.5	0.3	1.4	0.15	373		0.51	189	0	37	1.7	592	8.2	
Oct. 6, 1957	c 1,265.90	14	.00	47	24	73	10	298	0	105	14	.2	1.5	.17	438		.60	218	0	41	2.1	689	8.0	
June 25, 1958	c 1,265.63	1.4	.06	53	29	68	9.6	330	0	116	14	.2	.4	.17	477		.65	252	0	36	1.9	745	8.2	10

a Pool elevation, in feet below temporary reference mark no. 1.
b Lake content, in acre-feet.
c Pool elevation, in feet.

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

Chemical analyses, in parts per million, water year October 1957 to September 1958--Continued

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids: 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	Per cent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH	Color
5-580. SHEYENNE RIVER BELOW BALDHILL DAM																								
Jan. 6, 1958 .	73	18	0.08	53	28	66	11	318	0	111	14	0.2	4.0	0.16	477		0.65	246	0	36	1.8	727	7.8	35
Mar. 14.....	74	18	.01	65	35	77	10	344	16	134	17	.3	1.7	.17	549		.75	304	0	35	1.9	835	8.5	--
Apr. 23.....	34.0	15	.01	51	32	69	9.6	332	0	115	15	.2	2.0	.18	486		.66	258	0	36	1.9	752	7.7	--
June 16	5.6	9.8	.01	50	29	67	9.7	310	0	116	15	.3	1.9	.19	458		.62	246	0	36	1.9	734	7.2	14
June 25	4.9	5.0	.01	52	29	68	9.2	320	0	117	14	.2	.9	.18	482		.66	250	0	36	1.9	745	7.9	10
5-885. HOMME RESERVOIR NEAR PARK RIVER																								
Sept. 25, 1956	c 1,079.85	23	0.01	60	15	33	6.4	190	0	121	11	0.3	2.6	0.09	382		0.52	212	56	25	1.0	568	7.6	
Oct. 5, 1957 .	c 1,078.72	21	.01	68	23	37	7.4	221	0	145	12	.3	1.1	.12	436		.59	264	83	23	1.0	652	7.4	
5-1202. WINTERING RIVER NEAR BERGEN																								
Apr. 30, 1957	0.1	6.9	0.29	30	21	252	14	550	0	198	47	0.4	3.3	0.60	932		1.27	162	0	75	8.6	1,360	7.6	
July 8, 1958 .	42	37	.05	19	9.8	118	9.4	262	0	110	14	.4	2.0	.33	476		.65	88	0	72	5.5	665	7.4	
BUFFALO LODGE LAKE NEAR GRANVILLE																								
Apr. 30, 1957	a 10.27	30	0.00	35	54	139	17	384	0	240	30	0.2	4.5	0.36	767		1.04	308	0	48	3.4	1,130	7.7	
Oct. 3	a 10.91	34	.10	20	59	152	21	395	0	265	37	.2	1.5	.17	821		1.12	291	0	51	3.9	1,180	7.9	
June 20, 1958	a 10.93	25	.11	22	60	171	21	453	10	268	39	.3	.5	.21	861		1.17	301	0	53	4.3	1,220	8.3	

a Pool elevation, in feet below temporary reference mark no. 1.
c Pool elevation, in feet.

5-1299. SOUTH BRANCH LITTLE FORK RIVER NEAR COOK, MINN.

LOCATION.--At bridge on U.S. Highway 53, 3.1 miles south of Cook, St. Louis County.
RECORDS AVAILABLE.--Chemical analyses: April to September 1958.
REMARKS.--Records of turbidity available in district office at Lincoln, Nebr. Discharge records for miscellaneous sites for water year October 1957 to September 1958 given in WSP 1558.

Chemical analyses, in parts per million, April to September 1958

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180° C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate					
Apr. 18, 1958 a....	b 100	6.8	0.47	10	2.9	2.2	1.5	33	11	0.7	0.2	1.6	0.08	75	0.10		37	10	11	0.2	76.9	6.8	90
May 21.....	41	4.0	.12	9.3	3.1	2.8	1.0	33	14	.1	.2	.5		95	.13		36	9	14	.2	77.1	6.8	170
June 25	40	4.7	.17	8.6	3.3	3.2	.8	32	13	.1	.2	.6		91	.12		35	9	16	.2	68.9	6.7	180
July 18.....	51	6.1	.25	9.5	2.5	1.7	.6	28	10	.2	.2	2.4		94	.13		34	11	10	.1	66.6	6.1	180
Aug. 16.....	20	6.0	.13	11	3.1	2.1	.8	40	11	.2	.2	1.3		89	.12		40	7	10	.1	79.5	6.5	100
Sept. 25.....	42	8.9	.22	11	2.6	1.9	.7	35	11	.6	.2	.5		98	.13		38	9	10	.1	73.5	7.3	200

a Manganese (Mn), 0.00 ppm.
b Estimated.

LAKE OF THE WOODS BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN LAKE OF THE WOODS BASIN IN MINNESOTA

Chemical analyses, in parts per million, water year October 1957 to September 1958

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180° C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate					
5-1284. SAND RIVER NEAR BRITT																							
Apr. 26, 1958	12	3.5	0.25	3.6	1.9	1.5	0.8	16	7.5	0.5	0.2	0.8	0.05	55	0.07		17	4	15	0.2	43.0	6.4	110
May 21	11	2.2	.16	5.1	1.5	1.7	.6	17	7.8	1.0	.1	.3		54	.07		19	5	16	.2	46.9	6.6	125
June 25	22	3.0	.43	5.0	1.6	1.4	.2	14	9.5	.2	.1	.5		70	.10		19	8	14	.1	38.5	6.3	200
5-1296. LITTLE FORK RIVER AT COOK																							
Apr. 18, 1958 [a]	[b] 100	--	0.54	--	--	2.3	--	29	16	0.8	--	--	0.17	--	--		42	18	11	0.2	73.2	6.5	--
Apr. 25	28	3.7	.26	7.7	3.1	2.7	1.4	27	14	.1	0.3	1.4		96	0.13		32	10	15	.2	69.2	6.5	220
May 21	27	1.8	.19	9.4	3.5	2.2	.7	30	14	.6	.3	.5		104	.14		38	13	11	.2	71.5	6.5	225
June 25	20	3.5	.30	11	3.5	2.5	.6	33	16	1.4	.3	.5		117	.16		42	15	11	.2	81.4	6.5	250
5-1298. RICE RIVER NEAR ANGORA																							
Apr. 26, 1958	20	6.2	0.19	5.2	2.7	1.8	1.2	23	10	0.3	0.2	0.8	0.09	74	0.10		24	5	13	0.2	52.7	6.5	150
May 21	19	5.4	.12	6.5	2.4	1.8	.8	22	11	.3	.1	.4		78	.11		26	8	13	.2	53.1	6.6	125
June 25	23	5.9	.16	6.7	2.3	1.6	.6	22	9.3	.5	.1	.3		76	.10		26	8	12	.1	51.0	6.6	150
5-1305. STURGEON RIVER NEAR CHISHOLM																							
Apr. 18, 1958 [c]	75	6.9	0.61	12	2.4	2.4	1.1	43	7.3	1.0	0.1	1.1	0.05	78	0.11		40	5	11	0.2	83.6	7.1	60
July 20	60	7.1	.34	12	3.4	2.0	.7	42	14	.6	.2	2.1		103	.14		44	10	9	.1	84.7	6.7	160
Aug. 17	27	6.2	.08	14	2.7	3.0	.8	51	11	.2	.2	.9		91	.12		46	4	12	.2	93.6	6.8	60
Sept. 26	98	10	.10	11	3.3	2.6	1.2	43	7.3	.4	.2	.6		91	.12		41	6	12	.2	84.8	6.9	110

a Manganese (Mn), 0.00 ppm.
b Estimated.
c Manganese (Mn), 0.12 ppm.

MISCELLANEOUS ANALYSES OF STREAMS IN SWAN RIVER BASIN IN MINNESOTA

Chemical analyses, in parts per million, water year October 1957 to September 1958

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180° C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate					
5-2170. SWAN RIVER NEAR WARBA																							
Sept. 28, 1955.....	120	16	0.11	27	8.9	6.9		120	19	0.0	--	0.6	0.04	146	0.20		104	6	13	0.3	222	7.5	37
Apr. 19, 1958 a...	78	8.5	.24	31	10	4.3	1.9	134	16	1.2	0.4	.5	.04	143	.19		120	10	7	.2	243	7.3	15
Sept. 30 b.....	84	9.3	.32	30	10	4.6	1.4	123	24	2.2	.2	.8	--	156	.21		116	15	8	.2	236	6.9	40

a Manganese (Mn), 0.28 ppm.
b Manganese (Mn), 0.01 ppm.

MISSISSIPPI RIVER MAIN STEM

5-3310. MISSISSIPPI RIVER AT ST. PAUL, MINN.

LOCATION.--Temperature recorder at gaging station, 300 feet upstream from Robert Street Bridge in St. Paul, Ramsey County, and 6 miles downstream from Minnesota River.
DRAINAGE AREA.--36,800 square miles, approximately.
RECORDS AVAILABLE.--Water temperatures: October 1956 to September 1958.
EXTREMES, 1957-58.--Water temperatures: Maximum, 85°F Aug. 13-18; minimum, freezing point Feb. 23-26.
EXTREMES, 1956-58.--Water temperatures: Maximum, 85°F Aug. 13-18, 1958; minimum, freezing point on many days during winter months.
REMARKS.--Records of discharge for water year October 1957 to September 1958 given in WSP 1558.

Temperature (° F) of water, water year October 1957 to September 1958
/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	57	57	44	44	36	36	36	36	37	37	34	34	41	41	56	56	68	68	73	72	80	79	77	76
2	57	57	44	44	37	36	36	36	37	36	34	34	42	41	56	56	68	68	74	73	80	80	76	76
3	57	56	44	43	37	37	36	36	36	36	35	34	43	42	56	56	68	68	76	74	81	80	76	75
4	56	56	43	43	38	37	36	36	36	36	35	35	43	43	56	56	68	68	77	76	82	81	75	74
5	56	56	43	42	38	38	36	36	36	36	35	35	44	43	56	56	68	67	78	77	82	81	74	74
6	56	56	42	42	38	38	36	36	36	36	35	35	44	44	56	56	67	67	78	77	82	82	74	73
7	56	56	42	42	38	37	36	36	36	36	36	35	44	44	56	56	67	67	77	77	82	82	73	73
8	56	55	42	42	37	37	36	36	36	36	35	35	44	44	57	56	67	67	77	76	83	82	73	72
9	55	55	42	41	37	36	36	35	36	36	35	35	45	44	57	57	67	67	76	75	83	83	72	72
10	55	55	41	40	36	36	35	35	36	36	36	35	45	45	58	57	67	67	76	75	84	83	72	71
11	55	54	40	40	36	36	36	35	36	36	36	36	45	45	59	58	67	67	75	74	84	84	71	71
12	54	54	40	39	36	36	36	36	36	35	37	36	46	45	60	59	67	67	74	74	84	84	71	71
13	54	53	39	39	36	36	36	36	35	35	37	37	46	46	60	60	67	67	74	74	85	84	71	70
14	53	53	39	39	36	36	36	36	35	35	38	37	47	46	61	60	67	67	74	74	85	85	70	70
15	53	53	39	39	36	35	36	36	35	35	38	38	48	47	62	61	67	67	75	74	85	85	70	69
16	53	52	39	39	35	35	36	36	35	35	38	38	48	48	63	62	68	67	75	75	85	85	69	69
17	52	52	39	39	35	35	36	36	35	35	38	38	49	48	64	63	68	68	75	75	85	85	69	69
18	52	51	39	38	35	35	37	36	35	34	38	38	50	49	65	64	68	68	75	75	85	84	69	69
19	51	51	38	38	35	35	37	37	34	34	38	37	51	50	66	65	68	68	75	75	84	84	69	68
20	51	51	38	38	35	35	37	37	34	34	37	37	52	51	66	66	68	68	75	75	84	83	68	67
21	51	51	38	38	35	35	37	37	34	33	37	37	53	52	66	66	68	68	75	75	83	83	67	67
22	51	50	38	37	35	35	37	37	33	33	37	37	54	53	66	66	69	68	76	75	83	82	67	66
23	50	49	37	37	36	35	37	37	33	32	38	37	54	54	66	66	69	69	76	76	82	82	66	66
24	49	49	37	37	35	35	37	37	32	32	38	38	55	54	66	66	69	69	77	76	82	81	66	66
25	49	48	37	37	35	35	37	37	32	32	38	38	55	55	66	66	69	69	78	77	81	80	66	66
26	48	48	37	36	36	35	37	37	33	32	39	38	55	55	66	66	70	69	78	78	80	79	66	65
27	48	47	36	36	36	36	37	37	33	33	39	39	55	55	66	66	70	70	79	78	79	79	65	65
28	47	47	36	36	36	36	37	37	34	33	40	39	55	55	67	66	70	70	79	79	79	78	65	65
29	47	46	36	36	36	36	37	37	--	--	40	40	55	55	67	67	71	70	79	79	78	77	65	65
30	46	45	36	36	36	36	37	37	--	--	40	40	56	55	68	67	72	71	79	79	77	77	65	64
31	45	44	--	--	36	36	37	37	--	--	41	40	--	--	68	68	--	--	79	79	77	77	--	--
Average	52	52	39	39	36	36	36	36	35	35	37	37	49	48	62	62	68	68	76	76	82	82	70	69

WISCONSIN RIVER BASIN

5-4037. DELL CREEK NEAR LAKE DELTON, WIS.

LOCATION.--At gaging station at Butterfield Bridge on town road, 6 miles southwest of Lake Delton, Sauk County, 7 miles east of Reedsburg, and 7 miles upstream from mouth.
DRAINAGE AREA.--44.9 square miles.
RECORDS AVAILABLE.--Water temperatures: October 1957 to September 1958.
Sediment records: October 1957 to September 1958.
EXTREMES, 1957-58.--Water temperatures: Maximum, 65°F July 1, Aug. 10; minimum, freezing point on many days during November to February.
Sediment concentrations: Maximum daily, 87 ppm Feb. 25; minimum daily, 1 ppm May 1.
Sediment loads: Maximum daily, 17 tons Apr. 6; minimum daily, less than 0.05 ton May 1.
REMARKS.--Flow affected by ice Dec. 11-13, Dec. 29 to Feb. 24. Records of discharge for water year October 1957 to September 1958 given in WSP 1558.

Temperature (° F) of water, water year October 1957 to September 1958
/Once-daily measurement at approximately 8 a.m./

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

WISCONSIN RIVER BASIN--Continued

5-4037. DELL CREEK NEAR LAKE DELTON, WIS.--Continued

Suspended sediment, water year October 1957 to September 1958

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	8	0.3	16.3	6	0.3	19.4	7	0.4
2.....	14.9	9	.4	17.1	10	.5	19.7	4	.2
3.....	14.9	6	.2	23	15	.9	19.1	2	.1
4.....	14.6	6	.2	19.1	8	.4	18.5	3	.1
5.....	14.6	5	.2	18.0	4	.2	18.8	4	.2
6.....	14.6	3	.1	17.4	3	.1	19.1	3	.2
7.....	14.9	2	.1	17.7	3	.1	19.1	4	.2
8.....	14.9	2	.1	24	7	.4	18.8	3	.2
9.....	14.6	3	.1	21	4	.2	18.5	3	.1
10.....	15.2	2	.1	18.2	2	.1	18.5	4	.2
11.....	15.2	2	.1	18.5	2	.1	19	8	.4
12.....	15.2	2	.1	18.8	3	.2	19	3	.2
13.....	15.2	2	.1	20	4	.2	19	2	.1
14.....	15.4	2	.1	22	4	.2	18.2	3	.1
15.....	17.1	3	.1	23	6	.4	17.4	4	.2
16.....	21	5	.3	28	15	1.1	17.7	3	.1
17.....	17.1	3	.1	22	5	.3	17.7	4	.2
18.....	16.8	2	.1	27	14	s 1.4	20	10	.5
19.....	16.6	2	.1	52	56	7.9	31	30	2.5
20.....	16.3	3	.1	28	15	1.1	24	15	1.0
21.....	16.3	3	.1	24	8	.5	21	6	.3
22.....	16.3	3	.1	21	4	.2	21	5	.3
23.....	18.2	6	.3	21	5	.3	23	6	.4
24.....	21	11	.6	23	6	.4	21	8	.4
25.....	18.2	6	.3	21	5	.3	20	9	.5
26.....	17.1	6	.3	20	6	.3	19.7	6	.3
27.....	16.8	6	.3	20	6	.3	19.4	5	.3
28.....	16.6	6	.3	21	6	.3	19.7	5	.3
29.....	16.6	6	.3	21	5	.3	18	5	.2
30.....	16.6	4	.2	20	9	.5	17	5	.2
31.....	16.6	7	.3	--	--	--	17	5	.2
Total.	504.3	--	6.1	663.1	--	19.5	609.3	--	10.6

Day	January			February			March		
1.....	16	5	0.2	15	5	0.2	21	12	0.7
2.....	16	6	.2	16	6	.2	20	11	.6
3.....	16	6	.2	15	6	.2	20	9	.5
4.....	16	5	.2	15	6	.2	19.7	9	.5
5.....	17	6	.3	15	7	.3	19.7	9	.5
6.....	17	5	.2	15	6	.2	19.7	7	.4
7.....	18	5	.2	15	8	.3	19.7	8	.4
8.....	18	4	.2	15	5	.2	20	8	.4
9.....	18	5	.2	14	4	.2	20	8	.4
10.....	18	7	.3	14	4	.2	19.7	6	.3
11.....	17	5	.2	14	5	.2	19.4	6	.3
12.....	17	5	.2	14	5	.2	19.1	5	.2
13.....	17	5	.2	14	4	.2	19.1	6	.3
14.....	16.8	6	.3	13	5	.2	19.1	5	.2
15.....	17	4	.2	13	6	.2	18.5	4	.2
16.....	17	4	.2	14	4	.2	18.5	4	.2
17.....	16	5	.2	13	5	.2	18.5	5	.2
18.....	16	4	.2	13	3	.1	18.8	4	.2
19.....	16	8	.3	13	2	.1	19.1	5	.2
20.....	16	7	.3	12.3	3	.1	19.1	3	.2
21.....	16	4	.2	13	3	.1	18.8	4	.2
22.....	15	3	.1	13	4	.1	18.8	3	.2
23.....	15	4	.2	20	--	e 2	19.1	3	.2
24.....	16	6	.2	55	75	sa 12	19.1	2	.1
25.....	16	4	.2	69	87	16	19.7	2	.1
26.....	16	4	.2	46	77	9.6	20	3	.2
27.....	16	5	.2	31	28	2.3	20	3	.2
28.....	16	6	.2	25	16	1.1	20	3	.2
29.....	16	4	.2	--	--	--	20	4	.2
30.....	16	4	.2	--	--	--	20	5	.3
31.....	16	5	.2	--	--	--	20	4	.2
Total.	509.8	--	6.6	554.3	--	47.1	604.2	--	9.0

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

WISCONSIN RIVER BASIN--Continued

5-4037. DELL CREEK NEAR LAKE DELTON, WIS.--Continued

Suspended sediment, water year October 1957 to September 1958--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.....	20	4	0.2	18.0	1	(t)	31	40	sa 4
2.....	23	6	.4	18.2	2	0.1	21	13	.7
3.....	23	5	.3	21	4	.2	18.2	8	.4
4.....	22	4	.2	18.8	2	.1	17.7	8	.4
5.....	37	--	e 8	17.7	3	.1	17.4	7	.3
6.....	89	70	17	17.1	4	.2	16.6	6	.3
7.....	38	38	3.9	16.8	4	.2	16.0	7	.3
8.....	27	12	.9	16.3	3	.1	16.0	8	.3
9.....	25	8	.5	16.3	3	.1	15.7	9	.4
10.....	23	8	.5	16.0	3	.1	16.8	13	.6
11.....	22	7	.4	15.4	4	.2	16.0	8	.3
12.....	22	6	.4	15.0	5	.2	15.2	5	.2
13.....	22	6	.4	14.6	4	.2	14.9	5	.2
14.....	21	5	.3	14.6	6	.2	14.6	4	.2
15.....	21	4	.2	14.3	5	.2	14.3	2	.1
16.....	21	5	.3	14.3	3	.1	14.0	4	.2
17.....	21	5	.3	14.3	3	.1	13.8	5	.2
18.....	21	6	.3	14.6	3	.1	14.0	8	.3
19.....	21	5	.3	14.0	2	.1	14.0	5	.2
20.....	20	3	.2	13.8	2	.1	14.3	8	.3
21.....	20	4	.2	13.5	3	.1	13.8	7	.3
22.....	20	4	.2	13.8	2	.1	13.8	8	.3
23.....	20	8	.4	13.5	2	b .1	14.3	11	.4
24.....	39	60	6.3	13.5	2	b .1	14.6	10	.4
25.....	27	12	.9	14.9	2	.1	14.6	17	.7
26.....	22	3	.2	13.5	2	.1	15.4	12	.5
27.....	20	3	.2	13.2	2	.1	14.9	6	.2
28.....	19.7	2	.1	12.9	2	.1	14.3	7	.3
29.....	19.1	2	.1	12.7	5	.2	13.5	6	.2
30.....	18.2	2	.1	12.9	6	.2	13.5	7	.2
31.....	--	--	--	14.0	6	.2	--	--	--
Total.	764.0	--	43.7	469.5	--	4.2	474.2	--	13.4

Day	July			August			September		
1.....	13.2	11	0.4	12.7	9	0.3	12.7	7	0.2
2.....	16.0	30	sa 2	12.4	13	.4	12.4	8	.3
3.....	30	86	7.0	12.2	8	.3	12.2	8	.3
4.....	34	56	5.1	12.2	6	.2	13.2	8	.3
5.....	26	36	2.5	12.7	9	.3	13.8	11	.4
6.....	18.8	17	.9	19.1	77	s 4.7	17.4	22	1.0
7.....	17.1	12	.6	14.6	13	.5	14.6	11	.4
8.....	16.8	14	.6	13.2	10	.4	13.8	8	.3
9.....	17.1	14	.6	12.9	10	.3	13.5	8	.3
10.....	16.3	14	.6	12.7	10	.3	13.2	6	.2
11.....	15.7	10	.4	12.7	11	.4	13.2	5	.2
12.....	14.0	10	.4	13.5	17	.6	13.2	5	.2
13.....	13.5	9	.3	13.5	19	.7	12.7	5	.2
14.....	13.5	9	.3	12.7	8	.3	12.2	6	.2
15.....	15.2	11	.4	12.4	8	.3	12.7	7	.2
16.....	14.6	13	.5	12.2	8	.2	12.7	6	.2
17.....	14.0	16	.6	11.9	7	.2	12.9	7	.2
18.....	14.0	17	.6	11.6	8	.2	13.5	8	.3
19.....	13.8	12	.4	11.6	8	.2	13.2	7	.2
20.....	13.5	9	.3	12.7	10	.3	12.9	6	.2
21.....	13.2	7	.2	12.2	9	.3	12.7	5	.2
22.....	12.9	6	.2	12.2	8	.3	12.4	4	.1
23.....	12.9	7	.2	11.9	8	.2	12.4	4	.1
24.....	12.9	7	.2	12.7	10	.3	15.7	14	.6
25.....	13.2	8	.3	12.9	8	.3	14.6	8	.3
26.....	12.9	8	.3	13.2	7	.2	13.8	3	.1
27.....	12.9	7	.2	13.2	8	.3	13.5	3	.1
28.....	12.9	7	.2	13.2	8	.3	13.5	3	.1
29.....	12.4	8	.3	12.9	8	.3	13.5	4	.1
30.....	12.9	8	.3	12.7	8	.3	13.8	4	.1
31.....	12.9	8	.3	12.4	7	.2	--	--	--
Total.	489.1	--	27.2	399.0	--	14.1	401.9	--	7.6

Total discharge for year (cfs-days)..... 6,442.7
Total load for year (tons)..... 209.1

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.

WISCONSIN RIVER BASIN--Continued

5-4065. 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 1958.
Sediment records: February 1954 to September 1958.
EXTREMES, 1957-58.--Water temperatures: Maximum, 76°F Aug. 5; minimum, freezing point on several days during November to February.
Sediment concentrations: Maximum daily, 554 ppm June 1; minimum daily, 2 ppm Sept. 26-28.
Sediment loads: Maximum daily, 180 tons Feb. 24; minimum daily, 0.1 ton Sept. 25-30.
EXTREMES, 1954-58.--Water temperatures: Maximum, 78°F July 7, 1955, June 10, 1956, July 20, 1957; minimum, freezing point on many days during winter months.
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 many days.
REMARKS.--Flow affected by ice Nov. 28-30, Dec. 10-13, Dec. 29 to Jan. 7, Jan. 30 to Feb. 3, Feb. 7-19. Records of discharge for water year October 1957 to September 1958 given in WSP 1558.

Temperature (° F) of water, water year October 1957 to September 1958
/Once-daily measurement at varying hours/

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

WISCONSIN RIVER BASIN--Continued

5-4065. BLACK EARTH CREEK AT BLACK EARTH, WIS.--Continued

Suspended sediment, water year October 1957 to September 1958

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	21	20	1.1	22	46	2.7	23	32	2.0
2	20	18	1.0	22	52	3.1	23	38	2.4
3	20	15	.8	28	44	3.3	23	36	2.2
4	20	13	.7	23	39	2.4	22	52	3.1
5	20	18	1.0	22	70	4.2	22	49	2.9
6	20	13	.7	22	84	5.0	23	32	2.0
7	20	15	.8	22	51	3.0	22	25	1.5
8	21	13	.7	34	48	4.4	22	28	1.7
9	21	10	.6	27	27	2.0	22	20	1.2
10	20	13	.7	24	32	2.1	22	28	1.7
11	20	16	.9	23	39	2.4	22	24	1.4
12	20	13	.7	23	44	2.7	22	13	.8
13	20	13	.7	24	58	3.8	21	15	.8
14	20	6	.3	27	62	4.5	21	18	1.0
15	22	5	.3	27	59	4.3	21	31	1.8
16	23	6	.4	25	68	4.6	21	23	1.3
17	22	5	.3	24	60	3.9	21	17	1.0
18	21	5	.3	39	110	sa 16	23	23	1.4
19	21	6	.3	52	100	sa 15	27	37	2.7
20	21	8	.4	34	44	4.0	25	18	1.2
21	21	10	.6	31	40	3.3	23	16	1.0
22	21	16	.9	28	46	3.5	26	37	2.6
23	30	53	s 5.7	28	60	4.5	30	45	3.6
24	35	--	e 4	27	69	5.0	25	22	1.5
25	25	22	1.5	26	70	4.9	24	28	1.8
26	23	46	2.8	25	47	3.2	24	22	1.4
27	22	57	3.4	25	55	3.7	23	14	.9
28	22	75	4.4	23	64	4.0	24	13	.8
29	22	65	3.9	23	43	2.7	21	13	.7
30	22	47	2.8	23	32	2.0	21	14	.8
31	22	40	2.4	--	--	--	21	13	.7
Total	678	--	45.1	803	--	130.2	710	--	49.9

Day	January			February			March		
1	20	24	1.3	19	12	0.6	22	15	0.9
2	17	20	.9	19	15	.8	22	22	1.3
3	17	15	.7	19	22	1.1	21	18	1.0
4	19	14	.7	18	22	1.1	21	17	1.0
5	19	15	.8	18	30	1.4	20	14	.8
6	17	16	.7	18	22	1.1	21	21	1.2
7	16	10	.4	15	24	1.0	20	30	1.6
8	20	19	1.0	14	27	1.0	21	26	1.5
9	20	21	1.1	14	23	.9	20	23	1.2
10	20	14	.8	14	21	.8	20	17	.9
11	19	12	.6	15	16	.6	20	20	1.1
12	19	16	.8	15	22	.9	20	20	1.1
13	19	25	1.3	15	18	.7	20	22	1.2
14	19	13	.7	14	16	.6	19	17	.9
15	19	21	1.1	14	19	.7	20	8	.4
16	19	22	1.1	12	22	.7	19	10	.5
17	19	19	1.0	12	22	.7	19	15	.8
18	19	18	.9	12	19	.6	19	13	.7
19	19	14	.7	18	17	.8	19	11	.6
20	19	22	1.1	19	19	1.0	19	12	.6
21	19	20	1.0	18	21	1.0	19	13	.7
22	19	21	1.1	19	18	.9	19	13	b .7
23	18	27	1.3	74	262	s 128	18	16	.8
24	18	23	1.1	128	410	sa 180	18	19	.9
25	18	24	1.2	74	143	s 36	18	20	1.0
26	18	30	1.4	37	79	7.9	18	18	.9
27	19	22	1.1	29	40	3.1	18	18	.9
28	19	16	.8	24	18	1.2	18	14	.7
29	19	19	1.0	--	--	--	18	14	.7
30	18	18	.9	--	--	--	19	13	.7
31	18	14	.7	--	--	--	19	16	.8
Total	578	--	29.3	717	--	375.2	604	--	28.1

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

WISCONSIN RIVER BASIN--Continued

5-4065. BLACK EARTH CREEK AT BLACK EARTH, WIS.--Continued

Suspended sediment, water year October 1957 to September 1958--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	19	21	1.1	20	22	1.2	65	554	97
2	20	26	1.4	19	28	1.4	30	129	10
3	20	30	1.6	20	35	1.9	25	43	2.9
4	20	33	1.8	20	54	2.9	23	49	3.0
5	38	150	sa 25	19	51	2.6	22	58	3.4
6	44	110	sa 14	19	33	1.7	20	63	3.4
7	30	27	2.2	18	22	1.1	20	58	3.1
8	26	34	2.4	18	29	1.4	20	51	2.8
9	24	53	3.4	18	33	1.6	21	55	3.1
10	23	43	2.7	18	28	1.4	21	43	2.4
11	23	35	2.2	18	25	1.2	22	53	3.1
12	22	28	1.7	18	35	1.7	20	66	3.6
13	22	27	1.6	18	42	2.0	20	46	2.5
14	21	35	2.0	18	40	1.9	20	32	1.7
15	20	27	1.4	18	32	1.6	20	45	2.4
16	20	24	1.3	18	31	1.5	18	42	2.0
17	20	28	1.5	20	31	1.7	18	45	2.2
18	20			19	30	1.5	18	70	3.4
19	20			19	30	1.5	18	48	2.3
20	20	--	e 2	19	33	1.7	16	42	1.8
21	21			19	37	1.9	16	47	2.0
22	23			19	40	2.0	16	59	2.5
23	21	20	1.1	20	42	2.3	17	50	2.3
24	25	42	2.8	20	43	2.3	18	32	1.6
25	22			20	32	1.7	18	47	2.3
26	20	--	e 1	20	43	2.3	16	57	2.5
27	20			20	40	2.2	16	43	1.8
28	20			20	37	2.0	16	27	1.2
29	20			20	58	3.1	16	23	1.0
30	20	17	.9	26	120	sa 11	16	28	1.2
31	--	--	--	73	480	sa 150	--	--	--
Total	684	--	87.1	651	--	214.3	622	-	174.5

Day	July			August			September		
1	16	63	2.7	18	43	2.1	14	18	b 0.7
2	16	51	2.2	18	43	2.1	14	6	.2
3	16	36	1.6	18	63	3.1	14	11	.4
4	18	34	1.6	17	60	b 3	15	19	.8
5	18	37	1.8	16	46	2.0	16	20	.9
6	18	41	2.0	19	46	2.4	17	26	1.2
7	16	32	1.4	18	36	1.7	15	28	1.1
8	16	42	1.8	17	35	1.6	14	28	1.0
9	18	28	1.4	16	22	1.0	14	16	.6
10	18	20	1.0	16	28	1.2	14	8	b .3
11	18	32	1.6	16	20	.9	14	16	.6
12	17	35	1.6	16	25	1.1	14	11	.4
13	16	37	1.6	16	26	1.1	14	22	.8
14	16	32	1.4	15	12	.5	14	13	.5
15	16	26	1.1	15	20	.8	15	20	.8
16	16	26	1.1	15	28	1.1	15	20	.8
17	18	22	1.1	14	33	1.2	16	13	.6
18	18	46	2.2	14	27	1.0	16	12	.5
19	18	27	1.3	14	25	.9	16	14	b .6
20	18	24	1.2	16	30	b 1	15	17	.7
21	17	25	1.1	19	29	1.5	15	12	.5
22	18	13	.6	14	23	.9	15	10	.4
23	18	18	.9	14	32	1.2	15	5	.2
24	18	17	.8	14	35	1.3	20	3	b .2
25	18	19	.9	14	19	.7	17	3	b .1
26	18	16	.8	14	13	.5	16	2	.1
27	18	14	.7	14	18	.7	16	2	.1
28	18	23	1.1	13	26	.9	16	2	.1
29	18	59	2.9	14	37	1.4	16	3	.1
30	18	55	2.7	14	16	.6	16	3	.1
31	18	47	2.3	14	18	.7	--	--	--
Total	538	--	46.5	482	--	40.2	458	--	15.4

Total discharge for year (cfs-days) 7,525
Total load for year (tons) 1,235.8

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

5-4065. BLACK EARTH CREEK AT BLACK EARTH, WIS.--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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. 23, 1958....	4:35 p.m.	75		304	490	40	52	64	82	94	98	99	100				BSWCM
Feb. 24	4:30 p.m.	118		412	749	41	51	63	81	95	99	100					BSWCM
May 31.....	7:00 p.m.	143		2,350	2,170	43	58	74	88	97	99	100					BSWCM
May 31.....	7:00 p.m.	143		2,350	2,180	17	30	50	81	97	99	100					BSNM
June 1.....	10:50 a.m.	65		576	203	73	84	90	96	99	99	100					BSWCM

TURKEY RIVER BASIN

5-4125. TURKEY RIVER AT GARBER, IOWA

LOCATION.--At gaging station on downstream side of bridge at Garber, Clayton County, 800 feet upstream from Wayman Creek, 2,000 feet downstream from Elk Creek, and 1 mile downstream from Volga River.
DRAINAGE AREA.--1,545 square miles.
RECORDS AVAILABLE.--Water temperatures: October 1957 to September 1958.
Sediment records: October 1957 to September 1958.
EXTREMES, 1957-58.--Water temperatures: Maximum, 82°F Aug. 19; minimum, freezing point on many days during November to March.
Sediment concentrations: Maximum daily, 12,300 ppm May 31; minimum daily, not determined.
Sediment loads: Maximum daily, 279,000 tons May 31; minimum daily, not determined.
REMARKS.--Maximum observed sediment concentration during water year, 52,800 ppm May 31. Flow affected by ice Nov. 9-11, Nov. 21 to Feb. 25. Records of discharge for water year October 1957 to September 1958 given in WSP 1558.

Temperature (° F) of water, water year October 1957 to September 1958
/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	a 64	43	32	32	--	33	42	50	61	74	71	60
2	a 62	50	32	32	32	33	44	52	60	72	74	63
3	a 66	50	32	32	--	32	45	56	60	72	79	71
4	a 62	48	32	32	32	32	44	54	60	73	73	71
5	a 60	42	32	32	--	32	44	48	66	71	75	68
6	a 58	36	a 33	32	32	32	42	50	b 62	73	--	70
7	a 60	44	32	32	--	32	b 44	50	65	68	73	65
8	a 58	38	--	32	32	32	37	52	66	68	73	63
9	a 54	34	32	32	--	32	b 44	54	65	72	72	67
10	a 54	34	32	32	32	32	b 40	60	67	72	79	63
11	a 54	36	--	32	--	32	b 40	62	b 65	68	77	63
12	a 54	37	32	32	32	32	b 42	62	64	66	75	60
13	a 58	40	--	32	--	33	46	60	65	73	70	a 72
14	a 58	42	32	32	32	32	b 44	64	64	73	74	65
15	54	42	--	32	--	32	54	65	64	70	74	69
16	a 60	41	32	32	32	32	53	62	b 62	68	71	65
17	a 54	40	a 32	32	--	32	56	62	63	67	73	60
18	a 52	35	32	32	32	32	58	62	68	68	67	58
19	a 52	33	33	32	32	32	58	58	69	66	a 82	57
20	a 50	34	33	32	--	32	56	63	67	69	75	b 59
21	a 49	33	32	--	32	32	54	56	64	68	75	b 63
22	49	32	a 33	32	--	33	49	62	64	67	67	57
23	53	32	34	32	32	34	50	58	62	69	67	63
24	49	32	32	32	34	34	46	62	65	73	65	68
25	40	32	32	32	33	40	44	60	64	72	58	66
26	42	32	32	32	34	37	47	b 60	62	74	65	b 56
27	37	35	32	32	34	37	45	64	64	70	64	56
28	37	34	32	--	34	39	48	58	68	71	68	b 50
29	41	34	32	--	--	38	40	62	72	72	72	55
30	40	32	32	--	--	38	44	66	74	72	71	57
31	40	--	32	32	--	42	--	62	--	71	64	--
Average	52	38	32	32	c 32	34	47	59	65	70	71	63

a Measurement between 12 m. and 6 p.m.
b Measurement between 5 a.m. and 6 a.m.
c Includes estimated temperature, 32° F, on missing days.

TURKEY RIVER BASIN--Continued

5-4125. TURKEY RIVER AT GARBER, IOWA--Continued

Suspended sediment, water year October 1957 to September 1958

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	116			183			180		
2	125			181			190		
3	119			181			200		
4	119			202			170		
5	119			208	19	10	190	22	11
6	119			202			190		
7	125	9	3	202			180		
8	123			200			170		
9	127			168			180		
10	127			150			120	18	6
11	129			160			160	--	
12	132			192	23	11	145	17	
13	127			192			140	--	
14	144	13	5	192			140	17	
15	161	24	10	192			140	--	a 8
16	174			228	24	15	155	15	
17	170			210	22	12	155	24	
18	170			263	110	sb 95	170	23	
19	165	9	4	310	110	sb 100	180	200	97
20	157			236	50	32	200	340	184
21	174			195			195	70	37
22	167	--	e 7	175			190	45	23
23	202	--	e 50	205			215	83	48
24	255	90	62	220			230	25	16
25	220	37	22	220			240	48	31
26	208			222	20	11	225	29	18
27	188			224			215		
28	202	17	9	210			205		
29	185			170			190	13	7
30	185			140			175		
31	181			--	--	--	160		
Total	4,915	--	273	6,033	--	521	5,595	--	658

Day	January			February			March		
	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	150	10	4	140	--		950	334	857
2	138	12	4	140	13		720	212	412
3	125	12	4	135	--		580	105	164
4	115	--	e 6	130	12	a 4	496	110	147
5	105	29	8	130	--		424	75	86
6	103	22	6	120	12		402	33	36
7	103			115	--		399	62	67
8	103			110	44		385	38	40
9	103			105	--		364	31	30
10	103	12	4	103	37	a 12	351	25	24
11	105			100	--		328	23	20
12	110			96	14		361	43	42
13	118			95	--		420	84	95
14	122			94	15		388	55	58
15	122			94	--		344	49	46
16	122			94	12		304	18	15
17	122	15	5	94	--	a 4	304	19	16
18	122			94	14		247		
19	122			94	26		269		
20	122			94	--		260		
21	122			94	14		258	13	9
22	125			94	--		252		
23	130			200	500	sb 600	233		
24	135			900	1,480	s 4,150	247		
25	140			2,000	2,060	11,100	233		
26	145	16	6	2,230	1,450	8,730	218		
27	150			1,900	1,390	7,180	220		
28	150			1,310	679	2,400	218	12	7
29	150			--	--	--	218		
30	145			--	--	--	208		
31	145			--	--	--	223		
Total	3,872	--	160	10,905	--	34,288	10,824	--	2,269

e Estimated.
s Computed by subdividing day.
a Computed from samples obtained about three or four times a week.
b Computed from partly estimated concentration graph.

TURKEY RIVER BASIN--Continued

5-4125. TURKEY RIVER AT GARBER, IOWA--Continued

Suspended sediment, water year October 1957 to September 1958--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.....	205	13	7	260			1,060	12,200	s 38,000
2.....	226	17	10	244			540	2,500	3,650
3.....	236	15	10	244	46	30	344	950	882
4.....	250	22	15	220			310	550	460
5.....	366	440	sb 600	239			278	500	375
6.....	620	700	1,170	226			247	420	280
7.....	645	295	514	220			228	350	215
8.....	770	240	499	218	31	18	1,060	10,200	s 53,500
9.....	670	145	262	205			774	5,620	s 13,300
10.....	560	95	144	190			425	1,230	s 1,470
11.....	500	79	107	190			348	500	470
12.....	460	63	78	190			289	340	265
13.....	417	49	55	174			298	280	225
14.....	388	50	52	174			266	260	187
15.....	368	38	38	174			244	260	171
					43	20			
16.....	354	56	54	170			247	270	180
17.....	338	62	57	172			241	233	152
18.....	319	53	46	161			210	185	105
19.....	310	58	49	172			234	266	s 186
20.....	301	70	57	155			183	220	109
21.....	292			144			170	150	69
22.....	286			165			150	185	75
23.....	286			146			165	100	45
24.....	316			146			157	93	39
25.....	310			138			183	108	53
		45	35		40	15			
26.....	304			150			185	121	60
27.....	295			146			165	101	45
28.....	269			134			152	97	40
29.....	286			131			134	131	47
30.....	260			119			146	135	53
31.....	--	--	--	2,960	12,300	s 279,000	--	--	--
Total.	11,207	--	4,174	8,377	--	279,590	9,433	--	114,708

	July			August			September		
1.....	132	123	44	210	146	83	114		
2.....	136	128	47	185	126	63	123		
3.....	136	140	51	167	76	34	121		
4.....	176	250	119	157	93	39	107		
5.....	213	283	163	198	177	95	112		
								38	12
6.....	213	260	150	208	143	80	123		
7.....	220	280	166	185	79	39	119		
8.....	195	155	82	163	68	30	140		
9.....	178	122	59	176	121	58	129		
10.....	167	104	47	152	72	30	110		
11.....	161	96	42	403	5,160	s 9,520	109		
12.....	157	105	45	352	2,600	sb 2,600	109		
13.....	138	94	35	821	2,100	sb 5,000	100		
14.....	226	950	sb 800	403	500	sb 600	96		
15.....	1,110	5,910	s 18,300	349	750	707	118		
								32	9
16.....	1,120	2,200	s 6,900	255	520	358	109		
17.....	605	725	s 1,210	223	350	211	107		
18.....	468	550	695	198	250	134	105		
19.....	417	450	507	178	260	125	107		
20.....	344	290	269	176	275	131	96		
21.....	301	163	132	805	2,420	s 6,200	100		
22.....	269	120	87	293	1,300	sb 1,100	102		
23.....	215	115	67	174	300	141	98		
24.....	215	81	47	159	197	85	110		
25.....	210	79	45	170	97	45	116		
								29	8
26.....	200	--	e 40	140	104	39	102		
27.....	183	77	38	129	91	32	100		
28.....	200	97	52	132	80	29	86		
29.....	280	300	227	136	77	28	90		
30.....	316	720	614	127	88	30	96		
31.....	252	230	157	107	30	9	--	--	--
Total.	9,153	--	31,237	7,531	--	27,675	3,254	--	290

Total discharge for year (cfs-days)..... 91,099
Total load for year (tons)..... 495,843

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

TURKEY RIVER BASIN--Continued

5-4125. TURKEY RIVER AT GARBER, IOWA--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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, 1958....	4:30 p.m.	1,200	32	4,240	9,550	17	22	30	44	69	96	98	99		100		SPWCM
May 31.....	2:40 p.m.	9,420	62	3,620	4,610	--	26	--	77	--	99	99	100		--		SPWCM
May 31.....	2:40 p.m.	9,420	62	3,620	3,960	--	38	--	77	--	99	99	100		--		SPNM
May 31.....	3:20 p.m.	9,840	62	52,200	3,050	--	34	--	57	--	99	100	--		--		SPWCM
May 31.....	3:20 p.m.	9,840	62	52,200	2,590	--	25	--	55	--	99	100	--		--		SPNM
May 31.....	4:50 p.m.	11,400	62	50,400	5,970	--	29	--	54	--	99	100	--		--		SPWCM
May 31.....	4:50 p.m.	11,400	62	50,400	5,080	--	20	--	49	--	99	--	100		--		SPNM
June 1.....	6:15 a.m.	1,250	61	16,200	3,700	--	50	--	78	--	100	--	--		--		SPWCM
June 1.....	6:15 a.m.	1,250	61	16,200	3,170	--	39	--	75	--	100	--	--		--		SPNM
June 1.....	1:20 p.m.	1,040	60	11,200	3,290	34	47	63	80	92	99	99	100		--		SPWCM
June 1.....	1:20 p.m.	1,040	60	11,200	2,810	27	35	58	76	92	99	99	100		--		SPNM
June 8.....	7:30 a.m.	500	66	8,080	2,760	--	44	--	76	--	99	100	--		--		SPWCM
June 8.....	5:20 p.m.	1,070	70	16,300	3,270	--	34	--	62	--	100	--	--		--		SPWCM
June 8.....	6:40 p.m.	2,820	70	32,000	9,830	--	28	--	50	--	99	100	--		--		SPWCM
July 15.....	8:00 a.m.	1,280	70	9,080	3,700	--	43	--	68	--	98	99	100		--		SPWCM
July 16.....	7:35 a.m.	1,370	68	2,510	3,380	--	40	--	58	--	94	98	100		--		SPWCM
Aug. 11	11:40 a.m.	1,220	77	19,400	4,540	--	33	--	62	--	97	98	99		100		SPWCM
Aug. 21	10:15 a.m.	1,400	73	3,700	2,750	--	40	--	59	--	97	99	100		--		SPWCM

ROCK RIVER BASIN

5-4305. 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 1958.
EXTREMES, 1957-58.--Water temperatures: Maximum, 85°F Aug. 3; minimum, freezing point on several days during February and March.
EXTREMES, 1954-58.--Water temperatures: Maximum, 89°F July 27-30, Aug. 4, 1955; minimum, freezing point on many days during winter months.
REMARKS.--Records of discharge for water year October 1957 to September 1958 given in WSP 1558.

Temperature (° F) of water, water year October 1957 to September 1958
/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	65	56	51	46	36	35	34	34	33	33	33	32	50	44	58	49	66	63	74	69	78	71	69	64
2	65	55	50	49	36	35	34	34	33	33	33	32	49	46	54	50	65	62	72	69	82	72	71	64
3	63	55	51	49	35	35	35	34	33	33	34	33	50	45	59	52	64	62	76	68	85	72	72	65
4	62	55	49	48	35	34	35	34	33	33	34	33	47	46	58	52	67	61	75	71	80	73	74	68
5	61	53	48	46	35	34	34	34	33	33	34	34	46	45	59	50	69	64	75	70	80	75	71	65
6	60	54	48	44	35	35	34	34	34	33	37	34	45	43	59	50	70	63	79	69	81	72	70	65
7	58	54	47	46	35	35	34	34	33	32	36	36	46	42	60	51	69	64	79	70	80	71	70	64
8	60	54	47	41	35	35	34	34	33	32	37	36	47	43	61	53	68	65	80	72	80	69	70	62
9	58	56	41	40	35	35	34	34	33	33	37	36	47	44	64	52	66	64	80	72	80	70	72	63
10	58	53	42	38	35	35	34	34	33	33	36	35	48	44	65	53	70	64	74	70	81	72	70	65
11	58	51	43	40	36	35	34	34	33	33	38	34	50	45	69	56	70	64	72	66	82	76	68	62
12	56	50	41	39	35	35	34	34	33	32	39	35	52	47	67	58	68	64	79	66	83	73	69	60
13	56	49	42	41	34	34	34	34	33	32	39	36	54	49	68	57	69	65	79	70	80	70	69	60
14	56	51	42	42	34	34	34	34	32	32	39	38	56	52	68	60	71	63	77	71	82	69	69	63
15	56	55	44	42	34	34	34	34	33	32	38	37	59	53	70	62	68	63	76	70	82	70	70	66
16	59	56	44	43	35	34	34	34	33	33	37	36	60	56	67	59	70	62	77	68	79	69	71	64
17	57	53	43	43	35	35	35	34	33	33	38	36	62	58	71	61	70	65	73	67	78	69	67	62
18	54	50	43	42	36	35	34	34	33	33	38	36	59	58	70	62	68	63	73	68	78	67	66	59
19	54	48	42	40	36	36	34	34	33	32	38	37	59	58	66	61	69	63	72	66	79	69	67	61
20	54	48	40	39	36	35	35	34	34	32	38	37	57	56	67	56	69	62	77	65	77	71	67	61
21	52	49	39	36	36	34	34	34	33	32	38	37	57	55	70	56	71	61	78	66	78	70	68	63
22	53	52	36	35	37	35	35	34	32	32	40	37	55	52	64	60	69	62	79	70	78	67	66	60
23	54	52	35	35	37	36	34	34	32	32	41	38	53	52	67	55	72	63	78	69	71	66	66	60
24	52	50	36	35	37	36	34	34	34	32	41	39	56	50	66	56	71	65	79	69	70	67	67	63
25	50	48	35	35	37	37	34	34	35	33	42	39	54	50	68	58	68	64	80	71	69	62	68	66
26	48	46	35	35	37	36	34	34	34	32	44	40	54	50	66	57	71	63	79	69	72	63	67	63
27	48	45	36	35	36	35	36	34	34	33	45	42	53	49	68	59	75	65	77	70	72	64	67	62
28	48	46	36	36	35	34	35	34	33	33	46	43	52	50	68	59	75	66	77	70	77	66	65	59
29	46	45	36	36	35	34	35	34	--	--	49	43	53	46	70	57	76	67	75	69	75	68	64	59
30	46	45	36	35	35	34	36	34	--	--	49	43	55	46	68	59	77	67	73	68	78	71	62	57
31	48	45	--	--	34	34	34	33	--	--	50	44	--	--	69	62	--	--	77	68	76	68	--	--
Average	55	51	42	40	35	35	34	34	33	33	39	37	53	49	65	56	70	64	76	69	78	69	68	62

ROCK RIVER BASIN--Continued

5-4335. 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 1958.
Sediment records: August 1954 to September 1958.
EXTREMES, 1957-58.--Water temperatures: Maximum, 82°F Aug. 10; minimum, 33°F on many days during November to March.
Sediment concentrations: Maximum daily, 464 ppm Feb. 24; minimum daily, 1 ppm Mar. 23-28.
Sediment loads: Maximum daily, 572 tons Feb. 24; minimum daily, less than 0.05 ton on several days during February to April.
EXTREMES, 1954-58.--Water temperatures: Maximum, 89°F July 27, 1955; minimum, freezing point on many days during winter months.
Sediment concentrations: Maximum daily, 1,540 ppm June 13, 1957; minimum daily, 1 ppm on many days.
Sediment loads: Maximum daily, not determined; minimum daily, less than 0.05 ton on many days.
REMARKS.--Flow affected by ice Nov. 30, Dec. 10-14, Dec. 27 to Feb. 23. Records of discharge for water year October 1957 to September 1958 given in WSP 1558.

Temperature (° F) of water, water year October 1957 to September 1958
/Once-daily measurement between 5:30 p.m. and 8:30 p.m./

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

ROCK RIVER BASIN--Continued

5-4335. YELLOWSTONE RIVER NEAR BLANCHARDVILLE, WIS.--Continued

Suspended sediment, water year October 1957 to September 1958

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	6.1	28	0.5	5.6	28	0.4	5.8	35	0.5
2	5.6	24	.4	7.0	12	.2	5.8	47	.7
3	5.8	17	.3	7.8	6	.1	5.6	38	.6
4	6.1	19	.3	6.1	4	.1	5.6	35	.5
5	6.4	21	.4	5.6	8	.1	5.3	55	.8
6	6.7	36	.6	5.6	10	.2	5.8	58	.9
7	6.7	31	.6	5.8	12	.2	5.6	51	.8
8	6.7	26	.5	9.4	76	1.9	5.6	51	.8
9	6.7	18	.3	6.4	31	.5	5.6	68	1.0
10	6.7	13	.2	5.8	11	.2	4.8	49	.6
11	6.7	22	.4	5.8	11	.2	4.8	41	.5
12	6.7	20	.4	5.8	6	.1	4.8	42	.5
13	6.7	21	.4	6.4	6	.1	5.8	45	.7
14	7.0	25	.5	6.7	6	.1	6.1	49	.8
15	9.1	30	.7	6.7	9	.2	6.4	67	1.2
16	8.8	28	.7	6.1	11	.2	5.8	91	1.4
17	7.0	25	a .5	5.8	10	.2	5.8	62	1.0
18	6.7	23	.4	10.0	12	.3	24	--	e 7
19	6.4	27	.5	13.5	10	.4	16.6	110	4.9
20	6.1	28	.5	9.1	7	.2	10.4	88	2.5
21	6.1	22	.4	7.8	6	.1	9.1	79	1.9
22	6.1	24	.4	7.2	6	.1	9.7	63	1.6
23	10.0	60	sb 2	7.0	11	.2	12.8	49	1.7
24	11.4	--	e 4	7.0	37	.7	8.4	23	.5
25	6.4	36	.6	6.7	39	.7	9.4	9	.2
26	5.6	23	.3	6.4	41	.7	8.8	12	.3
27	6.1	13	.2	6.7	47	.8	7.5	13	.3
28	6.7	23	.4	6.4	49	.8	7.3	26	.5
29	5.8	36	.6	6.1	51	.8	6.7	25	.4
30	5.8	28	.4	4.0	40	.4	6.4	17	.3
31	5.6	30	.4	--	--	--	6.0	21	.3
Total	210.3	--	18.8	206.3	--	11.2	238.1	--	35.7

Day	January			February			March		
1	6.0	19	0.3	5.0	32	0.4	9.1	13	0.3
2	6.0	15	.2	5.0	37	.5	8.8	15	.4
3	5.8	11	.2	5.0	42	.6	8.8	36	.8
4	5.8	22	.3	5.0	41	.6	7.8	27	.6
5	5.8	17	.3	5.2	40	.6	7.5	18	.4
6	5.8	4	.1	5.2	40	.6	8.8	28	.7
7	5.8	9	.1	5.2	39	.5	10.7	36	1.0
8	5.8	15	.2	5.0	35	.5	8.1	24	.5
9	5.8	17	.3	4.8	33	.4	7.5	22	.4
10	5.8	19	.3	4.8	35	.4	6.7	8	.1
11	5.6	14	.2	4.8	12	.2	6.7	8	.1
12	5.6	10	.2	4.8	3	(t)	6.4	6	.1
13	5.6	7	.1	4.8	4	.1	6.4	7	.1
14	5.6	8	.1	4.8	5	.1	6.4	9	.2
15	5.6	16	.2	4.8	5	.1	6.4	7	.1
16	5.6	18	.3	4.6	6	.1	6.1	7	.1
17	5.6	18	.3	4.6	6	.1	6.1	4	.1
18	5.4	9	.1	4.6	5	.1	6.1	2	(t)
19	5.4	7	.1	4.6	5	.1	6.1	2	(t)
20	5.4	11	.2	5.2	5	.1	5.8	2	(t)
21	5.4	9	.1	5.4	5	.1	5.6	2	(t)
22	5.4	5	.1	5.4	4	.1	5.6	2	(t)
23	5.4	6	.1	110	280	s 188	5.6	1	(t)
24	5.4	9	.1	299	464	s 572	5.6	1	(t)
25	5.4	11	.2	41	169	s 20	5.6	1	(t)
26	5.4	13	.2	18.2	76	s 3.9	5.6	1	(t)
27	5.4	13	.2	14.2	22	.8	5.6	1	(t)
28	5.4	13	.2	11.0	8	.2	5.6	1	(t)
29	5.3	11	.2	--	--	--	5.8	2	(t)
30	5.3	11	.2	--	--	--	5.8	2	(t)
31	5.0	17	.2	--	--	--	5.8	2	(t)
Total	172.6	--	5.9	602.0	--	791.2	208.5	--	6.4

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

5-4335. YELLOWSTONE RIVER NEAR BLANCHARDVILLE, WIS.--Continued

Suspended sediment, water year October 1957 to September 1958--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	3	(t)	6.4	41	0.7	10.7	55	sb 2
2	7.5	4	0.1	6.4	45	.8	6.4	25	.4
3	7.0	4	.1	6.7	34	.6	5.8	29	.4
4	7.0	7	.1	6.4	37	.6	5.3	30	.4
5	18.8	--	e 4	6.4	36	.6	5.0	30	.4
6	17.4	--	e 1	6.1	34	.6	4.8	30	.4
7	12.8	10	.3	6.1	35	.6	5.0	31	.4
8	11.0	8	.2	6.1	36	.6	5.8	46	.7
9	9.7	9	.2	6.1	28	.5	6.7	59	1.1
10	9.1	10	.2	6.1	27	.4	5.6	54	.8
11	8.4	9	.2	5.8	45	.7	5.0	24	.3
12	8.1	8	.2	5.8	37	.6	4.8	22	.3
13	7.5	9	.2	5.8	26	.4	5.6	24	.4
14	7.2	11	.2	5.8	27	.4	5.0	25	.3
15	7.0	11	.2	5.8	27	.4	5.3	25	.4
16	7.0	8	.2	5.8	29	.4	4.8	26	.3
17	6.7	8	.1	6.4	30	.5	5.0	27	.4
18	6.4	8	.1	7.0	26	.5	5.3	24	.3
19	6.4	8	.1	6.1	25	.4	5.3	25	.4
20	6.4	17	.3	6.1	25	.4	5.0	30	.4
21	7.8	22	.5	6.1	38	.6	4.6	27	.3
22	9.4	27	.7	6.4	62	1.1	4.6	28	.3
23	7.8	27	.6	6.4	62	1.1	4.6	22	.3
24	7.0	31	.6	6.4	63	1.1	4.6	25	.3
25	7.0	34	.6	6.4	63	1.1	4.6	51	.6
26	7.0	22	.4	6.1	43	.7	4.2	21	.2
27	6.7	23	.4	6.1	42	.7	4.0	27	.3
28	7.0	30	.6	6.1	54	.9	3.8	28	.3
29	6.7	29	.5	6.1	54	.9	3.8	29	.3
30	6.7	30	.5	6.7	66	1.2	3.8	30	.3
31	--	--	--	12.4	95	sb 4	--	--	--
Total	250.6	--	13.4	198.4	--	24.1	154.8	--	13.7

	July			August			September		
1	3.6	30	0.3	4.0	44	0.5	5.0	30	0.4
2	4.4	23	.3	3.8	25	.2	5.0	22	.3
3	4.6	20	.2	3.6	16	.2	5.0	17	.2
4	5.6	21	.3	3.4	26	.2	8.1	26	.6
5	5.0	23	.3	3.8	24	.2	5.2	19	.3
6	4.0	24	.2	7.0	35	b .7	6.1	36	.6
7	3.8	25	.2	5.0	15	.2	3.6	24	.2
8	3.6	20	.2	4.0	17	.2	3.2	22	.2
9	3.6	19	.2	3.6	10	.1	3.0	27	.2
10	3.6	31	.3	3.6	10	.1	2.9	32	.2
11	3.8	33	.3	3.4	11	.1	2.7	22	.2
12	4.0	29	.3	3.6	18	.2	2.5	27	.2
13	3.8	19	.2	3.6	18	.2	2.5	23	.2
14	3.8	25	.2	3.4	12	.1	2.2	20	.1
15	4.0	28	.3	6.4	40	b .7	3.2	26	.2
16	3.6	29	.3	4.2	11	.1	3.2	26	.2
17	3.6	51	.5	3.4	13	.1	3.6	40	.4
18	3.8	57	.6	3.2	11	.1	3.6	32	.3
19	3.6	49	.5	3.2	14	.1	3.4	23	.2
20	3.4	26	.2	14.1	--	e 40	3.4	23	.2
21	3.2	24	.2	9.3	--	e 6	3.2	23	.2
22	3.2	24	.2	4.0	33	.4	3.2	23	.2
23	3.2	14	.1	3.4	12	.1	3.2	26	.2
24	3.2	16	.1	3.8	18	.2	8.1	--	e 2
25	3.4	18	.2	3.8	23	.2	4.8	19	.2
26	3.0	15	.1	3.6	31	.3	3.8	17	.2
27	3.8	18	.2	3.8	38	.4	3.6	27	.3
28	4.4	21	.2	4.0	37	.4	3.6	35	.3
29	7.0	28	.5	3.8	33	.3	3.8	28	.3
30	5.3	27	.4	4.4	19	.2	4.2	18	.2
31	4.2	28	.3	5.0	20	.3	--	--	--
Total	123.1	--	8.4	139.2	--	53.1	118.9	--	9.5

Total discharge for year (cfs-days) 2,622.8
Total load for year (tons) 991.4

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

5-4335. YELLOWSTONE RIVER NEAR BLANCHARDVILLE, WIS.--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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. 23, 1958....	6:00 p.m.	525		935	1,240	39	49	60	77	95	98	99	100				BSWCM
Feb. 24	2:15 p.m.	275		2,560	1,810	24	30	41	57	88	96	99	100				BSWCM
Feb. 24	2:15 p.m.	275		2,560	1,850	8	14	26	44	85	96	99	100				BSNM
Feb. 24	2:30 p.m.	426		2,450	3,960	22	28	38	56	89	97	100	--				BSWCM

ROCK RIVER BASIN--Continued

5-4360. 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 1958.
Sediment records: January 1954 to September 1958.
EXTREMES, 1957-58.--Water temperatures: Maximum, 71°F May 14, Aug. 8-10, 28, 30; minimum, freezing point on several days during January and February.
Sediment concentrations: Maximum daily, 550 ppm Feb. 24; minimum daily, 12 ppm Oct. 25.
Sediment loads: Maximum daily, 220 tons Feb. 24; minimum daily, 0.4 ton on several days during October, December to February, July to September.
EXTREMES, 1954-58.--Water temperatures: Maximum, 75°F July 14, 1955; minimum, freezing point on many 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 0.05 ton Sept. 20, 1955.
REMARKS.--Flow affected by ice Dec. 11-13, Dec. 27 to Feb. 20. Records of discharge for water year October 1957 to September 1958 given in WSP 1558.

Temperature (° F) of water, water year October 1957 to September 1958
/Once-daily measurement between 4 p.m. and 6 p.m./

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

ROCK RIVER BASIN--Continued

5-4360. MOUNT VERNON CREEK NEAR MOUNT VERNON, WIS.--Continued

Suspended sediment, water year October 1957 to September 1958

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.....	12	42	1.4	11	28	0.8	12	36	1.2
2.....	12	37	1.2	12	43	1.4	12	43	1.4
3.....	12	30	1.0	12	39	1.3	12	48	1.6
4.....	12	28	.9	11	17	.5	12	45	a 1
5.....	12	24	.8	11	20	.6	12	43	1.4
6.....	12	15	.5	11	26	.8	12	34	1.1
7.....	12	16	.5	12	37	1.2	12	20	.6
8.....	12	20	.6	15	46	1.9	11	35	1.0
9.....	12	22	.7	13	30	1.0	12	29	.9
10.....	12	28	.9	12	28	.9	12	17	.6
11.....	12	34	1.1	12	27	.9	12	15	.5
12.....	12	28	.9	12	26	.8	12	17	.6
13.....	12	24	.8	13	37	1.3	12	14	.4
14.....	12	25	.8	13	35	1.2	12	21	.7
15.....	12	27	.9	13	28	1.0	12	23	.7
16.....	12	32	1.0	13	35	1.2	12	23	.7
17.....	11	26	.8	12	36	1.2	12	22	.7
18.....	11	25	.7	19	60	sb 4	15	51	s 2.4
19.....	11	15	.4	22	90	b 5	14	43	1.6
20.....	11	19	.6	14	57	2.1	15	26	1.0
21.....	11	17	.5	13	57	2.0	14	42	1.6
22.....	11	17	.5	13	57	2.0	15	33	1.3
23.....	14	43	1.6	13	62	2.2	17	27	1.2
24.....	18	46	2.2	13	58	2.0	13	27	.9
25.....	12	12	.4	13	73	2.6	14	28	1.0
26.....	12	17	.6	12	102	3.3	13	31	1.1
27.....	12	18	.6	12	87	2.8	12	30	1.0
28.....	11	22	.6	12	55	1.8	11	30	.9
29.....	11	19	.6	12	49	1.6	11	30	.9
30.....	11	22	.6	12	46	1.5	11	28	.8
31.....	11	30	.9	--	--	--	11	27	.8
Total.	370	--	25.6	388	--	50.9	389	--	31.6
	January			February			March		
1.....	11	26	0.8	10	28	0.8	13	48	1.7
2.....	10	33	.9	10	23	.6	13	52	1.8
3.....	10	62	1.7	10	35	.9	13	47	1.6
4.....	10	61	1.6	9.8	19	.5	13	44	1.5
5.....	10	41	1.1	10	20	.5	13	40	1.4
6.....	10	36	1.0	10	38	1.0	13	49	1.7
7.....	10	37	1.0	10	38	1.0	13	50	1.8
8.....	10	38	1.0	10	25	.7	13	42	1.5
9.....	9.8	40	1.0	10	23	.6	13	37	1.3
10.....	10	42	1.1	10	21	.6	13	37	1.3
11.....	10	43	1.2	10	18	.5	12	43	1.4
12.....	10	41	1.1	10	24	.6	12	47	1.5
13.....	10	34	.9	15	22	.9	12	47	1.5
14.....	10	22	.6	10	31	.8	12	47	1.5
15.....	10	18	.5	10	28	.8	12	39	1.3
16.....	10	21	.6	10	17	.4	12	37	1.2
17.....	10	20	.5	10	23	.6	12	38	1.2
18.....	10	17	.4	11	28	.8	12	42	1.4
19.....	10	16	.4	12	28	.9	12	44	1.4
20.....	10	20	.5	15	27	1.1	12	42	1.4
21.....	10	26	.7	11	23	.7	12	38	1.2
22.....	10	36	1.0	11	22	.6	12	37	1.2
23.....	10	28	.8	33	--	e 60	12	38	1.2
24.....	10	17	.4	135	550	sb 220	12	42	1.4
25.....	10	22	.6	62	346	57	12	47	1.5
26.....	10	23	.6	21	185	10	12	46	1.5
27.....	10	22	.6	16	77	3.3	12	45	1.4
28.....	10	23	.6	14	48	1.8	12	46	1.5
29.....	10	18	.5	--	--	--	12	61	2.0
30.....	10	16	.4	--	--	--	12	48	1.6
31.....	10	21	.6	--	--	--	12	48	1.6
Total.	310.8	--	24.7	515.8	--	368.0	382	--	45.5

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

ROCK RIVER BASIN--Continued

5-4360. MOUNT VERNON CREEK NEAR MOUNT VERNON, WIS.--Continued

Suspended sediment, water year October 1957 to September 1958--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	12	45	1.4	12	46	1.5	15	43	1.7
2	13	50	1.8	12	39	1.3	12	43	1.4
3	13	51	1.8	12	42	1.4	11	68	2.0
4	13	41	1.4	11	52	1.5	11	61	1.8
5	25	211	s 20	11	43	1.3	11	59	1.8
6	24	70	4.5	11	38	1.1	10	57	1.5
7	15	54	2.2	10	54	1.4	11	48	1.4
8	13	63	2.2	10	50	1.4	11	42	1.2
9	13	53	1.9	10	42	1.1	11	37	1.1
10	13	53	1.9	10	34	.9	11	39	1.2
11	13	50	a 2	10	34	.9	11	32	1.0
12	13	50	1.8	10	38	1.0	11	33	1.0
13	13	34	1.2	10	49	1.3	11	34	1.0
14	13	41	1.4	10	58	1.6	11	49	1.4
15	13	46	1.6	10	57	1.5	11	81	2.4
16	12	42	1.4	10	42	1.1	11	67	2.0
17	12	51	1.6	11	57	1.7	11	43	1.3
18	12	71	2.3	11	40	1.2	11	33	1.0
19	11	42	1.2	10	30	.8	11	34	1.0
20	12	33	1.1	10	36	1.0	11	45	1.3
21	12	72	2.3	10	31	.8	11	41	1.2
22	13	47	1.6	10	34	.9	11	44	1.3
23	12	28	.9	10	57	1.5	11	56	1.7
24	13	30	1.0	10	51	1.4	11	49	1.4
25	12	22	.7	10	44	1.2	11	36	1.1
26	12	22	.7	10	49	1.3	11	37	1.1
27	12	20	.6	10	40	1.1	11	38	1.1
28	12	52	1.7	10	28	.8	11	31	.9
29	12	40	1.3	10	34	.9	11	32	1.0
30	12	35	1.1	11	72	2.1	11	40	1.2
31	--	--	--	16	95	s 4.3	--	--	--
Total	400	--	66.6	328	--	41.3	334	--	40.5

Day	July			August			September		
1	11	46	1.4	11	33	1.0	9.3	22	0.6
2	11	34	1.0	11	34	1.0	9.0	27	.6
3	11	27	.8	10	38	1.0	9.0	32	.8
4	12	53	1.7	10	25	.7	9.0	27	.6
5	11	40	1.2	9.9	33	.9	9.3	20	.5
6	11	28	.8	10	55	1.5	9.7	16	.4
7	11	29	.9	10	49	1.3	9.7	15	.4
8	11	43	1.3	9.9	43	1.1	9.3	27	.7
9	11	52	1.5	9.7	43	1.1	9.3	35	.9
10	10	39	1.0	9.9	43	1.1	9.3	33	.8
11	10	34	.9	10	53	1.4	9.3	29	.7
12	9.0	54	1.3	9.7	31	.8	9.3	26	.6
13	8.8	58	1.4	9.7	18	.5	9.3	25	.6
14	9.5	50	1.3	9.9	14	.4	9.3	23	.6
15	9.7	35	.9	9.9	22	.6	9.5	23	.6
16	9.9	31	.8	9.7	18	.5	9.5	17	.4
17	10	35	.9	9.7	27	.7	9.7	16	.4
18	11	35	1.0	9.7	30	.8	9.7	25	.6
19	11	24	.7	9.7	38	1.0	9.7	25	.6
20	11	22	.6	9.7	42	1.1	9.7	29	.8
21	11	18	.5	9.7	42	1.1	9.5	28	.7
22	11	13	.4	9.7	42	1.1	9.3	31	.8
23	11	17	.5	9.5	39	1.0	9.5	33	.8
24	11	24	.7	9.5	42	1.1	11	54	1.6
25	11	26	.8	9.7	42	1.1	11	38	1.1
26	10	41	1.1	9.5	38	1.0	10	31	.8
27	11	38	1.1	9.5	31	.8	10	32	.9
28	11	32	1.0	9.3	33	.8	9.9	20	.5
29	12	61	2.0	9.5	28	.7	9.9	28	.7
30	11	66	2.0	9.5	39	1.0	9.9	49	1.3
31	11	50	1.5	9.3	41	1.0	--	--	--
Total	330.9	--	33.0	303.8	--	29.2	287.9	--	21.4

Total discharge for year (cfs-days) 4,340.2
Total load for year (tons) 778.3

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

ROCK RIVER BASIN--Continued

5-4360. MOUNT VERNON CREEK NEAR MOUNT VERNON, WIS.--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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, 1958....	4:00 p.m.	133		1,170	2,030	23	32	43	65	91	98	99	100				BSWCM
Feb. 24	6:00 p.m.	165		830	1,440	25	37	50	69	88	96	97	100				BSWCM
Feb. 25	4:20 p.m.	42		543	778	30	35	44	63	78	85	89	99		100		BSWCM
Apr. 5	5:55 p.m.	34		692	1,210	37	49	53	73	94	98	99	100				BSWCM

IOWA RIVER BASIN

5-4495. IOWA RIVER NEAR ROWAN, IOWA

LOCATION.--At gaging station on downstream side of highway bridge, 3.8 miles northwest of Rowan, Wright County, and 9.4 miles downstream from confluence of East and West Forks.
DRAINAGE AREA.--429 square miles.
RECORDS AVAILABLE.--Water temperatures: October 1957 to September 1958.
Sediment records: October 1957 to September 1958.
EXTREMES, 1957-58.--Water temperatures: Maximum, 86°F Aug. 4; minimum, freezing point on many days during December to February.
Sediment concentrations: Maximum daily, 750 ppm May 27; minimum daily, not determined.
Sediment loads: Maximum daily, 850 tons May 27; minimum daily, not determined.
REMARKS.--Maximum observed sediment concentration during water year, 1,200 ppm May 27. Flow affected by ice Nov. 8-11, Nov. 18 to Mar. 21. Records of discharge for water year October 1957 to September 1958 given in WSP 1558.

Temperature (° F) of water, water year October 1957 to September 1958
/Once-daily measurement between 3 p.m. and 7 p.m./

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

a Measurement before 2 p.m.
b Measurement after 8 p.m.

IOWA RIVER BASIN--Continued

5-4495. IOWA RIVER NEAR ROWAN, IOWA--Continued

Suspended sediment, water year October 1957 to September 1958

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	13	--	e 1.9	19	34	1.7	35	39	3.7
2	13			22	43	2.6	30		
3	13			22	84	5.0	26		
4	13			24	59	3.8	25		
5	13	55	1.9	22	16	1.0	29	15	1.1
6	13			21	16	.9	31		
7	13			20	16	.9	27		
8	15	94	3.8	15			27		
9	16	72	3.1	10			22		
10	17			12	12	.5	17		
11	17	59	2.5	15			14		
12	16			18			17		
13	16			20			21		
14	16			22			21	7	.4
15	16	90	3.9	23			21		
16	17	69	3.2	28	16	.9	21		
17	17			26			23		
18	17			20			25		
19	16	49	2.1	14			27		
20	16			17			29		
21	15			20			31		
22	17	60	2.8	23			32		
23	22	70	4.2	21			33		
24	22	104	6.2	22			35		
25	23	18	1.1	23	19	1.2	30	19	1.5
26	21	8	.5	24			25		
27	19			27			25		
28	18			25			20		
29	18	13	.6	22			18	6	.3
30	18			19			16		
31	18			--	--	--	16		
Total	514	--	68.1	616	--	37.6	769	--	27.9

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	16	4		17	9		100	8	2.2
2	15	4		16	--		80	6	1.3
3	14	5		16	--		90	15	3.6
4	14	5		15	14		60	4	.6
5	14	--		15	--		50	6	.8
6	14	--		14	5	a 0.3	43		
7	13	29		13	--		41	18	1.9
8	13	--		12	4		40		
9	13	3		12	--		35		
10	13	3		11	--		31		
11	13	17		11	4		34		
12	14	--		10	2		33		
13	14	--		9.6	--		35		
14	15	6		9.2	--		35		
15	15	--		8.8	2		30		
16	15	2	a 0.4	8.4	--		32		
17	16	--		8.2	--	a .1	32		
18	16	4		8.0	5		32		
19	16	--		8.0	--		31		
20	16	--		8.0	10		30	8	.7
21	16	--		7.8	--		30		
22	16	4		7.8	9		32		
23	16	9		20	--	e .6	35		
24	16	--		80	--	e 2.0	37		
25	16	18		130	22	7.7	38		
26	16	--		200	25	14	38		
27	17	--		160	25	11	36		
28	17	14		130	17	6.0	34		
29	18	--		--	--	--	31		
30	18	17		--	--	--	31		
31	17	--		--	--	--	31		
Total	472	--	12.4	965.8	--	45.7	1,267	--	31.5

e Estimated.

a Computed on basis of samples obtained about three or four times a week.

IOWA RIVER BASIN--Continued

5-4495. IOWA RIVER NEAR ROWAN, IOWA--Continued

Suspended sediment, water year October 1957 to September 1958--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	32	12	1.0	34			335	550	sb 550
2	32	8	.7	33			195	180	b 95
3	34	8	.7	34			134	138	50
4	41	9	1.0	34			171	240	b 110
5	51	60	sb 9.0	33	40	3.5	423	280	b 320
6	84	46	10	32			518	186	260
7	108	35	10	30			335	192	174
8	94	29	7.4	29			231	188	117
9	83	21	4.7	29			188	189	96
10	71	31	5.9	28			161	204	89
11	65	14	2.5	25			134	198	72
12	61	21	3.5	24			109	185	54
13	59	48	7.6	22	47	2.9	96	175	45
14	54	25	3.6	21			80	177	38
15	50	49	6.6	21			69	173	32
16	47	50	6.3	22	80	4.8	59	256	41
17	42	49	5.6	24	93	6.0	52	303	43
18	40	50	5.4	23	106	6.6	49	161	21
19	38	37	3.8	22	101	6.0	45	161	20
20	37	53	5.3	22	95	5.6	40	161	17
21	36	56	5.4	19	90	4.6	37	157	16
22	34			18	98	4.8	36	136	13
23	35			18	92	4.5	36	165	16
24	37			17	102	4.7	69	200	37
25	42			18	98	4.8	129	230	80
26	42	31	3.3	18	140	b 7.0	105	176	50
27	41			357	750	sb 850	80	118	25
28	40			460	550	b 700	62	90	15
29	40			260	185	130	49	100	13
30	39			111	145	43	43	106	12
31	--	--	--	140	340	sb 170	--	--	--
Total	1,509	--	135.7	1,978	--	2,001.9	4,070	--	2,521

Day	July			August			September		
1	39	175	18	23	--	e 6.0	9.3	92	2.3
2	45	227	28	22	--	e 5.0	8.8	72	1.7
3	39	100	11	21	61	3.5	7.9	51	1.1
4	39	109	11	23	--	e 4.0	7.6	62	1.3
5	40	114	12	21	78	4.4	8.5	113	2.6
6	39	119	13	21	87	4.9	9.9	92	2.5
7	34	129	12	19	52		9.3	62	1.6
8	32	108	9.3	18	--	e 2.4	8.2	--	
9	31	157	13	16	--		7.9	--	
10	29	154	12	14	53		7.6	--	e 1.0
11	33	142	13	14	186	7.0	7.4	46	
12	36	139	14	14	62	2.3	7.6	--	
13	36	130	13	13	73	2.6	8.5	71	1.6
14	127	145	50	13	61	2.1	9.9	94	2.5
15	177	210	100	22	300	b 18	10	--	e 2.8
16	129	205	71	16	245	11	11	76	2.3
17	89	150	36	14	165	6.2	11	--	e 2.0
18	64	--	e 24	13	93	3.3	10	66	1.8
19	56	129	20	12	--	e 2.2	10	58	1.6
20	50	132	18	12	--	e 2.6	8.5	--	e 1.0
21	44	91	11	11	62	1.8	6.6		
22	39	--	e 8.5	11	56	1.7	6.4	31	.6
23	36	--	e 8.0	10	113	3.1	7.1		
24	33	68	6.1	10	123	3.3	8.2	62	1.4
25	31	75	6.3	10	63	1.7	8.2	67	1.5
26	29	82	6.4	10	75	2.0	10	82	2.2
27	29	76	6.0	10	64	1.7	12	79	2.6
28	28	64	4.8	9.6	--	e 1.8	10	--	e 2.0
29	30	157	13	9.9	85	2.3	9.0	--	e 1.6
30	26	--	e 11	10	54	1.5	8.5	--	e 1.0
31	25	135	9.1	10	85	2.3	--	--	--
Total	1,514	--	588.5	452.5	--	117.9	264.9	--	47.8

Total discharge for year (cfs-days) 14,392.2
Total load for year (tons) 5,636.0

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

IOWA RIVER BASIN--Continued

5-4545. 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 4.1 miles downstream from Clear Creek.
DRAINAGE AREA.--3,271 square miles.
RECORDS AVAILABLE.--Chemical analyses: September 1906 to September 1907, January 1944 to September 1954.
Water temperatures: January 1944 to September 1958.
Sediment records: October 1943 to September 1958.
EXTREMES, 1957-58.--Water temperatures: Maximum, 84°F Aug. 10, 14; minimum, freezing point on several days during November to March.
Sediment concentrations: Maximum daily, 2,460 ppm June 13; minimum daily, 3 ppm Jan. 29, 31, Feb. 6, 8.
Sediment loads: Maximum daily, 18,700 tons June 13; minimum daily, 2 tons on several days during January and February.
EXTREMES, 1943-58.--Water temperatures (1944-58): Maximum, 90°F July 19, 1957; minimum, freezing point on many days during winter months.
Sediment concentrations: Maximum daily, 7,800 ppm June 13, 1953; minimum daily, 3 ppm Jan. 29, 31, Feb. 6, 8, 1958.
Sediment loads: Maximum daily, 177,000 tons May 23, 1944; minimum daily, 2 tons on several days during 1951 and 1958.
REMARKS.--Flow affected by ice Dec. 10, 11, Dec. 30 to Jan. 3. Diurnal fluctuation at low stages caused by powerplants upstream from station. Records of discharge for water year October 1957 to September 1958 given in WSP 1558.

Temperature (° F) of water, water year October 1957 to September 1958
/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	a 66	b 50	36	33	b 32	33	52	59	b 68	77	76	70
2	a 64	50	b 36	b 32	33	32	52	60	67	78	a 78	73
3	a 66	49	33	b 33	33	32	50	a 63	66	79	82	74
4	a 66	49	b 36	34	34	34	51	59	76	76	82	71
5	a 66	48	b 38	37	36	33	a 50	60	71	79	82	70
6	a 62	48	b 34	b 33	33	36	48	60	74	79	83	a 69
7	66	b 48	34	32	b 32	35	49	59	a 70	77	83	a 70
8	63	42	32	33	32	36	52	63	73	78	82	71
9	60	b 38	36	a 34	32	37	52	64	74	79	a 83	72
10	62	b 40	32	b 34	33	36	50	a 65	75	76	a 84	69
11	62	43	32	b 33	33	38	52	70	73	74	83	69
12	60	40	34	34	33	39	a 54	71	70	78	82	70
13	62	42	36	38	b 33	39	54	72	72	76	82	a 70
14	62	b 43	39	b 36	b 33	39	51	72	70	73	84	70
15	59	46	38	36	32	39	62	74	68	73	82	69
16	60	44	a 38	b 35	32	37	64	72	70	74	a 82	67
17	60	44	b 37	b 36	32	37	66	a 75	70	70	80	66
18	58	b 42	36	b 36	32	37	67	72	72	74	78	68
19	57	b 36	b 36	34	b 32	38	a 64	72	72	66	79	67
20	56	b 36	38	b 32	34	37	65	71	70	68	78	a 68
21	54	b 36	38	33	b 36	40	60	70	a 71	71	76	68
22	56	b 36	42	33	b 36	40	60	69	68	74	76	68
23	56	b 36	38	34	36	43	57	70	71	75	a 73	67
24	51	36	38	b 33	a 37	52	55	a 72	72	76	70	71
25	46	36	38	b 33	b 38	52	57	a 74	70	78	68	68
26	46	b 36	38	33	a 38	52	a 56	71	71	78	70	70
27	46	b 38	39	34	a 38	54	55	72	75	77	71	a 62
28	47	38	b 39	b 34	a 33	51	55	72	a 76	78	76	66
29	49	b 33	38	34	--	50	55	74	79	78	75	66
30	50	32	a 33	b 34	--	52	56	73	81	76	a 78	60
31	52	--	33	b 33	--	53	--	a 74	--	78	a 71	--
Average	58	41	36	34	34	41	56	68	72	76	78	69

a Measurement between 9 a.m. and 1 p.m.
b Measurement between 7 p.m. and 9 p.m.

IOWA RIVER BASIN--Continued

5-4545. IOWA RIVER AT IOWA CITY, IOWA--Continued

Suspended sediment, water year October 1957 to September 1958

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	296	96	77	233			301		
2	196	83	44	251			301		
3	309	99	83	242	62	40	310	16	13
4	94	85	22	236			312		
5	224	117	71	398	55	59	350	10	9
6	242	101	66	126	55	19	464	10	13
7	100	100	27	308	31	26	495	11	15
8	232	147	92	290	31	24	476	11	14
9	196	120	64	214	24	14	348	11	10
10	134	110	40	318	24	21	300	23	19
11	138	95	35	208	15	8	230	10	6
12	243	97	64	336	15	14	175	10	5
13	198	75	40	292			280		
14	110	88	26	280			307		
15	284	103	79	234	24	17	287		
16	234	83	52	260			297	9	8
17	120	92	30	212	35	20	338		
18	302	102	83	411	35	39	372		
19	91	69	17	485	52	68	386		
20	269	86	62	383	52	54	550		
21	250	87	59	404	29	32	520	41	62
22	165	77	34	401	29	31	603		
23	186	85	43	350			825	45	100
24	207	85	48	399			699		
25	205	67	37	326	12	12	693	67	126
26	216	90	52	386			478	80	103
27	233	80	50	390			578	36	56
28	346	32	30	383			300	22	18
29	172	26	12	407	12	13	390	22	23
30	308	38	32	198	12	6	300	13	11
31	185	53	26	--	--	--	240	13	8
Total	6,485	--	1,497	9,361	--	748	12,505	--	956

Day	January			February			March		
1	145	10	4	280			2,530	560	3,830
2	160	16	7	287			2,530	385	2,630
3	220	27	16	284	9	7	2,050	255	1,410
4	267	9	6	284			1,620	195	853
5	274	11	8	274			1,340	155	561
6	303			264	3	2	1,200	100	324
7	326			242	7	5	1,120	82	248
8	350	17	15	236	3	2	1,020	72	198
9	354			233	6	4	988	69	184
10	334			239	7	5	890	52	125
11	307			221	6	4	825	42	94
12	303			202			795	41	88
13	294			185	8	4	729	40	79
14	287			170			681		
15	287	15	12	160			675		
16	290			150	5	2	693	35	63
17	297			143	5	2	675		
18	322			141	8	3	657		
19	364			147	6	2	621		
20	400			139	6	2	597		
21	408			153	14	6	565		
22	382	8	8	151	14	6	545	38	59
23	354			178	26	sa 16	530		
24	364			747	95	sa 240	627		
25	338			1,370	340	1,300	436		
26	322	5	4	1,810	400	2,000	495		
27	314	5	4	1,890	467	2,380	480		
28	303	4	3	2,210	563	3,360	500	51	64
29	297	3	2	--	--	--	449		
30	297	4	3	--	--	--	462		
31	294	3	2	--	--	--	428		
Total	9,557	--	286	12,790	--	9,392	27,753	--	11,745

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

IOWA RIVER BASIN--Continued

5-4545. IOWA RIVER AT IOWA CITY, IOWA--Continued

Suspended sediment, water year October 1957 to September 1958--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.....	548	64	95	560	124	187	442	276	329
2.....	458	53	66	550	105	156	465	324	407
3.....	462	63	79	535	86	124	735	263	522
4.....	476	65	84	520	93	131	858	525	1,220
5.....	467	74	93	498	98	132	795	535	1,150
6.....	570	65	100	515	90	125	765	463	956
7.....	597	63	102	420	84	95	1,020	448	1,230
8.....	699	56	106	525	95	135	1,160	405	1,270
9.....	988	80	213	446			1,440	980	3,810
10.....	1,260	124	422	458			1,480	850	3,400
11.....	1,400	149	563	460			1,510	520	2,120
12.....	1,400	120	454	436	105	121	1,800	800	sa 3,900
13.....	1,370	146	540	376			2,570	2,460	s 18,700
14.....	1,300	111	390	401			2,370	1,320	8,450
15.....	1,230	121	402	414			2,450	600	3,970
16.....	1,120	120	363	368	100	99	2,610	450	3,170
17.....	1,060	117	335	482	102	133	2,850	1,000	sa 8,400
18.....	988	125	333	373	248	250	3,370	950	8,640
19.....	922	124	309	498	152	204	3,280	620	5,490
20.....	890	122	293	474	132	169	3,090	450	3,750
21.....	858	98	227	444	143	171	3,460	355	3,320
22.....	795	110	236	456	195	240	3,280	285	2,520
23.....	795	95	204	406	171	187	3,010	304	2,470
24.....	795	124	266	354	136	130	2,050	356	1,970
25.....	741	145	290	351	99	94	1,340	376	1,360
26.....	687	107	198	356	133	128	1,060	328	939
27.....	675	105	191	348	154	145	988	258	688
28.....	651	91	160	256	54	37	922	247	615
29.....	560	73	110	326	94	83	890	238	572
30.....	565	86	131	266	89	64	795	208	447
31.....	--	--	--	350	93	88	--	--	--
Total.	25,327	--	7,355	13,222	--	4,154	52,855	--	95,785

Day	July			August			September		
1.....	765	224	463	2,210	221	1,320	922	107	266
2.....	765	227	469	2,050	254	1,410	795	106	228
3.....	765	212	438	1,810	209	1,020	677	120	a 220
4.....	890	269	646	1,580	199	849	2,580	750	sa 5,700
5.....	1,080	249	726	1,400	224	847	4,200	890	10,100
6.....	1,700	803	3,690	1,370	160	592	4,600	630	7,820
7.....	1,890	826	4,220	1,510	172	701	4,600	510	6,330
8.....	2,130	507	2,920	1,510	266	1,080	4,500	370	4,500
9.....	2,130	336	1,930	1,440	233	906	4,500	209	2,540
10.....	1,970	280	1,490	1,340	176	637	4,700	179	2,270
11.....	1,700	258	1,180	1,200	155	502	4,500	163	1,980
12.....	1,480	279	1,110	1,060	194	555	4,600	160	1,990
13.....	1,440	341	1,330	955	129	333	4,500	133	1,620
14.....	2,390	1,450	s 10,800	890	138	332	4,480	208	2,520
15.....	3,160	1,150	s 9,900	988	140	373	3,190	178	1,530
16.....	3,460	940	8,780	922	180	448	1,610	134	583
17.....	3,460	940	8,780	1,230	199	661	717	83	161
18.....	3,550	740	7,090	1,730	360	sa 1,800	414	86	96
19.....	3,550	515	4,940	2,370	440	2,820	633	76	130
20.....	3,460	370	3,460	2,690	315	2,290	645	80	139
21.....	3,550	270	2,590	2,770	255	1,910	645	89	155
22.....	3,460	192	1,790	2,230	228	1,370	645	110	192
23.....	3,280	170	1,510	1,160	155	486	585	129	204
24.....	3,100	148	1,240	1,960	190	1,010	711	133	255
25.....	2,850	146	1,120	1,920	185	959	858	122	283
26.....	2,770	130	972	1,550	178	745	858	129	299
27.....	2,690	160	1,160	1,160	126	395	747	82	165
28.....	2,610	184	1,300	1,060	112	321	693	74	138
29.....	2,450	196	1,300	1,060	113	323	639	98	169
30.....	2,620	750	sa 5,200	1,200	129	418	603	102	166
31.....	2,370	225	1,440	1,370	106	392	--	--	--
Total.	73,485	--	93,984	47,695	--	27,805	64,347	--	52,749

Total discharge for year (cfs-days)..... 355,382
Total load for year (tons)..... 306,456

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

5-4545. IOWA RIVER AT IOWA CITY, IOWA--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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. 26, 1958....	2:10 p.m.	1,930	35	366	2,530	61	69	84	91	96	99	99	100				SPWCM
June 10.....	9:15 a.m.	1,400	66	909	3,330	75	84	91	96	96	100						SPWCM
June 10.....	9:15 a.m.	1,400	66	909	2,750	40	68	82	94	98	100						SPNM
June 13.....	2:20 p.m.	2,930	64	3,490	3,310	--	67	--	92	--	100						SPWCM
July 16.....	5:45 p.m.	3,370	74	989	1,350	--	76	--	86	--	100						SPWCM

IOWA RIVER BASIN--Continued

5-4550. RALSTON CREEK AT IOWA CITY, IOWA

LOCATION.--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 1958.
EXTREMES, 1957-58.--Sediment concentrations: Maximum daily, 7,140 ppm July 14; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 1,380 tons July 14; minimum daily 0 tons on many days.
EXTREMES, 1952-58.--Sediment concentrations: Maximum daily, 8,230 ppm May 21, 1957; 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.--Maximum observed sediment concentration during water year, 73,500 ppm July 13. Records of discharge for water year October 1957 to September 1958 given in WSP 1558.

Suspended sediment, water year October 1957 to September 1958

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	0	--	0	0	--	0	0	--	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.....	0	--	0	0	--	0	0	--	0
13.....	0	--	0	0	--	0	0	--	0
14.....	0	--	0	0	--	0	0	--	0
15.....	.81	750	sa 6.5	0	--	0	0	--	0
16.....	0	--	0	0	--	0	0	--	0
17.....	0	--	0	0	--	0	0	--	0
18.....	0	--	0	3.0	1,400	sa 16	0	--	0
19.....	0	--	0	.24	550	sa .5	0	--	0
20.....	0	--	0	.02	--	(t)	4.8	1,100	sa 34
21.....	0	--	0	0	--	0	.10	420	.1
22.....	0	--	0	0	--	0	.06	200	(t)
23.....	.15	700	sa .4	0	--	0	.04	45	(t)
24.....	.06	220	sa .1	0	--	0	0	--	0
25.....	0	--	0	0	--	0	.98	170	sa .6
26.....	0	--	0	0	--	0	.24		
27.....	0	--	0	0	--	0	.05	--	(t)
28.....	0	--	0	0	--	0	.02		
29.....	0	--	0	0	--	0	0	--	0
30.....	0	--	0	0	--	0	0	--	0
31.....	0	--	0	--	--	--	0	--	0
Total	1.02	--	7.0	3.26	--	16.5	6.29	--	34.8

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

IOWA RIVER BASIN--Continued

5-4550. RALSTON CREEK AT IOWA CITY, IOWA--Continued

Suspended sediment, water year October 1957 to September 1958--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	0.43	35	(t)
2				0	--	0	.27	17	
3				0	--	0	.20	8	
4				0	--	0	.18	16	(t)
5				0	--	0	.18	--	
6				0	--	0	.36	58	0.1
7				0	--	0	.43	--	
8				0	--	0	.27	--	
9				0	--	0	.21	--	
10				0	--	0	.13	--	
11				0	--	0	.12	--	(t)
12				0	--	0	.10	--	
13				0	--	0	.11	--	
14				0	--	0	.09	6	
15				0	--	0	.09	--	
16				0	--	0	.07	--	
17				0	--	0	.06	--	
18				0	--	0	.06	--	
19				0	--	0	.05	--	
20				0	--	0	.05	13	
21				0	--	0	.04	--	
22				0	--	0	.05	--	
23				4.4	40	s 1.5	.04	--	(t)
24				27	1,420	s 234	.03	--	
25				6.5	942	s 19	.03	--	
26				2.1	600	sa 6.0	.03	--	
27				2.5	808	s 8.1	.05	--	
28				.98	132	.3	.05	--	
29				--	--	--	.03	--	
30				--	--	--	.04	--	
31				--	--	--	.04	--	
Total	0		0	43.48	--	268.9	3.89	--	0.2

	April			May			June		
1	0.11			0	--	0	0.29	1,920	s 1.9
2	.27	--	(t)	0	--	0	.02	522	(t)
3	.06			0	--	0	.01	418	(t)
4	.10			.04	--	(t)	0	--	0
5	.38	110	a 0.1	0	--	0	0	--	0
6	.26	56	(t)	0	--	0	0	--	0
7	.10	51		0	--	0	0	--	0
8	.08	--		0	--	0	5.6	6,290	s 514
9	.07	--		0	--	0	2.0	3,720	s 43
10	.05	--	(t)	0	--	0	.38	1,880	s 2.3
11	.05	--		0	--	0	.07	--	e .1
12	.03	51		0	--	0	1.8	2,440	s 21
13	.03	--		0	--	0	17	4,190	s 856
14	.02	32		0	--	0	.48	--	e 1.0
15	.02	--		0	--	0	.24	154	.1
16	.01	--		0	--	0	.14		
17	.01	--		.04	65	(t)	.09		
18	.01	--	(t)	.08	75	(t)	.06		
19	.01	--		0	--	0	.05		
20	.01	--		0	--	0	.05		
21	.04	43		0	--	0	.02	--	(t)
22	.04	--		2.5	6,600	sa 190	.01		
23	.06	58		.05	1,700	.2	.02		
24	.06	31	(t)	.01	--	(t)	.08		
25	.01	--		0	--	0	.03		
26	0	--	0	0	--	0	.01		
27	0	--	0	0	--	0	0	--	0
28	0	--	0	0	--	0	0	--	0
29	0	--	0	0	--	0	0	--	0
30	0	--	0	0	--	0	0	--	0
31	--	--	--	3.4	2,790	s 113	--	--	--
Total	1.89	--	0.2	6.12	--	303.3	28.45	--	1,439.5

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

IOWA RIVER BASIN--Continued

5-4550. RALSTON CREEK AT IOWA CITY, IOWA--Continued

Suspended sediment, water year October 1957 to September 1958--Continued

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	0	--	0	0.08			0	--	0
2	0	--	0	.05			0	--	0
3	0	--	0	.04	--	(t)	1.7	902	s 26
4	0	--	0	.04			2.3	500	3.1
5	.01	--	(t)	1.2	950	sb 6.5	17	1,930	s 219
6	0	--	0	.12	200	b .1	1.1	151	.4
7	0	--	0	.60	500	sb 4.0	.36	--	e .1
8	0	--	0	.26	--	e .1	.21		
9	0	--	0	.08			.15	--	(t)
10	0	--	0	.04	--	(t)	.11		
11	0	--	0	.03			.07		
12	0	--	0	.54	1,000	sa 3.0	.07		
13	2.6	4,260	s 255	.31	650	sa .7	.06		
14	42	7,140	s 1,380	.04	330	(t)	.05		
15	.85	160	.4	4.3	1,500	sa 46	.09	--	(t)
16	.29			.20	--	e .1	.06		
17	.26			.11	--		.04		
18	.27	49	(t)	.06	26	(t)	.04		
19	.32			.04	--		.03		
20	.21			.07	--	(t)	.02		
21	.09	--		.15	--	e .1	.02		
22	.05	20		.01	--	(t)	.01		
23	.02	--		0	--	0	.01		
24	.02	--	(t)	.01	--	(t)	.03	--	(t)
25	.02	--		0	--	0	.02		
26	.02	--		0	--	0	.01		
27	.07	100	sa .1	0	--	0	.01		
28	.03	--	(t)	0	--	0	.01		
29	.02	95	(t)	0	--	0	0	--	0
30	4.3	1,200	sa 26	0	--	0	0	--	0
31	.14	--	e .2	0	--	0	--	--	--
Total	51.59	--	1,661.9	8.38	--	60.8	23.58	--	248.7

Total discharge for year (cfs-days) 177.95
Total load for year (tons) 4,041.8

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.

5-4550. RALSTON CREEK AT IOWA CITY, IOWA--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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. 15, 1957....	12:10 p.m.	4.5	56	3,620	2,200	72	83	93	94	97	100	--					SPWCM
Oct. 23.....	5:15 p.m.	.14	54	900	3,070		91		93		100	--					SPWCM
Dec. 20.....	11:10 a.m.	5.5	34	2,440	2,730		69		85		100	--					SPWCM
Dec. 20.....	11:10 a.m.	5.5	34	2,440	2,370		67		83		100	--					SPNM
Feb. 24, 1958 ...	2:50 p.m.	136	33	4,200	2,710		56		73		99	100					SPWCM
Feb. 24.....	2:50 p.m.	136	33	4,200	2,940		17		52		99	100					SPNM
May 22.....	9:40 a.m.	25	54	27,000	4,660		53		95		100	--					SPWCM
May 31.....	3:45 p.m.	.36	66	3,080	2,320		75		81		100	--					SPWCM
May 31.....	7:50 p.m.	40	66	12,700	2,650		49		85		100	--					SPWCM
May 31.....	7:50 p.m.	40	66	12,700	2,570		39		79		100	--					SPNM
June 8	5:35 p.m.	20	72	40,500	2,800		50		85		100	--					SPWCM
June 8	6:20 p.m.	74	70	39,800	3,130		44		82		100	--					SPWCM
June 13	7:00 a.m.	221	70	18,800	4,130		37		75		100	--					SPWCM
June 13	7:00 a.m.	221	70	18,800	3,770		26		68		100	--					SPNM
July 14	8:10 a.m.	170	70	11,600	4,490		38		71		100	--					SPWCM
Sept. 5.....	5:00 a.m.	1.5	67	7,820	3,250		49		79		100	--					SPWCM

5-4620. SHELL ROCK RIVER AT SHELL ROCK, IOWA

LOCATION.--Temperature recorder at gaging station, 400 feet upstream from bridge on State Highway 3 in Shell Rock, Butler County, and 11 miles upstream from mouth.
DRAINAGE AREA.--1,746 square miles.
RECORDS AVAILABLE.--Water temperatures: June 1953 to September 1958.
EXTREMES, 1957-58.--Water temperatures: Maximum, 75°F Aug. 6-7, 11-13; minimum, 33°F Feb. 24 to Mar. 1.
EXTREMES, 1953-58.--Water temperatures: Maximum, 88°F June 19, 1953; minimum, freezing point on several days during winter months.
REMARKS.--Records of discharge for water years October 1953 to September 1958 given in WSP's 1278, 1338, 1388, 1438, 1508, and 1558.

Temperature (° F) of water, June to September 1953
/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																	--	--	78	74	79	76	77	71
2																	--	--	76	72	78	75	76	73
3																	--	--	75	72	77	73	73	66
4																	--	--	74	72	76	73	67	63
5																	--	--	73	69	74	73	67	61
6																	--	--	72	67	73	72	64	61
7																	--	--	72	68	74	72	63	57
8																	--	--	69	67	74	72	65	60
9																	--	--	68	66	73	71	65	63
10																	--	--	70	67	74	71	65	61
11																	--	--	70	68	74	73	67	62
12																	79	70	70	68	74	72	62	57
13																	78	74	69	66	74	72	60	57
14																	74	72	71	68	75	73	60	56
15																	80	74	77	70	75	71	63	59
16																	79	77	78	73	73	69	63	57
17																	81	74	78	74	72	69	63	59
18																	85	77	80	74	72	69	62	58
19																	88	81	81	75	72	69	62	56
20																	87	81	79	76	72	69	61	58
21																	82	79	78	74	72	69	58	55
22																	82	77	79	72	73	69	62	53
23																	82	68	78	76	73	69	58	55
24																	68	67	76	73	74	70	60	56
25																	69	63	78	74	75	71	60	58
26																	72	68	78	74	75	70	60	56
27																	72	64	78	72	75	69	58	54
28																	70	66	78	76	75	70	61	56
29																	76	69	77	74	75	70	62	59
30																	80	72	75	72	77	71	60	56
31																	--	--	76	74	77	73	--	--
Average																	78	72	75	72	74	71	63	59

Temperature (° F) of water, water year October 1953 to September 1954
/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	48	47	38	36	32	32	36	34	39	37	42	41	58	54	62	60	77	74	73	71	70	68
2	61	56	49	47	42	37	34	32	36	35	39	38	42	42	54	52	60	58	76	73	74	72	71	70
3	62	58	49	47	43	39	33	32	38	37	38	36	42	39	52	47	58	57	76	74	73	70	70	68
4	59	56	47	44	42	40	34	32	39	37	36	35	42	38	47	44	58	56	75	74	72	70	70	66
5	57	53	44	42	41	37	33	33	38	37	36	35	48	42	46	45	61	58	77	74	72	68	72	69
6	53	52	42	40	41	38	33	33	38	37	38	36	53	48	48	46	64	60	77	76	72	69	72	70
7	52	50	40	39	38	36	33	33	38	37	37	36	55	53	48	48	68	64	79	76	72	69	71	67
8	54	50	40	38	36	36	33	33	39	37	38	36	53	48	50	48	69	66	77	74	71	68	67	65
9	54	51	40	39	36	35	33	33	39	37	38	36	50	48	49	48	70	68	74	72	72	68	65	62
10	55	51	41	40	35	34	33	33	38	37	38	38	52	48	51	49	70	67	74	72	72	69	63	60
11	56	52	42	41	34	33	33	33	37	36	39	38	54	50	53	50	74	70	75	72	72	68	64	61
12	54	52	43	41	34	34	33	33	36	36	39	36	54	50	57	53	77	72	78	74	70	66	63	61
13	56	53	43	42	35	34	34	33	36	36	37	36	55	52	60	56	76	74	77	75	70	66	63	61
14	56	52	44	42	35	33	34	33	37	36	37	36	61	55	62	58	76	72	77	76	70	67	61	59
15	58	54	44	43	34	33	34	33	39	37	39	36	61	56	64	59	76	73	77	75	74	69	59	59
16	58	56	46	44	34	34	33	33	39	37	39	37	56	52	66	62	76	74	77	74	74	72	60	59
17	58	57	46	44	34	33	33	33	38	38	40	39	55	51	64	60	74	70	76	72	74	66	61	58
18	60	57	48	46	35	34	33	33	39	37	42	40	56	54	64	60	74	69	77	73	68	64	65	61
19	60	58	49	48	34	33	34	33	39	38	42	41	56	55	61	58	70	69	78	74	72	66	66	64
20	61	59	49	48	33	33	33	33	39	39	41	39	56	54	62	57	71	70	78	73	72	70	64	62
21	60	58	48	44	33	33	33	33	39	37	41	38	58	55	62	58	71	70	73	71	72	70	63	58
22	61	59	45	42	33	33	33	33	37	36	41	40	58	54	60	58	72	70	75	70	71	68	58	55
23	60	52	44	42	33	33	33	33	36	36	42	39	60	56	66	59	73	71	74	73	74	69	58	56
24	53	51	43	41	33	33	33	33	39	36	42	41	60	58	65	63	75	73	73	71	72	70	58	56
25	52	50	42	41	33	33	33	33	39	37	41	41	59	58	65	60	78	73	76	72	72	72	59	56
26	51	48	42	36	35	33	33	33	37	36	42	38	62	59	65	59	80	78	77	73	72	72	61	57
27	48	46	39	38	34	33	34	33	37	36	44	41	62	59	60	57	80	78	77	73	72	70	63	59
28	47	46	38	36	34	32	34	34	37	36	44	41	59	57	62	58	78	75	76	73	70	69	62	61
29	47	45	38	36	34	32	36	34	--	--	41	38	58	56	62	56	77	75	77	72	72	70	64	61
30	49	47	38	38	32	32	34	33	--	--	41	38	58	58	62	60	77	75	78	76	72	70	64	61
31	48	48	--	--	33	32	35	34	--	--	43	40	--	--	62	62	--	--	76	73	70	69	--	--
Average	55	53	44	42	36	34	33	33	38	37	40	38	55	52	58	55	72	69	76	73	72	69	64	62

5-4620. SHELL ROCK RIVER AT SHELL ROCK, IOWA--Continued

Temperature (° F) of water, water year October 1954 to September 1955
/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	59	41	38	34	34	36	36	34	34	35	34	49	46	64	62	66	65	80	72	82	76	67	63
2	59	58	38	37	34	34	36	36	34	34	35	34	51	49	69	64	68	64	79	70	82	79	67	65
3	61	58	37	36	34	34	36	36	34	34	35	35	53	51	70	66	70	68	79	73	82	79	67	63
4	61	59	37	36	34	34	36	36	34	34	36	35	53	50	69	65	73	69	79	76	81	77	68	64
5	59	57	36	36	34	34	36	36	34	34	37	36	52	50	68	66	74	72	79	74	80	77	68	64
6	58	57	37	36	34	34	36	36	34	34	38	37	50	49	68	64	74	72	79	73	79	76	67	63
7	57	55	39	37	34	34	36	36	35	34	39	38	51	49	68	64	73	66	79	74	77	73	66	63
8	55	54	40	39	34	34	37	36	35	35	39	38	53	50	64	60	69	66	81	78	74	69	66	63
9	55	54	41	40	34	34	36	36	35	34	39	37	55	52	64	58	68	65	84	81	75	71	67	63
10	56	55	42	40	34	34	36	36	35	34	39	37	58	55	63	58	67	65	84	81	75	72	67	64
11	58	56	44	42	34	34	36	36	35	35	38	37	58	57	67	61	66	64	82	80	72	67	64	59
12	61	58	44	43	34	34	36	36	35	35	37	37	58	57	66	63	64	61	81	78	73	67	62	58
13	61	59	44	43	35	35	36	35	35	35	38	37	58	54	67	62	61	60	79	77	72	69	61	59
14	59	55	44	43	35	35	35	35	35	35	38	38	54	54	69	65	64	60	82	77	73	69	64	60
15	55	52	43	41	35	35	35	35	35	34	39	38	57	54	70	65	67	64	82	79	73	68	67	63
16	52	50	43	41	35	35	35	35	35	34	39	39	59	56	71	66	70	66	79	77	74	69	69	65
17	50	49	44	43	35	35	35	35	35	34	39	38	59	57	71	65	72	68	80	76	76	72	69	66
18	50	48	44	44	35	35	35	35	34	34	38	38	61	58	69	64	71	69	81	78	76	73	70	66
19	48	47	44	43	35	34	35	35	34	33	38	38	62	60	73	67	71	68	83	79	77	74	69	66
20	47	47	43	43	35	35	35	35	34	33	38	38	63	60	73	70	74	69	83	80	77	74	66	63
21	49	47	43	42	35	35	35	35	34	34	38	38	64	59	74	68	75	71	85	81	77	73	65	62
22	50	49	42	41	36	35	35	35	34	34	39	38	65	60	74	71	74	71	85	81	76	71	64	62
23	51	49	41	41	36	36	35	35	34	33	39	38	64	55	72	69	74	69	84	81	73	68	63	62
24	51	51	41	38	36	35	35	34	34	33	39	38	55	53	72	69	73	69	81	76	72	69	63	59
25	53	51	38	37	36	35	34	34	34	34	39	38	57	52	70	67	72	68	81	76	69	67	59	57
26	53	52	37	35	36	35	34	34	34	34	39	38	58	55	69	64	74	69	85	80	72	67	59	58
27	52	50	36	35	36	35	34	34	34	34	40	38	61	57	66	63	73	69	86	82	71	69	61	58
28	50	48	36	36	36	35	34	34	34	34	41	38	63	61	65	62	73	68	86	83	73	68	61	59
29	48	44	36	34	36	36	34	34	--	--	43	40	64	61	62	61	73	69	85	82	73	69	62	60
30	44	42	34	34	36	36	34	34	--	--	44	42	64	62	67	60	74	68	84	82	69	68	62	58
31	42	41	--	--	36	36	34	34	--	--	47	43	--	--	66	64	--	--	84	80	69	65	--	--
Average	54	52	40	39	35	35	35	35	34	34	39	38	58	55	68	64	71	67	82	78	75	71	65	62

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

5-4620. SHELL ROCK RIVER AT SHELL ROCK, IOWA--Continued

Temperature (° F) of water, water year October 1956 to September 1957
/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	55	52	55	54	40	39	37	36	36	36	36	35	45	44	69	67	71	69	--	--	83	81	76	73
2	57	54	55	53	40	39	36	36	36	36	36	35	45	44	69	66	70	68	--	--	81	80	74	70
3	56	54	55	54	41	40	36	36	36	36	36	36	45	44	66	62	72	68	--	--	80	75	71	67
4	56	54	55	54	41	39	36	36	36	36	36	36	44	41	63	60	73	70	--	--	75	71	68	66
5	56	54	55	54	39	39	36	36	36	36	36	36	41	41	62	60	76	72	--	--	72	68	66	64
6	55	54	54	53	39	37	37	36	37	36	37	36	45	41	64	60	78	75	--	--	72	70	66	64
7	55	53	53	49	37	36	36	36	37	37	37	36	47	44	64	62	78	70	--	--	73	69	66	63
8	54	52	49	46	37	37	37	36	37	37	37	36	49	45	65	62	70	66	--	--	74	70	68	63
9	52	49	46	45	37	36	36	36	38	37	37	36	49	46	67	65	68	66	--	--	75	72	66	63
10	51	50	45	44	37	37	36	36	38	37	37	37	48	46	66	58	70	67	--	--	74	72	66	65
11	51	50	45	44	37	37	36	36	38	37	41	37	47	45	58	57	70	67	--	--	74	70	65	64
12	54	51	45	44	37	36	36	36	38	37	41	39	46	42	58	58	71	70	82	80	75	71	66	63
13	58	54	46	44	36	36	36	36	38	37	41	40	46	43	58	58	75	70	84	80	75	72	66	64
14	57	57	49	46	37	36	36	36	37	36	41	40	48	43	60	58	75	71	83	78	76	72	65	62
15	57	55	49	47	37	37	36	36	36	36	40	37	48	47	60	60	76	71	80	75	77	75	64	62
16	58	56	47	43	37	37	36	36	36	36	38	36	51	47	60	58	--	--	80	78	77	73	63	60
17	59	57	43	42	37	36	36	35	36	36	38	36	55	51	58	57	--	--	80	78	75	72	63	60
18	60	58	43	43	36	36	35	35	36	36	38	36	58	54	58	58	--	--	80	76	75	72	65	62
19	59	58	44	43	36	36	35	35	36	36	38	36	58	56	58	56	--	--	83	80	72	69	64	62
20	59	58	44	42	37	36	36	35	36	36	40	37	59	59	56	55	--	--	83	81	72	70	62	60
21	59	58	42	41	37	36	36	34	36	36	40	40	60	58	64	56	--	--	82	80	73	70	61	59
22	59	57	41	38	38	37	36	35	36	35	42	40	60	58	64	62	--	--	80	78	73	70	61	59
23	57	53	39	39	37	37	36	35	36	36	43	41	62	60	65	62	--	--	80	77	71	68	60	58
24	55	53	40	39	37	37	36	36	38	36	43	42	64	61	66	64	--	--	78	77	71	69	60	57
25	56	54	40	39	37	37	36	35	37	37	42	39	64	63	66	64	--	--	78	76	73	69	61	58
26	56	53	39	38	37	37	36	35	37	36	39	38	64	60	64	62	--	--	78	76	73	69	60	58
27	55	54	39	39	37	37	36	36	37	35	40	38	62	60	65	61	--	--	77	76	73	66	58	57
28	54	53	39	39	37	37	36	36	36	35	42	40	64	61	68	64	--	--	76	74	67	65	57	56
29	55	53	39	39	37	37	36	35	--	--	44	41	67	61	69	64	--	--	80	72	67	65	58	55
30	55	54	40	39	37	37	36	36	--	--	46	42	69	66	69	68	--	--	81	78	70	66	60	57
31	55	54	--	--	37	37	36	36	--	--	46	44	--	--	71	68	--	--	82	78	75	69	--	--
Average	56	54	46	44	38	37	36	36	37	36	40	38	54	51	64	59	--	--	80	77	74	71	64	62

Temperature (° F) of water, water year October 1957 to September 1958
/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	60	57	47	46	36	36	36	35	35	35	34	33	45	44	53	49	62	60	72	70	70	69	63	61
2	60	58	47	47	36	36	36	36	35	35	34	34	44	44	52	50	60	60	72	70	71	70	63	61
3	59	58	47	47	36	35	36	36	35	35	34	34	44	44	52	50	60	58	72	70	72	71	66	63
4	59	57	47	45	35	35	36	35	35	34	34	34	45	44	53	51	64	58	71	69	73	72	67	66
5	58	56	45	44	35	35	35	35	34	34	34	34	44	44	53	51	64	63	70	68	73	70	67	66
6	57	56	45	42	35	35	35	35	34	34	35	34	44	43	54	52	66	64	72	69	75	70	66	66
7	59	57	45	44	35	35	35	35	34	34	35	34	43	41	54	54	66	65	71	69	75	72	66	65
8	58	57	45	42	35	35	35	35	35	35	34	34	43	42	54	54	65	64	71	67	74	72	65	64
9	57	54	42	37	35	35	35	34	35	35	36	34	44	43	57	54	64	64	68	67	74	72	65	64
10	54	52	38	37	35	35	34	34	35	35	36	34	44	43	60	57	66	64	68	68	74	72	65	64
11	53	51	41	38	36	35	34	34	35	35	36	34	45	43	63	59	66	64	68	66	75	73	64	63
12	53	52	42	41	36	35	34	34	35	35	36	35	47	42	62	60	66	64	67	66	75	73	63	62
13	54	52	43	41	35	35	34	34	35	35	36	35	48	46	62	61	64	63	69	67	75	73	63	63
14	56	53	43	42	35	35	34	34	35	35	36	35	49	47	62	61	64	64	69	68	74	72	63	62
15	55	55	43	43	35	35	34	34	35	35	35	35	51	48	64	62	65	64	68	67	73	71	62	62
16	55	54	43	43	35	35	34	34	35	35	35	34	54	50	64	63	65	64	67	66	72	70	63	61
17	54	52	43	41	35	35	34	34	35	35	35	34	55	52	63	62	65	64	67	66	71	70	61	60
18	52	51	42	37	35	35	34	34	35	35	35	34	56	54	63	62	67	65	66	66	72	70	60	59
19	51	49	37	36	35	35	34	34	35	35	36	35	59	56	63	61	68	66	66	65	71	70	60	59
20	51	50	37	36	35	35	34	34	35	34	37	36	59	57	62	60	68	66	67	66	72	70	61	60
21	51	51	37	36	35	35	35	34	34	34	37	36	58	56	61	60	66	65	67	66	72	69	61	60
22	51	51	37	36	35	35	35	34	34	34	38	37	57	54	62	61	66	64	68	66	69	67	61	61
23	52	51	37	36	35	35	35	34	34	34	40	38	56	52	62	60	64	62	69	68	68	66	62	61
24	52	48	37	36	35	35	35	34	34	33	42	40	53	49	62	61	65	63	70	69	66	63	63	62
25	48	44	37	36	35	35	34	34	33	33	42	41	51	49	62	61	65	64	70	69	63	61	64	63
26	45	43	36	36	35	35	34	34	33	33	42	42	51	49	63	62	64	62	70	69	63	61	64	62
27	43	41	37	36	35	35	34	34	33	33	43	42	51	48	62	61	67	64	69	68	62	61	62	59
28	44	42	37	36	35	35	35	34	33	33	44	43	50	50	61	60	69	66	69	69	64	62	59	58
29	44	43	37	36	35	35	34	34	--	--	44	43	50	47	63	61	69	68	71	69	66	64	58	58
30	46	44	37	36	36	35	34	34	--	--	44	44	50	47	64	63	70	68	71	70	67	66	58	55
31	46	45	--	--	35	35	35	34	--	--	45	44	--	--	63	62	--	--	70	68	67	63	--	--
Average	53	51	41	40	35	35	35	34	34	34	38	37	50	48	60	58	65	64	69	68	71	69	63	62

DES MOINES RIVER BASIN

5-4820. 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, upstream from gaging station.
RECORDS AVAILABLE.--Chemical analyses: November 1954 to June 1955.
Water temperatures: November 1954 to September 1958.
Sediment records: November 1954 to September 1958.
EXTREMES, 1957-58.--Water temperatures: Minimum, freezing point on many days during November to March.
Sediment concentrations: Maximum daily, 4,200 ppm July 2; minimum daily, 7 ppm Feb. 2.
Sediment loads: Maximum daily, 51,400 tons July 3; minimum daily, 5 tons Feb. 2.
EXTREMES, 1954-58.--Water temperatures: Maximum (1954-57), 95°F July 28, 1955; minimum, freezing point on many days during winter months each year.
Sediment concentrations: Maximum daily, 5,900 ppm June 16, 1957; minimum daily, not determined.
Sediment loads: Maximum daily, 99,000 tons June 16, 1957; minimum daily, not determined.
REMARKS.--Maximum observed sediment concentration during water year, 5,670 ppm July 2. Flow affected by ice Nov. 10, 11, 20-22, Dec. 1-3, 7-10, Dec. 13 to Feb. 28. 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 1957 to September 1958 given in WSP 1558.

Temperature (° F) of water, water year October 1957 to September 1958
/Once-daily measurement between 12 m. and 6 p.m./

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

a Measurement between 7 p.m. and 10 p.m.

DES MOINES RIVER BASIN--Continued

5-4820. DES MOINES RIVER AT EUCLID AVENUE BRIDGE AT DES MOINES, IOWA--Continued

Suspended sediment, water year October 1957 to September 1958

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	172	46	21	305			450		
2	165	39	17	325	70	61	470	93	116
3	157	40	17	336			500		
4	157	40	17	315			424	76	95
5	150	58	23	336	--	e 46	485	50	65
6	150	56	23	358			600	50	81
7	237	53	34	347	31	29	500	121	163
8	202	61	33	336	91	83	420	121	137
9	202	61	33	305	68	53	360		
10	194	69	36	270			300	90	72
11	194	68	36	310			245		
12	202	54	29	347	41	36	285		
13	186	69	35	315	68	58	310	--	e 50
14	172	64	30	315	--	e 42	380	39	40
15	194	57	30	380			390		
16	172	66	31	380	43	44	400	99	109
17	157	52	22	380			400		
18	165	53	24	485			440		
19	202	48	26	424	--	e 60	470	123	161
20	202	28	15	370	95	95	500		
21	172	33	15	460	229	284	550	114	174
22	179	67	32	470	--	e 280	580		
23	237	59	38	424			640	47	76
24	305	58	48	510	245	337	560		
25	369	50	50	560			520		
26	325	56	49	587	--	e 320	460	67	87
27	315	89	76	587			500		
28	315	82	70	587			450		
29	275	56	42	587	--	e 200	370	66	66
30	255	59	41	336	--	e 90	280	66	50
31	255	56	39	--	--	--	250	62	42
Total	6,634	--	1,032	12,047	--	3,689	13,489	--	3,010

Day	January			February			March		
1	220			240	16	10	1,590	320	sa 1,400
2	310			245	7	5	1,390	310	1,160
3	400			250	40	27	1,310	200	707
4	500			250	13	9	1,350	200	729
5	540	--	e 60	220	21	12	1,390	260	976
6	400			180			1,140	150	462
7	350			180	17	8	1,000	130	351
8	380			195			1,050	105	298
9	310			205	14	8	922	72	179
10	280	65	49	175	58	27	860	58	135
11	270	39	28	160	34	15	815	51	112
12	270	36	26	150	56	23	740	39	78
13	280	53	40	135	83	30	725	54	106
14	300	36	29	125	65	22	770	58	121
15	320	58	50	115	64	20	755	44	90
16	340	94	86	110	39	12	725	36	70
17	350	37	35	105	38	11	695	46	86
18	350	124	117	98			654	48	85
19	350	119	112	94			614	43	71
20	340	76	70	92	32	8	535	47	68
21	325			90			548	38	56
22	320	28	24	94			560	51	77
23	310			115	70	a 22	498		
24	300			250	180	a 120	498		
25	290	21	16	700	300	a 550	498		
26	280			1,100	340	a 1,000	485		
27	280	33	25	1,400	440	a 1,700	498	60	81
28	270	14	10	1,700	550	a 2,500	510		
29	260	15	11	--	--	--	498		
30	250	39	26	--	--	--	498		
31	220	43	26	--	--	--	498		
Total	9,965	--	1,400	8,773	--	6,187	24,619	--	8,146

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

DES MOINES RIVER BASIN--Continued

5-4820. DES MOINES RIVER AT EUCLID AVENUE BRIDGE AT DES MOINES, IOWA-- Continued

Suspended sediment, water year October 1957 to September 1958--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	498	62	83	1,150	132	410	535	295	426
2	485	70	92	1,150	128	397	522	130	183
3	510	66	91	1,120	119	360	1,420	480	sa 1,900
4	574	65	101	1,050	123	349	1,760	500	2,380
5	628	100	170	1,020	124	342	4,710	2,100	sa 28,000
6	755	193	393	984	138	367	5,590	1,470	22,200
7	1,070	233	673	938	132	334	4,060	880	9,650
8	1,550	438	1,830	907	107	262	3,220	680	5,910
9	1,740	382	1,790	860	97	225	3,320	1,300	a 12,000
10	1,760	348	1,650	860	127	295	3,320	870	7,800
11	1,760	356	1,690	800	148	320	3,110	610	5,120
12	1,660	335	1,500	770	118	245	2,700	440	3,210
13	1,570	300	1,270	725	99	194	2,900	1,500	sa 12,000
14	1,440	235	914	695	115	216	3,110	1,890	15,900
15	1,310	223	789	654	105	185	2,600	960	6,740
16	1,220	232	764	682	150	276	2,060	635	3,530
17	1,170	225	711	654			1,850	850	4,250
18	1,080	232	677	641			1,780	800	3,840
19	1,020	205	565	628			1,570	500	2,120
20	1,000	215	581	641	101	176	1,240	384	1,290
21	969	192	502	668			1,100	306	909
22	922	138	344	600	138	224	984	246	654
23	892	115	277	600	77	125	938	231	585
24	892	111	267	548			892	321	773
25	860	90	209	548	97	142	1,030	349	971
26	907	89	218	535			1,030	356	990
27	892	129	311	485	96	126	984	310	824
28	922	116	289	460	79	98	1,020	303	834
29	1,070	109	315	448	67	81	907	225	551
30	1,150	112	348	424	59	68	815	214	471
31	--	--	--	644	300	sa 750	--	--	--
Total	32,276	--	19,414	22,889	--	7,555	61,077	--	156,011

Day	July			August			September		
1	695	202	379	1,680	280	1,270	255	22	15
2	2,900	4,200	sa 38,000	1,550	300	1,260	228	51	31
3	4,380	4,150	s 51,400	1,510	305	1,240	237	89	57
4	6,870	2,170	s 40,800	1,170	172	543	219	63	37
5	6,610	1,050	s 18,800	1,000	130	351	307	90	sa 100
6	5,260	650	9,230	845	170	388	587	260	sa 420
7	4,160	450	5,050	755	163	332	587	200	317
8	3,000	450	3,650	725	114	223	413	72	80
9	2,280	460	2,830	682	116	214	369	70	70
10	1,830	880	4,350	641	118	204	358	50	48
11	2,140	850	sa 5,200	614	117	194	305	45	37
12	4,600	2,600	s 32,700	535	95	137	265	76	54
13	3,740	2,000	sa21,000	485	72	94	245	60	40
14	3,840	800	8,290	472	--	e 65	275	46	34
15	3,420	690	6,370	448	34	41	305	27	22
16	4,930	1,500	sa 23,000	391	33	35	369	36	36
17	8,060	1,590	34,600	391	50	53	336	26	24
18	6,840	735	13,600	380	39	40	315	39	33
19	5,590	847	s 12,900	369	47	47	295	37	30
20	6,150	799	13,300	413	55	sa 65	275	28	21
21	5,260	480	6,820	725	500	sa 1,100	265		
22	4,160	392	4,400	574	200	310	255		
23	3,220	415	3,610	485	93	122	245	39	27
24	2,600	309	2,170	435	65	76	255		
25	2,140	321	1,850	391	41	43	245		
26	1,820	295	1,450	347	37	35	228	33	20
27	1,620	278	1,220	347	40	37	210	30	17
28	1,620	345	1,510	315	31	26	202		
29	1,350	322	1,170	305	33	27	202	26	14
30	2,160	1,000	s 6,000	295	46	37	179		
31	2,200	480	2,850	265	36	26	--	--	--
Total	115,445	--	378,499	19,540	--	8,635	8,831	--	1,720

Total discharge for year (cfs-days) 335,585
Total load for year (tons) 595,298

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

MISSOURI RIVER MAIN STEM

6A-265. JEFFERSON RIVER NEAR TWIN BRIDGES, MONT.

LOCATION.--At gaging station at private bridge, an eighth of a mile upstream from Hell Canyon Creek, 4 miles downstream from confluence of Beaverhead and Big Hole Rivers, and 4 miles north of Twin Bridges, Madison County.
DRAINAGE AREA.--7,632 square miles.
RECORDS AVAILABLE.-- Chemical analyses: September 1957 to September 1958.
Water temperatures: March to September 1958.
Sediment records: October 1957 to September 1958.
EXTREMES, September 1957 to September 1958.--Dissolved solids: Maximum, 390 ppm Sept. 30, 1957; minimum, 98 ppm May 11-31.
Hardness: Maximum, 272 ppm Aug. 28 to Sept. 30, 1958; minimum, 49 ppm May 11-31.
Specific conductance: Maximum daily, 640 micromhos Sept. 25, 1958; minimum daily, 102 micromhos May 23.
Water temperatures: Maximum, 65°F July 25, Aug. 2, 3, 11, 12; minimum, freezing point on many days during winter months.
Sediment concentrations: Maximum daily, 208 ppm Apr. 17; minimum daily, not determined.
Sediment loads: Maximum daily, 2,040 tons May 22; 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. 29, 30, Dec. 10-13, 23-25, Dec. 30 to Jan. 12, Jan. 14, 17, 19, 22, 23, 25-27, Feb. 8, 9, 14, 15. Records of discharge for water year October 1957 to September 1958 given in WSP 1559.

Chemical analyses, in parts per million, September 1957 to September 1958

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					
Sept. 30, 1957.....	a 1,100	20	0.09	65	26	28	5.5	252	103	14	0.5	0.9	0.06	390	0.53	1,160	270	63	18	0.7	618	7.9	6
Oct. 23.....	1,430	20	.00	63	21	23	4.7	235	83	13	.3	1.2	.04	358	.49	1,390	244	51	17	.6	554	8.0	5
Nov. 5.....	1,500	20	.01	65	21	23	4.5	238	84	13	.4	1.2	.04	354	.48	1,430	248	53	16	.6	563	7.9	5
Dec. 4.....	1,390	23	.09	63	22	24	4.3	232	88	11	.4	1.3	.05	351	.48	1,320	247	57	17	.7	551	8.1	8
Jan. 8, 1958	1,050	21	.02	61	21	22	4.5	225	83	8.8	.4	1.5	.02	334	.45	937	238	53	16	.6	538	8.1	4
Jan. 16.....	1,030	19	.01	57	20	22	4.0	210	81	11	.3	1.0	.00	314	.43	878	226	54	17	.6	514	7.8	6
Feb. 5.....	964	21	.01	58	20	21	4.0	217	78	11	.3	1.2	.00	317	.43	822	226	48	16	.6	512	7.9	6
Feb. 18.....	1,040	20	.02	54	21	19	4.0	207	76	9.9	.3	1.3	.00	308	.42	866	219	49	16	.6	493	8.0	6
Mar. 5	1,080	38	.00	57	20	19	4.2	214	77	11	.4	.2	.03	339	.46	985	224	49	15	.6	508	7.6	5
Mar. 15-Apr. 11 ..	1,201	37	.00	55	20	20	4.7	209	76	11	.4	.7	.04	320	.44	1,050	220	49	16	.6	504	7.7	5
Apr. 12-16.....	1,534	38	.02	47	15	17	4.0	178	60	9.0	.3	.8	.04	270	.37	1,130	181	35	17	.6	426	7.8	10
Apr. 17-23.....	3,123	34	.05	30	9.2	12	4.3	122	35	2.5	.3	1.0	.04	184	.25	1,550	113	13	18	.5	282	7.4	30
Apr. 24-May 3	2,062	19	.01	39	12	16	3.9	146	52	7.5	.3	.4	.04	231	.31	1,270	148	28	19	.6	357	7.3	10
May 4-10	3,490	17	.02	25	7.0	9.9	2.9	94	32	3.0	.2	.6	.02	159	.22	1,520	91	14	19	.5	233	7.1	16
May 11-31	5,671	14	.03	14	3.4	5.1	2.1	55	15	.2	.2	.7	.03	98	.13	1,460	49	4	18	.3	127	7.0	27
June 1-4	5,572	14	.05	17	4.0	6.0	1.7	66	18	.4	.2	.4	.03	106	.14	1,550	59	5	18	.3	147	7.0	27
June 5-11.....	6,143	16	.06	22	6.1	8.4	2.4	87	24	1.6	.2	.4	.04	136	.18	2,190	80	9	18	.4	197	7.2	31
June 12-16.....	6,566	17	.05	26	7.8	9.9	2.7	105	29	2.1	.2	.4	.04	159	.22	2,860	97	11	18	.4	234	7.2	29

a Discharge at time of sampling.

MISSOURI RIVER MAIN STEM--Continued

6A-265. JEFFERSON RIVER NEAR TWIN BRIDGES, MONT.--Continued

Chemical analyses, in parts per million, September 1957 to September 1958--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 17-24, 1958..	3,578	18	0.04	30	9.5	11	2.9	122	33	3.5	0.2	0.3	0.04	176	0.24	1,700	114	14	17	0.4	272	7.3	20
June 25-July 4	4,130	20	.02	35	12	13	3.6	143	41	6.1	.3	.4	.06	212	.29	2,380	137	20	17	.5	320	7.0	22
July 5-15	2,981	18	.01	39	14	14	3.6	158	47	7.1	.3	.4	.06	227	.31	1,830	155	25	16	.5	350	8.1	17
July 16-24	1,303	16	.00	38	13	14	3.4	149	46	7.0	.3	.3	.04	219	.30	775	147	25	17	.5	348	7.0	10
July 25-Aug. 3	872	16	.02	40	13	14	4.5	157	47	6.5	.3	.4	.06	226	.31	536	155	26	16	.5	361	7.0	7
Aug. 4-19.....	607	17	.03	50	18	19	4.5	193	67	9.2	.3	.3	.08	290	.39	470	200	42	17	.6	460	7.3	7
Aug. 20-27.....	670	21	.02	62	23	25	6.1	234	90	13	.4	.7	.08	367	.50	664	250	58	17	.7	566	7.4	7
Aug. 28-Sept. 30 ..	1,047	22	.02	68	25	26	5.4	256	98	14	.4	.9	.08	388	.53	1,100	272	62	17	.7	610	7.6	7

MISSOURI RIVER MAIN STEM--Continued

6A-265. JEFFERSON RIVER NEAR TWIN BRIDGES, MONT.--Continued

Temperature (° F) of water, March to September 1958
/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						--	43	49	54	55	64	57
2						--	a 45	50	54	57	65	56
3						--	43	56	55	56	65	52
4						--	41	53	54	55	62	57
5						a 36	41	52	53	57	60	58
6						34	a 45	53	56	62	61	55
7						a 37	44	51	59	58	62	55
8						40	45	48	57	57	64	51
9						35	43	53	54	59	62	60
10						34	41	52	53	60	63	57
11						a 36	42	55	55	62	65	54
12						34	52	a 50	55	63	65	57
13						32	43	48	54	62	63	53
14						33	48	48	54	58	63	52
15						32	49	51	56	57	64	50
16						32	48	53	a 64	59	62	49
17						32	47	49	60	62	63	54
18						34	a 46	56	61	60	63	43
19						a 41	45	56	58	62	63	49
20						a 40	46	57	57	63	61	49
21						a 42	43	58	59	62	61	52
22						a 44	42	57	58	59	62	52
23						a 46	37	57	61	64	60	a 49
24						43	38	56	62	61	61	47
25						44	40	57	55	65	60	48
26						43	44	59	59	64	62	a 55
27						41	41	61	63	61	59	50
28						43	40	59	60	63	51	51
29						43	42	58	59	64	59	48
30						43	45	58	55	62	55	46
31						41	--	55	--	62	56	--
Average						38	44	54	57	60	61	52

a Measurement between 12 m. and 6 p.m.

MISSOURI RIVER MAIN STEM--Continued

6A-265. JEFFERSON RIVER NEAR TWIN BRIDGES, MONT.--Continued

Suspended sediment, water year October 1957 to September 1958

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	1,050			1,700	--		1,330		
2	1,020			1,700	--		1,370		
3	997			1,610	--		1,410		
4	1,120			1,560	--		1,390	29	
5	1,300			1,500	21		1,380		
6	1,360			1,550	--		1,360		
7	1,390			1,550	--		1,390		
8	1,410			1,560	--		1,380		
9	1,340			1,500	--		1,380		
10	1,310			1,430	--		1,350		
11	1,300			1,460	--		1,300		
12	1,300			1,520	--		1,270		
13	1,280			1,520	--		1,250		
14	1,270			1,550	--		1,260		
15	1,320			1,550	--		1,260		
16	1,360		e 120	1,580	--	e 160	1,280		e 150
17	1,360			1,470	67		1,370		
18	1,360			1,380	--		1,330		
19	1,360			1,410	--		1,280		
20	1,370			1,460	--		1,340		
21	1,390			1,470	--		1,330		
22	1,420			1,470	--		1,270		
23	1,430	22		1,410	--		1,150		
24	1,540			1,440	--		1,100		
25	1,590			1,510	--		1,100		
26	1,600			1,550	--		1,280		
27	1,650			1,480	--		1,270		
28	1,780			1,420	--		1,250		
29	1,810			1,350	--		1,240		
30	1,770			1,300	--		1,200		
31	1,710			--	--	--	1,100		
Total	43,267		3,720	44,960	--	4,800	39,970		4,650

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	950	--		953	--		1,120		
2	900	--		964	--		1,080		
3	900	--		964	--		1,070		
4	950	--		964	--		1,100		
5	1,000	--		964	47		1,080		
6	1,050	--		975	--		1,080		
7	1,100	--		975	--		1,110		
8	1,050	58		980	--		1,100		
9	1,100	--		980	--		1,110		
10	1,150	--		986	--		1,080	24	69
11	1,200	--		986	--		1,050		
12	1,200	--		964	--		1,050		
13	1,150	--		986	--		1,060		
14	1,080	--		950	--		1,050		
15	1,040	--		950	--	e 110	1,030		
16	1,030	62	e 140	997	--		1,010		
17	1,040	--		1,010	--		1,030		
18	1,040	--		1,040	29		1,020		
19	1,000	--		1,060	--		1,040		
20	900	--		1,070	--		1,040		
21	997	--		1,120	--		1,080	32	93
22	1,030	--		1,140	--		1,140	43	132
23	1,030	--		1,150	--		1,180	52	166
24	997	--		1,160	--		1,240	67	224
25	970	--		1,190	--		1,280	80	276
26	950	--		1,190	--		1,330	85	305
27	960	--		1,140	--		1,280	73	252
28	975	--		1,130	--		1,220	58	191
29	975	--		--	--	--	1,210	50	163
30	1,010	--		--	--	--	1,220	53	175
31	964	--		--	--	--	1,270	53	182
Total	31,688	--	4,340	28,938	--	3,080	34,780	--	3,539

e Estimated.

MISSOURI RIVER MAIN STEM-- Continued

6A-265. JEFFERSON RIVER NEAR TWIN BRIDGES, MONT.--Continued

Suspended sediment, water year October 1957 to September 1958--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	1,260			1,890	28	143	5,480	42	621
2	1,250			2,060	30	167	5,500	48	713
3	1,250			2,380	43	276	5,280	--	e 700
4	1,260			2,640	57	406	6,030	69	1,120
5	1,280			2,800	57	431	6,840	75	1,390
6	1,270			2,920	55	434	7,080	85	1,620
7	1,260			3,600	132	1,280	6,540	65	1,150
8	1,270	39	136	4,230	129	1,470	5,570	50	752
9	1,280			4,210	110	1,250	5,460	50	737
10	1,310			4,030	80	870	5,810	57	894
11	1,330			4,160	77	865	5,700	46	708
12	1,330			4,540	100	1,230	5,680	48	736
13	1,330			4,850	112	1,470	6,990	77	1,450
14	1,410			4,590	69	855	7,370	74	1,470
15	1,590	78	335	4,200	52	590	6,870	60	1,110
16	2,010	150	814	3,790	44	450	5,920	55	879
17	2,720	208	1,530	3,740	44	444	5,040	53	721
18	3,120	156	1,310	4,000	46	497	4,290	53	614
19	3,350	140	1,270	4,380	56	662	3,770	48	489
20	3,380	132	1,200	4,910	76	1,010	3,460	42	392
21	3,350	99	895	5,770	108	1,680	3,310	36	322
22	3,140	66	560	6,500	116	2,040	3,040	32	263
23	2,800	59	446	6,960	97	1,820	2,750	28	208
24	2,320	50	313	7,420	99	1,980	2,960	51	408
25	2,010	41	223	7,490	85	1,720	4,910	125	1,660
26	1,980	37	198	7,920	82	1,750	5,390	80	1,160
27	2,100	36	204	7,890	66	1,410	5,330	68	979
28	2,040	34	187	7,400	57	1,140	4,420	52	621
29	1,960	28	148	6,640	53	950	3,580	38	367
30	1,880	26	132	6,160	46	765	3,310	30	268
31	--	--	--	5,790	42	657	--	--	--
Total	57,840	--	11,669	149,860	--	30,712	153,680	--	24,522

Day	July			August			September		
1	3,400	32	294	820			920		
2	3,410	30	276	802			953		
3	3,620	36	352	775			964		
4	3,930	47	499	730			986		
5	3,980	46	494	722			986		
6	3,600	63	612	698			986		
7	3,400	36	330	674			1,010		
8	3,350	36	326	629			953		
9	3,330	37	333	608			920		
10	3,240	40	350	615	14	24	920		
11	2,940	26	206	629			953		
12	2,680	25	181	622			986		
13	2,350	--	e 130	594			1,070		
14	2,070	18	101	574			1,070		
15	1,850	16	80	550			1,080		
								39	114
16	1,600	16	69	526			1,110		
17	1,480	13	52	510			1,110		
18	1,410	12	46	510			1,080		
19	1,340			520			1,060		
20	1,310			556			1,050		
21	1,240			615			1,050		
22	1,160			636			1,050		
23	1,110			658			1,120		
24	1,080			690			1,310		
25	1,020	9	25	714	41	80	1,320		
26	975			739			1,270		
27	920			748			1,240		
28	870			766			1,250		
29	850			811			1,240		
30	860			860			1,240		
31	830			910			--		--
Total	65,205	--	5,056	20,811	--	1,416	32,257		3,420

Total discharge for year (cfs-days) 703,236

Total load for year (tons) 100,924

e Estimated.

MISSOURI RIVER MAIN STEM--Continued

6A-265. JEFFERSON RIVER NEAR TWIN BRIDGES, MONT.--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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 8, 1958.....	2:00 p.m.	4,270	54	111							57	73	91		99	100	VM
June 4.....	10:45 a.m.	5,830	53	54							57	70	87		100		VM
June 17.....	8:25 a.m.	5,190	59	48							72	84	94		100		VM

MILK RIVER BASIN

6A-1740. WILLOW CREEK NEAR GLASGOW, MONT.

LOCATION.--At gaging station, 6 miles south of Glasgow, Valley County, and 8 miles upstream from mouth.
DRAINAGE AREA.--536 square miles
RECORDS AVAILABLE.--Sediment records: October 1953 to September 1958.
EXTREMES, 1957-58.--Sediment concentrations: Maximum daily, 18,000 ppm Feb. 26; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 2,380 tons Feb. 26; minimum daily, 0 tons on many days.
EXTREMES, 1953-58.--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.--Flow affected by ice Mar. 22-24. Bureau of Land Management has extensive spreader systems on some of the tributaries upstream from station. Records of discharge for water year October 1957 to September 1958 given in WSP 1559.

Monthly and annual summary of water and suspended-sediment discharge, water year October 1957 to September 1958

Month	Discharge (cfs)	Runoff (acre-feet)	Suspended sediment					
			Load (tons)	Daily load (tons)			Concentration (ppm)	
				Mean	Maximum	Minimum	Weighted mean	Maximum observed
October	15.4	31	e 8	0.3	--	0		--
November	0	0	0	0	0	0		--
December	0	0	0	0	0	0		--
January	0	0	0	0	0	0		--
February	85.5	170	a 3,440	123	2,380	0		22,200
March	228.3	453	a 3,800	123	1,500	0		6,730
April	14.7	29	a 22	.7	12	0		476
May	0	0	0	0	0	0		--
June	91.3	181	a 2,660	89	1,940	0		38,200
July	37.5	74	a 280	9	180	0		308
August	0	0	0	0	0	0		--
September	0	0	0	0	0	0		--
Water year	472.7	938	10,210	28	2,380	0		38,200

e Estimated.
a Includes loads computed from estimated concentration graph.

6A-1740. WILLOW CREEK NEAR GLASGOW, MONT.--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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, 1958...	4:10 p.m.	30		6,450	4,290		90		99		100						PWCM
Mar. 26	3:15 p.m.	13		4,200	3,140		97		99		100						PWCM
June 10.....	3:35 p.m.	130		38,200	3,640		85		--		100						VPWCM

6A-2145. 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 1958 (discontinued).
Water temperatures: December 1950 to September 1958 (discontinued).
EXTREMES, 1957-58.--Dissolved solids: Maximum, 323 ppm Feb. 1-16; minimum, 96 ppm June 1-3.
Hardness: Maximum, 192 ppm Feb. 1-16; minimum, 56 ppm June 1-3.
Specific conductance: Maximum daily, 573 micromhos Feb. 10; minimum daily, 134 micromhos May 29.
Water temperatures: Maximum, 72°F Sept. 10; minimum, freezing point on several days during November to January.
EXTREMES, 1950-58.--Dissolved solids: Maximum, 868 ppm Feb. 2, 1951; minimum, 96 ppm June 19, 1951, June 1-3, 1958.
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 1957 to September 1958 given in WSP 1559.

Chemical analyses, in parts per million, water year October 1957 to September 1958

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, 1957....	4,246	--	--	--	--	31	--	165	--	--	--	--	--	287	0.39	3,280	164	29	29	1.1	448	7.6	--
Nov. 1-30.....	3,904	--	--	--	--	32	--	169	--	--	--	--	--	305	.41	3,170	174	35	29	1.1	473	7.8	--
Dec. 1-31.....	3,108	19	0.01	45	16	31	3.4	172	95	7.0	0.3	1.4	0.16	300	.41	2,530	180	39	27	1.0	486	7.5	5
Jan. 1-31, 1958....	2,465	--	--	--	--	31	--	174	--	--	--	--	--	319	.43	2,100	184	41	27	1.0	495	7.8	--
Feb. 1-16.....	2,016	--	--	--	--	33	--	175	--	--	--	--	--	323	.44	1,760	192	48	27	1.0	510	7.4	--
Feb. 17-26.....	2,973	--	--	--	--	33	--	155	--	--	--	--	--	300	.41	2,420	170	43	30	1.1	478	7.4	--
Feb. 27-Mar. 31...	2,578	26	.00	42	16	33	3.6	160	103	9.0	.5	1.0	.23	312	.42	2,150	174	43	29	1.1	489	7.4	10
Apr. 1-19.....	2,802	--	--	--	--	31	--	158	--	--	--	--	--	290	.39	2,170	167	37	29	1.0	468	7.3	--
Apr. 20-22.....	3,583	--	--	--	--	24	--	144	--	--	--	--	--	247	.34	2,420	142	24	27	.9	390	7.3	--
Apr. 23-May 3.....	3,610	--	--	--	--	37	--	160	--	--	--	--	--	317	.43	3,080	172	41	32	1.2	500	7.3	--
May 4-7	5,890	--	--	--	--	27	--	164	--	--	--	--	--	265	.36	4,210	158	24	27	.9	418	7.5	--
May 8-11.....	9,782	--	--	--	--	17	--	140	--	--	--	--	--	215	.29	5,630	132	17	22	.6	328	7.4	--
May 12-18.....	12,190	--	--	--	--	11	--	99	--	--	--	--	--	154	.21	5,080	92	11	21	.5	236	7.1	--
May 19-20.....	15,750	--	--	--	--	9.0	--	79	--	--	--	--	--	120	.16	5,000	69	4	22	.5	183	7.5	--
May 21-31.....	27,080	11	.01	17	4.3	5.9	1.3	68	17	.3	.2	.9	.04	104	.14	7,520	60	4	17	.3	152	7.0	--
June 1-3	23,900	--	--	--	--	7.5	--	63	--	--	--	--	--	96	.13	6,160	56	4	23	.4	150	7.1	--
June 4	23,600	--	--	--	--	11	--	74	--	--	--	--	--	120	.16	7,490	70	9	25	.6	185	7.4	--
June 5-12	22,060	--	--	--	--	8.3	--	73	--	--	--	--	--	109	.15	6,560	63	3	22	.5	170	7.1	--
June 13-18	18,750	--	--	--	--	11	--	86	--	--	--	--	--	128	.17	6,320	75	4	24	.6	203	7.1	--
June 19	18,000	--	--	--	--	12	--	142	--	--	--	--	--	187	.25	8,930	132	16	16	.5	298	7.6	--

YELLOWSTONE RIVER BASIN--Continued

6A-2145. YELLOWSTONE RIVER AT BILLINGS, MONT.--Continued

Chemical analyses, in parts per million, water year October 1957 to September 1958--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 20-26, 1958...	17,480	--	--	--	--	11	--	85	--	--	--	--	--	125	0.17	5,900	75	5	24	0.6	201	7.2	--
June 27-July 2.....	13,000	--	--	--	--	11	--	84	--	--	--	--	--	124	.17	4,380	75	6	24	.6	205	7.1	--
July 3.....	10,900	--	--	--	--	17	--	148	--	--	--	--	--	214	.29	6,270	136	15	21	.6	343	7.3	--
July 4-18.....	8,948	--	--	--	--	17	--	112	--	--	--	--	--	170	.23	4,080	103	11	26	.7	280	7.3	--
July 19-26.....	5,712	--	--	--	--	22	--	120	--	--	--	--	--	195	.27	3,060	115	17	29	.9	321	7.1	--
July 27.....	6,460	--	--	--	--	23	--	150	--	--	--	--	--	242	.33	4,230	148	25	25	.8	387	7.4	--
July 28-Aug. 8.....	5,401	--	--	--	--	22	--	134	--	--	--	--	--	222	.30	3,210	132	22	27	.8	349	7.2	--
Aug. 9-31.....	3,393	--	--	--	--	29	--	154	--	--	--	--	--	271	.37	2,490	152	26	29	1.0	423	7.3	--
Sept. 1-30.....	2,957	--	--	--	--	34	--	172	--	--	--	--	--	310	.42	2,460	178	37	29	1.1	493	7.7	--
Weighted average a	5,976	--	--	--	--	19	--	119	--	--	--	--	--	200	0.27	3,200	116	18	26	0.8	314	--	--

a Represents 100 percent of runoff for water year October 1957 to September 1958.

YELLOWSTONE RIVER BASIN--Continued

6A-2145. YELLOWSTONE RIVER AT BILLINGS, MONT.--Continued

Temperature (° F) of water, water year October 1957 to September 1958
/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	64	46	--	33	36	36	36	54	42	40	45	38
2	64	40	31	33	34	39	38	42	43	42	47	38
3	60	40	36	32	36	38	40	44	38	42	46	65
4	57	41	39	33	38	37	39	45	39	42	47	67
5	50	39	39	33	35	38	38	45	40	43	44	68
6	--	40	36	32	46	38	40	43	43	42	44	67
7	--	40	34	32	36	40	39	44	44	41	46	68
8	42	39	39	34	35	38	38	50	40	42	46	70
9	48	41	43	34	35	35	42	44	42	44	45	71
10	50	40	40	33	37	36	39	40	40	44	45	72
11	--	42	36	34	38	35	41	43	38	45	45	70
12	51	41	38	38	36	34	42	43	39	45	45	62
13	55	40	38	36	45	34	42	40	38	46	44	65
14	56	41	38	36	35	35	43	41	41	41	46	62
15	53	40	36	34	34	35	41	42	40	41	43	59
16	57	38	47	38	35	33	44	41	42	42	45	60
17	51	40	40	38	37	34	42	43	43	45	44	40
18	49	38	38	37	35	36	41	41	42	45	45	59
19	48	35	38	34	38	37	42	45	43	42	46	64
20	54	31	37	34	37	39	40	40	42	46	47	62
21	50	34	39	34	33	40	40	46	39	43	42	60
22	49	37	35	37	36	38	38	44	41	43	42	60
23	40	38	34	37	37	38	34	43	43	44	40	58
24	40	39	32	36	39	38	38	41	42	42	40	56
25	42	40	36	39	40	39	39	43	42	45	46	57
26	41	41	32	36	36	40	38	42	43	41	42	56
27	43	38	32	34	35	40	38	43	43	43	41	55
28	45	39	34	34	38	39	39	44	44	45	41	56
29	48	45	32	38	--	40	37	42	45	43	38	54
30	48	35	33	37	--	41	41	42	42	42	36	--
31	49	--	33	35	--	41	--	41	--	44	41	--
Average	50	39	36	35	37	37	40	43	41	43	44	60

YELLOWSTONE RIVER BASIN--Continued

6A-2390. 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 1958 (discontinued).
EXTREMES, 1957-58.--Sediment concentrations: Maximum daily, 54,000 ppm June 8; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 23,000 tons Aug. 23; minimum daily, 0 tons on many days.
EXTREMES, 1950-58.--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 1957 to September 1958 given in WSP 1559.

Monthly and annual summary of water and suspended-sediment discharge, water year October 1957 to September 1958

Month	Discharge (cfs)	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	3.1	6.1	a 282	9.1	a 180	0		34,000
April	1.3	2.6	a 151	5.0	126	0		49,000
May	0	0	0	0	0	0		--
June	30	60	a 3,980	133	e 3,200	0		61,200
July	0	0	0	0	0	0		--
August	130	258	a 24,400	787	a 23,000	0		104,000
September	0	0	0	0	0	0		--
Water year	164.4	327	28,813	79	a 23,000	0		104,000

e Estimated.
a Partly estimated.

6A-2390. MUSKRAT CREEK NEAR SHOSHONI, WYO.--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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, 1958...	5:30 p.m.	e 0.6	51	34,000	3,320		97		100								PWCM
Apr. 11.....	11:00 a.m.	2.5	55	49,000	5,000		93		97		100						PWCM

e Estimated.

YELLOWSTONE RIVER BASIN--Continued

6A-2445. 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 1958 (discontinued).
EXTREMES, 1957-58.--Sediment concentrations: Maximum daily, 7,340 ppm July 30; minimum daily, no flow on many day.
Sediment loads: Maximum daily, 299 tons July 30; minimum daily, 0 tons on many days.
EXTREMES, 1949-58.--Sediment concentrations: Maximum daily, 77,400 ppm Sept. 20, 1950; minimum daily, 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.
RECORDS.--Flow affected by ice Nov. 3, 4, Nov. 9 to Mar. 19, Mar. 27. Records of discharge for water year October 1957 to September 1958 given in WSP 1559.

Suspended sediment, water year October 1957 to September 1958

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	4.5	--		0.4	--	
2	0		0	4.5	--		.4	136	
3	0		0	4.4	--		.4	--	
4	0		0	4.3	2,100		.4	--	
5	0		0	4.2	--	e 20	.4	--	(t)
6	0		0	4.2	--		.4	--	
7	0		0	4	--		.4	--	
8	0		0	4	--		.6	--	
9	0		0	3	500		1	--	
10	0		0	2	500		1	--	
11	0		0	2	--		1	--	
12	0		0	2	--	e 3	1	--	
13	0		0	2	--		1	--	
14	0		0	2	--		1	--	
15	.1			2	--		1	--	e 2
16	.1			1	--		1	--	
17	.2			.6	--		1	582	
18	.2	1,250		.4	310		1	--	
19	.9			.4	--		1	--	
20	.9		e 2	.4	--		1	597	
21	.9			.4	--		1	--	
22	.9			.4	--		1	--	
23	.6			.4	--	(t)	.5		
24	.7			.4	--		.5		
25	2.4			.4	--		.5		
26	3.0			.4	--		.5	--	e 1
27	2.9			.4	--		.5		
28	3.2		e 13	.4	--		.5		
29	3.4			.4	--		.5		
30	4.2			.4	--		.5		
31	4.5			--	--	--	0	--	0
Total	29.1		111	55.9	--	186	21.4	--	37

e Estimated.
t Less than 0.50 ton.

YELLOWSTONE RIVER BASIN--Continued

6A-2445. FIVEMILE CREEK ABOVE WYOMING CANAL, NEAR PAVILLION, WYO.--Continued

Suspended sediment, water year October 1957 to September 1958--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	1			2	--	e 1
2	0	--	0	1			2	--	e 2
3	0	--	0	1			2	290	2
4	0	--	0	1			2	185	1
5	0	--	0	1			2	180	1
6	0	--	0	1			2	480	3
7	0	--	0	1			2	580	3
8	0	--	0	1	320	1	2	590	3
9	.2	--		1			2	--	e 2
10	.5	--		1			.5	--	e 1
11	.5	--		1			.5	--	e 1
12	.5	--		1			.5	900	a 1
13	.5	--		1			.5	1,200	a 2
14	1	--		1			1	1,600	a 4
15	1	--		1			1	350	1
16	1	--	(t)	3	560	5	1	740	2
17	1	--		5	650	9	2	850	a 5
18	1	--		5	1,000	a 14	3	1,300	a 11
19	.5	--		5	700	a 9	4	1,500	a 16
20	.5	--		5	750	a 10	5.2	4,120	s 84
21	.5	280		5	850	11	6.6	5,700	sa 120
22	.5	--		5	--	e 10	7.6	5,940	s 143
23	.5	--		5	--	e 10	8.0	--	e 140
24	1			4	--	e 9	7.6	5,500	sa 120
25	1			3	1,100	9	8.3	6,000	sa 140
26	1			3	1,100	a 9	6.9	5,300	a 100
27	1	370	1	2	300	2	6	4,000	a 65
28	1			2	220	1	5.5	2,940	s 53
29	1			--	--	--	6.2	3,410	s 61
30	1			--	--	--	6.2	4,100	sa 75
31	1			--	--	--	6.3	3,510	60
Total	17.7	--	14	67	--	123	112.4	--	1,223

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	7.2	6,200	a 120	1.5	1,190	5	0	--	0
2	5.5	4,400	sa 75	1.1	810	2	0	--	0
3	5.0	3,700	sa 60	1.0	640	2	0	--	0
4	5.5	5,400	sa 85	1.0	700	2	0	--	0
5	5.8	4,440	70	1.0	450	1	0	--	0
6	5.2	4,200	59	1.1	720	2	0	--	0
7	5.2	5,000	70	4.6	4,200	sa 95	0	--	0
8	6.6	5,700	a 100	4.8	3,960	51	0	--	0
9	5.0	3,750	51	3.5	2,200	21	0	--	0
10	4.5	3,250	39	2.8	--	e 14	0	--	0
11	4.0	2,700	29	2.3	--	e 9	0	--	0
12	3.5	2,500	24	1.9	1,300	sa 11	0	--	0
13	2.7	2,550	19	7.4	3,400	sa 75	.6	1,800	sa 24
14	2.3	1,350	8	11	5,800	a 170	.9	3,380	s 17
15	2.3	2,400	15	9.5	6,000	sa 160	.2	--	e 1
16	2.3	2,000	12	5.8	3,320	s 57	.1	--	(t)
17	2.2	1,900	11	4.0	1,870	s 22	.6	--	e 2
18	1.8	1,700	8	2.3	1,050	7	.5	--	e 1
19	1.8	--	e 8	1.3	864	s 5	.1	--	(t)
20	1.6	2,300	s 12	.8	600	s 2	.9	1,160	s 4
21	1.8	1,300	6	.4	412	s 1	.7	--	e 2
22	3.2	3,900	sa 44	.4	217	s 1	.3	--	e 1
23	2.5	2,400	16	.6	227	s 1	.2	--	(t)
24	2.8	3,200	sa 30	.7	650	a 1	1.4	1,000	sa 7
25	2.5	2,500	17	.4	512	1	2.3	2,200	a 14
26	2.5	2,150	15	.1	41	(t)	.8	--	e 3
27	2.5	2,200	15	0	--	0	.3	--	e 1
28	2.0	1,500	8	0	--	0	0	--	0
29	1.8	1,460	s 8	0	--	0	0	--	0
30	1.5	1,600	sa 7	0	--	0	0	--	0
31	--	--	--	.2	--	(t)	--	--	--
Total	103.1	--	1,041	71.5	--	718	9.9	--	77

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

YELLOWSTONE RIVER BASIN--Continued

6A-2445. FIVEMILE CREEK ABOVE WYOMING CANAL, NEAR PAVILLION, WYO--Continued

Suspended sediment, water year October 1957 to September 1958--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	1.6		e 6	0		0
2	0	--	0	.9		e 3	0		0
3	0	--	0	.9		e 2	0		0
4	0	--	0	.4		e 1	0		0
5	0	--	0	.2		(t)	0		0
6	0	--	0	.1		(t)	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	.3	4,400	sa 7	0		0
11	0	--	0	0		0	0		0
12	0	--	0	0		0	0		0
13	0	--	0	0		0	0		0
14	0	--	0	0		0	0		0
15	0	--	0	0		0	0		0
16	.9	--	e 5	0		0	0		0
17	.2	--	e 1	0		0	0		0
18	1.7	3,600	sa 55	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	.1		(t)	0		0
24	0	--	0	.2		e 1	0		0
25	0	--	0	.4		e 2	0		0
26	.3	1,500	s 4	.5		e 2	0		0
27	.5	1,660	s 4	.3		e 1	0		0
28	.2	--	e 1	0		0	0		0
29	4.7	3,100	sa 240	0		0	.1		(t)
30	8.4	7,340	s 299	0		0	.2		e 1
31	1.5	--	e 10	0		0	--		--
Total	18.4	--	619	5.9		26	0.3		1

Total discharge for year (cfs-days) 512.6
Total load for year (tons) 4,176

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

YELLOWSTONE RIVER BASIN--Continued

6A-2445. FIVEMILE CREEK ABOVE WYOMING CANAL, NEAR PAVILLION, WYO.--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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, 1957.....	1:05 p.m.	a 4.3	37	9,020	7,770		16		30		58	87	99		100	--	VPWCM
Feb. 17, 1958....	4:50 p.m.	7.2	32	1,080	2,720		16		31		50	85	100		--	--	VPWCM
Feb. 21	3:10 p.m.	8.6	33	2,060	3,890		22		38		71	92	100		--	--	VPWCM
Mar. 20.....	2:25 p.m.	11	34	13,800	897		--		--		65	84	94		99	100	VPN
Mar. 20.....	2:25 p.m.	11	34	13,800	3,160	14	18		35		65	84	94		99	100	VPWC
Mar. 27.....	3:50 p.m.	12	42	7,200	5,320		20		33		69	91	99		100	--	VPWCM
Apr. 10	12:05 p.m.	5.0	58	4,010	4,400		14		22		42	67	92		99	100	VPWCM
Apr. 22	11:30 a.m.	4.8	54	4,700	5,680		15		22		45	69	93		100	--	VPWCM
May 13	8:30 p.m.	6.9	49	4,500	8,280		32		45		84	98	100		--	--	VPWCM
May 15	4:55 p.m.	7.2	65	5,610	2,980		20		30		45	64	85		96	100	VPWCM
June 13.....	11:10 p.m.	4.2	48	14,400	3,560		48		68		77	86	95		98	100	VPWCM
July 29.....	10:15 p.m.	25	60	17,500	5,870		45		--		82	95	100		--	--	VPWCM

a Daily mean discharge.

YELLOWSTONE RIVER BASIN--Continued

6A-2500. 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 1958 (discontinued).
Sediment records: October 1949 to September 1958 (discontinued).
EXTREMES, 1957-58.--Water temperatures: Maximum, 68°F July 20, Aug. 3, 6, 15; minimum, freezing point on many days during November to March.
Sediment concentrations: Maximum daily, 15,800 ppm Apr. 28; minimum daily, not determined.
Sediment loads: Maximum daily, 6,350 tons June 14; minimum daily, not determined.
EXTREMES, 1949-58.--Water temperatures (1950-51, 1952-58): 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 Jan. 1 to Feb. 20. Records of discharge for water year October 1957 to September 1958 given in WSP 1559.

Temperature (° F) of water, water year October 1957 to September 1958
/Once-daily measurement between 6 a.m. and 11 a.m./

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

YELLOWSTONE RIVER BASIN--Continued

6A-2500. FIVEMILE CREEK NEAR RIVERTON, WYO.--Continued

Suspended sediment, water year October 1957 to September 1958

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.....	121	2,580	843	58	1,400	219	48	1,410	183
2.....	127	3,120	1,070	56	1,360	206	47	1,540	195
3.....	137	2,840	1,050	57	1,400	215	46	1,160	144
4.....	137	2,710	1,000	59	1,700	271	46	1,390	173
5.....	137	3,190	1,180	57	1,560	240	48	520	67
6.....	140	3,280	1,240	57	1,500	231	48	500	65
7.....	132	2,800	998	56	1,520	230	45	1,410	171
8.....	124	2,600	870	54	1,310	191	46	1,060	132
9.....	124	2,490	834	53	1,180	169	46	1,750	s 238
10.....	119	2,400	771	53	1,310	187	42	1,600	sa 200
11.....	102	2,160	595	53	1,300	186	43	1,200	139
12.....	81	2,000	437	55	1,630	242	46	1,260	s 169
13.....	75	1,790	362	53	1,510	216	49	1,200	173
14.....	72	1,830	356	54	1,520	222	52	1,410	198
15.....	70	1,900	359	52	1,890	265	53	1,260	180
16.....	70	1,630	308	49	1,490	197	51	1,190	164
17.....	69	1,550	289	51	1,520	209	51	1,150	158
18.....	68	1,510	277	47	1,210	154	49	1,660	s 237
19.....	69	1,400	261	46	1,100	137	49	1,400	a 190
20.....	69	1,400	261	47	1,060	135	46	1,470	s 197
21.....	67	1,520	275	45	1,100	134	46	1,200	sa 160
22.....	66	1,650	294	45	1,120	136	45	1,390	169
23.....	64	1,500	259	49	1,320	175	41	1,140	126
24.....	64	1,960	339	51	1,250	172	41	800	89
25.....	63	1,800	306	51	1,790	246	42	700	sa 90
26.....	62	1,720	288	50	1,760	238	45	912	s 118
27.....	62	1,800	301	49	1,270	168	38	680	70
28.....	62	1,720	288	48	1,200	156	40	963	s 118
29.....	61	1,380	227	46	810	101	41	1,040	115
30.....	60	1,320	214	47	1,300	165	39	921	s 103
31.....	60	1,460	237	--	--	--	37	590	59
Total.	2,734	--	16,389	1,548	--	5,813	1,406	--	4,590

Day	January			February			March		
1.....	30			30	620	50	31	2,360	198
2.....	30			30	600	49	31	2,500	209
3.....	30			30	710	58	32	2,660	230
4.....	35			30	990	80	31	2,320	194
5.....	35	179	17	30	850	69	29	2,250	176
6.....	35			30	920	75	32	2,540	219
7.....	40			30	1,220	99	32	3,100	268
8.....	45			30	1,900	154	33	2,430	217
9.....	50	196	26	35	1,480	140	34	2,610	240
10.....	55	194	29	35	1,520	144	32	2,280	197
11.....	60	240	39	35	1,220	115	34	2,230	205
12.....	60	400	65	35	1,190	112	35	2,100	198
13.....	60	650	105	35	830	78	35	2,470	233
14.....	60	710	115	35	720	68	33	2,110	188
15.....	60	700	113	35	1,140	108	32	1,770	153
16.....	60	890	144	35	1,730	163	33	1,810	161
17.....	60	940	152	40	1,660	179	33	1,980	176
18.....	60	880	143	40	2,750	297	34	2,070	190
19.....	60	1,050	170	40	3,000	324	36	2,710	263
20.....	50	1,120	151	45	2,850	346	37	2,430	243
21.....	40	770	83	46	4,510	s 637	41	3,270	362
22.....	35	820	77	42	4,500	s 589	42	4,000	454
23.....	25	580	39	40	4,430	s 520	43	3,540	411
24.....	20	750	41	40	4,030	s 459	43	4,780	555
25.....	20	880	48	39	4,120	s 472	45	5,910	718
26.....	20	1,040	56	34	3,000	280	41	4,500	498
27.....	25	1,100	74	32	1,900	164	40	3,880	419
28.....	25	800	54	31	2,050	172	42	3,800	431
29.....	30	1,020	83	--	--	--	40	3,990	431
30.....	30	750	61	--	--	--	40	4,000	432
31.....	30	950	77	--	--	--	39	3,650	384
Total.	1,275	--	2,081	989	--	6,001	1,115	--	9,253

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

YELLOWSTONE RIVER BASIN--Continued

6A-2500. FIVEMILE CREEK NEAR RIVERTON, WYO.--Continued

Suspended sediment, water year October 1957 to September 1958--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	41	4,650	515	42	5,600	635	50	2,860	386
2	40	4,000	432	40	4,600	497	58	3,170	496
3	38	3,120	320	46	4,900	609	59	3,000	478
4	40	3,200	346	50	4,700	635	68	3,380	621
5	43	3,810	442	49	3,800	503	74	3,720	743
6	42	3,500	397	57	6,100	sa 1,000	71	3,610	692
7	41	3,450	382	51	5,200	716	93	5,040	1,270
8	43	3,710	431	71	6,750	1,290	93	4,990	1,250
9	41	3,600	399	52	4,700	660	105	4,580	1,300
10	39	3,340	352	50	3,700	500	119	4,930	1,580
11	38	3,350	344	52	4,300	604	141	5,490	2,090
12	37	2,790	279	52	4,250	597	146	5,240	2,070
13	37	3,300	330	55	4,300	639	167	6,870	3,100
14	32	2,690	232	100	7,970	2,150	195	11,300	s 6,350
15	28	2,200	166	94	7,000	1,780	131	6,500	2,300
16	29	2,450	192	65	4,800	842	127	6,550	2,250
17	34	3,060	281	58	3,500	548	150	7,000	2,840
18	34	2,830	260	53	3,440	492	166	5,850	2,620
19	32	2,810	243	53	3,440	492	161	5,800	2,520
20	32	2,610	226	58	3,480	545	168	5,700	2,590
21	30	2,260	183	59	4,020	640	174	5,450	2,560
22	34	3,170	291	55	3,880	576	181	5,200	2,540
23	31	2,100	176	57	3,490	537	176	5,250	2,490
24	31	2,350	197	52	3,500	491	188	5,300	2,690
25	49	9,600	s 1,670	52	4,110	577	211	5,400	3,080
26	52	8,700	1,220	51	4,150	571	194	5,000	2,620
27	53	13,100	1,870	55	3,410	506	192	4,920	2,550
28	63	15,800	s 2,850	61	3,740	616	181	4,710	2,300
29	62	12,600	s 2,270	55	3,550	527	170	4,210	1,930
30	44	6,400	760	58	3,370	528	171	4,110	1,900
31	--	--	--	52	2,500	351	--	--	--
Total	1,190	--	18,056	1,755	--	21,654	4,180	--	62,206

	July			August			September		
1	172	3,580	1,660	195	4,160	2,190	121	2,250	735
2	170	4,050	1,860	190	4,370	2,240	114	2,460	757
3	167	4,690	2,110	179	3,700	1,790	112	2,100	635
4	183	5,400	2,670	181	3,690	1,800	125	2,100	709
5	183	4,810	2,380	157	3,070	1,300	121	2,000	653
6	179	4,810	2,320	154	3,100	1,290	122	2,090	688
7	181	4,390	2,150	135	3,200	1,170	133	2,210	794
8	157	3,800	1,610	128	2,960	1,020	142	2,290	878
9	145	3,410	1,340	137	2,910	1,080	145	2,320	908
10	142	3,500	1,340	154	3,100	1,290	136	2,320	852
11	179	4,510	2,180	167	3,100	1,400	135	1,990	725
12	198	4,610	2,460	175	3,350	1,580	128	2,210	764
13	185	4,820	2,410	178	3,280	1,580	125	2,350	793
14	180	4,690	2,280	174	2,820	1,320	115	2,330	723
15	175	4,330	2,050	176	2,950	1,400	114	2,030	625
16	175	4,300	2,030	195	3,570	1,880	119	2,280	733
17	176	3,780	1,800	185	3,480	1,740	119	2,270	729
18	209	6,190	3,490	191	3,230	1,670	124	2,150	720
19	174	4,420	2,080	195	3,390	1,780	132	2,450	873
20	190	4,410	2,260	184	3,470	1,720	116	1,760	551
21	198	4,180	2,230	161	3,460	1,500	120	1,840	596
22	204	4,350	2,400	159	3,250	1,400	125	1,770	597
23	208	4,930	2,770	171	3,320	1,530	126	2,030	691
24	197	4,410	2,350	164	3,270	1,450	115	1,670	519
25	213	4,450	2,560	163	3,450	1,520	118	1,900	605
26	215	4,000	2,320	166	3,310	1,480	133	1,980	711
27	223	4,100	2,470	162	2,780	1,220	140	1,920	726
28	219	3,800	2,250	161	3,010	1,310	140	1,900	718
29	218	3,560	2,100	146	2,360	930	135	1,850	674
30	240	5,480	3,550	136	2,580	947	141	2,100	799
31	206	4,620	2,570	127	2,360	809	--	--	--
Total	5,861	--	70,050	5,146	--	45,336	3,791	--	21,481

Total discharge for year (cfs-days) 30,990
Total load for year (tons) 282,910

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

6A-2500. FIVEMILE CREEK NEAR RIVERTON, WYO.--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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. 11, 1957....	5:35 p.m.	105	55	1,880	2,810		16		25		39	54	76		91	99	VPWCM
Oct. 23	4:10 p.m.	52	50	1,230	1,410		12		19		26	34	60		86	100	VBWCM
Nov. 20.....	4:30 p.m.	45	33	1,340	1,540		12		19		31	44	68		89	100	VBWCM
Jan. 30, 1958....	3:05 p.m.	a 30	32	1,050	2,380		19		32		48	55	65		80	99	VPWCM
Feb. 20.....	2:50 p.m.	a 45	33	4,300	3,790		25		46		90	94	96		98	100	VPWCM
Feb. 22.....	4:25 p.m.	68	40	10,800	5,690		27		45		79	92	96		99	100	VPWCM
Feb. 25.....	2:00 p.m.	43	39	5,010	4,700		25		40		69	83	89		94	98	VPWCM
Mar. 11.....	5:20 p.m.	35	37	2,930	4,420		19		31		49	65	75		86	97	VPWCM
Mar. 25.....	3:45 p.m.	46	47	6,730	3,350		32		55		80	87	92		97	100	VPWCM
Apr. 14.....	5:55 p.m.	31	53	2,690	4,550		22		35		56	67	77		90	99	VPWCM
Apr. 21.....	6:00 p.m.	31	53	2,010	3,350		21		31		53	68	81		91	99	VPWCM
Apr. 28.....	1:40 p.m.	52	50	12,000	3,100		33		52		85	94	97		98	100	VPWCM
Apr. 29.....	9:40 a.m.	75	41	16,400	4,970		33		52		85	95	98		99	100	VPWCM
May 12.....	3:00 p.m.	51	66	3,810	8,430		24		36		58	75	86		93	98	VPWCM
May 15.....	7:35 p.m.	109	44	8,530	6,790		20		32		56	81	96		100	--	VPWCM
June 4	11:45 a.m.	65	65	3,110	2,910		23		33		50	68	83		90	97	VPWCM
June 13	9:45 p.m.	187	56	7,920	3,320		22		35		61	79	91		97	99	VPWCM
June 14	2:45 a.m.	246	63	12,000	2,990		33		49		76	90	96		99	100	VPWCM
June 14	12:30 p.m.	179	65	10,100	3,410		32		46		74	90	97		99	100	VPWCM
July 3.....	3:10 p.m.	172	73	3,930	4,950		23		36		57	72	86		94	98	VPWCM
July 17.....	4:40 p.m.	168	77	3,440	1,550		22		32		51	70	88		97	100	VBWCM
July 28.....	5:20 p.m.	209	76	3,230	1,360		19		28		46	65	89		98	100	VBWCM
Aug. 14.....	11:05 a.m.	185	69	2,670	2,930		16		24		39	57	84		95	98	VPWCM
Sept. 5.....	2:35 p.m.	122	70	1,750	668		20		26		41	55	80		95	100	VBWCM
Sept. 19.....	3:40 p.m.	135	63	2,400	3,120		23		34		53	65	81		92	98	VPWCM
Oct. 2	3:55 p.m.	174	55	3,180	5,320		24		37		59	73	87		96	100	VPWCM

a Daily mean discharge.

YELLOWSTONE RIVER BASIN--Continued

6A-2530. 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 1958.
Sediment records: August 1948 to September 1958.
EXTREMES, 1957-58.--Water temperatures: Maximum, 75°F May 26, Aug. 10; minimum, freezing point on many days during November to March.
Sediment concentrations: Maximum daily, 13,200 ppm Apr. 29; minimum daily, not determined.
Sediment loads: Maximum daily, 8,960 tons June 14; minimum daily, not determined.
EXTREMES, 1948-58.--Water temperatures: Maximum, 84°F June 10, 1949; minimum, freezing point on many days during winter.
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. 30, Dec. 2-4, Dec. 11 to Feb. 20. Records of discharge for water year October 1957 to September 1958 given in WSP 1559.

Temperature (° F) of water, water year October 1957 to September 1958
/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	53	39	34	--	--	33	37	53	63	63	63	59
2	56	36	32	--	--	33	39	51	60	64	65	62
3	54	34	33	--	--	33	37	54	63	66	69	58
4	49	32	34	--	32	32	39	53	a 66	59	67	54
5	46	38	33	--	38	33	35	55	62	57	64	60
6	47	38	33	--	38	37	47	52	64	65	63	59
7	44	32	33	a 32	37	35	40	54	62	63	66	63
8	47	38	33	32	36	38	44	48	65	58	62	60
9	47	32	34	--	36	--	45	53	a 69	62	65	65
10	46	34	31	a 32	39	35	40	57	59	63	a 75	61
11	46	35	35	--	--	38	45	61	60	61	66	62
12	47	35	38	--	31	38	43	53	61	66	69	59
13	48	35	34	--	34	38	52	49	57	65	66	a 67
14	50	37	34	--	38	33	44	49	60	60	68	--
15	50	a 40	34	a 33	34	33	47	49	61	59	68	57
16	50	33	35	32	39	37	54	55	59	61	65	51
17	47	35	34	34	38	32	53	56	60	65	66	54
18	47	32	34	--	36	37	50	59	a 71	66	70	57
19	45	a 32	32	33	38	36	51	60	61	66	65	53
20	46	35	33	--	32	42	44	60	58	a 70	65	53
21	46	33	33	--	33	42	50	59	61	66	64	55
22	45	32	35	32	36	43	49	59	67	62	60	53
23	44	34	33	--	39	45	38	59	64	65	60	a 65
24	44	--	32	33	38	45	--	63	63	66	63	49
25	46	32	--	--	38	45	44	63	56	65	63	48
26	41	34	--	--	38	45	48	a 75	61	61	64	51
27	39	a 34	a 32	--	33	45	47	58	64	65	65	50
28	39	34	--	--	34	39	39	65	64	62	64	51
29	a 46	35	--	a 34	--	40	42	62	62	67	67	52
30	40	34	32	32	--	46	43	66	62	64	60	48
31	39	--	--	--	--	45	--	60	--	64	59	--
Average	46	35	33	--	36	38	44	57	62	63	65	56

a Measurement between 12 m. and 4 p.m.

YELLOWSTONE RIVER BASIN--Continued

6A-2530. FIVEMILE CREEK NEAR SHOSHONI, WYO.--Continued

Suspended sediment, water year October 1957 to September 1958

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	208	2,050	1,150	77	380	79	86	1,120	260
2	211	2,010	1,150	77	390	81	80	830	179
3	222	2,110	1,260	80	620	134	75	910	184
4	231	1,820	1,140	82	790	175	70	820	155
5	234	1,830	1,160	84	810	184	66	910	162
6	240	1,920	1,240	84	610	138	66	860	153
7	231	1,710	1,070	82	740	164	64	880	152
8	214	1,480	855	80	700	151	63	1,070	182
9	205	1,700	941	77	520	108	64	1,100	190
10	200	1,770	956	77	600	125	61	920	151
11	183	1,700	840	79	580	124	55	500	a 75
12	147	1,320	524	79	710	151	55	510	76
13	108	1,010	295	79	880	188	60	400	a 65
14	92	950	236	80	870	188	70	620	117
15	89	950	228	80	830	179	80	900	194
16	87	780	183	77	790	164	75	1,610	326
17	86	900	209	77	790	164	75	1,550	314
18	86	810	188	74	770	154	70	1,270	240
19	91	870	214	72	490	95	70	700	132
20	91	840	206	72	560	109	65	1,020	179
21	89	670	161	71	610	117	60	1,380	224
22	87	660	155	69	500	93	60	1,120	181
23	86	690	160	74	420	84	55	430	64
24	84	620	141	74	--	e 90	55	400	a 60
25	84	410	93	75	550	a 110	55	--	
26	82	400	89	74	720	144	60	--	
27	80	520	112	71	620	119	55	250	e 50
28	80	390	84	72	850	165	55	--	
29	79	440	94	71	730	140	55	--	
30	79	640	137	65	700	123	55	413	
31	79	450	96	--	--	--	50	--	
Total	4,165	--	15,367	2,285	--	4,040	1,985	--	4,365

Day	January			February			March		
1	45			45	700	85	49	1,390	184
2	45			45	710	86	48	1,620	210
3	45			45	490	59	49	1,600	212
4	50	--	e 40	45	450	55	48	1,590	206
5	50			45	580	70	45	1,860	226
6	50			45	620	75	48	1,940	251
7	55	300		45	530	64	49	1,780	235
8	60	256	e 50	45	690	84	49	1,900	251
9	65	--		50	620	84	52	1,590	223
10	70	300		50	720	97	46	1,840	229
11	75			50	960	130	49	1,740	230
12	75			50	710	96	50	1,600	216
13	75	--	e 80	50	720	97	50	1,530	207
14	75			50	830	112	49	1,640	217
15	75	510	103	50	840	113	48	1,580	205
16	75	520	105	50	1,800	243	49	1,560	206
17	75	620	126	50	2,190	296	48	1,750	227
18	75	560	113	50	2,530	342	49	1,810	239
19	75	520	105	50	2,800	378	54	1,790	261
20	60	570	92	55	3,150	468	54	1,800	262
21	50	500	68	63	3,690	628	58	2,650	415
22	45	420	51	55	3,200	a 480	61	3,000	494
23	40	350	38	56	3,200	sa 550	63	3,400	578
24	35	510	48	58	3,510	s 580	61	3,960	652
25	35	520	49	58	2,900	a 460	64	4,720	815
26	35	520	49	50	2,590	350	63	4,130	703
27	40	500	54	49	1,740	230	58	2,670	418
28	40	450	49	48	1,580	205	61	3,550	585
29	45	530	64	--	--	--	58	3,350	525
30	45	430	52	--	--	--	56	3,010	455
31	45	550	67	--	--	--	56	3,120	472
Total	1,725	--	1,993	1,402	--	6,517	1,642	--	10,609

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

YELLOWSTONE RIVER BASIN--Continued

6A-2530. FIVEMILE CREEK NEAR SHOSHONI, WYO.--Continued

Suspended sediment, water year October 1957 to September 1958--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	3,460	523	141	6,J60	2,300	130	1,620	569
2	58	2,660	417	141	3,400	1,290	171	2,110	974
3	55	1,810	269	139	2,680	1,010	166	1,860	834
4	60	2,440	395	130	2,690	944	164	1,680	744
5	64	2,900	501	118	2,340	746	176	1,800	855
6	66	3,130	558	141	4,420	s 1,850	173	1,680	785
7	61	2,350	387	166	3,770	1,690	197	2,730	1,450
8	64	2,710	468	192	4,100	2,130	202	2,760	1,510
9	63	2,430	413	141	2,570	978	214	3,030	1,750
10	56	2,060	311	130	2,250	790	225	3,370	2,050
11	55	1,770	263	136	2,130	782	265	4,200	3,010
12	54	1,650	241	141	2,150	819	302	4,920	4,010
13	54	1,740	254	147	2,710	1,080	330	4,890	4,360
14	49	1,620	214	225	5,610	s 3,660	386	8,600	8,960
15	43	1,110	129	205	4,700	2,600	298	5,220	4,200
16	43	1,260	146	161	2,730	1,190	291	4,630	3,640
17	48	1,550	201	161	2,410	1,050	312	4,960	4,180
18	48	1,650	214	147	1,970	782	326	5,490	4,830
19	46	1,380	171	143	1,900	734	330	4,040	3,600
20	46	1,360	169	141	1,920	731	337	3,890	3,540
21	46	1,290	160	143	2,090	807	308	3,540	2,940
22	54	1,560	227	132	1,630	581	308	3,690	3,070
23	52	1,470	206	178	2,770	1,330	298	4,170	3,360
24	48	1,040	135	159	1,590	683	319	4,620	3,980
25	58	4,830	s 1,080	141	1,620	617	382	4,330	4,470
26	75	7,900	1,600	132	1,180	421	355	4,000	3,830
27	71	8,050	1,540	147	1,490	591	337	3,970	3,610
28	79	9,550	2,040	168	1,850	839	326	3,500	3,080
29	96	13,200	3,420	150	1,640	664	305	3,370	2,780
30	105	6,650	1,890	134	1,510	546	302	3,450	2,810
31	--	--	--	118	1,090	347	--	--	--
Total	1,773	--	18,542	4,648	--	34,582	8,235	--	89,781

Day	July			August			September		
1	319	3,130	2,700	359	3,440	3,330	278	1,650	1,240
2	319	2,960	2,550	330	3,110	2,770	265	1,580	1,130
3	312	3,440	2,900	330	2,850	2,540	250	1,180	796
4	330	4,280	3,810	344	2,900	2,690	275	1,220	906
5	330	3,610	3,220	322	2,520	2,190	275	1,310	973
6	305	3,300	2,720	312	2,510	2,110	275	1,500	1,110
7	326	3,480	3,060	305	2,450	2,020	285	1,320	1,020
8	308	3,030	2,520	302	2,200	1,790	302	1,610	1,310
9	291	2,920	2,290	305	1,810	1,490	308	1,580	1,310
10	288	3,070	2,390	312	1,100	927	302	1,620	1,320
11	319	3,430	2,950	326	1,970	1,730	302	1,420	1,160
12	341	3,600	3,310	330	2,280	2,030	302	1,370	1,120
13	330	3,620	3,230	333	2,280	2,050	302	1,470	1,200
14	319	3,770	3,250	330	2,030	1,810	272	1,500	1,100
15	312	3,700	3,120	326	2,010	1,770	268	1,510	1,090
16	322	3,180	2,760	344	2,550	2,370	275	1,830	1,360
17	322	2,780	2,420	352	2,720	2,590	278	1,460	1,100
18	344	4,440	4,120	366	2,450	2,420	278	1,400	1,050
19	322	3,430	2,980	363	2,250	2,210	282	1,490	1,130
20	326	3,260	2,870	355	2,540	2,430	268	1,100	796
21	337	2,810	2,560	316	1,960	1,670	275	1,060	787
22	340	3,170	2,910	316	2,240	1,910	275	1,300	965
23	355	3,270	3,130	337	2,300	2,090	272	1,200	881
24	340	3,350	3,080	330	2,310	2,060	265	1,130	809
25	363	3,210	3,150	326	2,180	1,920	262	1,290	913
26	386	3,400	3,540	330	2,220	1,980	268	1,270	919
27	406	2,720	2,980	326	1,790	1,580	268	1,410	1,020
28	394	2,920	3,110	322	1,940	1,690	272	1,260	925
29	410	2,900	3,210	319	1,780	1,530	272	1,200	881
30	450	4,100	4,980	305	1,730	1,420	275	1,240	921
31	410	3,470	3,840	282	2,070	1,580	--	--	--
Total	10,576	--	95,660	10,155	--	62,697	8,346	--	31,242

Total discharge for year (cfs-days) 56,937
Total load for year (tons) 375,395

s Computed by subdividing day.

6A-2530. FIVEMILE CREEK NEAR SHOSHONI, WYO.--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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. 11, 1957....	1:10 p.m.	164	54	1,210	2,160		17		25		37	48	73		91	100	VBWCM
Oct. 23	12:00 m.	84	47	604	1,760		23		34		42	47	67		93	100	VBWCM
Nov. 20	1:35 p.m.	72	35	857	1,620		18		30		54	68	87		99	100	VBWCM
Dec. 17.....	1:05 p.m.	78	35	1,900	2,510		14		24		41	57	85		99	100	VPWCM
Jan. 30, 1958....	11:05 a.m.	58	32	396	1,510		25		35		50	64	88		100	--	VBWCM
Feb. 18.....	4:30 p.m.	52	34	3,230	4,620		31		52		81	93	98		100	--	VPWCM
Feb. 24.....	5:15 p.m.	61	46	2,540	3,060		18		32		57	68	88		99	100	VPWCM
Mar. 11.....	3:35 p.m.	56	41	2,020	3,340		15		27		54	68	87		98	100	VPWCM
Mar. 25.....	12:40 p.m.	63	49	3,750	2,990		35		57		78	86	94		99	100	VPWCM
Apr. 21.....	5:30 p.m.	46	57	1,080	4,010		23		36		58	73	88		99	100	VPWCM
Apr. 28.....	3:30 p.m.	75	51	9,000	4,270		38		60		90	96	98		100	--	VPWCM
May 1.....	8:40 a.m.	152	45	7,760	2,650		18		32		70	87	96		99	100	VPWCM
June 3	10:55 a.m.	183	65	1,840	2,220		17		26		44	64	84		98	100	VPWCM
June 14	4:55 p.m.	352	69	7,050	2,810		31		46		76	91	97		100	--	VPWCM
July 3.....	11:55 a.m.	326	69	3,540	3,310		17		26		44	61	85		97	99	VPWCM
July 17.....	12:45 p.m.	340	71	3,080	2,500		20		30		50	69	87		98	100	VPWCM
July 28.....	1:20 p.m.	402	71	3,030	2,580		19		28		48	67	87		98	100	VBWCM
Aug. 14.....	3:15 p.m.	322	77	2,050	1,280		16		24		41	57	80		95	99	VBWCM
Sept. 9.....	4:55 p.m.	305	72	1,640	1,530		19		28		43	57	80		94	100	VBWCM
Sept. 19.....	11:50 a.m.	295	58	1,510	1,590		16		24		45	62	81		96	100	VBWCM

YELLOWSTONE RIVER BASIN--Continued

6A-2570. 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 1958.
EXTREMES, 1957-58.--Sediment concentrations: Maximum daily, 64,400 ppm July 25; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 19,000 tons June 25; minimum daily, 0 tons on many days.
EXTREMES, 1947-58.--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 October to December; record is omitted. Flow affected by ice Mar. 16, 17. Records of discharge for water year October 1957 to September 1958 given in WSP 1559.

Suspended sediment, January to September 1958

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							0	--	0
11							0	--	0
12							0	--	0
13							0	--	0
14							0	--	0
15							0	--	0
16							1	333	s 3
17							1	442	s 4
18							1.6	1,400	sa 18
19							1.6	--	e 30
20							4.5	2,900	sa 55
21							5.5	3,240	s 62
22							8.8	5,140	s 146
23							18	5,070	246
24							22	4,350	258
25							40	4,400	475
26							46	4,350	540
27							31	4,350	364
28							36	3,400	sa 420
29							29	3,540	277
30							11	3,800	s 125
31							11	3,850	114
Total	0		0	0		0	268.0	--	3,137

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

YELLOWSTONE RIVER BASIN--Continued

6A-2570. BADWATER CREEK AT BONNEVILLE, WYO.--Continued

Suspended sediment, January to September 1958--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	11	4,480	s 174	15	3,650	148	0	--	0
2	14	5,960	s 257	17	3,700	170	0	--	0
3	18	4,950	s 264	17	3,150	145	0	--	0
4	22	4,440	264	18	3,450	168	0	--	0
5	12	4,930	s 239	21	4,250	241	0	--	0
6	12	4,010	130	31	4,250	356	0	--	0
7	11	5,250	s 164	42	7,310	s 2,680	0	--	0
8	14	3,800	144	22	5,780	s 380	0	--	0
9	11	4,100	122	27	4,950	361	0	--	0
10	11	4,370	s 146	40	4,600	497	0	--	0
11	15	4,800	194	50	3,300	446	0	--	0
12	12	5,520	179	50	3,100	418	0	--	0
13	12	3,820	124	59	3,670	585	0	--	0
14	10	4,000	108	82	5,100	1,130	0	--	0
15	9.4	4,240	108	133	9,300	3,340	0	--	0
16	13	3,650	128	115	5,300	1,650	0	--	0
17	15	3,350	136	82	3,950	875	0	--	0
18	13	3,500	123	69	3,100	578	0	--	0
19	17	3,400	156	56	2,500	378	0	--	0
20	17	3,050	140	59	2,400	382	7.8	29,200	s 1,470
21	17	3,250	149	56	2,550	386	13	48,000	1,750
22	16	3,300	143	42	10,200	1,160	7.3	19,300	s 573
23	18	3,770	s 194	21	4,120	234	0	--	0
24	16	3,530	152	18	3,180	155	8.7	14,000	sa 700
25	13	3,400	119	22	29,700	s 2,050	85	57,000	sa 19,000
26	13	3,940	s 160	16	20,300	877	16	21,600	933
27	14	3,230	s 131	11	9,000	267	4.9	7,790	s 137
28	11	4,120	s 132	8.8	6,200	147	0	--	0
29	14	3,610	136	0	--	0	0	--	0
30	13	3,850	s 154	0	--	0	0	--	0
31	--	--	--	0	--	0	--	--	--
Total	414.4	--	4,770	1,199.8	--	20,204	142.7	--	24,563

Day	July			August			September		
1	0	--	0						
2	0	--	0						
3	0	--	0						
4	2.5	35,700	s 504						
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	.6	--	e 50						
22	0	--	0						
23	0	--	0						
24	0	--	0						
25	41	64,400	s 18,800						
26	1.6	22,100	s 145						
27	0	--	0						
28	0	--	0						
29	0	--	0						
30	24	39,400	s 5,080						
31	4.7	24,200	s 652						
Total	74.4	--	25,231	0		0	0		0

Total discharge for year (cfs-years) 2,099.3

Total load for year (tons) 77,905

e Estimated.

s Computed by subdividing day.

a Computed from partly estimated concentration graph.

YELLOWSTONE RIVER BASIN--Continued

6A-2570. BADWATER CREEK AT BONNEVILLE, WYO.--Continued

Particle-size analyses of suspended sediment, January to September 1958

(*Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water*)

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, 1958...	7:30 p.m.	20	45	5,400	3,220		41		60		86	97	100		--		VPWCM
Mar. 27.....	10:40 a.m.	24	43	4,540	2,640		37		54		86	98	100		--		VPWCM
Apr. 1	12:10 p.m.	14	52	2,040	2,930		50		64		85	97	100		--		VPWCM
Apr. 7	4:55 p.m.	17	62	11,200	3,370		34		58		90	98	100		--		VPWCM
Apr. 11.....	12:40 p.m.	12	59	5,200	3,480		52		70		90	98	100		--		VPWCM
Apr. 18.....	11:50 a.m.	11	59	4,880	3,250		50		74		95	99	100		--		VPWCM
Apr. 25.....	6:05 p.m.	17	54	5,420	1,570		41		64		85	92	97		100		VPWCM
May 1	10:35 a.m.	16	61	4,800	5,730		30		50		76	84	92		98	100	VPWCM
May 15	10:30 a.m.	146	48	17,400	5,280		46		63		87	95	99		100		VPWCM
May 22	11:20 a.m.	40	79	14,200	4,970		71		92		98	100	--		--		VPWCM
May 26	2:10 p.m.	14	78	18,200	3,230		72		97		98	100	--		--		VPWCM
June 25.....	1:20 a.m.	17	52	17,200	3,050		71		96		97	99	100		--		VPWCM
June 25.....	2:00 a.m.	82	52	62,600	4,830		46		85		96	99	100		--		VPWCM
June 25.....	10:10 a.m.	106	63	60,300	5,010		56		81		90	96	100		--		VPWCM
July 4	11:40 a.m.	7.0	66	102,000	5,260		76		99		100	--	--		--		PWCM
July 25	4:20 p.m.	20	74	46,200	4,260		71		96		99	100	--		--		VPWCM
July 30	7:50 p.m.	26	67	62,200	3,270		69		96		98	99	100		--		VPWCM
July 31	7:15 a.m.	4.5	57	47,400	4,370		81		100		--	--	--		--		PWCM

YELLOWSTONE RIVER BASIN--Continued

6A-2575. MUDDY CREEK NEAR PAVILLION, WYO.

LOCATION.--At gaging station, 600 feet upstream from Wyoming Canal siphon, 4 1/8 miles downstream from Sheep Creek, and 9¼ miles northeast of Pavillion, Fremont County.
DRAINAGE AREA.--267 square miles.
RECORDS AVAILABLE.--Water temperatures: March to July 1949, October 1954 to September 1958 (discontinued).
Sediment records: March 1949 to November 1953, October 1954 to September 1958 (discontinued).
EXTREMES, 1957-58.--Water temperatures: Maximum, 87°F Aug. 1; minimum, freezing point on many days during November to March.
Sediment concentrations: Maximum daily, 29,000 ppm July 21; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 15,000 tons July 21; minimum daily, 0 tons on many days.
EXTREMES, 1949-53, 1954-58.--Water temperatures (1954-58): Maximum, 89°F June 5, 1957; 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.--Flow affected by ice Nov. 10 to Mar. 26. Records of discharge for water year October 1957 to September 1958 given in WSP 1559.

Temperature (° F) of water, water year October 1957 to September 1958
/Once-daily measurement between 2 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	69	39	34	32	a 36	32	39	53	70	--	87	--
2	a 67	a 35	33	32	a 33	32	37	61	--	--	83	--
3	61	38	33	32	a 32	32	39	58	--	--	74	--
4	a 52	37	33	a 32	32	32	35	63	--	--	85	62
5	58	35	33	a 33	a 32	34	39	64	--	--	76	63
6	60	34	33	33	33	33	41	59	--	--	85	61
7	54	37	33	32	32	34	47	a 50	--	--	--	67
8	56	a 33	32	34	33	33	41	a 51	--	--	84	70
9	a 60	34	35	33	32	--	46	63	--	--	a 79	a 77
10	a 53	33	--	a 32	33	32	50	68	--	--	78	70
11	a 43	33	33	34	32	32	49	64	--	--	71	a 63
12	--	34	32	34	32	32	52	60	--	--	77	64
13	a 43	32	32	34	32	32	63	61	--	--	82	a 64
14	54	32	--	32	a 32	32	47	49	74	--	74	50
15	47	32	a 34	a 35	32	32	54	66	70	--	68	60
16	55	32	32	35	32	32	52	a 60	68	--	76	71
17	54	33	32	32	a 35	32	58	a 65	69	--	71	--
18	55	32	34	32	a 34	32	52	65	80	--	65	60
19	a 43	32	32	32	35	32	49	72	68	--	65	59
20	50	32	35	a 32	35	32	52	68	74	--	81	--
21	52	32	32	32	34	34	53	74	66	--	62	--
22	52	--	a 32	a 32	34	34	52	67	a 72	81	63	70
23	a 41	33	33	32	34	34	37	81	72	68	66	--
24	46	33	32	33	36	34	41	67	64	72	67	--
25	49	33	a 34	33	33	34	44	a 75	70	70	71	--
26	54	--	32	a 33	33	33	55	71	76	56	69	--
27	44	32	a 32	a 33	33	33	39	82	85	70	63	63
28	51	32	--	a 32	32	34	43	76	60	a 79	60	--
29	47	32	--	a 33	--	36	52	76	--	a 70	64	--
30	51	34	--	32	--	37	55	68	--	60	66	--
31	46	--	a 32	35	--	36	--	71	--	81	62	--
Average	52	34	33	33	33	33	47	65	71	71	72	--

a Measurement between 9 a.m. and 1 p.m.

YELLOWSTONE RIVER BASIN--Continued

6A-2575. MUDDY CREEK NEAR PAVILLION, WYO.--Continued

Suspended sediment, water year October 1957 to September 1958

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	3.0			8.0	550	a 12	2		
2	3.5			8.0	700	a 15	2		
3	3.5			8.3	850	a 19	2		
4	4.0			7.6	950	sa 20	2		
5	4.2			7.6	922	19	2		
6	4.2			7.2	857	s 18	2		
7	4.2	324	3	7.6	881	18	2		
8	4.0			6.9	850	a 16	2		
9	4.2			5.8	370	6	2		
10	4.5			5	390	5	2		
11	4.0			5	460	6	2		
12	4.2			5	550	7	2		
13	4.2			5	370	5	2		
14	5.0			5	390	5	2		
15	5.2			4	590	6	2		
16	5.8			4	580	6	2	263	1
17	5.5			4	430	5	2		
18	5.8			4	390	4	2		
19	5.8			4			2		
20	5.8			4			2		
21	5.8			4			2		
22	5.8	531	8	3			2		
23	5.8			3			2		
24	6.2			2			2		
25	6.2			2	162	1	2		
26	5.8			2			2		
27	6.6			2			2		
28	6.2			2			2		
29	5.5			2			2		
30	6.2			2			2		
31	6.2			--	--	--	.5		
Total	156.9	--	183	140.0	--	204	60.5		31

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	0.1			1			4	130	1
2	.1			1			4	210	2
3	.1			1			4	300	3
4	.1			1			4	280	3
5	.1			1			5	220	3
6	.1	216	(t)	1			6	410	7
7	.1			1			6	440	7
8	.1			1	162	(t)	6	360	6
9	.1			1			6	--	e 6
10	.1			1			5	440	6
11	.2			1			5	420	6
12	.2			1			5	500	7
13	.2			1			5	570	8
14	.2			1			5	390	5
15	.2			1			6	290	5
16	.2			2	510	3	7	370	7
17	.2			3	750	6	8	440	10
18	.2	49	(t)	3	1,100	a 9	8	540	12
19	.2			4	280	3	9	880	21
20	.2			5	120	2	9	1,250	30
21	.2			5	440	6	15	2,800	113
22	.2			6	210	3	20	4,900	265
23	.2			8	140	3	30	5,300	429
24	.3			8	390	8	35	7,100	671
25	.4			8	560	12	40	10,600	1,140
26	.5	27	(t)	8	240	5	35	10,000	945
27	.7			6	180	3	33	10,600	s 1,010
28	1			4	110	1	35	9,070	s 979
29	1			--	--	--	30	8,450	684
30	1	44	(t)	--	--	--	26	8,220	577
31	1			--	--	--	24	6,900	a 440
Total	9.5	--	2	85	--	70	440	--	7,408

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

YELLOWSTONE RIVER BASIN--Continued

6A-2575. MUDDY CREEK NEAR PAVILLION, WYO.--Continued

Suspended sediment, water year October 1957 to September 1958--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	17	8,270	s 401	6.2			0.1	350	(t)
2	12	7,500	243	4.4			0	--	0
3	7.4	7,120	s 175	4.4			0	--	0
4	7.0			4.4	4,040	50	0	--	0
5	8.6			4.4			0	--	0
6	7.4			4.1			0	--	0
7	6.2			4.7	6,900	sa 140	0	--	0
8	7.4			5.4	12,000	a 180	0	--	0
9	8.6			6.2	5,800	97	0	--	0
10	8.6			7.4			0	--	0
		11,100	231		3,760	97			
11	8.2			9.5			0	--	0
12	8.6			12			0	--	0
13	7.4			14	4,100	155	.7	1,330	s 12
14	7.4			16	4,500	194	5.1	7,260	s 130
15	7.4			14	6,800	257	1.8	2,000	10
16	7.4			14	4,550	172	2.3		
17	7.8			6.6	3,100	55	2.9		
18	9.5	19,400	s 660	4.7	6,100	77	3.5		
19	8.2	19,300	427	3.2	3,050	26	4.1	1,410	11
20	4.4	11,800	140	2.6			3.5		
21	3.2			2.9			2.0		
22	4.1			2.9			2.0	1,090	s 7
23	3.5			3.2			1.2	310	1
24	3.5			3.5			1.4	511	s 4
25	4.7			3.8	1,620	16	2.0		
		6,980	85					1,570	8
26	5.0			4.4			2.6		
27	5.4			5.0			1.2		
28	4.7			5.8			.3	119	(t)
29	5.4			2.9			0	--	0
30	5.8			.5	450	sa 2	0	--	0
31	--	--	--	.5	563	s 2	--	--	--
Total	211.8	--	6,130	183.6	--	2,108	36.7	--	255

Day	July			August			September		
1	0	--	0	2.0	1,360	s 8	0	--	0
2	0	--	0	1.1	410	1	0	--	0
3	0	--	0	1.0	923	s 4	0	--	0
4	0	--	0	.9	340	1	.2		
5	0	--	0	.4	190	(t)	.4		
6	0	--	0	.3			.4		
7	0	--	0	.3			.4		
8	0	--	0	.3			.4	21	(t)
9	0	--	0	.2	89	(t)	.3		
10	0	--	0	.3			.4		
11	0	--	0	.3			.5		
12	0	--	0	.3	600	sa 1	.5		
13	0	--	0	1.5	650	sa 4	1.2		
14	0	--	0	2.1	210	1	1.2		
15	0	--	0	.8			1.2		
16	0	--	0	.6			1.3		
17	0	--	0	.5			1.6		
18	0	--	0	.4			1.8		
19	0	--	0	.4			1.5		
20	0	--	0	.4			1.4		
21	35	29,000	sa 15,000	.4			1.4	78	(t)
22	14	14,000	sa 850	.4			1.4		
23	5.0	670	s 10	.3	48	(t)	1.3		
24	5.0	553	s 8	.3			1.3		
25	4.5	383	5	.4			1.6		
26	4.2	1,180	s 17	.5			1.8		
27	4.0	1,010	s 13	.4			1.8		
28	4.0	380	4	.3			2.1		
29	4.0	300	3	.3			2.2		
30	22	20,800	s 2,370	.3			2.1		
31	13	8,930	s 437	.3			--	--	--
Total	114.7	--	18,717	18.0	--	22	31.7	--	6

Total discharge for year (cfs-days) 1,488.4
Total load for year (tons) 35,136

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

YELLOWSTONE RIVER BASIN--Continued

6A-2575. MUDDY CREEK NEAR PAVILLION, WYO.--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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, 1957	2:20 p.m.	9.0	38	2,520	4,620		40		68		84	96	100				VPWCM
Feb. 25, 1958	4:25 p.m.	15	32	1,130	1,450		19		26		52	88	100				VBWCM
Mar. 20	4:45 p.m.	11	32	2,460	4,330		38		49		64	79	98		100		VPWCM
Apr. 1	3:20 p.m.	31	40	30,300	4,460		18		31		84	97	100				VPWCM
Apr. 10	2:05 p.m.	9.0	59	8,120	4,210		29		47		93	100	--				VPWCM
June 14	1:30 a.m.	14	51	16,000	4,220		27		43		80	96	100				VPWCM
July 22	3:20 p.m.	8.0	81	3,260	3,700		70		88		96	99	100				VPWCM
July 30	11:00 a.m.	64	67	70,400	2,870		42		74		94	99	100				VPWCM
July 30	9:05 p.m.	15	63	11,500	3,970		63		90		97	99	100				VPWCM

YELLOWSTONE RIVER BASIN--Continued

6A-2580. MUDDY CREEK NEAR SHOSHONI, WYO.

LOCATION.--At gaging station 2¼ 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, October 1956 to September 1958.
Sediment records: March 1949 to September 1958.
EXTREMES, 1957-58.--Water temperatures: Maximum, 87°F July 12; minimum, freezing point on many days during November to March.
Sediment concentrations: Maximum daily, 43,000 ppm July 22; minimum daily, no flow on several days during January and February.
Sediment loads: Maximum daily, 15,000 tons July 22; minimum daily, 0 tons on several days during January and February.
EXTREMES, 1949-58.--Water temperatures: Maximum (1956-58), 87°F July 12, 1958; minimum (1949, 1956-58), freezing point on many days during winter months.
Sediment concentrations: Maximum daily (1951-58), 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. 17 to Mar. 25. Records of discharge for water year October 1957 to September 1958 given in WSP 1559.

Temperature (° F) of water, water year October 1957 to September 1958
(Once-daily measurement between 1 p.m. and 6 p.m. Several days of no flow)

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

a Measurement between 8 a.m. and 12 m.
b Includes estimated temperature, 32° F, on missing days.

YELLOWSTONE RIVER BASIN--Continued

6A-2580. MUDDY CREEK NEAR SHOSHONI, WYO.--Continued

Suspended sediment, water year October 1957 to September 1958

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	11			13			3	--	
2	10	1,000	27	14			3	208	
3	10			15			3	331	
4	12	1,380	45	16			3	--	
5	18	2,200	a 110	17			3	--	
6	18	2,100	a 100	18			3	--	
7	15			18			3	--	
8	15			17			3	--	
9	16			14			3	--	
10	16	1,870	76	12	2,010	76	3	--	
11	15			12			3	364	
12	13			11			3	--	
13	12			9.4			3	--	
14	12			12			3	--	
15	12			15			3	--	
16	12			10			3	--	e 3
17	13			10			3	236	
18	12			5	200		3	--	
19	13			5	--		3	--	
20	14			4	373		3	--	
21	14	1,350	47	3	--		3	--	
22	13			2	286		3	--	
23	13			2	--		3	--	
24	13			2	--	e 3	3	350	
25	13			3	--		3	--	
26	13			3	--		3	--	
27	14			3	330		3	355	
28	14			3	--		3	--	
29	14			3	--		3	--	
30	14			3	--		3	370	
31	14			--	--	--	3	--	
Total	418	--	1,656	274.4	--	1,331	93	--	93

Day	January			February			March		
1	2	--		0	--	0	10	--	e 6
2	1	--		0	--	0	9	--	e 6
3	1	--		0	--	0	8	280	6
4	1	--		0	--	0	8	360	8
5	1	--		0	--	0	9	310	8
6	1	196		.1	--		11	400	12
7	1	242		.1	45		15	430	17
8	1	--		.1	--		15	--	e 18
9	2	--		.1	--		10	--	e 15
10	3	--		.1	32		9	840	20
			e 1			(t)			
11	3	--		.1	--		8	390	8
12	3	--		.1	--		7	420	8
13	3	--		.1	--		6	440	7
14	3	--		.1	--		6	370	6
15	3	184		.1	--		6	360	6
16	3	--		.5	--	(t)	6	370	6
17	3	194		1	110	(t)	6	320	5
18	3	--		2	120	1	10	450	12
19	3	--		3	140	1	15	1,020	41
20	1	--		3	130	1	20	1,580	85
21	.5			4	160	2	25	1,820	123
22	.2	162	(t)	4	220	2	30	2,620	212
23	.1			5	220	3	35	3,400	321
24	0	--	0	10	370	10	40	5,750	621
25	0	--	0	15	400	16	45	7,650	929
26	0	--	0	14	370	14	40	8,440	912
27	0	--	0	12	220	7	29	7,250	568
28	0	--	0	11	190	6	22	9,520	565
29	0	--	0	--	--	--	23	9,350	581
30	0	--	0	--	--	--	23	7,400	460
31	0	--	0	--	--	--	23	7,000	435
Total	42.8	--	20	85.5	--	64	529	--	6,027

e Estimated.
t Less than 0.50 ton.
a Computed from estimated concentration graph.

6A-2580. MUDDY CREEK NEAR SHOSHONI, WYO.--Continued

Suspended sediment, water year October 1957 to September 1958--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	22	6,900	410	10			17	1,510	69
2	22	7,500	446	9.1			14	1,120	42
3	20	6,000	324	8.6			14	1,200	45
4	22	6,750	401	8.2	2,680	64	11	1,060	31
5	27	7,200	525	8.2			9.1	940	23
6	25	5,200	351	8.6			7.3	610	12
7	21	5,000	284	16	6,200	sb 480	8.6		
8	20	5,500	297	27	11,600	s 1,040	6.4		
9	20	5,520	298	59	18,900	s 3,220	4.8	1,070	17
10	17	5,250	241	74	15,000	3,000	4.4		
11	16	4,400	190	74	12,300	2,460	12	2,000	s 81
12	17	3,450	158	72	11,600	2,260	31	4,000	sb 360
13	15			45	8,840	s 1,210	40	3,490	377
14	14			60	10,700	s 2,000	65	10,700	1,880
15	12			85	13,000	2,980	54	7,600	a 1,100
		4,010	119						
16	11			58	9,650	1,510	52	5,600	786
17	9.1			30	5,370	s 476	55	6,200	921
18	7.8			14	2,100	79	58	6,300	987
19	13	--	e 180	8.2	1,900	42	58	5,850	916
20	17	--	e 240	19	3,790	s 206	52	5,000	702
21	14			23	2,800	174	43	4,350	505
22	14			17	2,050	94	49	5,200	a 700
23	14			37	5,200	519	47	4,550	577
24	14			47	6,100	774	47	4,500	571
25	13			54	5,400	a 800	43	3,750	435
		3,660	128						
26	12			47	5,150	654	31	2,750	230
27	12			44	4,650	552	32	3,750	324
28	12			36	3,550	345	25	2,500	169
29	11			34	3,150	289	22	2,400	a 140
30	11			33	3,000	267	20	1,850	100
31	--	--	--	22	2,000	a 120	--	--	--
Total	474.9	--	6,339	1,087.9	--	25,935	932.6	--	12,151

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	17	1,280	59	40	7,450	805	22		
2	15	1,120	45	33	4,000	356	18		
3	17	1,370	63	23	2,400	149	18		
4	36	3,000	292	20	1,650	89	18		
5	46	3,800	a 480	16	1,450	63	19		
6	46	3,550	441	17	1,500	69	19		
7	47	3,500	444	21	2,650	150	17		
8	46	3,650	453	25	2,500	169	15		
9	34	2,700	248	25	2,800	a 190	16	1,400	76
10	25	2,950	199	21	1,900	108	17		
11	15	1,350	55	28	2,150	163	22		
12	22	2,250	134	25	2,000	135	22		
13	29	3,000	a 240	31	2,800	234	26		
14	34	2,700	248	37	3,750	375	23		
15	37	3,050	305	36	3,500	340	21		
16	44	3,850	457	31	3,000	251	22		
17	48	3,500	454	25	2,100	a 140	27	2,000	146
18	77	12,000	sb 3,100	25	1,950	132	35	2,600	a 240
19	47	4,650	590	29	2,680	210	30	2,250	182
20	48	4,600	596	32	3,200	276	20		
21	45	4,250	516	43	4,450	517	22		
22	97	43,000	sb 15,000	57	5,900	908	20		
23	56	9,800	1,480	60	5,550	899	17		
24	49	5,650	747	61	5,200	a 850	17		
25	43	5,000	580	61	5,300	873	17	1,920	104
26	27	3,730	s 285	61	5,400	a 900	19		
27	26	3,250	228	57	4,950	762	20		
28	25	2,350	159	33	3,100	a 280	23		
29	25	2,680	s 190	29	3,000	235	24		
30	49	7,670	s 1,840	25	2,400	a 160	22		
31	58	20,000	3,130	23	1,950	121	--	--	--
Total	1,230	--	33,058	1,050	--	10,909	628	--	2,928

Total discharge for year (cfs-days) 6,846.1
Total load for year (tons) 100,511

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

YELLOWSTONE RIVER BASIN--Continued

6A-2580. MUDDY CREEK NEAR SHOSHONI, WYO.--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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. 11, 1957....	2:05 p.m.	16	60	1,890	2,670	--	26		37		47	72	97		99	100	VBWCM
Mar. 20, 1958...	3:45 p.m.	52	33	3,000	1,590	--	27		45		73	84	96		100	--	VPWCM
Mar. 27.....	1:25 p.m.	26	40	11,000	5,100	--	31		48		70	86	98		100	--	VPWCM
Apr. 11.....	3:20 p.m.	14	55	4,220	4,710	--	45		64		83	95	100		--	--	VPWCM
May 8.....	12:15 p.m.	37	52	16,000	4,210	--	27		45		74	91	99		100	--	VPWCM
May 8.....	5:45 p.m.	33	54	16,600	4,670	--	33		83		97	99	100		--	--	VPWCM
May 9.....	9:05 a.m.	71	49	26,500	3,630	0	9		47		78	90	98		100	--	VPN
May 9.....	9:05 a.m.	71	49	26,500	3,790	22	27		50		78	90	98		100	--	VPWC
May 9.....	10:10 a.m.	79	53	26,600	3,630	--	31		53		78	90	98		100	--	VPWCM
May 14.....	10:20 a.m.	66	49	14,900	3,340	--	25		38		76	92	99		100	--	VPWCM
June 3	12:50 p.m.	17	80	1,350	2,900	--	20		26		46	67	83		99	100	VPWCM
June 14	12:35 p.m.	63	67	12,200	2,970	--	37		51		66	83	97		100	--	VPWCM
July 3.....	12:50 p.m.	18	81	1,380	1,770	--	18		25		45	80	99		100	--	VPWCM
July 14.....	1:45 p.m.	36	73	2,760	2,600	--	13		18		40	73	96		99	100	VPWCM
July 18.....	2:35 p.m.	56	71	11,400	2,840	--	45		59		76	88	98		100	--	VPWCM
July 22.....	2:15 p.m.	88	73	54,200	2,410	--	54		75		90	95	99		100	--	VPWCM
July 23.....	12:05 p.m.	55	73	8,970	4,730	--	30		46		71	86	98		100	--	VPWCM
July 30.....	12:40 a.m.	51	63	10,800	11,100	--	30		49		77	90	99		100	--	VPWCM
July 30.....	9:20 p.m.	146	66	25,500	4,820	--	19		32		66	79	95		100	--	VPWCM
July 31.....	6:35 a.m.	60	59	30,600	4,560	--	53		75		85	92	99		100	--	VPWCM
Aug. 14.....	11:10 a.m.	38	76	3,630	3,430	--	19		30		54	77	97		100	--	VPWCM
Sept. 3.....	1:35 p.m.	19	73	1,580	996	--	14		19		37	72	98		100	--	VBWCM
Sept. 19.....	1:40 p.m.	32	67	2,380	2,570	--	16		24		47	76	97		100	--	VPWCM

YELLOWSTONE RIVER BASIN--Continued

6A-2685. FIFTEEN MILE CREEK NEAR WORLAND, WYO.

LOCATION.--At gaging station, 1¾ miles upstream from mouth and 2 3/4 miles west of Worland, Washakie County.
DRAINAGE AREA.--594 square miles.
RECORDS AVAILABLE.--Sediment records: March 1951 to September 1958.
EXTREMES, 1957-58.--Sediment concentrations: Maximum daily, 82,400 ppm June 8; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 110,000 tons June 13; minimum daily, 0 tons on many days.
EXTREMES, 1951-58.--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 Feb. 21-25. Bureau of Land Management has extensive spreader systems on some of the tributaries upstream from station. Records of discharge for water year October 1957 to September 1958 given in WSP 1559.

Suspended sediment, water year October 1957 to September 1958

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.....	14	27,000	sa 3,100						
6.....	.2	2,500	sa 2						
7.....	0	--	0						
8.....	0	--	0						
9.....	0	--	0						
10.....	0	--	0						
11.....	0	--	0						
12.....	1.2	11,000	sa 140						
13.....	0	--	0						
14.....	0	--	0						
15.....	0	--	0						
16.....	0	--	0						
17.....	0	--	0						
18.....	0	--	0						
19.....	0	--	0						
20.....	.5	14,100	s 29						
21.....	.4	9,860	s 16						
22.....	0	--	0						
23.....	0	--	0						
24.....	0	--	0						
25.....	0	--	0						
26.....	0	--	0						
27.....	0	--	0						
28.....	47	40,000	sa 7,000						
29.....	20	40,000	sa 2,600						
30.....	2.2	17,000	sa 130						
31.....	.4	3,000	sa 5						
Total	85.9	--	13,022	0		0	0		0

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

YELLOWSTONE RIVER BASIN--Continued

6A-2685. FIFTEEN MILE CREEK NEAR WORLAND, WYO.--Continued

Suspended sediment, water year October 1957 to September 1958--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			
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				1	4,000	b 11			
22				3	12,600	102			
23				2	12,000	b 65			
24				2	19,000	b 100			
25				1	10,200	28			
26				1	3,200	a 9			
27				.5	300	(t)			
28				0	--	0			
29				--	--	--			
30				--	--	--			
31				--	--	--			
Total	0		0	10.5	--	315	0		0

Day	April			May			June		
1	0	--	0	0	--	0	0	--	0
2	0	--	0	0	--	0	0	--	0
3	0	--	0	0	--	0	0	--	0
4	0	--	0	0	--	0	174	65,800	s 66,800
5	0	--	0	0	--	0	13	65,300	s 2,660
6	0	--	0	0	--	0	3.5	51,000	500
7	0	--	0	0	--	0	11	49,000	sb 3,200
8	0	--	0	32	51,800	s 7,970	6.5	82,400	s 1,660
9	0	--	0	12	56,600	s 2,390	1	25,600	s 124
10	0	--	0	2.2	50,700	312	.5	540	1
11	0	--	0	.4	41,000	s 62	0	--	0
12	0	--	0	0	--	0	172	25,200	s 44,700
13	0	--	0	0	--	0	438	78,000	sb 110,000
14	0	--	0	0	--	0	202	56,000	sb 41,000
15	0	--	0	0	--	0	89	46,100	s 13,600
16	0	--	0	0	--	0	37	40,200	s 5,110
17	0	--	0	0	--	0	16	22,600	976
18	0	--	0	0	--	0	6.5	20,300	s 386
19	0	--	0	0	--	0	2.7	13,900	101
20	0	--	0	0	--	0	17	35,000	sb 4,200
21	0	--	0	0	--	0	12	54,100	s 2,180
22	0	--	0	0	--	0	2	39,000	218
23	5.6	31,000	sb 900	0	--	0	1	33,500	94
24	9.7	41,100	s 1,190	0	--	0	.5	29,000	a 40
25	4.5	25,100	s 288	9.7	60,500	s 1,790	58	38,200	s 9,360
26	1.8	23,300	s 127	9.3	64,000	sb 2,200	22	38,700	s 2,580
27	.6	20,000	s 36	9.0	45,800	s 1,380	6.2	34,500	599
28	.4	11,300	s 11	5.0	32,000	sb 400	1.7	29,600	s 157
29	0	--	0	1.3	34,900	s 156	.3	7,950	s 8
30	0	--	0	.4	9,000	a 10	0	--	0
31	--	--	--	0	--	0	--	--	--
Total	22.6	--	2,552	81.3	--	16,670	1,293.4	--	310,254

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

YELLOWSTONE RIVER BASIN--Continued

6A-2685. FIFTEEN MILE CREEK NEAR WORLAND, WYO.--Continued

Suspended sediment, water year October 1957 to September 1958--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	22	33,900	s 2,320	0	--	0
2.....	0	--	0	8.5	25,200	578	0	--	0
3.....	0	--	0	2.4	13,600	88	0	--	0
4.....	11	33,400	s 1,650	.2	1,000	a 1	0	--	0
5.....	29	40,600	s 3,500	4.9	14,000	sb 240	0	--	0
6.....	9.4	30,200	766	.8	1,500	sa 4	0	--	0
7.....	3.7	27,000	270	0	--	0	0	--	0
8.....	1.1	26,000	77	0	--	0	0	--	0
9.....	50	31,800	s 10,500	0	--	0	2.4	4,670	s 417
10.....	13	32,000	s 1,350	0	--	0	224	48,000	sb 45,000
11.....	2.5	25,200	s 185	2.4	17,000	sb 650	7.6	18,400	s 459
12.....	.5	15,300	s 33	4.6	59,200	s 874	1.0	1,700	sa 6
13.....	0	--	0	.4	26,800	s 41	0	--	0
14.....	0	--	0	2.5	45,000	sa 400	2.3	15,000	sa 240
15.....	0	--	0	2.4	48,000	sb 340	.3	1,600	sa 3
16.....	0	--	0	122	56,900	s 27,200	0	--	0
17.....	0	--	0	5.4	29,300	s 583	0	--	0
18.....	1.0	3,300	sa 48	0	--	0	0	--	0
19.....	22	41,700	s 3,380	91	48,600	s 20,100	0	--	0
20.....	1.9	18,100	93	6.9	46,700	s 1,040	0	--	0
21.....	35	51,700	s 7,870	.4	12,000	sa 26	0	--	0
22.....	8.0	78,400	s 1,680	0	--	0	0	--	0
23.....	.6	31,200	s 95	0	--	0	0	--	0
24.....	.4	3,400	s 6	0	--	0	0	--	0
25.....	3.7	33,000	b 340	0	--	0	0	--	0
26.....	91	39,900	s 23,900	0	--	0	0	--	0
27.....	121	65,500	s 31,100	0	--	0	0	--	0
28.....	14	33,500	1,310	0	--	0	0	--	0
29.....	7.6	24,700	507	0	--	0	0	--	0
30.....	251	69,200	s 56,600	0	--	0	0	--	0
31.....	341	72,500	s 87,700	0	--	0	--	--	--
Total.	1,018.4	--	232,960	276.8	--	54,485	237.6	--	46,125

Total discharge for year (cfs-days)..... 3,026.5
Total load for year (tons)..... 676,383

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

YELLOWSTONE RIVER BASIN--Continued

6A-2685. FIFTEEN MILE CREEK NEAR WORLAND, WYO.--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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 8, 1958.....	9:50 a.m.	102	--	99,000	2,650		70		94		98	99	100		--		VPWCM
June 4.....	3:50 p.m.	106	62	70,400	3,640		68		93		99	99	100		--		VPWCM
June 12.....	5:15 p.m.	842	--	130,000	2,810		43		66		88	94	98		100		VPWCM
June 12.....	9:15 p.m.	778	--	114,000	2,760		47		68		93	97	99		100		VPWCM
July 21.....	4:45 p.m.	64	74	72,300	3,580		66		91		99	99	100		--		VPWCM
July 26.....	2:35 p.m.	49	63	53,600	5,640		66		90		99	99	100		--		VPWCM
July 26.....	4:00 p.m.	129	63	71,600	3,200		58		81		98	100	--		--		VPWCM
July 30.....	5:05 a.m.	115	62	66,900	3,900		57		80		98	100	--		--		VPWCM
July 30.....	10:00 a.m.	591	65	94,200	4,290		41		58		90	96	99		100		VPWCM
July 31.....	1:15 a.m.	290	63	67,800	3,760		51		64		89	96	99		100		VPWCM
July 31.....	5:45 a.m.	669	62	126,000	4,920		46		62		85	92	98		100		VPWCM
July 31.....	10:00 a.m.	754	66	73,500	3,780		60		76		87	94	99		100		VPWCM

6A-2780. DRY CREEK AT GREYBULL, WYO.

LOCATION.--At gaging station, half a mile north of Greybull, Big Horn County, and half a mile upstream from mouth.
RECORDS AVAILABLE.--Chemical analyses: December 1950 to September 1951, August 1957 to September 1958.
Water temperatures: October 1951 to June 1953.
Sediment records: April 1951 to June 1953.
REMARKS.--Records of discharge for water year October 1957 to September 1958 given in WSP 1559.

Chemical analyses, in parts per million, August 1957 to September 1958

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 $CaCO_3$		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					
														Residue at 180°C	Sum									
Aug. 8, 1957....	60	--	--	84	35	154	--	262	430	9.8	--	--	--	--	--	--	--	352	137	49	3.6	1,270	7.7	--
Nov. 6	12	20	0.00	158	85	444	5.7	371	1,310	34	1.6	11	0.40	2,320	2,250	3.16	61.4	744	440	56	7.1	2,910	8.0	11
Dec. 5	a 13	26	.00	178	87	448	4.7	418	1,290	35	1.7	16	.41	2,390	2,290	3.25	83.9	802	459	55	6.9	2,970	7.9	--
Jan. 7, 1958....	a 9	26	.02	211	101	500	5.4	b 493	1,520	37	1.9	20	.42	2,700	2,670	3.77	67.3	940	536	53	7.1	3,380	8.3	9
Feb. 4	a 6	24	.00	199	96	466	4.8	473	1,440	37	1.6	19	.47	2,640	2,520	3.59	40.8	892	504	53	6.8	3,220	7.9	8
Mar. 4.....	a 7	20	.10	180	89	465	6.9	418	1,390	42	1.4	15	.35	2,470	2,420	3.36	46.6	814	471	55	7.1	3,100	8.1	7
Apr. 4	6.0	17	.00	174	99	532	13	396	1,580	64	1.3	8.7	.39	2,830	2,680	3.85	53.4	843	518	57	8.0	3,510	8.1	12
Apr. 30	20	15	.01	162	100	577	20	381	1,580	74	1.0	7.3	.42	2,840	2,720	3.86	138	816	504	60	8.8	3,570	7.9	15
June 2	58	18	.01	72	27	147	4.3	224	391	11	.8	6.8	.15	803	--	1.09	106	292	108	52	3.8	1,150	7.8	18
July 2.....	37	15	.01	79	31	150	3.9	243	417	11	1.0	8.8	.16	858	--	1.17	51.1	324	125	50	3.6	1,210	7.5	12
Aug. 1	154	16	.58	110	41	228	9.0	249	705	25	.8	1.3	.34	1,280	1,260	1.74	494	444	240	52	4.7	1,720	7.1	21
Sept. 2.....	59	15	.01	84	38	156	4.2	300	448	13	1.4	2.8	.18	925	--	1.26	147	366	120	48	3.6	1,290	8.2	17

a Daily mean discharge.
b Includes equivalent of 6 ppm of carbonate (CO_3).

YELLOWSTONE RIVER BASIN--Continued

6A-2795. 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.
DRAINAGE AREA.--15,900 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: December 1949 to September 1953, June 1955 to September 1957.
Water temperatures: July to September 1949, October 1950 to September 1958.
Sediment records: March 1946 to September 1958.
EXTREMES, 1957-58.--Water temperatures: Maximum, 82°F Aug. 8, 13; minimum, freezing point on many days during November to February.
Sediment concentrations: Maximum daily, 21,500 ppm June 14; minimum daily, 143 ppm Sept. 6.
Sediment loads: Maximum daily, 239,000 tons June 13; minimum daily, 313 tons Sept. 6.
EXTREMES, 1946-58.--Water temperatures (1950-58): Maximum, 85°F July 14, 30, 1953, July 12, 1954; minimum, freezing point on many days during winter months.
Sediment loads: Maximum daily, 972,000 tons June 25, 1946; minimum daily, not determined.
REMARKS.--Flow affected by ice Feb. 9-17. No appreciable inflow between gaging station and sampling point except during periods of intense local precipitation. Records of discharge for water year October 1957 to September 1958 given in WSP 1559.

Temperature (° F) of water, water year October 1957 to September 1958
/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 59	a 45	37	33	37	35	51	56	69	74	75	74
2	a 61	a 40	34	32	a 31	38	52	60	68	74	81	68
3	a 52	a 38	34	--	--	37	a 43	61	64	72	79	67
4	a 56	a 39	36	33	38	38	50	64	65	a 59	78	a 69
5	a 49	a 40	34	32	33	a 36	46	66	70	71	78	72
6	a 48	42	37	34	35	39	50	63	72	67	78	74
7	a 48	a 41	36	33	32	41	51	63	75	a 68	80	a 65
8	a 45	a 38	38	34	32	41	49	63	a 65	74	82	76
9	52	a 36	38	34	31	36	52	68	71	76	76	72
10	a 47	a 38	35	a 32	a 32	a 34	53	69	69	75	79	72
11	a 48	a 39	36	33	32	36	52	70	69	78	81	74
12	a 49	a 39	--	a 32	31	39	55	65	65	a 67	79	70
13	a 52	42	36	33	32	38	60	59	60	77	82	71
14	a 55	40	34	34	31	37	59	59	61	69	81	62
15	a 53	39	34	a 31	a 32	38	58	60	66	73	81	61
16	a 51	38	37	--	32	37	58	67	68	76	80	55
17	a 49	38	a 34	--	34	42	60	60	69	78	77	64
18	a 51	36	36	33	a 32	42	59	69	69	78	73	64
19	49	--	34	34	40	39	a 49	61	65	78	74	66
20	49	35	37	33	43	46	53	69	a 66	77	69	61
21	53	35	37	33	44	42	54	65	67	a 66	75	a 54
22	50	32	34	32	a 39	48	46	65	a 61	80	72	65
23	46	35	32	32	43	53	44	67	73	77	70	a 58
24	45	35	32	a 32	44	49	47	66	66	76	73	a 52
25	a 44	36	33	33	41	47	49	70	a 66	79	75	a 51
26	50	35	32	34	38	48	52	69	a 68	67	73	50
27	a 43	--	31	34	a 36	49	45	71	74	71	75	--
28	a 45	32	33	32	34	49	45	71	74	74	72	a 54
29	a 45	36	32	34	--	50	49	72	74	71	68	a 54
30	50	33	32	33	--	52	57	66	73	74	69	a 48
31	a 46	--	32	33	--	49	--	70	--	74	73	--
Average	50	38	35	33	36	42	52	66	68	73	76	64

a Measurement between 6 a.m. and 12 m.

YELLOWSTONE RIVER BASIN--Continued

6A-2795. BIGHORN RIVER AT KANE, WYO.--Continued

Suspended sediment, water year October 1957 to September 1958

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.....	2,400	610	3,950	2,640	558	3,980	1,580	488	2,080
2.....	2,400	680	4,410	2,730	405	2,990	1,700	544	2,500
3.....	2,410	560	3,640	2,600	477	3,350	1,700	440	2,020
4.....	2,440	590	3,890	2,670	495	3,570	1,700	320	1,470
5.....	2,460	550	3,650	2,660	513	3,680	1,700	408	1,870
6.....	2,660	820	5,890	2,670	684	4,930	1,710	360	1,660
7.....	2,400	720	4,670	2,690	450	3,270	1,730	312	1,460
8.....	2,440	680	4,480	2,670	585	4,220	2,590	714	4,990
9.....	2,490	570	3,830	2,640	585	4,170	2,710	520	3,800
10.....	2,110	380	2,160	2,620	648	4,580	2,410	560	3,640
11.....	1,930	560	2,920	2,640	702	5,000	1,660	408	1,830
12.....	2,400	639	4,140	2,670	702	5,060	1,520	312	1,280
13.....	2,640	594	4,230	2,690	405	2,940	1,550	456	1,910
14.....	2,570	540	3,750	2,730	405	2,990	1,400	432	1,630
15.....	2,590	603	4,220	2,730	513	3,780	1,370	320	1,180
16.....	2,670	810	5,840	2,670	522	3,760	1,610	384	1,670
17.....	2,690	1,050	7,630	2,670	468	3,370	1,700	344	1,580
18.....	2,640	990	7,060	2,690	459	3,330	1,700	272	1,250
19.....	2,640	711	5,070	2,660	--	e 3,800	1,660	336	1,510
20.....	2,710	720	5,270	2,750	702	5,210	1,460	312	1,230
21.....	2,840	1,080	8,280	2,710	648	4,740	1,980	645	3,450
22.....	2,820	702	5,350	2,600	540	3,790	2,600	900	6,320
23.....	2,640	684	4,880	2,620	549	3,880	2,670	920	6,630
24.....	2,590	585	4,090	2,730	630	4,640	2,710	790	5,780
25.....	2,620	567	4,010	2,800	468	3,540	2,590	830	5,800
26.....	2,640	531	3,780	2,800	315	2,380	2,660	750	5,390
27.....	2,620	522	3,690	1,860	--	e 2,000	2,820	690	5,250
28.....	2,640	675	4,810	1,710	400	1,850	2,820	690	5,250
29.....	2,730	954	7,030	1,710	624	2,880	2,800	780	5,900
30.....	2,670	1,380	9,950	1,610	560	2,430	2,890	300	2,340
31.....	2,670	693	5,000	--	--	--	2,850	170	1,310
Total.	79,170	--	151,570	76,640	--	110,110	64,550	--	93,980
	January			February			March		
1.....	2,730	350	2,580	2,730	648	4,780	2,560	552	3,820
2.....	2,730	360	2,650	2,670	588	4,240	2,570	420	2,910
3.....	2,840	--	e 3,000	2,640	--	e 4,700	2,320	312	1,950
4.....	2,930	418	3,310	2,640	564	4,020	2,300	468	2,910
5.....	2,960	495	3,960	2,620	504	3,570	2,220	636	3,810
6.....	2,980	528	4,250	2,620	492	3,480	2,240	516	3,120
7.....	2,960	561	4,480	2,560	540	3,730	2,280	552	3,400
8.....	2,960	605	4,840	2,590	696	4,870	2,270	516	3,160
9.....	2,850	550	4,230	2,600	792	5,560	2,280	504	3,100
10.....	2,800	572	4,320	2,600	864	6,070	2,240	576	3,480
11.....	2,820	517	3,940	2,500	672	4,540	2,160	564	3,290
12.....	2,840	198	1,520	2,500	804	5,430	2,170	612	3,590
13.....	2,850	363	2,790	2,500	780	5,270	2,190	564	3,330
14.....	2,980	308	2,480	2,500	768	5,180	2,120	456	2,610
15.....	2,760	396	2,950	2,500	696	4,700	1,620	312	1,360
16.....	2,710	726	5,310	2,500	720	4,860	1,640	336	1,490
17.....	2,730	--	e 5,500	2,500	624	4,210	1,640	312	1,380
18.....	2,670	792	5,710	2,570	672	4,660	1,660	420	1,880
19.....	2,910	770	6,050	2,590	564	3,940	1,670	456	2,060
20.....	2,930	836	6,610	2,640	588	4,190	1,670	480	2,160
21.....	2,760	858	6,390	2,710	744	5,440	1,700	420	1,930
22.....	2,600	748	5,250	2,840	1,150	8,820	1,710	372	1,720
23.....	1,710	341	1,570	2,870	1,140	8,830	1,800	480	2,330
24.....	2,430	384	2,520	2,820	876	6,670	1,830	696	3,440
25.....	2,670	612	4,410	2,910	1,150	9,040	1,840	912	4,530
26.....	2,620	840	5,940	2,780	648	4,860	1,870	756	3,820
27.....	2,780	912	6,850	2,690	660	4,790	2,240	936	5,660
28.....	2,750	900	6,680	2,600	648	4,550	2,220	738	s 4,710
29.....	1,840	648	3,220	--	--	--	1,690	444	2,030
30.....	2,690	840	6,100	--	--	--	1,870	847	s 4,550
31.....	2,800	780	5,900	--	--	--	1,230	254	844
Total.	84,590	--	135,310	73,790	--	145,000	61,820	--	90,374

e Estimated.
s Computed by subdividing day.

YELLOWSTONE RIVER BASIN--Continued

6A-2795. BIGHORN RIVER AT KANE, WYO.--Continued

Suspended sediment, water year October 1957 to September 1958--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.....	1,200	240	778	4,040	2,920	s 33,600	3,070	913	7,570
2.....	1,120	432	s 1,390	2,480	960	6,430	2,840	968	7,420
3.....	1,130	732	2,230	2,400	852	5,520	2,600	1,110	7,790
4.....	1,120	501	1,520	2,360	804	5,120	2,760	2,230	16,600
5.....	1,130	402	1,230	2,380	780	5,010	2,640	2,420	17,200
6.....	1,140	372	1,150	1,440	420	1,630	2,110	5,780	32,900
7.....	1,110	288	863	1,430	876	3,380	2,120	2,070	11,800
8.....	1,100	288	855	1,800	2,100	s 10,700	2,120	1,110	6,350
9.....	1,110	288	863	1,760	4,080	19,400	2,280	1,740	10,700
10.....	1,130	240	732	1,880	3,000	15,200	1,940	4,360	22,800
11.....	1,090	240	706	2,110	2,870	16,400	1,440	1,210	4,700
12.....	1,080	252	735	2,840	2,740	21,000	1,310	680	2,410
13.....	1,030	240	677	3,420	2,490	23,000	4,220	17,700	s 239,000
14.....	1,040	312	876	2,890	1,630	12,700	3,740	21,500	217,000
15.....	990	300	802	2,510	1,250	8,470	3,400	16,900	155,000
16.....	1,070	240	693	2,100	847	4,800	2,430	9,050	59,400
17.....	1,090	264	777	1,990	550	2,960	2,620	5,460	38,600
18.....	1,450	456	1,790	2,510	1,110	7,520	2,250	5,000	30,400
19.....	1,530	492	2,030	2,980	1,290	10,400	2,280	2,350	14,500
20.....	1,470	480	1,910	3,560	2,020	s 21,400	2,640	3,670	26,200
21.....	1,460	432	1,700	4,890	3,950	s 54,900	2,800	5,660	42,800
22.....	1,490	444	1,790	5,910	4,010	64,000	2,460	4,730	31,400
23.....	1,440	540	2,100	6,090	3,260	53,600	2,170	2,120	12,400
24.....	1,350	1,190	4,340	6,640	3,380	60,600	2,170	7,800	45,700
25.....	1,250	792	2,670	6,070	2,540	41,600	2,520	4,000	s 29,800
26.....	1,200	864	2,800	5,540	2,360	35,300	3,290	4,880	43,300
27.....	1,130	612	1,870	5,110	1,980	27,300	3,160	6,090	52,000
28.....	1,160	492	1,540	4,490	2,150	26,100	2,560	2,820	19,500
29.....	1,190	432	1,390	4,200	2,100	23,800	2,170	1,530	8,960
30.....	1,320	548	s 3,410	3,820	1,200	12,400	1,810	1,020	4,980
31.....	--	--	--	3,250	910	7,990	--	--	--
Total.	36,120	--	46,207	104,890	--	642,230	75,920	--	1,219,180

Day	July			August			September		
1.....	1,640	715	3,170	2,410	16,500	107,000	970	363	951
2.....	1,400	704	2,660	1,900	8,600	44,100	990	330	882
3.....	1,330	2,640	9,480	1,580	4,200	17,900	930	253	635
4.....	1,130	2,330	7,110	1,570	3,400	14,400	900	220	535
5.....	1,990	4,760	25,600	1,570	1,210	5,130	850	154	353
6.....	1,620	7,040	30,800	1,300	2,310	8,110	810	143	313
7.....	1,340	2,520	9,120	1,060	1,760	5,040	790	198	422
8.....	1,330	1,780	6,390	910	627	1,540	780	154	324
9.....	1,390	2,440	9,160	770	484	1,010	790	198	422
10.....	1,240	2,060	6,900	710	385	738	880	335	s 1,100
11.....	1,160	2,040	6,390	740	330	659	2,020	6,340	34,600
12.....	980	1,520	4,020	860	385	894	1,780	4,980	23,900
13.....	940	924	2,350	850	396	909	1,810	2,270	11,100
14.....	850	946	2,170	780	649	1,370	1,830	1,690	8,350
15.....	800	396	855	710	650	1,050	1,980	2,040	10,900
16.....	800	275	594	710	286	548	1,900	2,330	12,000
17.....	760	220	451	810	275	601	1,830	1,450	7,160
18.....	740	220	440	790	231	493	1,880	920	4,670
19.....	910	453	s 1,280	770	5,940	12,300	1,900	1,380	7,080
20.....	1,430	6,600	s 29,800	920	4,120	10,200	1,900	1,300	6,670
21.....	1,470	15,200	60,300	990	4,600	12,300	1,880	1,370	6,950
22.....	1,280	9,900	34,200	970	4,620	12,100	1,960	1,220	6,460
23.....	1,210	2,920	9,540	940	2,340	5,940	2,000	1,240	6,700
24.....	1,090	2,090	6,150	970	1,100	2,880	1,990	1,080	5,800
25.....	1,110	1,650	s 5,370	1,050	1,020	2,890	2,080	1,140	6,400
26.....	1,870	18,000	90,900	1,090	913	2,690	2,120	1,120	6,410
27.....	2,220	8,250	49,500	990	1,660	4,440	2,110	1,140	6,490
28.....	2,410	16,400	107,000	900	1,160	2,820	2,140	1,130	6,530
29.....	1,670	7,500	33,800	870	891	2,090	2,160	1,220	7,120
30.....	1,600	3,710	s 18,300	900	517	1,260	2,170	1,500	8,790
31.....	2,890	16,400	128,000	930	385	967	--	--	--
Total.	42,600	--	701,800	32,320	--	284,369	48,130	--	200,017

Total discharge for year (cfs-days)..... 780,540
Total load for year (tons)..... 3,820,147

s Computed by subdividing day.

6A-2795. BIGHORN RIVER AT KANE, WYO.--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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. 9, 1957	3:50 p.m.	2,490	53	579	1,400	--	9		13		25	47	88		100	--	VBWCM
Nov. 6	9:20 a.m.	2,710	39	552	--	--	--		--		17	30	85		100	--	VM
Dec. 5	9:00 a.m.	1,690	32	250	--	--	--		--		19	21	72		100	--	VM
Feb. 4, 1958	11:20 a.m.	2,640	--	564	--	--	--		--		26	50	87		100	--	VM
Mar. 4	12:55 p.m.	2,600	38	559	859	--	6		10		24	38	81		100	--	VBWCM
Mar. 31	10:15 a.m.	1,190	--	174	572	--	22		32		51	70	92		100	--	VBWCM
Apr. 30	1:25 p.m.	1,040	53	239	1,030	--	48		61		67	72	94		100	--	VBWCM
May 7	10:00 a.m.	1,460	59	448	1,620	--	36		53		70	89	99		100	--	VBWCM
May 15	10:15 a.m.	2,540	55	1,340	4,880	3	6		53		72	83	95		99	100	VPN
May 15	10:15 a.m.	2,540	55	1,340	4,980	28	34		54		72	83	95		99	100	VPWC
June 2	1:45 p.m.	2,710	68	949	4,290	--	31		46		70	87	99		100	--	VPWCM
June 15	7:40 a.m.	4,360	62	18,700	3,750	3	5		87		96	98	100		--	--	VPN
June 15	7:40 a.m.	4,360	62	18,700	3,840	49	62		85		96	98	100		--	--	VPWC
July 2	9:50 a.m.	1,410	68	540	2,870	--	30		48		77	93	99		100	--	VPWCM
Aug. 1	10:40 a.m.	2,350	72	14,400	5,310	--	61		82		95	97	99		100	--	VPWCM

Particle-size analyses of bed material, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time	Discharge (cfs)	Number of sampling points	Bed material												Methods of analysis
				Percent finer than indicated size, in millimeters												
				0.031	0.062	0.125	0.175	0.250	0.350	0.500	1.000	2.000	4.000	8.000	16.000	
Oct. 9, 1957	4:30 p.m.	2,490	21		2	7	18	39	68	90	96	97	97	100		SV
Apr. 30, 1958	2:05 p.m.	1,030	22		0	3	18	54	80	94	99	99	99	100		SV

YELLOWSTONE RIVER BASIN--Continued

6A-2947. 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.
RECORDS AVAILABLE.--Chemical analyses: February 1950 to September 1958.
Water temperatures: April 1949 to September 1951, August 1952 to September 1958.
Sediment records: July 1947 to September 1954, October 1955 to September 1958 (discontinued).
EXTREMES, 1957-58.--Dissolved solids: Maximum, 1,030 ppm July 24; minimum, 409 ppm May 23-31.
Hardness: Maximum, 454 ppm July 24; minimum, 224 ppm May 23-31.
Specific conductance: Maximum daily, 1,380 micromhos July 24; minimum daily, 574 micromhos May 27.
Water temperatures: Maximum, 74°F Aug. 3; minimum, freezing point on many days during November to March.
Sediment concentrations: Maximum daily, 13,800 ppm June 16; minimum daily, 60 ppm Jan. 1.
Sediment loads: Maximum daily, 299,000 tons June 15; minimum daily, 632 tons Jan. 1.
EXTREMES, 1947-58.--Dissolved solids (1951-58): Maximum, 1,190 ppm July 28-31, 1955; minimum, 304 ppm June 23, 1951.
Hardness (1951-58): Maximum, 544 ppm July 28-31, 1955; minimum, 151 ppm June 23, 1951.
Specific conductance (1951-58): Maximum daily, 1,640 micromhos Nov. 18, 1955; minimum daily, 384 micromhos June 20, 1951.
Water temperatures (1949-51, 1952-58): Maximum, 89°F Aug. 7, 1953; minimum, freezing point on many days during winter months.
Sediment concentrations (1947-54, 1955-58): Maximum daily, 23,200 ppm May 24, 1952; minimum daily, not determined.
Sediment loads (1947-54, 1955-58): Maximum daily, 727,000 tons May 24, 1952; minimum daily, 128 tons Jan. 10, 1957.
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. 30, Dec. 14, 15, Dec. 22 to Feb. 24. Records of discharge for water year October 1957 to September 1958 given in WSP 1559.

Chemical analyses, in parts per million, water year October 1957 to September 1958

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, 1957	3,985	--	--	--	--	92	--	204	--	--	--	--	--	671	0.91	7,190	310	143	39	2.3	954	7.6	--
Nov. 1-29	4,192	--	--	--	--	88	--	204	--	--	--	--	--	641	.87	7,230	301	134	39	2.2	910	7.7	--
Nov. 30-Dec. 25	3,181	12	0.01	86	30	90	3.6	222	310	13	0.5	1.2	0.13	676	.92	5,800	338	156	36	2.1	966	7.7	--
Dec. 26-Jan. 31, 1958	3,916	--	--	--	--	75	--	204	--	--	--	--	--	591	.80	5,210	293	126	36	1.9	858	7.8	--
Feb. 1-17	3,941	--	--	--	--	75	--	204	--	--	--	--	--	581	.79	6,180	292	125	36	1.9	850	7.7	--
Feb. 19-Mar. 18	4,231	18	.01	77	27	83	3.4	204	285	12	.4	.7	.19	624	.85	7,130	302	135	37	2.1	894	7.7	5
Mar. 19-Apr. 4	3,121	--	--	--	--	100	--	214	--	--	--	--	--	736	1.00	6,190	338	163	39	2.4	1,010	7.4	--
Apr. 5-22	2,416	--	--	--	--	100	--	210	--	--	--	--	--	750	1.02	4,890	347	175	39	2.3	1,040	7.3	--
Apr. 23-May 2	2,707	--	--	--	--	103	--	213	--	--	--	--	--	736	1.00	5,370	341	166	40	2.4	1,040	7.3	--
May 3-7	3,834	--	--	--	--	100	--	230	--	--	--	--	--	714	.97	7,380	342	153	39	2.4	1,020	7.3	--
May 8-13	3,063	--	--	--	--	88	--	221	--	--	--	--	--	665	.90	5,470	323	142	37	2.1	955	7.3	--
May 14-22	3,858	--	--	--	--	71	--	201	--	--	--	--	--	562	.76	5,820	284	119	35	1.8	814	7.3	--
May 23-31	6,578	--	--	--	--	45	--	186	--	--	--	--	--	409	.56	7,310	224	71	30	1.3	620	7.3	--
June 1-2	4,880	--	--	--	--	57	--	186	--	--	--	--	--	458	.62	6,000	239	86	34	1.6	683	7.4	--
June 3-9	4,901	--	--	--	--	83	--	180	--	--	--	--	--	610	.83	8,070	286	138	39	2.1	866	7.3	--
June 10-11	5,165	--	--	--	--	109	--	230	--	--	--	--	--	821	1.12	11,500	387	198	38	2.4	1,120	7.7	--
June 12-14	6,013	--	--	--	--	88	--	191	--	--	--	--	--	652	.89	10,600	299	142	39	2.2	916	7.2	--

June 15	8,070	--	--	--	--	115	--	232	--	--	--	--	--	913	1.24	19,800	434	244	37	2.4	1,220	7.2	--
June 16-23	5,828	--	--	--	--	88	--	199	--	--	--	--	--	650	.88	10,200	298	135	39	2.2	934	7.3	--
June 24-July 2	6,922	13	.00	61	19	56	2.8	165	207	7.7	.3	.8	.10	466	.63	8,650	230	95	34	1.6	675	7.1	7
July 3-8	4,460	--	--	--	--	75	--	185	--	--	--	--	--	565	.77	6,810	272	120	37	2.0	825	7.2	--
July 9-16	2,235	--	--	--	--	108	--	206	--	--	--	--	--	769	1.05	4,650	340	171	41	2.5	1,080	7.0	--
July 17-23	1,830	--	--	--	--	130	--	205	--	--	--	--	--	890	1.21	4,390	378	210	43	2.9	1,230	7.1	--
July 24	2,040	--	--	--	--	143	--	218	--	--	--	--	--	1,030	1.40	5,660	454	275	41	2.9	1,380	7.2	--
July 25-28	2,445	--	--	--	--	132	--	215	--	--	--	--	--	962	1.31	6,350	416	240	41	2.8	1,300	7.2	--
July 29-Aug. 4	4,317	--	--	--	--	110	--	220	--	--	--	--	--	806	1.10	9,420	360	180	40	2.5	1,100	7.5	--
Aug. 5-31	3,760	--	--	--	--	78	--	176	--	--	--	--	--	568	.77	5,740	254	110	40	2.1	815	7.6	--
Sept. 1-21	3,990	--	--	--	--	78	--	176	--	--	--	--	--	569	.77	6,090	252	108	40	2.1	821	7.6	--
Sept. 22-30	2,836	--	--	--	--	105	--	214	--	--	--	--	--	766	1.04	5,850	344	169	40	2.5	1,070	7.7	--
Weighted average[a]	3,886	--	--	--	--	84	--	200	--	--	--	--	--	630	0.86	6,630	298	134	38	2.1	898	--	--

a Represents 100 percent of runoff for water year October 1957 to September 1958.

YELLOWSTONE RIVER BASIN--Continued

6A-2947. BIGHORN RIVER AT BIGHORN, MONT.--Continued

Temperature (° F) of water, water year October 1957 to September 1958
/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	60	44	34	32	a 35	32	45	50	64	65	70	65
2	61	40	33	a 33	--	32	45	51	65	70	71	63
3	60	36	34	a 33	a 34	32	45	58	61	57	74	61
4	52	33	a 36	a 33	a 35	33	48	57	59	64	72	61
5	50	35	34	a 34	a 33	34	45	55	60	65	69	61
6	50	35	a 36	a 35	--	34	42	60	64	63	66	62
7	46	32	a 37	a 35	--	34	45	69	67	62	69	63
8	44	37	a 37	a 34	a 32	34	45	57	67	63	71	63
9	44	36	--	a 35	a 32	36	45	60	65	66	73	61
10	44	33	a 36	a 34	a 32	33	45	61	60	67	70	66
11	46	36	a 35	a 34	--	35	44	63	60	67	72	66
12	50	35	--	a 33	--	33	42	64	61	70	72	65
13	50	39	33	--	--	32	49	61	58	70	70	66
14	51	39	a 35	a 33	--	33	53	56	60	65	70	61
15	51	39	a 34	--	--	32	50	55	64	64	70	58
16	49	35	a 37	a 36	--	33	51	59	62	65	71	58
17	48	38	a 37	a 38	--	33	53	61	62	67	71	58
18	47	35	a 37	--	--	33	55	58	64	70	71	58
19	49	35	35	a 34	a 34	36	52	59	65	69	70	57
20	48	34	a 37	a 32	a 35	37	53	64	61	67	67	56
21	48	35	a 38	a 33	33	42	49	65	59	69	67	56
22	49	33	a 34	a 33	34	40	47	65	65	72	67	55
23	45	36	a 34	a 33	35	41	43	66	67	71	66	55
24	38	37	a 34	a 35	36	43	43	65	65	69	65	52
25	37	38	35	a 34	40	44	43	65	61	69	65	50
26	40	39	--	a 33	39	43	42	65	64	70	68	52
27	40	35	a 34	--	35	44	44	65	66	66	65	50
28	44	36	--	--	32	43	42	67	67	66	67	53
29	42	a 35	a 33	--	--	44	43	67	63	72	66	52
30	45	34	a 33	--	--	46	49	70	67	67	62	47
31	46	--	a 32	--	--	47	--	64	--	69	62	--
Average	48	36	35	--	--	37	47	61	63	67	69	58

a Measurement between 2 p. m. and 6 p.m.

YELLOWSTONE RIVER BASIN--Continued

6A-2947. BIGHORN RIVER AT BIGHORN, MONT.--Continued

Suspended sediment, water year October 1957 to September 1958

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.....	3,550	360	3,450	4,510	500	6,090	2,830	408	3,120
2.....	3,530	408	3,890	4,490	550	6,670	2,860	722	5,580
3.....	3,530	480	4,570	4,460	400	4,820	2,920	527	4,160
4.....	3,550	440	4,220	4,390	370	4,390	2,960	561	4,480
5.....	3,620	344	3,360	4,440	470	5,630	2,900	612	4,790
6.....	3,620	336	3,280	4,390	330	3,910	2,920	561	4,420
7.....	3,730	324	3,260	4,370	320	3,780	2,940	510	4,050
8.....	3,810	333	3,430	4,420	300	3,580	2,960	552	4,410
9.....	3,680	396	3,930	4,440	370	4,440	3,340	714	6,440
10.....	3,810	351	3,610	4,300	350	4,060	4,030	672	7,310
11.....	3,640	252	2,480	4,210	450	5,120	4,140	484	5,410
12.....	3,590	342	3,310	4,170	370	4,170	3,570	434	4,180
13.....	3,380	297	2,710	4,210	330	3,750	3,040	408	3,350
14.....	3,880	430	4,500	4,210	350	3,980	2,900	382	2,990
15.....	3,950	350	3,730	4,190	300	3,390	2,900	323	2,530
16.....	3,860	380	3,960	4,280	260	3,000	2,900	298	2,330
17.....	4,010	380	4,110	4,280	170	1,960	2,920	264	2,080
18.....	4,060	500	5,480	4,260	200	2,300	3,140	264	2,240
19.....	4,030	580	6,310	4,230	210	2,400	3,180	289	2,480
20.....	4,060	380	4,170	4,190	200	2,260	3,140	221	1,870
21.....	4,280	480	5,550	4,210	230	2,610	2,940	264	2,100
22.....	4,490	850	10,300	4,190	220	2,490	3,200	374	3,230
23.....	4,350	680	7,990	4,140	250	2,790	3,300	408	3,640
24.....	4,230	730	8,340	4,170	270	3,040	4,000	289	3,120
25.....	4,390	430	5,100	4,230	240	2,740	3,900	170	1,790
26.....	4,560	480	5,910	4,300	310	3,600	4,000	153	1,650
27.....	4,510	430	5,240	4,210	260	2,960	4,200	382	4,330
28.....	4,420	310	3,700	3,510	190	1,800	4,200	212	2,400
29.....	4,440	300	3,600	3,160	297	2,530	4,000	280	3,020
30.....	4,530	390	4,770	2,900	119	932	4,000	272	2,940
31.....	4,440	360	4,320	--	--	--	4,000	85	918
Total.	123,530	--	142,580	125,460	--	105,192	104,230	--	107,358

Day	January			February			March		
1.....	3,900	60	632	2,900	620	4,850	4,100	368	4,070
2.....	3,900	136	1,430	3,800	536	5,500	3,990	315	3,390
3.....	4,000	332	3,590	4,000	629	6,790	3,990	278	2,990
4.....	4,000	476	5,140	4,200	680	7,710	3,990	270	2,910
5.....	4,200	484	5,490	4,000	348	3,760	3,680	300	2,980
6.....	4,200	408	4,630	3,900	170	1,790	3,700	322	3,220
7.....	4,200	348	3,950	3,800	128	1,310	3,680	352	3,500
8.....	4,200	382	4,330	3,800	144	1,480	3,680	315	3,130
9.....	4,100	459	5,080	3,800	170	1,740	3,680	278	2,760
10.....	4,100	510	5,650	3,900	119	1,250	3,680	285	2,830
11.....	4,100	366	4,050	3,900	68	716	3,660	368	3,640
12.....	4,200	374	4,240	4,000			3,590	382	3,700
13.....	4,200	--	e 4,100	4,000	--	e 800	3,490	315	2,970
14.....	4,200	348	3,950	4,000			3,550	278	2,660
15.....	4,200	187	2,120	4,000			3,510	255	2,420
16.....	4,200	374	4,240	4,200	--	e 1,000	3,160	202	1,720
17.....	4,000	552	5,960	4,800	--	e 2,000	3,000	420	3,400
18.....	4,000	493	5,320	5,400	--	e 2,600	2,960	195	1,560
19.....	3,900	476	5,010	5,600	200	3,020	3,000	248	2,010
20.....	3,900	340	3,580	5,400	250	3,650	3,040	262	2,150
21.....	3,800	450	4,620	5,800	320	5,010	3,100	240	2,010
22.....	3,700	357	3,570	6,000	450	7,290	3,120	262	2,210
23.....	3,700	314	3,140	5,800	1,230	19,300	3,180	285	2,450
24.....	3,200	298	2,580	5,600	1,830	27,700	3,200	390	3,370
25.....	3,000	272	2,200	4,560	1,110	13,700	3,240	315	2,760
26.....	3,300	255	2,270	4,690	1,040	13,200	3,320	300	2,690
27.....	3,800	--	e 2,600	4,490	720	8,730	3,340	382	3,440
28.....	3,900	--	e 3,200	4,260	570	6,560	3,320	585	5,240
29.....	3,800	306	3,140	--	--	--	3,950	645	6,880
30.....	3,300	--	e 2,700	--	--	--	3,240	540	4,720
31.....	3,300	382	3,400	--	--	--	3,220	405	3,520
Total.	120,500	--	115,912	124,600	--	153,856	107,360	--	97,300

e Estimated.

YELLOWSTONE RIVER BASIN--Continued

6A-2947. BIGHORN RIVER AT BIGHORN, MONT.--Continued

Suspended sediment, water year October 1957 to September 1958--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	2,980	375	3,020	2,560	1,480	10,200	4,820	1,040	13,500
2	2,690	345	2,510	3,760	2,880	29,200	4,940	950	12,700
3	2,580	278	1,940	4,080	1,760	19,400	4,800	2,020	26,200
4	2,540	262	1,800	3,990	1,160	12,500	5,030	2,670	36,300
5	2,560	315	2,180	3,880	918	9,620	5,790	1,860	29,100
6	2,540	285	1,950	3,900	783	8,240	4,610	2,650	33,000
7	2,540	315	2,160	3,320	567	5,080	4,290	2,140	24,800
8	2,540	300	2,060	2,500	657	4,430	4,520	2,250	27,500
9	2,560	240	1,660	2,620	576	4,070	5,270	5,300	75,400
10	2,520	240	1,630	3,320	837	7,500	5,630	9,600	146,000
11	2,520	262	1,780	3,100	1,120	9,380	4,700	6,200	78,700
12	2,430	285	1,870	3,140	1,560	13,200	4,080	3,200	35,300
13	2,280	232	1,430	3,700	1,650	16,500	5,140	3,600	50,000
14	2,410	315	2,050	4,720	1,820	23,200	8,820	6,200	148,000
15	2,350	450	2,860	4,320	1,470	17,100	8,070	13,700	299,000
16	2,290	300	1,850	3,590	1,070	10,400	7,110	13,800	265,000
17	2,220	188	1,130	3,180	864	7,420	5,520	10,800	161,000
18	2,220	255	1,530	2,830	711	5,430	5,420	7,500	110,000
19	2,240	255	1,540	2,960	630	5,030	4,690	3,700	46,900
20	2,450	292	1,930	3,470	594	5,570	4,880	3,900	51,400
21	2,450	315	2,080	4,140	864	9,660	5,100	3,100	42,700
22	2,370	338	2,160	5,510	1,940	28,900	6,430	3,500	60,800
23	2,450	390	2,580	7,430	3,600	72,200	7,470	4,350	87,700
24	3,080	552	4,590	7,560	3,050	62,300	7,050	2,780	52,900
25	3,180	920	7,900	7,210	2,350	45,700	7,470	2,330	47,000
26	2,640	928	6,610	7,180	2,330	45,200	8,080	3,750	81,800
27	2,370	968	6,190	6,760	1,750	31,900	8,920	3,380	81,400
28	2,370	960	6,140	6,300	1,630	27,700	7,440	3,130	62,900
29	2,310	752	4,690	5,800	1,260	19,700	6,680	3,520	63,500
30	2,350	782	4,960	5,900	1,150	18,300	6,250	1,900	32,100
31	--	--	--	5,060	1,670	22,800	--	--	--
Total	75,030	--	86,780	137,790	--	607,830	179,020	--	2,282,600

Day	July			August			September		
1	5,570	1,430	21,500	5,150	6,300	87,600	4,080	876	9,650
2	4,840	1,400	18,300	4,650	9,000	113,000	4,060	722	7,910
3	6,600	8,300	148,000	4,780	9,500	123,000	4,010	604	6,540
4	4,900	1,840	24,300	5,080	6,900	94,600	3,950	578	6,160
5	3,890	972	10,200	4,760	2,660	34,200	3,880	510	5,340
6	4,190	1,790	20,300	4,420	2,330	27,800	3,790	527	5,390
7	3,750	1,350	13,700	3,990	1,400	15,100	3,660	459	4,540
8	3,430	2,920	27,000	3,620	1,260	12,300	3,550	680	6,520
9	2,980	2,880	23,200	3,360	1,040	9,430	3,510	442	4,190
10	2,830	1,580	12,100	3,360	944	8,560	3,400	391	3,590
11	2,510	2,030	13,800	3,360	816	7,400	3,360	459	4,160
12	2,130	1,280	7,360	3,400	776	7,120	4,260	935	10,800
13	2,070	900	5,030	3,440	720	6,690	4,490	1,170	14,200
14	1,940	1,050	5,500	3,400	704	6,460	4,390	2,850	33,800
15	1,800	1,280	6,220	3,380	664	6,060	4,390	1,060	12,600
16	1,620	900	3,940	3,320	712	6,380	4,440	876	10,500
17	1,430	825	3,190	3,320	616	5,520	4,580	833	10,300
18	1,440	465	1,810	3,400	664	6,100	4,460	782	9,420
19	1,500	420	1,700	3,510	664	6,290	4,490	680	8,240
20	1,580	345	1,470	3,530	765	7,290	3,950	638	6,800
21	1,930	536	2,790	3,810	1,260	13,000	3,100	488	4,080
22	2,560	912	6,300	3,860	2,140	22,300	2,750	458	3,400
23	2,370	2,200	14,100	3,990	1,230	13,300	2,640	525	3,740
24	2,040	4,200	23,100	3,750	1,440	14,600	2,710	600	4,390
25	1,710	2,480	11,500	4,170	1,320	14,900	2,770	420	3,140
26	1,970	2,770	14,700	4,190	1,080	12,200	2,790	382	2,880
27	2,900	2,610	20,400	4,190	1,120	12,700	2,900	510	3,990
28	3,200	3,960	34,200	4,060	1,010	11,100	2,920	488	3,850
29	3,840	7,650	79,300	3,950	774	8,250	3,000	570	4,620
30	3,440	5,760	53,500	3,970	765	8,200	3,040	525	4,310
31	3,280	5,760	51,000	4,030	765	8,320	--	--	--
Total	90,240	--	679,510	121,200	--	729,770	109,320	--	219,050

Total discharge for year (cfs-days) 1,418,280

Total load for year (tons) 5,327,738

YELLOWSTONE RIVER BASIN--Continued

6A-2947. BIGHORN RIVER AT BIGHORN, MONT.--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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, 1957	6:50 a.m.	3,570	59	357	1,290	--	25		36		46	59	93		100		VBWCM
Oct. 15	3:05 p.m.	3,920	52	282	1,010	--	17		25		32	46	91		100		VBWCM
Nov. 6	2:35 p.m.	4,390	39	291	1,420	--	30		38		49	60	99		100		VBWCM
Dec. 3	4:10 p.m.	3,000	35	446	1,970	--	50		62		67	71	99		100		VBWCM
Jan. 8, 1958	9:50 a.m.	a 4,200	32	189	--	--	--		--		19	22	90		100		VM
Feb. 4	2:50 p.m.	a 4,200	34	668	2,780	--	12		24		61	79	100		--		VPWCM
Mar. 6	9:05 a.m.	3,440	36	273	681	--	16		26		41	58	99		100		VBWCM
Apr. 3	3:30 p.m.	2,690	54	231	781	--	25		37		49	57	98		100		VBWCM
May 1	11:40 a.m.	2,580	54	916	2,970	--	68		88		90	91	99		100		VPWCM
May 11	4:50 p.m.	3,000	74	1,160	3,390	--	66		84		89	93	100		--		VPWCM
May 15	3:50 p.m.	4,420	63	1,360	4,270	--	49		74		86	91	100		--		VPWCM
June 6	2:35 p.m.	4,540	71	2,200	3,440	--	59		82		91	97	100		--		VPWCM
June 15	7:30 p.m.	7,590	64	14,700	5,110	2	3		91		97	99	100		--		VPN
June 15	7:30 p.m.	7,590	64	14,700	5,230	54	68		91		97	99	100		--		PWC
July 2	11:55 a.m.	4,920	--	1,020	2,210	--	29		43		64	85	99		100		VPWCM
Aug. 4	3:10 p.m.	4,950	76	5,180	4,140	--	61		83		93	97	100		--		VPWCM
Sept. 3	7:35 a.m.	4,010	61	582	906	--	26		37		55	75	99		100		VBWCM
Sept. 30	2:55 p.m.	3,020	53	504	669	--	23		34		45	56	97		100		VBWCM

a Daily mean discharge.

Particle-size analyses of bed material, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time	Discharge (cfs)	Number of sampling points	Bed material												Methods of analysis
				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	32.000	
Oct. 15, 1957	3:50 p.m.	3,920	22			1	8	66	95	95	95	95	96	96	100	SV
May 1, 1958	1:00 p.m.	2,600	20			5	18	75	91	92	92	92	92	92	100	SV

6A-3085. 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 1958.
Water temperatures: April 1949 to September 1958.
Sediment records: June 1946 to September 1951.
EXTREMES, 1957-58.--Dissolved solids: Maximum, 1,790 ppm Sept. 11; minimum, 220 ppm June 1-2.
Hardness: Maximum, 688 ppm Sept. 11; minimum, 143 ppm July 4-7.
Specific conductance: Maximum daily, 2,390 micromhos Sept. 11; minimum daily, 337 micromhos June 1.
Water temperatures: Maximum, 72°F Aug. 3; minimum, freezing point on many days during November to March.
EXTREMES, 1949-58.--Dissolved solids (1951-58): Maximum, 1,790 ppm Sept. 11, 1958; minimum, 200 ppm June 23-27, 1953.
Hardness (1951-58): Maximum, 688 ppm Sept. 11, 1958; minimum, 94 ppm May 4, 1955.
Specific conductance (1951-58): Maximum daily, 2,390 micromhos Sept. 11, 1958; 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 1957 to September 1958 given in WSP 1559.

Chemical analyses, in parts per million, water year October 1957 to September 1958

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. 1-15, 1957...	408	--	--	--	--	44	--	260	--	--	--	--	--	524	0.71	574	340	127	22	1.0	790	7.9	--
Oct. 16-Nov. 1 ...	99.3	--	--	--	--	84	--	318	--	--	--	--	--	712	.97	191	406	145	31	1.8	1,020	7.9	--
Nov. 2-29.....	168	--	--	--	--	79	--	305	--	--	--	--	--	655	.89	296	375	125	31	1.8	949	7.8	--
Nov. 30-Dec. 31..	163	5.1	0.01	79	57	75	4.6	338	284	5.7	0.4	0.6	0.10	699	.95	307	432	155	27	1.6	1,010	8.0	--
Jan. 1-25, 1958...	171	--	--	--	--	73	--	362	--	--	--	--	--	733	1.00	339	456	159	26	1.5	1,050	8.2	--
Jan. 26-Feb. 5 ...	145	--	--	--	--	64	--	315	--	--	--	--	--	633	.86	248	394	136	26	1.4	933	7.8	--
Feb. 6-22.....	146	--	--	--	--	73	--	355	--	--	--	--	--	688	.94	273	430	139	27	1.5	1,020	7.8	--
Feb. 23-24.....	255	--	--	--	--	71	--	280	--	--	--	--	--	555	.75	380	320	90	33	1.7	852	7.5	--
Feb. 25-26.....	285	--	--	--	--	57	--	210	--	--	--	--	--	404	.55	311	216	44	36	1.7	636	7.6	--
Feb. 27-Mar. 1...	230	--	--	--	--	51	--	257	--	--	--	--	--	528	.72	328	314	103	26	1.3	782	7.4	--
Mar. 2-20.....	218	9.1	.00	67	46	60	4.0	297	232	4.5	.3	.1	.12	579	.79	341	358	114	26	1.4	867	7.8	10
Mar. 21-25.....	317	--	--	--	--	50	--	254	--	--	--	--	--	517	.70	440	318	110	26	1.2	799	7.2	--
Mar. 26-Apr. 8...	199	--	--	--	--	69	--	288	--	--	--	--	--	608	.83	328	366	130	29	1.6	913	7.6	--
Apr. 9-30.....	209	--	--	--	--	63	--	270	--	--	--	--	--	592	.81	336	356	135	28	1.5	885	7.5	--
May 1-9	180	--	--	--	--	63	--	270	--	--	--	--	--	610	.83	296	363	142	27	1.4	899	7.6	--
May 10	35	--	--	--	--	98	--	336	--	--	--	--	--	746	1.01	70.1	407	131	34	2.1	1,100	7.8	--
May 11-16.....	313	--	--	--	--	53	--	264	--	--	--	--	--	584	.79	491	358	142	24	1.2	856	7.6	--
May 17-20.....	834	--	--	--	--	35	--	222	--	--	--	--	--	440	.60	992	292	110	21	.9	671	7.5	--
May 21-27.....	733	--	--	--	--	25	--	190	--	--	--	--	--	316	.43	625	216	60	20	.7	509	7.5	--
May 28-31.....	1,070	--	--	--	--	16	--	160	--	--	--	--	--	235	.32	679	163	32	18	.5	380	7.4	--

June 1-2	738	--	--	--	--	17	--	150	--	--	--	--	--	220	.30	439	148	25	20	.6	348	7.4	--
June 3-8	348	--	--	--	--	41	--	199	--	--	--	--	--	357	.49	338	204	41	30	1.2	556	7.3	--
June 9-14	764	9.8	.03	48	16	40	4.0	193	108	.2	.4	3.1	.07	341	.46	697	186	28	31	1.3	522	7.2	27
June 15	991	--	--	--	--	30	--	180	--	--	--	--	--	283	.38	747	170	22	28	1.0	449	7.5	--
June 16-30	708	--	--	--	--	27	--	173	--	--	--	--	--	298	.41	576	188	46	24	.9	473	7.3	--
July 1	886	--	--	--	--	47	--	212	--	--	--	--	--	364	.50	878	194	20	34	1.5	560	7.2	--
July 2-3	1,583	--	--	--	--	34	--	192	--	--	--	--	--	336	.46	1,440	203	46	27	1.0	527	7.4	--
July 4-7	2,129	--	--	--	--	53	--	182	--	--	--	--	--	323	.44	1,860	143	0	45	1.9	504	7.4	--
July 8-26	221	--	--	--	--	57	--	231	--	--	--	--	--	452	.61	267	249	60	33	1.6	693	7.3	--
July 27	135	--	--	--	--	91	--	296	--	--	--	--	--	684	.93	249	350	107	36	2.1	1,000	7.6	--
July 28-Aug. 14	134	--	--	--	--	60	--	267	--	--	--	--	--	516	.70	186	296	77	31	1.5	779	7.3	--
Aug. 15-29	28.8	--	--	--	--	166	--	434	--	--	--	--	--	982	1.34	76.5	418	62	46	3.5	1,400	7.7	--
Aug. 30-Sept. 10	64.3	--	--	--	--	72	--	292	--	--	--	--	--	572	.78	99.4	316	77	33	1.8	863	7.6	--
Sept. 11	18	--	--	--	--	318	--	752	--	--	--	--	--	1,790	2.43	86.8	688	71	50	5.3	2,390	8.0	--
Sept. 12-27	19.5	--	--	--	--	236	--	548	--	--	--	--	--	1,260	1.71	66.1	498	49	51	4.6	1,770	7.9	--
Sept. 28-30	49.0	--	--	--	--	128	--	378	--	--	--	--	--	804	1.09	106	364	54	43	2.9	1,180	7.9	--
Weighted average a	268	--	--	--	--	51	--	244	--	--	--	--	--	475	0.64	340	283	83	28	1.3	716	--	--

a Represents 100 percent of runoff for water year October 1957 to September 1958.

YELLOWSTONE RIVER BASIN--Continued

6A-3085. TONGUE RIVER AT MILES CITY, MONT.--Continued

Temperature (° F) of water, water year October 1957 to September 1958
(Once-daily measurement at 7 a.m.)

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

6A-3265. 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 1958.
Water temperatures: February 1951 to May 1954, October 1954 to September 1958.
Sediment records: March 1950 to September 1953.
EXTREMES, 1957-58.--Dissolved solids: Maximum, 3,100 ppm Jan. 15; minimum, 427 ppm May 25-31.
Hardness: Maximum, 1,400 ppm Jan. 15; minimum, 240 ppm May 25 to June 3.
Specific conductance: Maximum daily, 3,440 micromhos Jan. 15; minimum daily, 567 micromhos May 26.
Water temperatures: Maximum, 77°F Aug. 13; minimum, freezing point on many days during November to March.
EXTREMES, 1951-58.--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, 1954-58), 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 1957 to September 1958 given in WSP 1559.

Chemical analyses, in parts per million, water year October 1957 to September 1958

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. 1-23, 1957.	94.5	--	--	--	--	196	--	226	--	--	--	--	--	1,470	--	2.00	374	662	477	39	3.3	1,840	7.7	--
Oct. 24-Nov. 20.	216	--	--	--	--	162	--	236	--	--	--	--	--	1,260	--	1.71	732	594	400	37	2.9	1,630	7.8	--
Nov. 21-Dec. 5.	133	--	--	--	--	172	--	279	--	--	--	--	--	1,410	--	1.92	507	668	439	36	2.9	1,780	7.8	--
Dec. 6-28.....	118	14	0.01	183	73	200	5.5	336	810	49	0.3	3.3	0.08	1,610	1,500	2.19	512	756	480	36	3.2	1,980	7.8	10
Dec. 29-Jan. 14, 1958	156	--	--	--	--	240	--	376	--	--	--	--	--	1,950	--	2.65	820	914	606	36	3.5	2,350	8.0	--
Jan. 15	170	--	--	--	--	388	--	398	--	--	--	--	--	3,100	--	4.22	1,420	1,400	1,070	38	4.5	3,440	8.0	--
Jan. 16-26	159	--	--	--	--	200	--	334	--	--	--	--	--	1,630	--	2.22	699	782	508	36	3.1	2,030	8.0	--
Jan. 27-Feb. 19	155	--	--	--	--	174	--	312	--	--	--	--	--	1,460	--	1.99	611	704	448	35	2.9	1,830	7.6	--
Feb. 20.....	190	--	--	--	--	124	--	76	--	--	--	--	--	820	--	1.12	422	316	254	46	3.0	1,130	7.2	--
Feb. 21-22.....	210	--	--	--	--	187	--	286	--	--	--	--	--	1,350	--	1.84	767	600	365	40	3.3	1,750	7.8	--
Feb. 23.....	275	--	--	--	--	123	--	216	--	--	--	--	--	862	--	1.04	567	386	209	41	2.7	1,190	7.7	--
Feb. 24-26.....	343	--	--	--	--	97	--	180	--	--	--	--	--	666	--	.91	619	307	159	41	2.4	975	7.5	--
Feb. 27-Mar. 14	257	--	--	--	--	134	--	202	--	--	--	--	--	1,050	--	1.43	729	492	326	37	2.6	1,390	7.2	--
Mar. 15-19.....	269	--	--	--	--	161	--	212	--	--	--	--	--	1,220	--	1.66	886	562	388	38	3.0	1,600	7.3	--
Mar. 20-27.....	404	13	.01	122	46	138	5.3	204	525	49	.3	3.5	.11	1,070	1,000	1.46	1,170	495	328	37	2.7	1,420	7.6	20
Mar. 28-Apr. 2.	512	--	--	--	--	179	--	227	--	--	--	--	--	1,280	--	1.74	1,770	589	403	40	3.2	1,680	7.3	--
Apr. 3-12.....	387	--	--	--	--	212	--	232	--	--	--	--	--	1,470	--	2.00	1,540	634	444	42	3.7	1,930	7.3	--
Apr. 13-25.....	401	--	--	--	--	220	--	230	--	--	--	--	--	1,560	--	2.12	1,690	648	459	42	3.8	2,070	7.3	--
Apr. 26-May 3..	441	--	--	--	--	146	--	209	--	--	--	--	--	1,080	--	1.47	1,290	483	312	40	2.9	1,440	7.5	--
May 4-12	351	--	--	--	--	173	--	232	--	--	--	--	--	1,310	--	1.78	1,240	591	401	39	3.1	1,690	7.5	--

YELLOWSTONE RIVER BASIN--Continued

6A-3265. POWDER RIVER NEAR LOCATE, MONT.--Continued

Chemical analyses, in parts per million, water year October 1957 to September 1958--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 $CaCO_3$		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					
														Residue at 180°C	Sum									
May 13-16, 1958	1,081	--	--	--	--	93	--	224	--	--	--	--	--	780	--	1.06	2,270	395	211	34	2.0	1,090	7.3	--
May 17-24	1,094	--	--	--	--	54	--	190	--	--	--	--	--	542	--	.74	1,610	302	146	28	1.4	791	7.3	--
May 25-31	1,181	--	--	--	--	41	--	164	--	--	--	--	--	427	--	.58	1,360	240	106	27	1.1	631	7.4	--
June 1-3	765	--	--	--	--	45	--	146	--	--	--	--	--	455	--	.62	941	240	120	29	1.3	662	7.3	--
June 4-10	1,404	--	--	--	--	91	--	201	--	--	--	--	--	805	--	1.09	3,040	403	238	33	2.0	1,090	7.4	--
June 11	2,120	--	--	--	--	61	--	228	--	--	--	--	--	644	--	.88	3,700	362	175	27	1.4	886	8.0	--
June 12-14	992	--	--	--	--	100	--	192	--	--	--	--	--	955	--	1.30	2,560	486	329	31	2.0	1,240	7.4	--
June 15-20	1,471	14	0.03	240	63	111	8.5	224	853	29	0.5	1.2	0.15	1,560	1,430	2.12	6,190	858	674	22	1.6	1,810	7.0	27
June 21-July 2	358	--	--	--	--	177	--	213	--	--	--	--	--	1,490	--	2.03	1,440	702	527	35	2.9	1,850	7.3	--
July 3-11	1,564	--	--	--	--	113	--	197	--	--	--	--	--	777	--	1.06	3,290	329	167	48	2.7	1,080	7.3	--
July 12-20	546	--	--	--	--	176	--	214	--	--	--	--	--	1,680	--	2.28	2,470	833	658	31	2.7	2,010	7.0	--
July 21-24	1,458	--	--	--	--	138	--	216	--	--	--	--	--	1,730	--	2.35	6,800	942	765	24	2.0	1,970	7.0	--
July 25-Aug. 14	4,757	--	--	--	--	162	--	224	--	--	--	--	--	1,480	--	2.01	19,000	722	538	33	2.6	1,810	7.4	--
Aug. 15-31	47.1	--	--	--	--	238	--	221	--	--	--	--	--	1,680	--	2.28	213	698	517	43	3.9	2,070	7.4	--
Sept. 1-14	14.6	--	--	--	--	266	--	242	--	--	--	--	--	1,890	--	2.57	74.4	716	518	45	4.3	2,330	7.6	--
Sept. 15-30	3.9	--	--	--	--	300	--	270	--	--	--	--	--	2,060	--	2.80	21.6	758	537	46	4.7	2,540	7.4	--
Weighted average a	379	--	--	--	--	134	--	220	--	--	--	--	--	1,150	--	1.56	1,170	558	378	34	2.5	1,480	--	--

a Represents 100 percent of runoff for water year October 1957 to September 1958.

YELLOWSTONE RIVER BASIN--Continued

6A-3265. POWDER RIVER NEAR LOCATE, MONT.--Continued

Temperature (° F) of water, water year October 1957 to September 1958
/Once-daily measurement between 1 p.m. and 5 p.m. October to March and between 7 a.m. and 10 a.m. May to September/

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

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

6A-3295. 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.
Water temperatures: January 1951 to September 1958.
EXTREMES, 1957-58.--Dissolved solids: Maximum, 724 ppm July 24; minimum, 192 ppm June 1-4.
Hardness: Maximum, 376 ppm July 24; minimum, 108 ppm June 1-4.
Specific conductance: Maximum daily, 1,020 micromhos July 24; minimum daily, 284 micromhos June 3.
Water temperatures: Maximum, 77°F Aug. 13, 14, 17; minimum, freezing point on many days during December to March.
EXTREMES, 1951-58.--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. Records of discharge for water year October 1957 to September 1958 given in WSP 1559.

Chemical analyses, in parts per million, water year October 1957 to September 1958

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, 1957...	8,494	--	--	--	--	70	--	194	--	--	--	--	--	518	0.70	11,790	256	97	37	1.9	785	7.7	--
Nov. 1-30.....	8,789	--	--	--	--	75	--	202	--	--	--	--	--	541	.74	12,900	264	98	38	2.0	801	7.5	--
Dec. 1-26.....	6,797	13	0.01	69	27	74	3.9	216	246	10	0.4	0.9	0.22	561	.76	10,250	282	105	36	1.9	826	7.6	6
Dec. 27-Jan. 12, 1958	6,048	--	--	--	--	80	--	232	--	--	--	--	--	618	.84	10,100	307	117	36	2.0	891	7.8	--
Jan. 13-31	6,789	--	--	--	--	71	--	214	--	--	--	--	--	566	.77	10,370	284	109	35	1.8	822	7.8	--
Feb. 1-13.....	5,415	--	--	--	--	75	--	216	--	--	--	--	--	586	.80	8,590	300	123	35	1.9	862	7.3	--
Feb. 14-17.....	3,525	--	--	--	--	78	--	238	--	--	--	--	--	659	.90	6,290	328	133	34	1.9	956	7.4	--
Feb. 18-Mar. 4...	8,127	--	--	--	--	69	--	182	--	--	--	--	--	507	.69	11,120	248	99	38	1.9	756	7.2	--
Mar. 5-27.....	7,874	10	.00	66	26	80	3.9	199	250	13	.4	1.5	.12	553	.75	11,710	273	110	38	2.1	826	7.7	6
Mar. 28-Apr. 2...	11,670	--	--	--	--	75	--	184	--	--	--	--	--	521	.71	16,430	254	103	39	2.0	783	7.3	--
Apr. 3-30.....	6,506	--	--	--	--	85	--	197	--	--	--	--	--	601	.82	10,580	287	125	39	2.2	881	7.3	--
May 1-11.....	7,873	--	--	--	--	75	--	194	--	--	--	--	--	570	.78	12,180	268	109	38	2.0	829	7.6	--
May 12-15.....	12,140	--	--	--	--	53	--	179	--	--	--	--	--	447	.61	14,690	225	78	34	1.5	657	7.5	--
May 16-21.....	14,700	--	--	--	--	36	--	162	--	--	--	--	--	346	.47	13,700	191	58	29	1.1	523	7.3	--
May 22-25.....	22,920	--	--	--	--	28	--	153	--	--	--	--	--	285	.39	17,730	168	43	27	.9	444	7.4	--
May 26-31.....	35,970	13	.01	38	8.5	17	1.9	130	57	1.6	.2	2.3	.06	220	.30	21,400	130	23	22	.6	334	7.5	7
June 1-4	31,120	--	--	--	--	20	--	111	--	--	--	--	--	192	.26	16,050	108	17	29	.8	304	7.2	--
June 5-10	29,750	--	--	--	--	33	--	129	--	--	--	--	--	270	.37	21,830	138	32	34	1.2	416	7.2	--
June 11-15	30,320	11	.03	48	12	34	2.5	146	112	4.2	.3	1.6	.08	310	.42	25,260	168	48	30	1.1	472	7.3	13

June 16-20	28,120	--	--	--	--	45	--	171	--	--	--	--	--	397	.54	30,120	213	73	32	1.3	595	7.2	--
June 21-26	24,580	--	--	--	--	39	--	143	--	--	--	--	--	324	.44	21,450	171	54	33	1.3	502	7.2	--
June 27-July 3	22,540	--	--	--	--	33	--	141	--	--	--	--	--	292	.40	17,880	157	41	31	1.1	459	7.1	--
July 4-8	20,760	--	--	--	--	47	--	152	--	--	--	--	--	334	.45	18,530	156	31	40	1.6	514	7.2	--
July 9-13	15,120	--	--	--	--	57	--	147	--	--	--	--	--	405	.55	16,490	186	65	40	1.8	618	7.2	--
July 14-23	9,450	--	--	--	--	58	--	160	--	--	--	--	--	445	.61	11,430	216	85	37	1.7	669	7.2	--
July 24	8,070	--	--	--	--	84	--	204	--	--	--	--	--	724	.98	15,690	376	209	33	1.9	1,020	7.2	--
July 25-Aug. 6	8,550	--	--	--	--	75	--	186	--	--	--	--	--	595	.81	13,740	286	133	36	1.9	848	7.5	--
Aug. 7-31	5,870	--	--	--	--	72	--	186	--	--	--	--	--	524	.71	8,270	242	89	39	2.0	773	7.4	--
Sept. 1-30	5,810	--	--	--	--	77	--	188	--	--	--	--	--	542	.74	8,530	243	89	41	2.1	786	7.3	--
Weighted average a	10,190	--	--	--	--	58	--	175	--	--	--	--	--	448	0.61	12,330	224	80	36	1.7	668	--	--

a Represents 100 percent of runoff for water year October 1957 to September 1958.

YELLOWSTONE RIVER BASIN--Continued

6A-3295. YELLOWSTONE RIVER NEAR SIDNEY, MONT.--Continued

Temperature (° F) of water, water year October 1957 to September 1958
/Once-daily measurement at varying hours/

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

YELLOWSTONE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN YELLOWSTONE RIVER BASIN IN WYOMING

Periodic determinations of suspended-sediment discharge, water year October 1957 to September 1958

Date	Discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Discharge (tons per day)
6A-2280. WIND RIVER AT RIVERTON			
Oct. 14, 1957	1,790	319	1,540
Nov. 21	464	55	69
Dec. 3	471	51	65
Jan. 10, 1958	a 500	75	101
Feb. 7	a 500	42	57
Feb. 19	466	52	65
Mar. 4	397	30	32
Mar. 21	350	11	10
Apr. 2	442	24	29
Apr. 17	408	116	128
May 2	234	24	15
May 15	1,390	742	2,780
May 21	5,520	4,180	62,300
May 29	4,880	1,710	22,500
June 10	467	124	156
June 26	1,450	1,370	5,360
July 25	a 50	35	5
July 27	406	1,920	2,100
July 31	902	10,100	24,600
Aug. 22	1,310	11,900	42,100
Sept. 10	226	36	22
Oct. 2	250	29	20
6A-2355. POPO AGIE RIVER NEAR RIVERTON			
Oct. 14, 1957	406	35	38
Nov. 21	a 200	60	32
Dec. 4	a 250	55	37
Jan. 10, 1958	a 220	20	12
Feb. 7	a 200	24	13
Mar. 4	a 200	33	18
Mar. 21	a 350	37	35
Apr. 2	a 400	163	176
Apr. 17	238	303	195
May 2	226	129	79
May 19	1,570	970	4,110
May 21	3,330	1,120	10,100
May 29	5,240	242	3,420
June 10	1,360	127	466
July 8	312	108	91
July 25	149	119	48
July 27	247	97	65
July 31	165	108	48
Sept. 10	96	69	18
Oct. 2	154	25	10

a Daily mean discharge.

YELLOWSTONE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN YELLOWSTONE RIVER BASIN IN WYOMING--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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	
6A-2280. WIND RIVER AT RIVERTON																	
Oct. 14, 1957....	3:20 p.m.	1,790	53	319	--		--		--		49	60	79		100	--	VM
May 15, 1958....	4:25 p.m.	1,390	53	742	3,750		58		79		84	89	96		100	--	VPWCM
May 21.....	3:50 p.m.	5,520	62	4,180	3,530		15		32		72	88	95		99	100	VPWCM
May 29.....	4:25 p.m.	4,880	62	1,710	3,950		8		18		51	70	88		99	100	VPWCM
June 10	4:40 p.m.	467	66	124	793		36		56		87	94	98		100	--	VPWCM
June 26	9:40 a.m.	1,450	60	1,370	4,070		41		67		80	84	92		99	100	VPWCM
July 27.....	5:30 p.m.	406	67	1,920	2,130		76		99		99	100	--		--	--	VPWCM
July 31.....	11:05 a.m.	902	65	10,100	3,880		77		92		98	99	99		100	--	VPWCM
Aug. 22.....	7:35 p.m.	1,310	52	11,900	3,830		45		75		98	99	100		--	--	VPWCM
6A-2355. POPO AGIE RIVER NEAR RIVERTON																	
May 19, 1958....	9:35 a.m.	1,570	58	970	4,700		25		39		76	94	96		99	100	VPWCM
May 21.....	4:55 p.m.	3,330	57	1,120	4,050		23		38		74	90	97		100	--	VPWCM
May 29.....	3:30 p.m.	5,240	59	242	913		26		40		67	78	91		100	--	VBWCM

6A-3300. 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 1958.
Water temperatures: May 1951 to September 1958.
EXTREMES, 1957-58.--Dissolved solids: Maximum, 599 ppm Dec. 28 to Jan. 13; minimum, 240 ppm May 28 to June 5.
Hardness: Maximum, 304 ppm Dec. 28 to Jan. 13; minimum, 139 ppm May 28 to June 5.
Specific conductance: Maximum daily, 957 micromhos Jan. 10, 12; minimum daily, 337 micromhos June 1.
Water temperatures: Maximum, 80°F July 21, 22; minimum, 33°F Dec. 1-3, 5.
EXTREMES, 1950-58.--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, 957 micromhos Jan. 10, 12, 1958; minimum daily, 317 micromhos June 17, 1957.
Water temperatures (1951-58): Maximum, 80°F July 21, 22, 1958; minimum (1954-55, 1956-58), freezing point on several days during winter months.
REMARKS.--Daily samples for chemical analysis composited by discharge. Records of specific conductance of daily samples and some records of strontium available in district office at Lincoln, Nebr. Records of discharge for water year October 1957 to September 1958 given in WSP 1559.

Chemical analyses, in parts per million, water year October 1957 to September 1958

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, 1957...	14,420	--	--	--	--	63	--	200	--	--	--	--	--	483	0.66	18,810	245	81	36	1.8	732	8.0	--
Nov. 1-30.....	14,440	--	--	--	--	68	--	212	--	--	--	--	--	511	.69	19,920	254	80	37	1.9	762	7.8	--
Dec. 1-27.....	12,280	--	--	--	--	65	--	214	--	--	--	--	--	504	.69	16,710	263	88	35	1.7	760	7.9	--
Dec. 28-Jan. 13, 1958	10,530	19	0.00	73	30	74	5.1	245	249	13	0.6	1.9	0.19	599	.81	17,030	304	103	34	1.8	876	7.7	6
Jan. 14-Feb. 12 ..	12,220	--	--	--	--	64	--	210	--	--	--	--	--	502	.68	16,560	264	92	34	1.7	764	7.6	--
Feb. 13-22.....	9,780	--	--	--	--	67	--	224	--	--	--	--	--	520	.71	13,730	274	90	35	1.8	785	7.7	--
Feb. 23-Mar. 27..	14,730	9.4	.01	62	23	63	3.8	195	205	12	.6	.9	.15	492	.67	19,570	248	88	35	1.7	730	7.9	4
Mar. 28-Apr. 30..	17,430	--	--	--	--	62	--	192	--	--	--	--	--	486	.66	22,870	241	84	36	1.7	738	7.0	--
May 1-11.....	13,460	--	--	--	--	68	--	193	--	--	--	--	--	497	.68	18,060	246	88	38	1.9	746	7.3	--
May 12-22.....	18,190	12	.03	49	18	44	3.5	168	143	7.7	.4	1.5	.13	375	.51	18,420	197	59	32	1.4	570	7.4	8
May 23-27.....	31,460	--	--	--	--	30	--	148	--	--	--	--	--	278	.38	23,610	160	39	29	1.0	440	7.3	--
May 28-June 5....	40,170	24	.00	39	10	22	2.7	136	69	2.4	.4	.5	.09	240	.33	26,030	139	27	25	.8	365	7.0	8
June 6-16	35,950	--	--	--	--	37	--	145	--	--	--	--	--	302	.41	29,310	158	39	34	1.3	460	7.4	--
June 17-20	34,880	--	--	--	--	44	--	158	--	--	--	--	--	389	.53	36,630	209	79	31	1.3	585	7.6	--
June 21-July 7....	29,940	--	--	--	--	41	--	157	--	--	--	--	--	336	.46	27,160	178	49	33	1.3	519	7.5	--
July 8-24.....	18,950	--	--	--	--	56	--	174	--	--	--	--	--	424	.58	21,690	211	68	37	1.7	643	7.3	--
July 25-Aug. 11...	15,930	--	--	--	--	61	--	188	--	--	--	--	--	510	.69	21,940	259	105	34	1.6	746	7.1	--
Aug. 12-28.....	13,080	--	--	--	--	56	--	183	--	--	--	--	--	446	.61	15,750	227	77	35	1.6	671	6.9	--
Aug. 29-Sept. 12..	14,320	--	--	--	--	59	--	187	--	--	--	--	--	456	.62	17,630	230	77	36	1.7	688	7.0	--
Sept. 13-30.....	13,190	9.6	.00	58	22	59	3.7	198	191	9.7	.8	.5	.14	463	.63	16,490	235	73	35	1.7	695	7.6	4
Weighted average a	16,790	--	--	--	--	55	--	185	--	--	--	--	--	439	0.60	19,900	225	73	35	1.6	661	--	--

a Represents 100 percent of runoff for water year October 1957 to September 1958.

MISSOURI RIVER MAIN STEM--Continued

6A-3300. MISSOURI RIVER NEAR WILLISTON, N. DAK.--Continued

Temperature (° F) of water, water year October 1957 to September 1958
/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	63	a 42	a 33	a 34	a 34	a 36	--	56	a 63	a 70	a 76	b 70
2	64	40	33	a 34	a 34	a 36	--	57	a 63	a 70	a 75	b 63
3	60	38	33	a 34	34	a 36	--	b 57	64	b 69	a 74	64
4	49	38	34	a 34	34	36	--	57	a 66	--	a 74	60
5	51	40	33	a 34	34	36	--	62	a 66	65	a 74	61
6	46	38	35	34	34	36	b 51	62	a 68	63	a 73	a 61
7	44	38	a 34	--	34	36	51	64	a 70	a 62	a 75	60
8	43	38	a 34	--	a 34	b 36	51	66	b 71	a 65	a 78	59
9	46	b 38	35	34	a 34	a 36	52	66	a 68	a 64	a 76	58
10	48	38	a 36	34	34	36	52	a 67	b 68	a 68	a 78	58
11	50	38	a 36	a 34	34	36	52	b 67	a 66	a 70	b 75	59
12	53	37	a 36	a 34	34	36	b 52	66	a 66	a 72	a 72	60
13	55	38	a 36	34	34	36	b 53	66	a 66	a 69	77	a 62
14	55	38	a 36	34	34	36	53	--	a 65	a 66	b 74	a 59
15	52	37	a 36	34	a 34	a 36	55	--	a 64	a 64	a 77	59
16	51	37	37	34	a 34	a 36	55	--	a 64	a 68	a 77	62
17	53	36	a 38	34	34	36	55	--	a 65	a 68	b 76	63
18	51	--	36	a 34	34	36	55	--	a 66	a 70	b 77	63
19	51	35	35	a 34	34	36	a 55	--	a 64	a 74	74	60
20	51	34	35	a 34	35	36	b 55	--	a 63	77	a 66	a 58
21	51	--	--	--	35	36	55	--	a 62	a 80	b 68	61
22	--	34	a 34	--	a 35	a 36	55	--	a 62	80	b 66	60
23	40	36	--	--	a 35	a 38	55	--	a 62	a 75	a 67	58
24	38	36	a 34	--	36	38	54	--	a 62	a 70	a 67	54
25	38	36	a 34	a 34	36	38	54	--	a 63	76	64	51
26	40	37	a 34	a 35	36	a 38	a 54	--	a 64	--	b 67	52
27	42	--	a 34	34	36	a 38	b 54	--	70	a 70	72	a 56
28	--	35	a 34	34	36	a 38	52	b 70	--	a 70	a 68	a 54
29	42	34	a 34	34	--	a 38	52	a 70	a 69	a 69	a 66	--
30	45	34	34	34	--	b 38	52	--	72	a 67	a 62	--
31	46	--	34	34	--	--	--	--	--	a 70	a 66	--
Average	49	37	35	34	35	37	53	--	66	70	72	59

a Measurement between 9 a.m. and 12 m.
b Measurement between 1 p.m. and 3 p.m.

MISCELLANEOUS ANALYSES OF STREAMS IN SNAKE CREEK BASIN IN NORTH DAKOTA

Chemical analyses, in parts per million, water year October 1957 to September 1958

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
SNAKE CREEK, A QUARTER OF A MILE EAST OF EMBANKMENT OF GARRISON DAM																								
Jan. 8, 1958...		36	0.00	54	137	820	34	a 1,100	1,520	20	0.2	4.7	1.0	3,190	3,170	4.31		696	0	71	14	4,050	8.5	40
June 19		16	.04	31	122	750	26	b 932	1,400	11	.5	.7	.98	2,870	2,820	3.90		579	0	73	14	3,720	8.5	

a Includes equivalent of 39 ppm of carbonate (CO_3).
b Includes equivalent of 45 ppm of carbonate (CO_3).

MISSOURI RIVER MAIN STEM--Continued

6A-3390. 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 1958.
EXTREMES, 1957-58.--Water temperatures: Maximum, 64°F Aug. 25-28; minimum, freezing point Jan. 28, Feb. 1, 9.
EXTREMES, 1952, 1954-58.--Water temperatures: Maximum, 76°F July 27, 28, 1954; minimum (1954-58), freezing point on many days during winter months.
REMARKS.--Records of discharge for water year October 1957 to September 1958 given in WSP 1559.

Temperature (° F) of water, water year October 1957 to September 1958
/Recorder with temperature attachment, continuous ethyl alcohol-actuated thermograph except during Nov. 13 to Apr. 21/

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

MISSOURI RIVER MAIN STEM--Continued

MISCELLANEOUS ANALYSES OF LAKES ON THE MISSOURI RIVER MAIN STEM, NORTH DAKOTA

Chemical analyses, in parts per million, water year October 1957 to September 1958

Date of collection	Pool elevation (feet)	Silica (SiO_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					
GARRISON RESERVOIR, A QUARTER OF A MILE WEST OF SNAKE CREEK EMBANKMENT																							
Jan. 8, 1958.....	1,802.9	11	0.02	48	17	51	4.0	174	150	8.0	0.2	0.7	0.11	378	0.51		188	45	37	1.6	587	7.7	10
June 19		4.1	.11	52	19	66	4.1	187	171	8.2	.6	1.1	.14	418	.57		209	56	40	2.0	651	7.5	

TURTLE CREEK BASIN

MISCELLANEOUS ANALYSES OF LAKES IN TURTLE CREEK BASIN IN NORTH DAKOTA

Chemical analyses, in parts per million, water year October 1957 to September 1958

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				
LAKE ORDWAY NEAR TURTLE LAKE																							
Oct. 2, 1957.....	a 7.51	13	0.02	9.0	35	1,460	38	1,890	370	1,110	30	0.7	5.4	3.0	b 4,100	5.58		166	0	94	49	5,550	9.3
June 19, 1958.....	a 7.40	13	.13	25	22	1,500	41	2,000	330	1,150	30	.4	1.7	3.1	c 4,230	5.75		154	0	94	53	5,690	8.9

a Pool elevation, in feet below reference mark no. 1.
b Sum, 4,000 ppm.
c Sum, 4,100 ppm.

PAINTED WOODS CREEK BASIN

6A-3418. PAINTED WOODS CREEK NEAR WILTON, N. DAK.

LOCATION.--At gaging station at county highway bridge, 7 miles upstream from mouth of Yanktonai Creek, and 8 miles north of Wilton, Burleigh County.
DRAINAGE AREA.--427 square miles, of which about 310 square miles is probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: October 1957 to September 1958.
REMARKS.--No flow during August to September. Records of discharge for water year October 1957 to September 1958 given in WSP 1559.

Chemical analyses, in parts per million, October 1957 to July 1958

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. 2, 1957	0.2	9.3	0.01	35	60	426	14	736	0	628	14	0.3	4.0	0.60	a1,590	2.16		336	0	72	10	2,210	8.2
Jan. 27, 1958	.14	--	--	97	76	455	--	1,030	0	680	15	--	--	--	1,860	2.53		556	0	63	8.4	2,570	8.1
Feb. 24	15.5	12	.28	27	17	100	11	248	0	166	2.4	.1	.8	.14	504	.69		136	0	59	3.7	729	7.4
Mar. 27	160	15	.08	18	11	19	11	128	0	35	.5	.1	1.1	.11	199	.27		92	0	28	.9	271	7.1
Apr. 14	7.84	--	--	40	29	140	--	378	0	218	6.5	--	--	--	686	.93		218	0	58	4.1	994	7.5
June 19	1.50	--	.05	15	49	316	--	394	57	512	9.2	--	--	--	1,210	1.65		240	0	74	8.9	1,740	8.8
June 25	.61	--	--	18	56	341	--	473	32	542	11	--	--	--	1,280	1.74		278	0	73	8.9	1,830	8.7
July 15	.15	--	--	17	53	333	--	415	64	531	10	--	--	--	1,280	1.74		261	0	71	9.0	1,810	8.9

a Sum, 1,550 ppm.

GRAND RIVER BASIN

6A-3575. 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 1958.
Water temperatures: August 1954 to September 1958.
EXTREMES, 1957-58 (irrigation outlet).--Dissolved solids: Maximum, 990 ppm Sept. 3-30; minimum, 909 ppm Oct. 1-28.
Hardness: Maximum, 149 ppm Jan. 29 to Feb. 28; minimum, 137 ppm Aug. 1 to Sept. 2.
Specific conductance: Maximum daily, 1,480 micromhos Sept. 25-30; minimum daily, 1,350 micromhos on many days during October.
EXTREMES, 1954-58.--Dissolved solids: Maximum, 990 ppm Sept. 3-30, 1958 (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, 1,480 micromhos Sept. 25-30, 1958 (irrigation outlet); minimum daily, 790 micromhos Mar. 27, 1956 (spillway outlet).
REMARKS.--Records of specific conductance of daily samples available in district office at Lincoln, Nebr. Flow is regulated by an ungated spillway and by a regulated irrigation outlet. Discharge records for gaging station at Shadehill for water year October 1957 to September 1958 given in WSP 1559.

Chemical analyses, in parts per million, water year October 1957 to September 1958

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. 1-28, 1957....	10.9	--	--	--	--	265	--	398	--	--	--	--	--	909	1.24	26.8	143	0	80	9.6	1,370	8.0	--
Oct. 29-Nov. 30 ...	10.0	--	--	--	--	260	--	402	--	--	--	--	--	916	1.25	24.7	143	0	80	9.5	1,380	8.0	--
Dec. 1-30.....	10.0	2.2	0.02	30	17	270	8.1	404	387	5.5	0.5	0.2	0.11	931	1.27	25.1	144	0	79	9.8	1,380	8.2	--
Dec. 31-Jan. 28, 1958	10.0	--	--	--	--	270	--	a 420	--	--	--	--	--	953	1.30	25.7	147	0	80	9.7	1,430	8.4	--
Jan. 29-Feb. 28 ...	10.0	--	--	--	--	283	--	422	--	--	--	--	--	978	1.33	26.4	149	0	81	10	1,460	7.7	--
Mar. 1-31.....	10.1	.2	.00	31	17	286	8.3	430	395	5.7	.5	.4	.38	984	1.34	26.8	148	0	80	10	1,460	7.9	8
Apr. 1-30.....	39.4	--	--	--	--	293	--	413	--	--	--	--	--	963	1.31	102	148	0	81	10	1,440	7.9	--
Apr. 1-28 b	41.4	--	--	--	--	286	--	411	--	--	--	--	--	964	1.31	108	146	0	81	10	1,440	7.8	--
May 1-June 2.....	20.4	--	--	--	--	261	--	412	--	--	--	--	--	950	1.29	52.3	146	0	80	9.4	1,420	7.9	--
June 3-July 1.....	67.2	1.7	.01	30	17	272	7.8	410	388	6.6	.4	.6	.33	950	1.29	172	144	0	79	9.9	1,410	7.8	17
June 16-July 25 b ..	67.0	--	--	--	--	268	--	415	--	--	--	--	--	958	1.30	173	144	0	80	9.7	1,430	7.9	--
July 2-31.....	37.7	--	--	--	--	263	--	416	--	--	--	--	--	959	1.30	97.6	140	0	80	9.7	1,430	8.0	--
Aug. 1-Sept. 2.....	12.6	--	--	--	--	275	--	406	--	--	--	--	--	974	1.32	33.1	137	0	81	10	1,460	7.8	--
Sept. 3-30.....	10.8	2.0	.00	27	17	280	8.1	418	411	6.0	.4	.2	.38	990	1.35	28.9	139	0	80	10	1,450	8.0	10
Weighted average c	20.5	--	--	--	--	274	--	412	--	--	--	--	--	955	1.30	52.9	144	0	81	9.9	1,420	--	--

a Includes equivalent of 14 ppm of carbonate (CO_3).
b Samples collected at service spillway. Not included in weighted average.
c Represents 100 percent of the runoff for water year October 1957 to September 1958.

GRAND RIVER BASIN

6A-3575. GRAND RIVER NEAR SHADEHILL, S. DAK.

Temperature (° F) of water, water year October 1957 to September 1958
/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	61	--	--	--	36	--	40	--	--	67	--	--
2	--	--	37	a 35	--	--	41	47	a 62	a 68	--	68
3	--	--	38	35	a 35	38	40	--	b 64	--	--	b 68
4	a 58	--	38	--	36	--	--	--	62	--	69	67
5	--	--	37	--	35	a 38	--	46	62	--	70	66
6	--	--	36	a 35	35	39	--	--	b 62	--	72	67
7	a 57	--	--	--	35	39	39	--	--	65	--	--
8	--	42	--	35	35	--	39	--	--	65	a 74	67
9	--	43	37	35	--	--	41	--	--	--	--	67
10	54	--	36	--	34	38	40	--	--	65	--	--
11	--	--	34	--	34	38	41	--	62	--	a 74	a 67
12	--	43	--	--	b 34	b 36	--	--	61	--	72	--
13	--	--	a 35	b 35	b 34	b 37	--	--	a 61	--	73	--
14	55	44	--	36	--	b 36	44	--	61	66	--	--
15	55	--	--	a 37	--	--	45	--	--	a 69	--	a 65
16	b 54	43	--	36	--	--	45	--	61	69	--	--
17	a 55	--	34	36	36	--	46	56	--	a 68	--	--
18	--	--	b 33	--	37	37	44	--	63	b 68	a 74	a 66
19	--	--	33	--	37	b 37	--	58	64	--	b 73	65
20	--	38	--	b 36	38	36	--	57	63	--	b 71	--
21	a 53	b 38	--	35	a 37	b 36	a 45	58	--	--	--	--
22	52	b 39	--	--	--	--	a 45	--	--	69	--	--
23	50	--	36	37	--	--	44	58	a 65	70	--	--
24	a 50	--	a 36	37	38	--	45	--	63	71	--	62
25	--	39	--	36	--	39	--	--	b 62	a 71	b 70	a 61
26	--	39	35	--	38	--	--	60	64	--	a 71	60
27	--	--	a 35	a 37	36	b 39	--	--	--	--	--	b 61
28	a 51	--	--	a 38	38	39	--	--	--	--	b 70	--
29	51	38	--	b 35	--	--	--	--	--	70	a 70	57
30	50	38	35	a 36	--	--	a 46	--	65	b 69	--	a 58
31	--	--	36	--	--	a 40	--	--	--	--	--	--
Average	--	--	--	--	--	--	--	--	--	--	--	--

a Measurement between 12 m. and 3 p.m.
b Measurement between 4 p.m. and 6 p.m.

CHEYENNE RIVER BASIN

6A-4005. 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 1958.
Sediment records: April 1946 to September 1958.
EXTREMES, 1957-58.--Water temperatures: Maximum, 91°F Aug. 9.
Sediment concentrations: Maximum daily, 40,900 ppm June 15; minimum daily, not determined.
Sediment loads: Maximum daily, 288,000 tons July 11; minimum daily, less than 0.50 ton on many days during May and June.
EXTREMES, 1946-58.--Water temperatures: Maximum (1947-49, 1951-55, 1956-58), 91°F Aug. 9, 1958; 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.--Records of discharge for water year October 1957 to September 1958 given in WSP 1559.

Temperature (° F) of water, water year October 1957 to September 1958
/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	--	--	--	--	--	46	--	a 58	67	78	76	76
2	--	41	b 51	--	46	44	--	b 71	--	--	80	--
3	70	--	--	--	--	43	a 51	--	b 75	80	a 69	67
4	--	--	--	57	--	b 54	a 48	--	--	72	a 71	72
5	--	--	--	--	--	45	a 43	72	--	--	80	b 75
6	--	--	--	b 53	--	37	a 41	--	62	a 75	85	74
7	59	--	b 45	--	--	37	a 44	--	63	--	85	77
8	--	--	--	--	--	--	a 41	--	72	--	90	--
9	--	45	--	--	--	35	a 41	--	--	b 72	91	70
10	--	--	--	--	--	38	a 44	74	--	--	81	--
11	62	--	a 45	--	--	42	a 41	--	--	70	82	74
12	--	--	--	--	--	--	--	68	--	--	a 70	--
13	--	b 60	51	--	--	37	a 43	--	--	--	85	70
14	68	--	--	--	--	--	a 51	63	--	72	84	--
15	--	45	--	--	--	--	--	--	b 70	--	72	--
16	--	--	--	--	--	b 36	--	a 66	b 68	72	74	--
17	--	--	--	--	--	--	b 69	--	a 63	85	84	64
18	--	--	--	--	--	a 34	60	--	70	69	77	--
19	--	--	--	52	46	a 37	60	75	--	65	80	65
20	--	--	--	--	--	--	55	--	a 59	71	77	--
21	--	--	--	--	--	a 37	--	79	--	a 70	77	69
22	--	--	--	b 46	--	a 38	46	--	--	b 77	74	--
23	52	--	--	--	47	a 46	--	--	72	b 79	70	70
24	--	--	a 40	--	43	a 40	--	--	--	75	72	--
25	--	--	--	--	46	a 40	a 36	b 85	a 57	80	a 66	--
26	50	--	--	--	43	--	39	--	a 66	71	78	--
27	--	--	--	--	35	a 38	--	80	--	b 74	76	--
28	--	--	--	--	44	--	a 41	--	--	74	73	--
29	--	--	--	--	--	--	a 42	--	--	68	--	--
30	--	--	--	--	--	--	--	--	--	67	70	60
31	--	--	--	--	--	--	--	b 72	--	a 69	--	--
Average	--	--	--	--	--	--	--	--	--	--	78	--

a Measurement between 6 a.m. and 10 a.m.
b Measurement between 11 a.m. and 3 p.m.

CHEYENNE RIVER BASIN--Continued

6A-4005. CHEYENNE RIVER NEAR HOT SPRINGS, S. DAK.--Continued

Suspended sediment, water year October 1957 to September 1958

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	23			57	--	e 30	28		
2	18			62	190	32	28		
3	18			60	150	24	27		
4	18			60	--	e 26	27		
5	18			60	170	28	23		
6	18			55	190	28	27		
7	18			55	170	25	27		
8	18			51	--	e 24	27		
9	18			40	180	19	27		
10	19	21	1	41	--	e 22	26		
11	19			54	230	34	26		
12	19			54	--	e 28	26	38	3
13	21			52	150	21	26		
14	21			52	140	20	26		
15	21			52	73	10	26		
16	18			52	--	e 7	26		
17	16			52	--	e 6	27		
18	15			52	34	5	25		
19	19			49	--	e 4	24		
20	30	--	e 3	40	--	e 4	31		
21	26	--	e 2	27			31		
22	28	--	e 2	27			26		
23	42	48	5	22			25		
24	35	--	e 5	22			21		
25	35	--	e 5	20	44	3	22		
26	40	160	17	22			23		
27	44	270	32	22			22	24	1
28	45	--	e 30	22			22		
29	48	240	31	25			23		
30	51	200	28	27			22		
31	54	190	28	--	--	--	22		
Total	833	--	207	1,286	--	427	789	--	77

Day	January			February			March		
1	23			23			24	64	4
2	22			22			40	200	22
3	22			23			62	300	s 55
4	22			23			76	290	60
5	23			23			82	350	s 86
6	23			21			78	440	s 117
7	23			21			76	300	62
8	23			20			64	200	s 37
9	24			21			53	210	s 32
10	24			20			51	200	s 32
11	24			19	17	1	58	240	s 42
12	24			20			50	240	s 36
13	24			19			53	270	s 42
14	24			19			53	220	s 37
15	24			20			59	240	s 40
16	24	13	1	20			65	290	51
17	23			20			55	220	s 36
18	23			20			62	300	50
19	23			20			64	310	s 58
20	22			20			76	490	s 109
21	23			21			85	590	135
22	24			30	110	a 9	82	440	97
23	22			41	220	s 27	92	380	94
24	22			57	320	s 58	109	370	109
25	22			96	550	143	132	1,040	s 418
26	23			120	520	168	140	1,300	491
27	23			117	640	s 225	120	720	233
28	23			28	110	8	118	550	a 180
29	23			--	--	--	106	500	a 140
30	22			--	--	--	93	440	a 110
31	23			--	--	--	91	460	a 110
Total	714		31	924	--	669	2,369	--	3,125

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

CHEYENNE RIVER BASIN--Continued

6A-4005. CHEYENNE RIVER NEAR HOT SPRINGS, S. DAK.--Continued

Suspended sediment, water year October 1957 to September 1958--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	160	4,400	a 1,900	76	230	47	21	250	14
2	209	6,700	3,780	50	120	16	11	--	e 1
3	206	4,900	2,730	34	60	6	14	9	(t)
4	260	7,650	5,370	31	28	2	15	--	e 5
5	278	9,360	7,030	22	21	1	36	12,000	s 1,390
6	213	6,400	3,680	22			27	5,200	379
7	535	14,900	s 21,100	23			17	400	18
8	438	13,400	15,800	22	9	(t)	16	180	8
9	357	8,300	8,000	20			18	240	s 13
10	270	3,600	2,620	14			11	140	4
11	202	2,060	1,120	12			5	--	e 1
12	132	1,300	463	12			5	23	(t)
13	104	900	253	10			33	14,600	1,300
14	102	790	218	10			56	13,200	s 2,660
15	89	740	a 180	9			608	40,900	69,600
16	74	650	a 130	11			407	24,900	27,400
17	58	480	75	10			333	18,100	16,300
18	48	370	48	10			191	12,800	6,600
19	42	310	35	10			135	5,840	2,130
20	40	280	30	8			123	2,250	747
21	32	220	19	8	7	(t)	166	2,890	s 1,570
22	41	190	21	9			471	29,100	s 39,800
23	62	220	a 36	10			333	17,300	15,600
24	62	220	a 36	10			240	10,100	6,540
25	85	280	64	10			170	3,880	1,780
26	98	380	101	9			102	1,740	479
27	111	530	159	9			62	670	112
28	120	5,060	1,640	9			52	340	48
29	125	1,330	449	9			38	160	16
30	100	650	176	8			27	80	6
31	--	--	--	15	117	5	--	--	--
Total	4,653	--	77,263	522	--	84	3,743	--	194,522

Day	July			August			September		
1	22	64	4	2,540	15,600	s 114,000	14		
2	25	74	5	1,050	10,300	29,200	14	51	2
3	35	150	s 15	589	6,000	9,540	12		
4	213	17,100	s 24,400	381	3,090	3,180	17		
5	274	34,300	26,300	265	1,600	1,190	17		
6	115	14,400	4,470	209	960	542	16		
7	882	23,000	54,800	165	580	258	15		
8	537	5,750	s 9,180	123	380	126	15	26	1
9	228	2,770	1,710	102	290	80	15		
10	202	2,140	1,170	120	380	s 134	14		
11	2,710	30,700	s 288,000	104	5,510	s 1,420	14		
12	2,130	24,600	141,000	70	2,900	548	14	--	e 1
13	2,150	19,300	112,000	54	1,100	160	13		
14	892	10,700	s 27,400	65	970	s 205	13		
15	529	4,900	7,000	72	2,570	s 473	13		
16	328	4,250	3,760	64	2,140	370	13		
17	221	2,750	1,640	44	400	48	12	20	1
18	458	7,090	s 10,900	34	220	20	12		
19	2,740	18,600	s 153,000	41	310	s 39	12		
20	4,950	21,100	282,000	40	2,200	s 225	11		
21	2,650	15,600	112,000	30	1,220	99	11		
22	1,350	9,920	36,200	28	750	57	11	--	e 1
23	838	6,810	15,400	25	450	30	16		
24	470	6,500	8,250	151	26,800	s 15,200	16		
25	361	3,400	3,310	113	25,800	7,870	18		
26	253	1,900	1,300	55	9,500	1,410	17	30	1
27	206	1,000	556	35	2,400	227	17		
28	172	670	311	25	880	59	17		
29	125	540	182	16	300	a 13	17		
30	132	450	160	15	190	8	17		
31	2,740	15,900	s 136,000	14	120	a 5	--	--	--
Total	28,938	--	1,462,423	6,639	--	186,736	433	--	34

Total discharge for year (cfs-days) 51,843
Total load for year (tons) 1,925,588

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

CHEYENNE RIVER BASIN--Continued

6A-4005. CHEYENNE RIVER NEAR HOT SPRINGS, S. DAK.--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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. 3, 1958	11:00 a.m.	221	51	4,940	3,420	--	83		--		99	100	--		--	--	VPWCM
Apr. 17	3:05 p.m.	58	69	498	1,930	--	90		97		97	100	--		--	--	VPWCM
June 15	12:40 p.m.	680	70	43,100	3,850	--	76		99		99	99	100		--	--	VPWCM
June 16	11:35 a.m.	412	68	24,600	4,890	--	82		97		99	100	--		--	--	VPWCM
June 23	5:15 p.m.	282	72	13,200	4,270	--	86		--		99	100	--		--	--	VPWCM
July 4	6:10 p.m.	553	69	49,300	5,060	--	72		98		99	100	--		--	--	VPWCM
July 11	12:05 p.m.	3,920	70	40,800	5,080	--	54		80		96	98	100		--	--	VPWCM
July 11	4:50 p.m.	4,520	70	41,400	5,210	--	55		79		95	98	99		100	--	VPWCM
July 11	8:10 p.m.	3,720	67	35,400	3,570	--	60		81		95	98	99		100	--	VPWCM
July 14	5:00 p.m.	699	72	8,960	2,690	--	66		86		93	93	95		98	100	VPWCM
July 22	2:15 p.m.	1,160	77	10,400	3,130	--	66		83		90	92	94		96	100	VPWCM
July 31	1:40 p.m.	2,120	74	14,000	4,600	--	48		65		83	88	92		94	100	VPWCM
July 31	11:10 p.m.	4,920	70	23,000	4,070	2	6		69		86	92	96		98	100	VPN
July 31	11:10 p.m.	4,920	70	23,000	3,640	45	52		71		86	92	96		98	100	VPWCM
Aug. 24	5:00 p.m.	195	72	35,900	--	64	78		98		100	--	--		--	--	VPWCM
Aug. 25	9:45 a.m.	120	66	27,800	--	73	86		99		100	--	--		--	--	SPWCM
Aug. 26	5:00 p.m.	47	78	7,530	--	84	94		99		100	--	--		--	--	SPWCM

CHEYENNE RIVER BASIN--Continued

6A-4015. 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 1958.
REMARKS.--Records of discharge for gaging station below Angostura Dam for water year October 1957 to September 1958 given in WSP 1559.

Monthly and annual summary of water and suspended-sediment discharge, water year October 1957 to September 1958

Month	Discharge (cfs-days)	Runoff (acre-feet)	Suspended sediment					
			Load (tons)[a]	Daily load (tons)			Concentration (ppm)	
				Mean	Maximum	Minimum	Weighted mean	Maximum daily
October	49.0	97	1.2	0.04			9	
November	1,010.2	2,000	26.5	.88			10	
December	1,685.9	3,340	23.3	.75			5	
January	1,771.0	3,510	24.4	.79			5	
February	1,622.0	3,220	44.4	1.59			10	
March	1,728.0	3,430	69.7	2.25			15	
April	35.0	69	6.2	.21			66	
May	99.7	198	11.4	.37			42	
June	41.9	83	6.2	.21			55	
July	4,540.3	9,010	1,350	43.5			110	
August	6,230.3	12,360	1,130	36.5			67	
September	118.1	234	14.4	.48			45	
Water year	18,931.4	37,550	2,707.7	7.42			53	

a Based on infrequent samples.

CHEYENNE RIVER BASIN--Continued

6A-4215. RAPID CREEK NEAR FARMINGDALE, S. DAK.

LOCATION.--At gaging station at highway bridge, 2 miles southeast of Farmingdale, Pennington County, and 4¾ miles downstream from Antelope Creek.
DRAINAGE AREA.--602 square miles.
RECORDS AVAILABLE.--Chemical analyses: February to September 1953, October 1955 to September 1958 (discontinued).
Water temperatures: October 1955 to September 1958 (discontinued).
EXTREMES, 1957-58.--Dissolved solids: Maximum, 1,030 ppm Sept. 10-13, 17-30; minimum, 362 ppm Jan. 6-8.
Hardness: Maximum, 580 ppm Sept. 10-13, 17-30; minimum, 259 ppm Jan. 6-8.
Specific conductance: Maximum daily, 1,580 micromhos Sept. 18; minimum daily, 422 micromhos Jan. 8.
Water temperatures: Minimum, freezing point on several days during December, January, March.
EXTREMES, 1955-58.--Dissolved solids: Maximum, 1,210 ppm Oct. 1-7, 9-26, 1956; minimum, 320 ppm Nov. 5-9, 1956.
Hardness: Maximum, 690 ppm Oct. 1-7, 9-26, 1956; minimum, 320 ppm Nov. 5-9, 1956.
Specific conductance: Maximum daily, 1,650 micromhos Oct. 16, 1956; minimum daily, 422 micromhos Jan. 8, 1958.
Water temperatures: Maximum (1955-57), 93°F June 12, 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. Records of discharge for water year October 1957 to September 1958 given in WSP 1559.

Chemical analyses, in parts per million, water year October 1957 to September 1958

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, 1957.....	27.0	9.8	0.01	115	51	46	6.1	272	340	17	0.4	2.3	0.15	769		1.05	56.1	498	275	17	0.9	1,050	7.4	--
Nov. 1-29	31.9	3.9	.01	111	45	40	4.9	262	303	18	.3	4.4	.13	705		.96	60.7	464	249	16	.8	979	7.6	--
Nov. 30-Dec. 11	36.5	4.0	.01	76	21	17	2.4	137	186	7.0	.3	1.0	.14	393		.53	38.7	274	162	12	.4	590	7.5	5
Dec. 12	38	4.6	.02	101	47	39	5.5	236	310	20	.4	4.3	.15	664		.90	68.1	446	252	16	.8	947	7.9	--
Dec. 13-15	37.8	4.8	.01	80	23	19	2.7	144	200	8.3	.3	1.8	.06	425		.58	43.4	293	175	12	.5	629	7.5	--
Dec. 26-Jan. 5, 1958.....	33.3	6.1	.02	95	47	36	5.9	210	303	19	.4	5.3	.17	662		.90	59.5	430	258	15	.8	923	7.9	--
Jan. 6-8.....	43.3	5.3	.01	64	24	18	3.2	174	128	9.0	.3	2.8	.07	362		.49	42.3	259	116	13	.5	562	7.7	--
Jan. 9-31.....	29.9	6.3	.01	105	39	33	4.5	262	234	16	.4	7.1	.12	610		.83	49.2	423	208	14	.7	888	7.8	--
Feb. 1-20	25.4	7.6	.00	105	35	30	4.7	252	225	15	.4	8.9	.15	595		.81	40.8	406	199	14	.7	860	7.7	--
Feb. 21-26	40.3	5.9	.02	82	33	32	4.5	195	213	11	.3	5.2	.14	511		.69	55.6	340	180	17	.8	752	7.8	--
Feb. 27-Mar. 14	31.6	6.9	.01	105	42	37	4.5	254	261	14	.4	7.5	.15	642		.87	54.8	433	225	15	.8	905	7.8	4
Mar. 15-18....	32.5	6.2	.05	79	29	24	3.2	200	184	8.8	.4	3.8	.09	456		.62	40.0	316	152	14	.6	684	7.8	7
Mar. 19-Apr. 5	38.3	2.7	.01	89	41	37	4.7	217	256	13	.4	3.3	.15	600		.82	62.0	392	214	17	.8	862	7.6	8
Apr. 6-29	40.2	3.6	.02	115	52	48	6.0	253	357	17	.4	3.4	.13	786		1.07	85.3	500	293	17	.9	1,070	7.8	--
Apr. 30	54	4.6	.08	78	30	28	4.3	130	249	13	.4	4.9	.07	518		.70	75.5	318	211	16	.7	722	7.1	--
May 1-30.....	12.2	4.5	.03	101	59	55	6.5	212	392	18	.4	1.6	.21	800		1.09	26.4	493	319	19	1.1	1,090	7.4	--
May 31-June 14	43.7	14	.04	123	57	73	8.9	258	454	16	.4	.2	.28	946		1.29	112	542	330	22	1.4	1,210	7.7	--
June 17-30.....	52.8	11	.04	81	48	32	5.1	230	258	11	.4	3.3	.16	620		.84	88.4	400	211	15	.7	844	7.4	9

July 7-16.....	26.2	9.6	.01	102	49	45	6.1	228	333	18	.4	1.1	.21	726		.99	51.4	455	268	17	.9	986	7.0	--
July 21-22.....	132	12	.01	107	31	28	9.4	193	279	9.6	.4	1.7	.17	604		.82	215	394	236	13	.6	831	7.2	--
July 23-Aug. 7.	29.6	11	.02	109	45	37	7.0	231	318	17	.4	1.4	.23	696		.95	55.6	456	267	15	.8	933	7.1	--
Aug. 8-19, 24-31.....	2.17	7.4	.01	106	52	52	7.4	231	359	21	.5	.4	.24	766		1.04	4.49	477	288	19	1.0	1,060	7.1	--
Sept. 10-13, 17-30	3.52	6.0	.00	125	65	89	8.3	230	513	23	.5	1.6	.31	1,030	945	1.40	9.79	580	391	25	1.6	1,320	7.1	5
Weighted average a	29.2	7.0	0.02	101	44	39	5.4	231	294	15	0.4	3.5	0.16	667		0.91	52.6	431	242	16	0.8	925	--	--
Weighted average b	30.4	7.4	0.02	99	44	39	5.4	230	290	14	0.4	3.4	0.16	657		0.89	53.9	426	237	16	0.8	914	--	--

a Represents 91 percent of runoff for water year October 1957 to September 1958.

b Includes estimated data for missing periods. Represents 100 percent of runoff for water year October 1957 to September 1958.

CHEYENNE RIVER BASIN--Continued

6A-4215. RAPID CREEK NEAR FARMINGDALE, S. DAK.--Continued

Temperature (° F) of water, water year October 1957 to September 1958
/Once-daily measurement between 3 p.m. and 5 p.m./

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

a Measurement between 8 a.m. and 10 a.m.
b Measurement between 11 a.m. and 2 p.m.

6A-4370. 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 1958 (discontinued).
Water temperatures: August 1954 to September 1958 (discontinued).
Sediment records: October 1955 to September 1958 (discontinued).
EXTREMES, 1957-58.--Dissolved solids: Maximum, 5,320 ppm May 25; minimum, 1,060 ppm June 12-14.
Hardness: Maximum, 1,950 ppm May 25; minimum, 518 ppm June 15-18.
Specific conductance: Maximum daily, 5,770 micromhos May 25; minimum daily, 1,230 micromhos July 13.
Water temperatures: Maximum, 84°F June 29; minimum, freezing point on many days during October to March.
Sediment concentrations: Maximum daily, 78,000 ppm Apr. 28; minimum daily, not determined.
Sediment loads: Maximum daily, 110,000 tons June 8; minimum daily, not determined.
EXTREMES, 1954-58.--Dissolved solids: Maximum, 5,320 ppm May 25, 1958; 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, 5,770 micromhos May 25, 1958; minimum daily, 1,120 minromhos July 5, 1956.
Water temperatures: Maximum, 84°F Aug. 29, 1954, July 12, Aug. 5, 1956, June 29, 1958; minimum, freezing point on many days during winter months.
Sediment concentrations (1955-58): Maximum daily, 78,000 ppm Apr. 28, 1958; minimum daily, not determined.
Sediment loads (1955-58): Maximum daily, 130,000 tons May 21, 1957; 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. 21-23, Dec. 1 to Mar. 16. Records of discharge for water year October 1957 to September 1958 given in WSP 1559.

Chemical analyses, in parts per million, water year October 1957 to September 1958

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. 1-22, 1957.	79.5	7.9	0.01	248	127	150	17	236	1,250	22	0.5	7.0	0.34	2,090	1,950	2.84	449	1,140	946	22	1.9	2,340	7.8	--
Oct. 23-Nov. 17.	51.5	9.2	.01	273	151	210	16	272	1,460	28	.5	11	.41	2,510	2,290	3.41	349	1,300	1,080	27	2.5	2,740	7.8	--
Nov. 18-25.....	72.0	8.9	.02	298	194	325	19	292	1,860	56	.5	4.0	.46	3,260	2,910	4.43	634	1,540	1,300	31	3.6	3,440	7.8	--
Nov. 26-Dec. 10	45.2	5.9	.00	269	138	196	16	264	1,360	30	.6	20	.50	2,380	2,170	3.24	290	1,240	1,020	25	2.4	2,610	7.8	--
Dec. 11-29.....	42.6	6.8	.01	308	163	240	17	296	1,600	33	.6	26	.54	2,790	2,540	3.79	321	1,440	1,200	26	2.8	2,980	8.0	5
Dec. 30-Jan. 6, 1958.....	18.1	7.6	.02	360	193	255	19	341	1,820	38	.7	15	.61	3,210	2,880	4.37	157	1,690	1,410	24	2.7	3,330	7.8	3
Jan. 7-31.....	33.8	5.9	.02	295	154	210	15	306	1,480	32	.6	15	.52	2,570	2,360	3.50	235	1,370	1,120	25	2.5	2,790	7.6	--
Feb. 1-23.....	24.8	7.1	.01	310	179	266	15	328	1,690	39	.5	24	.55	2,970	2,690	4.04	199	1,510	1,240	27	3.0	3,150	7.6	--
Feb. 24-25.....	225	7.4	.03	200	115	167	15	218	1,060	28	.5	19	.40	1,880	1,720	2.56	1,140	970	791	27	2.3	2,160	7.9	--
Feb. 26-Mar. 2.	109	5.1	.02	238	179	343	21	240	1,700	57	.6	53	.35	3,030	2,720	4.12	892	1,330	1,130	35	4.1	3,290	7.8	--
Mar. 3-5.....	61.7	6.9	.01	308	227	416	21	310	2,130	59	.6	55	.48	3,740	3,380	5.09	623	1,700	1,450	34	4.4	3,890	8.0	7
Mar. 6-24.....	64.3	5.5	.05	250	167	273	18	262	1,550	42	.5	36	.36	2,770	2,470	3.77	481	1,310	1,100	31	3.3	3,000	7.8	4
Mar. 25-26.....	62.0	6.3	.08	260	224	535	26	276	2,190	86	.6	142	.41	3,890	3,610	5.29	651	1,570	1,340	42	5.9	4,260	7.9	5
Mar. 27-Apr. 8.	76.3	6.2	.02	239	169	352	30	275	1,650	48	.5	8.3	.34	2,890	2,640	3.90	595	1,290	1,060	37	4.3	3,170	8.0	--

CHEYENNE RIVER BASIN--Continued

6A-4370. BELLE FOURCHE RIVER NEAR STURGIS, S. DAK.--Continued

Chemical analyses, in parts per million, water year October 1957 to September 1958--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									
Apr. 9-24, 1958.	52.8	6.5	0.01	194	133	200	24	231	1,170	19	0.6	6.2	0.25	2,090	1,870	2.80	298	1,030	841	29	2.7	2,360	8.0	--
Apr. 25-May 1..	153	6.1	.01	205	121	243	30	236	1,270	36	.6	1.9	.31	2,260	2,030	3.07	934	1,010	816	34	3.3	2,600	7.7	--
May 2	98	3.2	.00	300	251	507	35	285	2,380	86	.8	1.8	.58	4,190	3,710	5.70	1,110	1,780	1,550	38	5.2	4,310	7.7	--
May 3-24.....	52.8	4.3	.01	185	103	138	21	193	960	23	.7	4.8	.29	1,740	1,540	2.37	248	885	727	25	2.0	2,010	7.7	--
May 25	93	2.5	.06	280	304	837	37	255	3,170	139	.6	89	.83	5,320	4,980	7.24	1,340	1,950	1,740	48	8.2	5,770	7.7	--
May 26-June 3..	161	15	.00	245	124	200	31	241	1,310	30	.6	.6	.44	2,260	2,080	3.07	982	1,120	922	27	2.6	2,480	7.3	3
June 4-11	595	16	.00	177	66	119	21	202	771	17	.5	.2	.26	1,380	1,290	1.88	2,220	712	546	26	1.9	1,670	7.1	--
June 12-14	459	14	.00	125	53	104	16	156	590	15	.4	1.0	.21	1,060	995	1.44	1,310	528	400	29	2.0	1,340	7.3	--
June 15-18	886	14	.00	125	50	113	16	174	586	20	.5	.1	.25	1,070	1,010	1.46	2,560	518	375	31	2.2	1,390	7.3	--
June 19-21	195	13	.00	140	58	108	18	145	665	17	.5	.8	.26	1,170	1,090	1.59	616	589	470	28	1.9	1,450	7.3	--
June 22-July 3..	85.8	6.7	.01	211	106	176	15	179	1,100	27	.6	8.8	.34	1,920	1,740	2.61	445	964	817	28	2.5	2,170	7.0	7
July 4-10.....	296	6.9	.01	230	85	116	19	179	975	20	.6	1.9	.24	1,670	1,540	2.27	1,330	922	775	21	1.7	1,930	7.1	--
July 11-16.....	528	7.2	.01	177	62	94	18	163	741	15	.5	.4	.22	1,280	1,200	1.74	1,820	697	563	22	1.6	1,550	7.5	--
July 17-Aug. 6..	238	7.5	.01	230	86	113	16	138	981	17	.6	2.1	.33	1,650	1,520	2.24	1,060	929	816	21	1.6	1,900	7.1	--
Aug. 7-31.....	237	7.0	.01	247	91	119	17	194	1,040	18	.6	3.2	.30	1,780	1,640	2.42	1,140	992	833	20	1.6	2,010	7.1	--
Sept. 1-30.....	189	7.7	.01	243	108	134	15	183	1,150	17	.5	4.6	.35	1,900	1,770	2.58	970	1,050	900	21	1.8	2,140	7.3	7
Weighted average a	132	9.0	0.01	219	101	155	18	201	1,070	23	0.5	6.3	0.32	1,850	--	2.52	659	963	798	25	2.2	2,110	--	--

a Represents 100 percent of runoff for water year October 1957 to September 1958.

CHEYENNE RIVER BASIN--Continued

6A-4370. BELLE FOURCHE RIVER NEAR STURGIS, S. DAK.--Continued

Temperature (° F) of water, water year October 1957 to September 1958
/Once-daily measurement between 6 a.m. and 8 a.m./

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

a Measurement between 1 p.m. and 5 p.m.
b Measurement between 9 a.m. and 12 m.

CHEYENNE RIVER BASIN--Continued

6A-4370. BELLE FOURCHE RIVER NEAR STURGIS, S. DAK.--Continued

Suspended sediment, water year October 1957 to September 1958

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	132	1,400	500	50	1,100	150	50		
2	134	1,400	510	54	1,100	160	45		
3	123	1,500	500	52	1,200	170	45	650	79
4	98	1,200	320	54	1,200	170	45		
5	95	1,100	280	52	1,300	180	40		
6	93	1,100	280	51	1,400	190	35		
7	84	1,200	270	52	1,500	210	30	--	e 36
8	84	1,200	270	48	1,500	190	25		
9	86	1,200	280	44	1,000	120	25	410	28
10	77	1,100	230	50	1,200	160	30	2,200	180
11	73	1,100	220	44	1,200	140	25	140	9
12	71	1,100	210	48	1,300	170	30	220	18
13	67	1,100	200	50	1,100	150	35		
14	60	870	140	48	1,200	160	45	370	40
15	64	750	130	46	1,200	150	55		
16	62	990	170	54	1,000	150	65		
17	58	830	130	54	1,200	170	70	440	78
18	56	770	120	44	1,000	120	70		
19	56	890	130	46	950	120	70		
20	60	740	120	46	750	93	65		
21	58	630	99	50	330	45	55	270	40
22	58	680	110	60	250	40	45		
23	60	1,000	160	75	1,900	380	35		
24	58	1,200	190	137	3,500	1,300	30		
25	58	910	140	118	2,800	890	25		
26	56	920	140	95	2,700	690	25		
27	54	860	130	84	2,900	660	25	220	15
28	52	940	130	73	1,100	220	20		
29	51	1,000	140	28	1,600	120	20		
30	50	1,100	150	28	1,100	83	20		
31	50	1,200	160	--	--	--	20		
Total	2,238	--	6,559	1,735	--	7,551	1,220	--	1,463

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	15			30			70		
2	15			30			65		
3	15			30			60		
4	15			30	100	8	60		
5	20	260	14	25			65		
								420	75
6	25			25			70		
7	25			20			70		
8	30			20			65		
9	35			20			65		
10	40			20			70		
11	40			20			80	1,000	220
12	40			15			85	770	180
13	40			15			90	1,600	390
14	35			15	100	4	85	--	e 300
15	35			10			80	1,300	280
16	35			10			70	980	190
17	35			10			60	2,300	370
18	35			10			27	1,600	120
19	35			15			45	2,600	320
20	35	160	15	20			52	3,500	490
21	35			30	180	15	44	5,100	610
22	35			50	120	16	52	6,800	950
23	35			100	89	24	52	5,800	810
24	35			200	390	210	60	7,900	1,300
25	30			250	2,600	1,800	60	8,700	1,400
26	30			180	6,200	3,000	64	8,200	1,400
27	30			130	790	280	58	8,800	1,400
28	30			100	660	180	52	8,100	1,100
29	30			--	--	--	46	7,000	870
30	30			--	--	--	45	7,800	950
31	30			--	--	--	52	9,300	1,300
Total	950	--	457	1,430	--	5,629	1,919	--	15,700

e Estimated.

CHEYENNE RIVER BASIN--Continued

6A-4370. BELLE FOURCHE RIVER NEAR STURGIS, S. DAK.--Continued

Suspended sediment, water year October 1957 to September 1958--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.....	89	20,000	4,800	69	5,700	1,100	171	30,000	14,000
2.....	105	35,000	10,000	98	15,000	4,000	253	32,000	23,000
3.....	60	16,000	2,600	98	10,000	2,600	599	42,000	a 70,000
4.....	55	9,400	1,400	80	8,800	1,900	710	30,000	a 58,000
5.....	75	16,000	3,200	67	4,400	800	404	13,000	14,000
6.....	91	23,000	5,700	73	4,000	790	261	6,000	4,200
7.....	115	33,000	11,000	73	4,100	810	234	6,600	s 4,500
8.....	149	40,000	17,000	71	3,300	a 630	1,340	32,000	sa 110,000
9.....	112	22,000	6,700	64	2,600	450	860	16,000	37,000
10.....	64	11,000	1,900	65	2,800	490	383	6,800	7,000
11.....	50	5,700	770	50	2,700	360	566	11,000	17,000
12.....	45	5,000	610	50	2,000	270	438	10,000	12,000
13.....	36	5,200	510	45	2,100	260	272	6,700	4,900
14.....	37	5,200	520	42	1,700	190	668	11,000	a 20,000
15.....	42	6,400	730	45	1,900	230	1,220	17,000	a 56,000
16.....	38	7,800	800	50	1,900	260	1,130	17,000	s 57,000
17.....	32	7,100	610	50	2,400	320	695	11,000	21,000
18.....	34	6,600	610	30	1,600	130	499	6,500	8,800
19.....	38	7,400	760	34	1,700	160	273	4,300	3,200
20.....	36	7,200	700	34	1,500	140	179	2,000	970
21.....	42	6,700	760	32	1,400	120	134	1,100	400
22.....	50	8,500	1,100	27	1,200	87	110	720	210
23.....	94	13,000	3,300	25	--	e 95	91	390	96
24.....	94	30,000	7,600	56	--	e 800	84	180	41
25.....	88	33,000	8,100	93	--	e 3,800	73	140	28
26.....	168	50,000	24,000	64	7,000	a 1,200	65	110	19
27.....	207	64,000	a 37,000	58	6,400	1,000	58	96	15
28.....	238	78,000	a 52,000	65	6,100	1,100	50	110	15
29.....	204	25,000	14,000	65	5,500	970	44	81	10
30.....	95	9,700	2,500	77	10,000	2,100	60	80	13
31.....	--	--	--	98	24,000	6,400	--	--	--
Total.	2,583	--	221,280	1,848	--	33,562	11,924	--	543,417

Day	July			August			September		
1.....	64	90	16	307	2,800	2,300	241	3,100	2,000
2.....	115	240	75	257	2,300	1,600	226	2,400	1,500
3.....	215	12,000	a 7,000	249	2,200	1,500	218	1,800	1,100
4.....	562	22,000	a 33,000	269	2,500	1,800	182	1,400	690
5.....	348	7,500	7,000	278	2,500	1,900	175	1,900	900
6.....	282	3,200	2,400	226	1,800	1,100	200	2,000	1,100
7.....	234	2,000	1,300	207	1,600	890	193	2,200	1,100
8.....	207	1,600	890	204	1,600	880	186	2,000	1,000
9.....	186	1,500	750	234	2,300	1,500	182	2,100	1,000
10.....	256	14,000	a 9,700	230	3,400	2,100	169	1,700	780
11.....	792	16,000	a 34,000	226	3,000	1,800	186	1,900	950
12.....	785	11,000	23,000	218	3,300	1,900	196	2,200	1,200
13.....	748	9,800	20,000	238	2,300	1,500	186	1,900	950
14.....	368	4,700	4,700	238	3,600	2,300	193	1,600	830
15.....	261	2,400	1,700	226	4,000	2,400	189	2,000	1,000
16.....	214	1,400	810	245	4,000	2,600	200	2,200	1,200
17.....	200	1,100	590	249	4,500	3,000	214	3,200	1,800
18.....	182	840	410	273	4,600	3,400	214	3,300	1,900
19.....	200	1,400	760	245	2,700	1,800	193	3,300	1,700
20.....	241	1,600	1,000	238	2,800	1,800	175	2,700	1,300
21.....	245	1,700	1,100	249	2,700	1,800	172	2,200	1,000
22.....	218	1,500	880	245	2,500	1,700	162	1,600	700
23.....	204	1,400	770	265	3,100	2,200	172	1,700	790
24.....	222	1,600	960	265	3,800	2,700	149	1,500	600
25.....	189	1,200	610	265	4,000	2,900	156	1,400	590
26.....	211	1,500	850	238	3,900	2,500	182	1,700	840
27.....	230	1,500	930	211	2,900	1,700	193	2,800	1,500
28.....	245	1,500	990	207	3,700	2,100	211	3,000	1,700
29.....	218	1,400	820	226	3,500	2,100	186	2,500	1,300
30.....	278	2,500	a 1,900	234	3,600	2,300	175	2,300	1,100
31.....	338	3,700	3,400	241	3,500	2,300	--	--	--
Total.	9,058	--	162,311	7,503	--	62,370	5,676	--	34,120

Total discharge for year (cfs-days)..... 48,084
Total load for year (tons)..... 1,094,419

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

CHEYENNE RIVER BASIN--Continued

6A-4370. BELLE FOURCHE RIVER NEAR STURGIS, S. DAK.--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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. 8, 1957.....	4:15 p.m.	88	46	1,580	3,320		34		89		97	99	100				VPWCM
Nov. 4.....	1:05 p.m.	56	39	1,280	5,140		37		93		99	100	--				VPWCM
Mar. 21, 1958...	12:25 p.m.	40	36	4,840	3,350		33		96		99	100	--				VPWCM
Apr. 4.....	12:10 p.m.	50	47	9,290	3,870		26		77		99	100	--				VPWCM
May 9.....	10:00 a.m.	62	65	2,440	3,570		25		68		96	100	--				VPWCM
May 26.....	1:00 p.m.	64	78	6,000	4,380		17		56		97	100	--				VPWCM
June 6	10:25 a.m.	253	66	5,080	3,820		9		26		84	98	100				VPWCM
June 17	2:20 p.m.	607	71	9,800	4,900		62		72		91	99	100				VPWCM
June 20	10:20 a.m.	179	65	1,970	5,030		69		88		94	99	100				VPWCM
July 7.....	10:20 a.m.	234	68	1,660	2,390		22		46		81	96	100				VPWCM
July 16.....	2:45 p.m.	207	75	1,330	3,650		54		74		92	98	100				VPWCM
Aug. 7.....	4:05 p.m.	204	83	1,240	4,430		15		53		87	98	100				VPWCM
Aug. 27.....	4:25 p.m.	207	78	1,470	3,300	12	18		52		87	97	100				VPWCM

6A-4380. BELLE FOURCHE RIVER NEAR ELM SPRINGS, S. DAK.

LOCATION.--At gaging station at highway bridge, 4¼ miles northwest of Elm Springs, Meade County, and 5½ miles downstream from Hay Creek.
DRAINAGE AREA.--7,210 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1951, July 1956 to September 1958.
REMARKS.--Determinations of manganese, copper, lead, zinc, arsenic, selenium, cyanides, and sulfides available in district office at Lincoln, Nebr. Records of discharge for water year October 1957 to September 1958 given in WSP 1559.

Chemical analyses, in parts per million, October 1957 to August 1958

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. 31, 1957...	53	6.6	0.08	265	146	216	15	213	1,420	31	0.5	16	0.40	2,460	2,220	3.35		1,260	1,090	27	2.6	2,700	7.7	--
Dec. 20.....	77	7.8	.05	273	146	200	15	258	1,410	28	.6	15	.38	2,460	2,220	3.35		1,280	1,070	25	2.4	2,680	7.6	--
Jan. 29, 1958...	35	6.2	.03	268	141	200	15	267	1,360	28	.5	14	.40	2,420	2,160	3.29		1,250	1,030	26	2.5	2,640	7.7	--
Mar. 7.....	82	3.6	.07	260	185	362	19	227	1,760	60	.7	59	.66	3,160	2,820	4.30		1,410	1,220	35	4.2	3,430	7.4	4
Mar. 21.....	51	4.8	.03	245	146	250	16	236	1,480	40	.5	23	.32	2,550	2,320	3.47		1,210	1,020	31	3.1	2,780	7.7	--
Apr. 29.....	440	7.2	.06	149	71	217	21	165	983	23	.7	.1	.24	1,630	1,550	2.22		664	529	41	3.7	2,030	7.4	6
May 14.....	47	6.1	.03	199	111	176	24	164	1,120	27	.7	6.6	.33	1,970	1,750	2.68		952	818	28	2.5	2,240	7.9	3
June 19	510	6.8	.06	115	44	107	15	137	541	15	.5	1.0	.22	971	--	1.32		466	354	32	2.2	1,270	7.2	--
July 17.....	218	5.9	.02	163	66	113	15	132	765	15	.4	5.2	.23	1,300	1,210	1.77		678	570	26	1.9	1,570	7.2	3
Aug. 27.....	224	5.6	.02	239	93	129	16	173	1,050	16	.6	5.3	.31	1,740	1,640	2.37		978	836	22	1.8	2,010	6.9	5

CHEYENNE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN CHEYENNE RIVER BASIN--Continued

Chemical analyses, in parts per million, water year October 1957 to September 1958

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180° C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate					
TRIBUTARY TO SOUTH BRANCH OF DRY CREEK NEAR RAPID CITY, S. DAK.																							
Apr. 30, 1958a....	b 0.1								3,030		5.1		0.62										
June 9 a.....	.52	8.6		151	22	12	9.2	72	400	0.0	.7		.11				468	409	5	0.2	901	6.5	
BOXELDER CREEK NEAR RAPID CITY, S. DAK.																							
June 9, 1958 c....	2.59	8.0		142	39	13	9.6	174	370	4.0	0.4		0.16				513	370	5	0.3	963	7.0	
July 19 c.....	28.1								225		.3		.10										

a Also Selenium (Se), 0.01 ppm.
b Estimated.
c Also Selenium (Se), 0.00 ppm.

CHEYENNE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN CHEYENNE RIVER BASIN--Continued

Periodic determinations of suspended-sediment discharge, water year October 1957 to September 1958

Date	Discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Discharge (tons per day)
6A-3860. LANCE CREEK AT SPENCER, WYO.			
Oct. 7, 1957, 2:15 p.m.	0.2	38	0.02
Nov. 5, 2:00 p.m.	a .8	68	.1
Nov. 12, 1:35 p.m.	.4	198	.2
Nov. 25, 1:15 p.m.	.7	114	.2
Dec. 12, 1:10 p.m.	.4	20	.02
Dec. 18, 12:45 p.m.	1.1	110	.3
Mar. 3, 1958, 12:30 p.m.	2.2	170	1.0
Mar. 4, 11:20 a.m.	a 3.0	172	1.4
Mar. 19, 11:50 a.m.	15	248	10
Mar. 24, 4:20 p.m.	28	1,220	92
Apr. 1, 1:55 p.m.	170	24,000	11,000
Apr. 2, 12:25 p.m.	163	11,700	5,150
Apr. 9, 11:20 a.m.	122	3,760	1,240
Apr. 17, 12:20 p.m.	27	442	32
Apr. 21, 5:00 p.m.	15	196	8.0
May 1, 2:20 p.m.	23	274	17
May 12, 2:20 p.m.	12	101	3.3
May 16, 2:00 p.m.	4.3	68	.8
May 30, 9:40 a.m.	.2	149	.08
June 4, 2:10 p.m.	24	12,700	823
June 11, 11:25 a.m.	.1	151	.04
June 14, 7:10 p.m.	112	24,900	7,530
June 15, 10:20 a.m.	61	12,000	1,980
June 16, 5:00 p.m.	20	3,400	184
June 23, 1:40 p.m.	38	5,510	565
June 24, 2:40 p.m.	22	1,800	107
July 3, 8:00 a.m.	130	18,500	6,490
July 3, 8:15 a.m.	478	36,500	48,900
July 3, 8:25 a.m.	714	39,500	79,000
July 3, 2:15 p.m.	880	53,500	132,000
July 3, 3:15 p.m.	754	58,700	124,000
July 4, 12:20 p.m.	126	20,900	7,110
July 8, 2:15 p.m.	10	547	15
July 10, 1:10 a.m.	171	19,400	8,960
July 10, 12:50 p.m.	552	40,200	62,100
July 10, 1:00 p.m.	820	52,400	120,000
July 10, 3:30 p.m.	1,560	67,700	296,000
July 10, 4:00 p.m.	2,080	56,100	327,000
July 11, 12:15 a.m.	3,210	33,000	297,000
July 16, 1:55 p.m.	23	295	18
July 18, 1:00 a.m.	64	1,720	297
July 18, 1:30 a.m.	171	6,950	3,210
July 18, 11:00 p.m.	350	20,200	19,100
July 19, 5:00 a.m.	539	37,500	56,600
July 19, 5:30 a.m.	802	29,800	64,500
July 19, 5:50 a.m.	1,130	25,900	79,000
July 19, 6:30 a.m.	1,520	26,000	107,000
July 19, 10:20 a.m.	2,030	18,800	103,000
July 19, 11:10 a.m.	2,620	20,100	142,000
July 19, 7:10 p.m.	2,740	34,000	261,000
July 22, 3:50 p.m.	115	6,550	2,030
July 24, 10:00 a.m.	56	1,550	234
July 30, 9:00 p.m.	156	10,800	4,550
July 30, 9:30 p.m.	330	16,900	15,100
July 30, 10:45 p.m.	530	8,780	12,600
July 31, 3:45 p.m.	310	19,700	16,500
Aug. 6, 1:00 p.m.	13	234	8.2
Aug. 8, 6:00 p.m.	50	2,960	400
Aug. 8, 8:00 p.m.	138	12,400	4,620
Aug. 13, 2:50 p.m.	10	772	21
Aug. 16, 11:45 a.m.	3.8	249	2.6
Aug. 17, 6:00 a.m.	43	7,160	831
Aug. 22, 5:40 p.m.	146	30,200	11,900
Aug. 22, 7:50 p.m.	318	45,290	40,200
Aug. 26, 9:50 a.m.	13	1,960	69

a Daily mean discharge.

CHEYENNE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN CHEYENNE RIVER BASIN--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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	
6A-3860. LANCE CREEK AT SPENCER, WYO.																	
Apr. 1, 1958.....	1:55 p.m.	170	51	24,000	4,160	--	72		95		96	98	100		--		VPWCM
Apr. 2	12:25 p.m.	163	--	11,700	4,190	0	3		92		97	99	100		--		VPN
Apr. 2	12:25 p.m.	163	--	11,700	4,240	56	73		91		97	99	100		--		VPWC
Apr. 17	12:20 p.m.	27	64	442	1,660	--	63		80		87	93	100		--		VBWCM
June 4	2:10 p.m.	24	79	12,700	4,730	--	90		100		--	--	--		--		PWCM
June 15.....	10:20 a.m.	61	68	12,000	4,470	--	86		100		--	--	--		--		PWCM
June 24.....	2:40 p.m.	22	67	1,800	3,130	--	94		100		--	--	--		--		PWCM
July 3	2:15 p.m.	880	--	53,500	4,010	--	49		74		94	98	100		--		VPWCM
July 4	12:20 p.m.	126	65	20,900	3,740	--	77		98		99	100	--		--		VPWCM
July 11.....	12:15 a.m.	3,210	--	33,000	5,210	--	54		70		89	96	99		100		VPWCM
July 22.....	3:50 p.m.	115	83	6,550	3,710	--	86		--		98	99	100		--		VPWCM
July 31.....	3:45 p.m.	310	77	19,700	4,260	--	62		78		83	85	88		93	100	VPWCM

6A-4400. MISSOURI RIVER AT PIERRE, S. DAK.

LOCATION.--At gaging station at Chicago and North Western Railway Co. bridge at Pierre, Hughes County, 1.2 miles upstream from Bad River.
DRAINAGE AREA.--243,500 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1958 (discontinued).
Water temperatures: March 1951 to September 1958 (discontinued).
EXTREMES, 1957-58.--Dissolved solids: Maximum, 627 ppm Aug. 3-5; minimum, 387 ppm Mar. 31 to Apr. 4.
Hardness: Maximum, 280 ppm Aug. 3-5; minimum, 190 ppm Mar. 31 to Apr. 4.
Specific conductance: Maximum daily, 923 micromhos Aug. 5; minimum daily, 564 micromhos Apr. 3.
Water temperatures: Maximum, 78°F on several days during August; minimum, freezing point on many days during November to March.
EXTREMES, 1951-58.--Dissolved solids: Maximum, 872 ppm May 25-26, 1957; minimum, 264 ppm June 18-26, 1952.
Hardness: Maximum, 354 ppm May 25-26, 1957; minimum, 134 ppm July 9, 1951.
Specific conductance: Maximum daily, 1,150 micromhos May 25-26, 1957; minimum daily, 394 micromhos July 3, 1951.
Water temperatures: Maximum, 81°F July 17, 18, 28, 1957; 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 1957 to September 1958 given in WSP 1559.

Chemical analyses, in parts per million, water year October 1957 to September 1958

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, 1957....	14,020	--	--	--	--	57	--	175	--	--	--	--	--	423	0.58	16,010	205	61	38	1.7	640	7.9	--
Nov. 1-30.....	10,540	--	--	--	--	59	--	177	--	--	--	--	--	421	.57	11,980	205	60	39	1.8	642	7.8	--
Dec. 1-31.....	10,290	8.4	0.01	51	19	57	4.0	180	168	8.5	0.5	0.1	0.12	414	.56	11,500	204	56	37	1.7	641	7.3	12
Jan. 1-13, 1958....	8,077	--	--	--	--	63	--	199	--	--	--	--	--	465	.63	10,140	227	64	38	1.8	705	7.7	--
Jan. 14-31	15,510	--	--	--	--	51	--	171	--	--	--	--	--	394	.54	16,500	197	57	36	1.6	611	7.7	--
Feb. 1-25	13,500	--	--	--	--	53	--	176	--	--	--	--	--	410	.56	14,940	202	58	36	1.6	625	7.6	--
Feb. 26-Mar. 7....	14,430	--	--	--	--	55	--	167	--	--	--	--	--	400	.54	15,580	197	60	38	1.7	619	7.1	--
Mar. 8-29.....	16,810	9.1	.01	57	20	66	4.4	181	195	8.7	.5	.3	.18	462	.63	20,970	224	76	38	1.9	701	7.6	7
Mar. 30.....	49,100	--	--	--	--	59	--	196	--	--	--	--	--	434	.59	57,540	224	63	36	1.7	671	7.7	--
Mar. 31-Apr. 4....	35,420	--	--	--	--	53	--	161	--	--	--	--	--	387	.53	37,010	190	58	38	1.7	595	7.4	--
Apr. 5-28.....	21,030	--	--	--	--	68	--	182	--	--	--	--	--	465	.63	26,400	222	73	40	2.0	710	7.5	--
Apr. 29-May 31....	21,420	--	--	--	--	64	--	182	--	--	--	--	--	439	.60	25,390	214	65	39	1.9	675	7.4	--
June 1-10	22,450	--	--	--	--	64	--	191	--	--	--	--	--	461	.63	27,940	228	71	38	1.8	705	7.4	--
June 11-18	34,550	9.8	.02	64	17	67	6.0	182	218	9.1	.4	.4	.19	495	.67	46,180	231	82	38	1.9	742	7.5	8
June 19-July 8.....	31,480	--	--	--	--	65	--	188	--	--	--	--	--	456	.62	38,760	220	66	39	1.9	690	7.4	--
July 9-31.....	15,320	--	--	--	--	66	--	196	--	--	--	--	--	479	.65	19,810	232	71	38	1.9	725	7.5	--
Aug. 1-2.....	8,845	--	--	--	--	66	--	185	--	--	--	--	--	501	.68	11,960	248	96	37	1.8	750	7.1	--
Aug. 3-5.....	2,087	--	--	--	--	87	--	187	--	--	--	--	--	627	.85	3,530	280	127	40	2.3	903	7.1	--
Aug. 6-17.....	5,413	--	--	--	--	76	--	189	--	--	--	--	--	550	.75	8,040	256	101	39	2.1	815	7.0	--
Aug. 18-28.....	12,800	--	--	--	--	64	--	190	--	--	--	--	--	489	.67	16,900	242	86	36	1.8	736	7.0	--
Aug. 29-Sept. 30...	26,950	7.9	.00	46	20	58	4.5	184	184	9.5	.6	.4	.14	443	.60	32,230	222	71	36	1.7	674	7.1	9
Weighted average[a]	17,380	--	--	--	--	61	--	182	--	--	--	--	--	444	0.60	20,840	217	68	38	1.8	676	--	--

a Represents 100 percent of runoff for water year October 1957 to September 1958.

MISSOURI RIVER MAIN STEM--Continued

6A-4400. MISSOURI RIVER AT PIERRE, S. DAK.--Continued

Temperature (° F) of water, water year October 1957 to September 1958
/Once-daily measurement at 8 a.m./

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

a Measurement between 11 a.m. and 12 m.

6A-4505. 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 1958 (discontinued).
Water temperatures: February 1951 to September 1954, August 1955 to September 1958 (discontinued).
Sediment records: December 1950 to September 1954, October 1955 to September 1958 (discontinued).
EXTREMES, 1957-58.--Dissolved solids: Maximum, 326 ppm Apr. 20 to May 21; minimum, 243 ppm Feb. 25 to Mar. 18.
Hardness: Maximum, 148 ppm Apr. 20 to May 21; minimum, 114 ppm Feb. 25 to Mar. 18.
Specific conductance: Maximum daily, 544 micromhos July 24; minimum daily, 291 micromhos Feb. 25.
Water temperatures: Maximum, 95°F Aug. 17; minimum, freezing point on many days during November to March.
Sediment concentrations: Maximum daily, 5,400 ppm Apr. 7; minimum daily, not determined.
Sediment loads: Maximum daily, 8,790 tons Apr. 7; minimum daily, not determined.
EXTREMES, 1950-58.--Dissolved solids (1952-54, 1955-58): Maximum, 948 ppm Aug. 3, 1953; minimum, 226 Aug. 9-31, 1956.
Hardness (1952-54, 1955-58): Maximum, 435 ppm June 15, 1953; minimum, 102 ppm Aug. 9-31, 1956.
Specific conductance (1952-54, 1955-58): Maximum daily, 1,200 micromhos Aug. 3, 1953; minimum daily, 243 micromhos Aug. 14, 1956.
Water temperatures (1951-54, 1955-58): Maximum, 97°F June 18, 1953; minimum, freezing point on many days during winter months.
Sediment concentrations (1950-54, 1955-58): Maximum daily, 19,300 ppm May 29, 1951; minimum daily, not determined.
Sediment loads (1950-54, 1955-58): 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 and records of selenium available in district office at Lincoln, Nebr. Flow affected by ice Dec. 29 to Mar. 25. Flow partly regulated by small powerplant reservoir 3 miles upstream. Records of discharge for water year October 1957 to September 1958 given in WSP 1559.

Chemical analyses, in parts per million, water year October 1957 to September 1958

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. 1-28, 1957....	82.3	--	0.02	38	5.1	22	8.2	186	21	0.4	--	--	--	245	0.33	54.4	116	0	27	0.9	332	8.0	7
Oct. 29-Nov. 30 ...	102	--	.19	40	5.4	24	8.7	195	21	.0	--	--	--	261	.35	71.9	122	0	28	.9	355	7.5	17
Dec. 1-Jan. 8, 1958	112	61	.02	42	7.5	31	11	224	24	.1	0.6	2.5	0.09	292	.40	88.3	136	0	31	1.2	403	7.8	17
Jan. 9-31	103	--	.02	38	6.1	25	10	194	20	.1	--	--	--	255	.35	70.9	120	0	29	1.0	349	7.8	17
Feb. 1-9	65.6	--	.03	39	6.0	24	8.9	194	19	.0	--	--	--	254	.35	45.0	122	0	28	.9	346	8.1	20
Feb. 10-24.....	88.0	--	.02	41	5.2	24	9.2	194	24	.0	--	--	--	264	.36	62.7	124	0	28	.9	359	7.9	10
Feb. 25-Mar. 18...	152	43	.01	37	5.2	21	8.4	173	19	.2	.5	2.7	.06	243	.33	99.7	114	0	27	.9	325	7.6	8
Mar. 19-Apr. 4....	197	--	.05	41	6.4	24	9.6	192	34	.2	--	--	--	276	.38	147	129	0	27	.9	370	8.0	17
Apr. 5-19.....	358	--	.07	39	7.4	29	11	192	43	.2	--	--	--	290	.39	280	128	0	31	1.2	388	8.0	24
Apr. 20-May 21....	204	--	.02	46	8.0	36	11	216	53	.1	--	--	--	326	.44	180	148	0	33	1.3	454	7.7	22
May 22-June 12....	120	58	.02	41	7.4	30	9.1	212	33	.8	--	1.5	--	306	.42	99.1	133	0	31	1.1	404	7.6	10
June 13-30	162	47	.03	39	6.9	29	11	203	26	.3	.6	2.1	.08	283	.38	124	126	0	31	1.1	381	7.4	25
July 1-31.....	134	--	.02	40	5.6	27	11	196	27	1.0	--	--	--	267	.36	96.6	123	0	30	1.1	364	7.1	13
Aug. 1-12.....	88.3	--	.03	39	5.7	29	11	210	21	1.3	--	--	--	296	.40	70.6	121	0	32	1.1	375	7.4	12

WHITE RIVER BASIN--Continued

6A-4505. SOUTH FORK WHITE RIVER BELOW WHITE RIVER, S. DAK.--Continued

Chemical analyses, in parts per million, water year October 1957 to September 1958--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					
Aug. 13-31, 1958...	67.3	--	0.01	38	5.6	23	9.6	192	18	1.5	--	--	--	256	0.35	46.5	118	0	28	0.9	337	7.5	7
Sept. 1-21.....	60.3	61	.00	40	5.1	23	9.0	197	16	.2	0.4	1.0	0.08	266	.36	43.3	121	0	27	.9	339	7.8	6
Sept. 22-30.....	50.4	66	.01	39	5.7	24	8.6	199	15	.3	.5	.7	.07	267	.36	36.3	121	0	28	.9	344	7.8	5
Weighted average a	128	--	0.04	40	6.8	28	10	200	30	0.3	--	--	--	280	0.38	96.8	128	0	30	1.1	379	--	--

a Represents 100 percent of runoff for water year October 1957 to September 1958.

WHITE RIVER BASIN--Continued

6A-4505. SOUTH FORK WHITE RIVER BELOW WHITE RIVER, S. DAK.--Continued

Temperature (° F) of water, water year October 1957 to September 1958
/Once-daily measurement between 12 m. and 3 p.m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a 55	--	a 33	32	32	--	43	--	70	a 72	--	a 68
2	b 70	b 40	35	32	32	--	45	67	b 74	a 71	a 73	a 57
3	68	40	35	32	32	--	48	67	78	a 70	b 82	69
4	--	b 37	35	32	32	--	--	68	b 75	--	--	a 60
5	--	41	35	32	--	32	--	b 69	b 72	--	a 70	--
6	--	b 35	32	--	--	32	45	b 65	b 75	--	a 70	a 60
7	--	--	35	32	--	--	46	--	--	a 65	--	a 70
8	a 45	--	35	32	--	32	50	b 78	77	75	--	b 80
9	48	36	36	--	--	--	52	--	b 85	a 65	a 75	a 65
10	a 45	b 46	32	--	32	--	54	a 60	a 69	a 69	b 88	a 60
11	b 55	b 39	32	32	32	--	--	a 60	--	b 80	a 75	a 60
12	--	b 44	32	a 32	32	--	60	70	a 58	a 70	a 74	a 64
13	a 55	44	35	b 32	32	32	60	--	--	a 78	--	a 68
14	b 60	41	32	32	32	32	65	64	a 65	a 70	a 72	a 63
15	b 56	a 40	32	32	32	32	61	a 57	b 70	70	--	--
16	a 50	39	--	32	32	32	--	b 66	b 70	a 66	a 70	b 66
17	--	b 38	34	32	32	--	60	a 65	b 72	83	95	a 52
18	--	37	36	32	32	34	61	a 70	a 65	a 70	85	a 60
19	a 52	37	--	32	32	--	--	--	a 65	75	--	a 72
20	a 47	33	b 33	32	32	--	58	b 72	b 70	b 80	a 70	b 65
21	--	a 32	b 40	32	32	34	b 52	b 78	a 60	a 70	a 62	a 57
22	a 47	b 33	35	32	32	35	--	b 62	b 70	a 70	b 70	a 58
23	b 40	b 35	33	32	a 34	35	--	a 60	a 64	a 72	a 65	a 65
24	b 40	b 38	b 32	--	--	35	--	--	a 63	a 70	--	--
25	b 38	42	34	32	34	37	45	--	a 55	--	--	a 50
26	40	40	b 33	--	36	37	45	b 76	a 58	a 69	a 60	a 55
27	a 35	32	34	--	--	36	47	a 65	a 60	b 76	--	a 46
28	b 47	a 32	32	32	--	37	--	a 70	a 70	b 75	a 68	--
29	b 50	32	--	--	--	38	50	a 68	a 80	b 80	b 77	a 55
30	50	35	32	32	--	45	60	a 66	87	--	--	--
31	b 50	--	32	32	--	45	--	--	--	a 70	--	--
Average	--	38	34	--	--	--	--	--	69	72	--	62

a Measurement between 7 a.m. and 11 a.m.
b Measurement between 4 p.m. and 8 p.m.

WHITE RIVER BASIN--Continued

6A-4505. SOUTH FORK WHITE RIVER BELOW WHITE RIVER, S. DAK.--Continued

Suspended sediment, water year October 1957 to September 1958

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	63	200	34	90	440	107	110	420	125
2	60	180	31	100	390	105	113	850	s 308
3	57	180	28	118	280	a 89	107	1,140	329
4	58	120	19	100	220	59	118	1,000	319
5	61	110	a 18	96	330	86	118	780	249
6	66	240	43	87	340	80	118	880	280
7	66	210	a 37	82	300	a 66	130	900	316
8	87	400	s 107	79	300	a 64	103	820	228
9	65	540	s 100	88	340	81	139	730	274
10	71	300	58	93	1,820	s 509	91	360	88
11	90	260	63	106	1,100	315	74	370	74
12	75	280	a 57	76	310	64	99	590	158
13	85	280	64	85	500	115	104	500	140
14	75	320	65	102	520	143	120	540	174
15	66	330	59	110	680	202	115	580	180
16	84	370	84	103	620	172	136	550	a 202
17	84	320	a 73	117	540	171	154	500	208
18	66	240	a 43	110	430	128	158	450	192
19	78	210	44	113	490	149	148	440	176
20	80	250	54	120	600	194	127	430	147
21	84	280	64	103	570	159	140	310	117
22	80	280	60	108	860	s 296	156	400	168
23	110	600	s 201	102	810	223	151	540	220
24	139	760	285	114	460	142	104	330	93
25	120	980	318	139	520	195	107	390	113
26	115	720	224	122	430	142	99	290	78
27	119	500	161	103	570	159	135	300	109
28	99	620	166	120	610	198	97	400	105
29	93	670	168	102	820	226	95		
30	100	620	167	103	610	170	90	55	13
31	82	400	89	--	--	--	85		
Total	2,578	--	2,984	3,091	--	4,809	3,641	--	5,209

Day	January			February			March		
1	75			70			130		
2	80			70			120	--	e 95
3	80			65			100		
4	85	35	8	60			160		
5	90			70			145		
6	95			70	75	13	145	450	183
7	105			70			145		
8	100			60			160		
9	120	110	34	55			170		
10	130			65			175		
11	115			65			175		
12	110			70			175		
13	110	180	54	75			175	500	235
14	110			75			175		
15	110			80			175		
16	105			85			175		
17	110			85	150	35	180		
18	115	100	30	90			180		
19	115			95			185		
20	110			105			190		
21	110			100			190	1,200	612
22	105			105			195		
23	115	85	26	110			195		
24	120			115			195		
25	110			115	300	94	190		
26	95			115			195	1,540	811
27	75			120			181	2,130	1,040
28	70			130			183	2,080	1,030
29	70	75	16	--	--	--	201	1,270	689
30	75			--	--	--	201	1,220	662
31	75			--	--	--	201	1,170	635
Total	3,090	--	830	2,390	--	1,151	5,362	--	13,455

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

WHITE RIVER BASIN--Continued

6A-4505. SOUTH FORK WHITE RIVER BELOW WHITE RIVER, S. DAK.--Continued

Suspended sediment, water year October 1957 to September 1958--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	192	860	446	225	810	492	110	200	59
2	192	500	259	208	450	253	102	170	47
3	225	380	231	192	420	218	110	200	59
4	239	400	a 258	175	420	a 198	97	300	a 79
5	382	--	e 2,200	179	420	203	100	330	89
6	525	--	e 5,500	185	650	a 325	127	280	96
7	603	5,400	a 8,790	157	--	e 750	127	240	82
8	467	2,240	2,820	170	920	422	143	270	104
9	414	1,210	1,350	175	640	a 302	150	440	178
10	362	620	606	179	440	a 213	146	240	95
11	329	500	a 444	178	260	125	158	320	a 137
12	329	610	542	175	320	151	235	500	317
13	323	920	802	177	360	a 172	240	580	a 376
14	304	420	345	170	320	a 147	239	620	a 400
15	288	380	295	162	230	101	210	710	403
16	276	560	417	155	410	172	215	840	488
17	267	400	288	163	587	258	192	800	415
18	259	620	434	154	250	104	179	620	300
19	242	600	a 392	152	180	a 74	170	510	234
20	192	370	192	164	200	a 89	180	410	199
21	194	1,750	s 995	193	220	a 115	147	290	115
22	182	2,300	a 1,130	143	250	97	139	250	94
23	213	3,110	sa 1,990	124	300	100	131	250	88
24	226	2,400	a 1,460	110	240	a 71	131	210	74
25	369	5,160	a 5,140	101	160	44	127	230	79
26	359	1,380	1,340	96	190	49	188	270	a 137
27	357	1,250	1,200	93	190	48	143	280	108
28	254	1,100	754	87	95	22	110	220	65
29	230	1,010	627	80	100	22	94	170	43
30	249	1,550	1,040	94	140	36	87	160	38
31	--	--	--	100	180	a 49	--	--	--
Total	9,043	--	42,287	4,716	--	5,422	4,527	--	4,998

Day	July			August			September		
1	87	120	28	162	280	a 122	47	56	7.1
2	85	130	30	139	220	83	36	75	7.3
3	100	160	43	124	270	90	51	90	12
4	143	--	e 180	103	240	a 67	62	47	7.9
5	115	--	e 85	85	170	39	65	190	a 33
6	100	--	e 44	72	170	33	105	270	77
7	100	170	46	60	190	a 31	71	97	19
8	95	160	41	44	130	a 15	52	50	7.0
9	93	270	68	69	120	22	73	56	11
10	86	120	28	70	140	26	48	65	8.4
11	156	200	a 84	68	90	17	79	72	15
12	171	280	129	64	78	13	70	83	16
13	130	310	109	67	75	a 14	56	95	a 14
14	103	190	53	69	75	14	56	110	a 17
15	82	200	44	86	100	a 23	59	130	a 21
16	93	140	35	70	110	21	56	190	a 29
17	90	140	34	82	100	22	59	200	32
18	79	110	23	76	70	14	57	130	20
19	85	110	25	82	65	a 14	57	115	18
20	147	660	a 262	75	400	s 59	57	98	15
21	103	140	39	78	400	84	51	88	12
22	107	150	43	77	330	69	51	110	15
23	106	260	a 74	66	100	18	64	200	35
24	212	--	e 5,600	62	60	10	50	150	a 20
25	185	--	e 2,600	65	65	a 11	52	140	20
26	315	2,150	1,830	55	70	10	40	220	24
27	264	920	656	54	95	14	44	140	17
28	151	1,100	448	54	43	6.3	49	130	a 17
29	156	690	291	53	30	4.3	58	130	20
30	189	400	a 204	53	32	a 4.6	46	130	a 16
31	225	500	a 304	54	44	a 6.4	--	--	--
Total	4,153	--	13,480	2,338	--	976.6	1,721	--	582.7

Total discharge for year (cfs-days) 46,650
Total load for year (tons) 96,184.3

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

WHITE RIVER BASIN--Continued

6A-4505. SOUTH FORK WHITE RIVER BELOW WHITE RIVER, S. DAK.--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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. 3, 1957	3:35 p.m.	87	68	180	--		--		--		38	56	97		100		V
Oct. 23	12:35 p.m.	140	47	918	1,530		16		23		52	80	96		100		VBWCM
Nov. 19	3:30 p.m.	127	36	745	--		--		--		21	48	88		100		V
Apr. 7, 1958	4:15 p.m.	678	48	6,110	3,230		52		65		84	93	99		100		VPWCM
Apr. 9	6:40 p.m.	397	53	984	1,870		20		48		59	80	100		--		VPWCM
May 12	2:50 p.m.	166	76	323	1,170		24		36		49	74	100		--		VBWCM
June 3	5:35 p.m.	100	80	234	599		33		48		63	74	99		100		VBWCM
June 18	4:30 p.m.	239	71	522	922		25		37		47	69	94		100		VBWCM
June 30	6:45 p.m.	93	80	262	--		--		--		39	53	94		100		V
July 17	3:10 p.m.	100	83	159	249		41		53		57	63	97		100		VBWCM
Aug. 5	9:35 a.m.	79	74	172	252		50		67		76	84	97		100		VBWCM
Sept. 13	7:30 a.m.	41	68	2,370	2,770	35	46		75		100	--	--		--		VPWCM

Particle-size analyses of bed material, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time	Discharge (cfs)	Number of sampling points	Bed material												Methods of analysis
				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	128.000	
Oct. 3, 1957	3:35 p.m.	87	14	4	9	44	87	95	96	97	98	99	--	--		SV
Nov. 19	3:30 p.m.	127	13	1	4	36	83	92	93	94	95	96	--	--		SV
May 12, 1958	2:50 p.m.	106	15	5	8	62	90	93	93	94	95	97	100	--		SV
June 3	5:35 p.m.	100	17	0	2	48	91	97	98	99	100	--	--	--		SV
June 18	4:30 p.m.	239	17	0	1	28	72	80	81	82	86	90	97	100		SV
June 30	6:45 p.m.	93	18	0	3	50	84	89	90	91	92	94	99	100		SV
July 17	3:10 p.m.	100	18	0	1	48	81	86	87	88	90	92	95	95	100	SV
Aug. 5	9:35 a.m.	79	17	0	2	34	77	83	84	85	87	90	97	100		SV
Aug. 18	1:50 p.m.	41	15	0	1	28	82	91	92	94	96	97	99	100		SV

NIOBRARA RIVER BASIN

6A-4655. NIOBRARA RIVER NEAR VERDEL, NEBR.

LOCATION.--At gaging station at Pishelville bridge, 6 miles south of Verdel, Knox County, and 7 miles upstream from Verdigre Creek.
DRAINAGE AREA.--10,900 square miles, approximately.
RECORDS AVAILABLE.--Water temperatures: June to September 1958.
EXTREMES, June to September 1958.--Water temperatures: Maximum, 94°F Aug. 2.
REMARKS.--Records of discharge for June to September 1958 given in WSP 1559.

Temperature (° F) of water, June to September 1958
/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																	--	--	90	77	91	73	80	65
2																	--	--	89	76	94	76	83	69
3																	--	--	80	73	90	76	75	67
4																	--	--	82	71	90	73	69	64
5																	--	--	83	69	85	76	74	68
6																	--	--	82	69	89	75	77	63
7																	--	--	--	--	93	75	80	63
8																	--	--	--	--	91	77	81	68
9																	--	--	--	--	90	77	82	71
10																	--	--	79	66	93	76	73	63
11																	--	--	83	67	90	76	75	63
12																	--	--	85	70	91	79	77	66
13																	--	--	81	70	88	73	73	67
14																	--	--	79	69	84	77	72	68
15																	76	61	80	68	86	73	74	61
16																	78	66	76	67	87	73	70	61
17																	81	65	78	67	90	75	72	59
18																	82	66	89	71	85	73	72	59
19																	81	68	83	70	89	72	76	64
20																	75	67	83	72	81	74	71	66
21																	78	64	82	71	83	68	68	56
22																	71	64	84	69	76	69	75	59
23																	76	64	89	72	79	66	77	67
24																	72	62	83	75	76	61	73	68
25																	68	55	84	69	77	62	69	58
26																	66	58	85	68	79	64	63	57
27																	82	62	80	71	83	68	64	51
28																	86	66	86	70	82	69	66	52
29																	86	74	84	71	85	72	64	56
30																	88	73	76	70	75	68	56	48
31																	--	--	84	70	77	61	--	--
Average																	--	--	83	70	85	72	73	62

6A-4675. MISSOURI RIVER AT YANKTON, S. DAK.

LOCATION.--At gaging station at Meridian Highway Bridge on U.S. Highway 81 in Yankton County, 5.8 miles upstream from James River, and 6.1 miles downstream from Gavins Point Dam.
DRAINAGE AREA.--279,500 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1951; October 1956 to September 1958.
Water temperatures: October 1956 to September 1958.
EXTREMES, 1957-58.--Dissolved solids: Maximum, 489 ppm Oct. 1-31; minimum, 377 ppm May 26 to Apr. 17.
Hardness: Maximum, 236 ppm Oct. 1-31; minimum, 194 ppm Mar. 26 to Apr. 17.
Specific conductance: Maximum daily, 772 micromhos Oct. 1; minimum daily, 537 micromhos Apr. 6, 7.
Water temperatures: Maximum, 81°F Aug. 19; minimum, 33°F on many days during December to February.
EXTREMES, 1956-58.--Dissolved solids: Maximum, 559 ppm Aug. 29 to Sept. 30, 1957; minimum, 327 ppm Mar. 16-31, 1957.
Hardness: Maximum, 250 ppm Aug. 29 to Sept. 30, 1957; minimum, 168 ppm Mar. 16-31, 1957.
Specific conductance: Maximum daily, 839 micromhos Aug. 24-25, Sept. 5-8, 1957; minimum daily, 479 micromhos Mar. 30, 1957.
Water temperatures: Maximum, 81°F Aug. 19, 1958; 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 1957 to September 1958 given in WSP 1559.

Chemical analyses, in parts per million, water year October 1957 to September 1958

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, 1957....	28,120	10	0.04	64	19	71	5.6	191	209	12	0.6	0.4	0.19	489	0.67	37,130	236	79	39	2.0	748	7.7	
Nov. 1-30.....	11,800	13	.02	63	17	64	5.2	185	190	10	.7	.5	.14	466	.63	14,850	228	76	37	1.8	698	7.3	
Dec. 1-31.....	8,351	18	.01	59	18	60	4.9	200	180	11	.5	1.2	.07	453	.62	10,210	222	58	36	1.8	678	7.4	
Jan. 1-31, 1958....	8,803	13	.01	61	17	58	5.3	182	174	10	.5	1.2	.12	440	.60	10,460	222	73	35	1.7	661	7.7	
Feb. 1-28.....	8,695	13	.01	60	17	55	5.0	185	167	9.8	.5	.6	.10	442	.60	10,380	221	69	34	1.6	674	7.7	
Mar. 1-25.....	8,206	13	.01	56	16	55	4.6	174	168	9.0	.5	1.2	.13	414	.56	9,170	207	64	36	1.7	627	7.6	
Mar. 26-Apr. 17...	20,820	14	.00	51	16	44	4.7	166	140	7.7	.5	1.4	.08	377	.51	21,190	194	58	32	1.4	578	7.5	
Apr. 18-May 12....	24,920	11	.04	56	17	54	4.7	176	164	9.4	.5	1.4	.10	411	.56	27,650	210	66	35	1.6	637	7.5	
May 13-31.....	26,580	9.5	.04	54	18	55	4.6	172	167	9.2	.5	.8	.11	411	.56	29,500	208	67	36	1.6	639	7.3	
June 1-30	27,950	9.6	.01	53	18	60	4.7	162	184	8.9	.4	.6	.12	425	.58	32,070	206	73	38	1.8	652	7.6	
July 1-31.....	25,970	7.7	.00	56	17	60	5.2	168	195	8.9	.5	.1	.19	445	.61	31,200	211	73	38	1.8	675	7.2	
Aug. 1-31.....	28,220	8.5	.00	56	18	61	6.0	174	194	9.0	.5	.8	.16	456	.62	34,740	215	72	37	1.8	673	7.0	
Sept. 1-30.....	28,910	8.6	.00	58	19	63	5.2	187	201	10	.5	.4	.15	470	.64	36,690	224	71	37	1.8	699	7.2	
Weighted average [a]	19,720	10	0.01	57	18	60	5.1	177	184	9.6	0.5	0.7	0.14	443	0.60	23,590	216	71	37	1.8	671	--	

a Represents 100 percent of runoff for water year October 1957 to September 1958.

MISSOURI RIVER MAIN STEM--Continued

6A-4675. MISSOURI RIVER AT YANKTON, S. DAK.--Continued

Temperature (° F) of water, water year October 1957 to September 1958
/Once-daily measurement between 5 p.m. and 9 p.m./

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

a Measurement between 8 a.m. and 12 m.
b Measurement between 1 p.m. and 4 p.m.

JAMES RIVER BASIN

6A-4695. 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, October 1957 to June 1958 (discontinued).
REMARKS.--Records of discharge for water year October 1957 to September 1958 given in WSP 1559.

Chemical analyses, in parts per million, October 1957 to June 1958

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180° C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate					
Oct. 1, 1957	13.3	32	0.03	44	26	67	9.8	311	96	10	0.3	2.4	0.16	453	0.62		218	0	39	2.0	669	7.5	45
Jan. 29, 1958	1.00	12	.02	102	56	160	12	609	271	33	.1	.3	.12	985	1.34		484	0	41	3.2	1,450	8.0	32
Feb. 27	373	9.6	.08	12	5.4	6.5	13	56	22	2.0	.0	15	.00	127	.17		52	6	17	.4	175	6.8	110
Mar. 28	93.0	--	--	--	--	72	--	148	49	6.5	--	--	--	246	.33		114	0	58	2.9	338	7.0	--
Apr. 24	28.0	--	--	--	--	71	--	a 331	132	13	--	--	--	525	.71		268	0	36	1.9	768	8.6	--
May 28	5.14	--	--	--	--	100	--	460	193	20	--	--	--	704	.96		382	5	36	2.2	1,070	7.3	--
June 23	4.41	--	--	--	--	126	--	433	260	21	--	--	--	771	1.05		386	31	42	2.8	1,140	7.8	--

a Includes equivalent of 18 ppm of carbonate (CO_3).

6A-4705. 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 1958.
EXTREMES, 1957-58.--Water temperatures: Maximum, 82°F July 1, 2, Aug. 10; minimum, freezing point on many days during January and February.
EXTREMES, 1953-58.--Water temperatures: Maximum, 91°F July 12, 13, 1957; minimum, freezing point on many days during winter months.
REMARKS.--Records of discharge for water year October 1957 to September 1958 given in WSP 1559.

Chemical analyses, in parts per million, September 1957 to September 1958

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									
Sept. 30, 1957..	22	21	0.01	73	35	118	10	363	189	64	0.5	1.6	0.40	694		0.94		326	28	43	2.8	1,080	7.9	--
Jan. 9, 1958 ...	17	32	.02	109	54	161	12	570	272	64	.2	8.7	.39	1,020	995	1.39		496	29	41	3.1	1,480	7.5	15
Mar. 14	89.2	16	.08	32	14	24	16	156	62	12	.1	8.7	.09	278		.38		138	10	25	.9	418	7.2	10
Apr. 23	116	19	.02	59	31	75	11	318	141	25	.2	2.4	.18	536		.73		276	15	36	2.0	822	7.5	30
June 18.....	39	--	--	--	--	80	--	331	133	33	--	3.2	.26	544		.74		270	0	38	2.1	848	7.1	--
Sept. 30	4.1	--	.03	--	--	--	--	--	--	--	--	--	--	--		--		--	--	--	--	1,210	--	--

6A-4705. JAMES RIVER AT LA MOURE, N. DAK.--Continued

Temperature (° F) of water, water year October 1957 to September 1958
[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	63	60	43	41	37	36	35	34	32	32	34	34	37	35	45	44	66	63	82	70	76	69	61	56
2	63	60	41	39	37	36	35	34	32	32	34	34	38	37	50	43	63	61	82	74	79	71	64	59
3	63	60	39	38	37	37	35	34	32	32	34	34	39	38	51	47	63	61	80	72	76	72	64	60
4	62	59	39	38	37	36	34	34	32	32	34	33	39	38	50	47	63	62	74	72	76	70	62	59
5	60	58	39	38	36	35	34	33	32	32	33	33	38	37	50	46	66	59	74	69	73	70	61	58
6	58	57	38	36	36	35	34	33	32	32	33	33	38	36	54	48	70	62	72	69	74	68	68	58
7	57	55	38	36	36	35	34	33	32	32	33	33	40	38	59	52	72	67	71	67	80	68	65	58
8	55	52	36	34	35	35	34	32	32	32	33	33	42	40	58	53	72	68	69	64	75	68	67	60
9	52	51	35	34	35	34	33	33	32	32	33	33	44	42	59	55	72	68	64	63	76	70	66	62
10	52	51	37	35	36	34	33	33	32	32	33	33	46	43	63	57	70	65	70	62	82	72	63	60
11	51	50	39	36	36	35	33	33	32	32	33	33	45	44	65	59	71	63	77	67	77	72	63	58
12	52	51	40	38	35	34	33	33	32	32	33	33	45	43	65	61	68	64	78	72	78	70	65	60
13	54	52	41	39	35	34	34	33	32	32	33	33	47	42	63	60	67	62	76	70	74	70	64	62
14	53	53	40	39	35	34	34	33	32	32	33	33	49	44	62	58	65	62	73	70	76	68	66	63
15	54	53	39	38	35	34	33	33	32	32	33	33	53	47	65	59	69	60	71	68	75	69	64	58
16	54	51	37	36	35	35	33	33	32	32	33	33	53	49	66	60	68	66	74	68	73	67	60	57
17	52	50	36	35	35	35	33	33	32	32	33	33	54	50	70	62	67	63	71	68	71	67	60	56
18	51	50	38	36	35	35	33	33	32	32	33	33	53	50	64	58	69	62	74	68	70	66	61	57
19	51	49	38	35	35	35	33	33	32	32	33	33	51	49	60	56	68	66	73	70	70	65	61	57
20	51	49	36	36	35	35	33	33	32	32	33	33	51	48	68	56	70	64	74	70	68	63	60	58
21	49	49	36	34	35	34	33	32	32	32	33	33	50	45	65	59	74	65	75	71	66	61	59	56
22	49	47	38	35	35	34	32	32	33	32	33	33	46	44	63	58	71	66	79	72	65	62	63	56
23	47	44	36	36	36	35	32	32	33	32	33	33	46	42	61	58	70	67	78	72	64	60	66	60
24	44	41	37	36	36	35	32	32	33	33	33	33	44	40	64	58	67	63	76	73	65	57	66	57
[illegible]	41	38	38	36	36	35	32	32	34	33	33	33	44	41	65	60	64	61	77	71	62	59	57	55
26	41	37	37	36	36	35	32	32	34	33	34	33	44	43	66	61	70	61	76	71	63	59	55	53
27	41	40	36	35	35	34	32	32	34	34	34	33	45	44	64	60	71	66	74	70	72	60	55	52
28	41	40	37	36	35	35	32	32	34	34	34	33	45	40	67	60	76	68	73	70	66	63	55	52
29	42	40	36	36	35	35	32	32	--	--	34	33	43	39	71	64	76	71	72	68	65	62	54	50
30	42	40	36	36	35	35	32	32	--	--	35	34	46	42	77	67	73	71	78	69	63	58	50	46
31	43	42	37	36	35	35	32	32	--	--	35	34	--	--	70	66	--	--	73	69	60	56	--	--
Average	51	49	38	36	36	35	33	33	32	32	33	33	45	42	62	57	69	64	75	69	71	66	62	57

6A-4710. JAMES RIVER AT COLUMBIA, S. DAK.
(Formerly published as James River near Columbia)

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 1958.
REMARKS.--No flow during July to September. Records of discharge for water year October 1957 to September 1958 given in WSP 1559.

Chemical analyses, in parts per million, October 1957 to July 1958

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, 1957...	19	19	0.14	43	40	151	14	385	196	75	0.4	1.4	0.43	743		1.01		271	0	53	4.0	1,140	8.0	40
Nov. 13.....	47	--	--	--	--	146	--	359	--	--	--	--	--	--		--		285	0	53	3.8	1,130	7.9	--
Dec. 3.....	58	--	--	52	46	156	--	342	237	78	--	--	.41	820		1.12		320	40	51	3.8	1,250	7.8	--
Jan. 7, 1958....	43	36	.01	66	61	200	17	478	307	100	.3	13	.52	1,070	1,040	1.46		414	22	50	4.3	1,570	7.3	35
Feb. 3.....	30	--	--	68	65	221	--	492	330	106	--	--	.60	1,100		1.50		436	33	52	4.6	1,620	7.7	--
Mar. 5.....	35	14	.03	43	36	107	13	266	190	65	.4	6.5	.28	631		.86		254	36	46	2.9	979	7.2	30
Mar. 11.....	88	16	.02	56	56	173	12	392	282	88	.4	7.4	.39	911		1.24		370	49	49	3.9	1,370	7.6	25
Mar. 19.....	115	--	--	--	--	129	--	344	--	--	--	--	--	--		--		324	42	46	3.1	1,180	7.2	--
Mar. 27.....	134	--	--	--	--	116	--	320	--	--	--	--	--	--		--		292	30	46	3.0	1,040	7.3	--
Apr. 1.....	142	--	--	--	--	107	--	288	--	--	--	--	--	--		--		259	23	47	2.9	928	7.1	--
Apr. 10.....	182	--	--	43	30	91	--	260	142	48	--	--	.25	520		.71		230	17	46	2.6	821	7.2	--
Apr. 29.....	208	--	--	34	25	67	--	236	99	33	--	--	.23	412		.56		186	0	44	2.1	665	7.3	--
May 20.....	41	--	--	38	28	75	--	262	103	35	--	--	.28	478		.65		210	0	44	2.2	735	7.3	--
June 10	65	--	--	--	--	81	--	260	--	--	--	--	--	--		--		220	7	44	2.4	774	7.0	--
July 2	.01	--	--	--	--	124	--	341	--	--	--	--	--	--		--		300	20	47	3.1	1,090	6.9	--

6A-4760. JAMES RIVER UPSTREAM FROM DIVERSION AT HURON, S. DAK.

LOCATION.--Just upstream from Chicago and North Western Railway bridge, 135 feet upstream from gaging station, 150 feet upstream from city dam at Huron, Beadle County, and 300 feet upstream from bridge on U.S. Highway 14.
DRAINAGE AREA.--16,800 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: April 1950 to September 1951, August 1956 to September 1958.
Water temperatures: August 1956 to September 1958.
EXTREMES, 1957-58.--Dissolved solids: Maximum, 1,260 ppm Feb. 12-23; minimum, 429 ppm Mar. 29 to Apr. 5.
Hardness: Maximum, 478 ppm Feb. 26 to Mar. 2; minimum, 166 ppm Mar. 29 to Apr. 5.
Specific conductance: Maximum daily, 1,930 micromhos Jan. 15; minimum daily, 558 micromhos Apr. 1.
Water temperatures: Maximum, 75°F on several days during July and August; minimum, freezing point on several days during March.
EXTREMES, 1956-58.--Dissolved solids: Maximum, 1,580 ppm Mar. 6-15, 1957; minimum, 340 ppm Mar. 29 to Apr. 4, 1957.
Hardness: Maximum, 764 ppm Mar. 6-15, 1957; minimum, 166 ppm Mar. 29 to Apr. 5, 1958.
Specific conductance: Maximum daily, 2,270 micromhos Mar. 9, 1957; minimum daily, 483 micromhos Mar. 30, 1957.
Water temperatures: Maximum, 83°F July 17, 1957; minimum, freezing point on several days during winter months.
REMARKS.--No flow during August and September. Daily samples for chemical analysis composited by discharge. Records of specific conductance of daily samples and some records of strontium available in district office at Lincoln, Nebr. Records of discharge for gaging station at Huron, downstream from the diversion, for water year October 1957 to September 1958 given in WSP 1559.

Chemical analyses, in parts per million, October 1957 to August 1958

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. 7-10, 14-31, 1957	12.7	14	0.01	64	43	197	20	372	315	98	0.4	0.9	0.50	963	--	1.31	33.0	338	33	54	4.6	1,450	7.8	
Nov. 1-24	19.1	24	.01	69	51	189	17	370	345	89	.3	1.4	.52	970	--	1.32	50.0	380	77	51	4.2	1,450	7.8	
Nov. 25-Dec. 20.	39.5	25	.01	95	56	185	15	436	373	95	.3	.7	.49	1,080	1,060	1.47	115	466	108	45	3.7	1,580	7.8	
Dec. 21-Jan. 8, 1958	53.0	15	.02	87	54	250	16	432	380	154	.5	.3	.08	1,160	1,170	1.58	166	440	86	54	5.2	1,740	7.7	
Jan. 9-24	43.5	14	.02	87	60	250	19	452	410	160	.6	1.7	.12	1,240	1,220	1.69	146	464	93	53	5.1	1,850	7.7	
Jan. 25-Feb. 11.	29.1	9.5	.03	80	58	230	18	469	370	130	.6	1.5	.64	1,170	1,130	1.59	91.9	438	53	52	4.8	1,730	7.8	
Feb. 12-23	31.3	13	.02	80	63	246	18	503	400	137	.6	1.5	.71	1,260	1,210	1.71	106	460	48	53	5.0	1,840	7.8	
Feb. 24-25	45.0	17	.06	72	58	225	17	458	363	120	.6	1.4	.40	1,150	1,100	1.56	140	420	44	53	4.8	1,690	8.1	
Feb. 26-Mar. 2.	104	15	.03	82	67	242	18	520	393	125	.6	1.3	.63	1,250	1,200	1.70	351	478	52	51	4.8	1,830	7.9	
Mar. 3-14	114	16	.03	68	50	179	14	412	297	92	.5	1.1	.47	960	--	1.31	295	376	38	50	4.0	1,430	7.7	
Mar. 15-19	93.8	20	.04	82	64	229	16	528	373	122	.6	2.1	.64	1,220	1,170	1.66	309	468	35	50	4.6	1,790	7.8	
Mar. 20-22	167	18	.09	73	55	200	15	a 460	327	106	.6	2.5	.55	1,060	1,020	1.44	478	410	33	50	4.3	1,570	8.3	
Mar. 23-28	422	15	.04	51	36	132	13	298	220	71	.4	4.7	.38	718	--	.98	818	274	30	50	3.5	1,100	7.7	
Mar. 29-Apr. 5.	630	12	.04	33	20	72	12	177	125	38	.3	3.4	.16	429	--	.58	730	166	21	46	2.4	676	7.8	
Apr. 6-30	429	11	.03	44	29	99	13	245	162	55	.3	1.6	.22	552	--	.75	639	229	28	47	2.8	862	7.8	
May 1-31	227	9.1	.02	45	31	96	13	270	156	49	.3	.9	.27	558	--	.76	342	239	18	45	2.7	872	7.8	
June 1-13	150	12	.03	66	25	103	14	278	197	51	.3	1.7	.31	618	--	.84	250	269	41	44	2.7	961	7.4	
June 14-28	106	12	.03	77	29	126	15	325	221	63	.3	1.7	.40	720	--	.98	206	313	46	45	3.1	1,100	7.4	

June 29-July 10.	162	23	.01	61	38	137	15	328	214	85	.4	1.5	.40	743	--	1.01	325	310	41	48	3.4	1,150	7.3
July 11-24.....	44.5	20	.01	44	29	83	13	214	174	46	.3	2.5	.32	518	--	.70	62.2	230	55	42	2.4	810	7.2
July 25-Aug. 3, 5-7	10.9	15	.00	41	28	95	15	237	173	54	.7	3.1	.34	538	--	.73	15.8	219	25	46	2.8	863	7.6
Weighted average b	107	13	0.03	53	34	122	14	290	204	66	0.4	1.9	0.30	672	--	0.91	194	273	35	48	3.2	1,030	--

a Includes equivalent of 8 ppm of carbonate (CO_3).
b Represents 100 percent of runoff for water year October 1957 to September 1958.

JAMES RIVER BASIN--Continued

6A-4760. JAMES RIVER UPSTREAM FROM DIVERSION AT HURON, S. DAK.--Continued

Temperature (° F) of water, water year October 1957 to September 1958
(Once-daily measurement between 7 a.m. and 8 a.m. No flow Aug. 8 to Sept. 30)

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

a Measurement between 9 a.m. and 10 a.m.

6A-4785. JAMES RIVER NEAR SCOTLAND, S. DAK.

LOCATION.--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.--Chemical analyses: August 1956 to September 1958.
Water temperatures: January 1953 to September 1958.
EXTREMES, 1957-58.--Water temperatures: Maximum, 89°F Aug. 8, 12, 13; minimum, freezing point on many days during December to February.
EXTREMES, 1953-58.--Water temperatures: Maximum, 90°F Aug. 1, 2, 1957; minimum, freezing point on many days during winter months.
REMARKS.--Records of discharge for water year October 1957 to September 1958 given in WSP 1559.

Chemical analyses, in parts per million, water year October 1957 to September 1958

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
Oct. 29, 1957...	27	16	0.01	150	60	122	17	284	549	57	0.5	1.6	0.50	1,180	1,110	1.60		622	389	29	2.1	1,560	7.6	
Dec. 12.....	48	17	.08	165	84	224	18	344	740	137	.6	6.0	.76	1,660	1,560	2.26		756	474	38	3.5	2,150	7.8	
Jan. 3, 1958....	55	5.5	.00	103	74	230	17	224	675	137	.8	3.5	.66	1,440	1,360	1.96		560	376	46	4.2	1,980	7.4	
Feb. 6.....	52	16	.02	158	83	248	20	500	665	151	.6	4.5	.72	1,660	1,590	2.26		735	325	42	4.0	2,290	7.8	
Mar. 4.....	102	10	.02	132	61	172	15	336	520	114	.5	5.2	.55	1,240	1,200	1.69		582	306	38	3.1	1,700	7.5	
Mar. 27.....	787	13	.03	88	43	128	14	290	333	66	.4	5.2	.36	850	--	1.16		396	158	40	2.8	1,240	7.3	
May 13.....	331	9.3	.02	76	40	109	14	272	288	52	.2	1.2	.31	748	--	1.02		352	129	39	2.5	1,110	7.4	
May 26.....	252	9.5	.02	77	44	122	15	298	323	57	.4	2.8	.38	815	--	1.11		374	130	40	2.7	1,200	7.4	
June 18	162	3.7	.02	70	42	124	15	286	294	59	.4	3.2	.42	764	--	1.04		346	111	42	2.9	1,160	7.2	
July 8	117	9.5	.02	76	46	138	16	234	386	58	.5	8.5	.46	870	--	1.18		378	186	43	3.1	1,270	7.0	
July 31.....	36	8.5	.02	70	50	139	18	244	360	91	.4	3.1	.48	899	--	1.22		382	182	43	3.1	1,320	7.4	
Aug. 21.....	21	11	.52	78	54	140	18	184	467	77	.5	.1	.57	971	--	1.32		416	265	41	3.0	1,370	6.8	
Sept. 4.....	5	6.0	.02	61	45	139	17	197	364	83	.5	3.9	.50	853	--	1.16		335	173	46	3.3	1,260	7.2	

6A-4785. JAMES RIVER NEAR SCOTLAND, S. DAK.--Continued

Temperature (° F) of water, water year October 1957 to September 1958
/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	65	63	47	47	33	33	32	32	32	32	34	33	45	42	55	53	78	78	82	80	84	83	70	69
2	65	63	47	46	33	32	32	32	32	32	34	34	46	45	59	55	78	74	83	81	86	84	71	69
3	65	62	46	43	32	32	32	32	32	32	34	33	46	45	60	59	74	74	82	78	88	86	72	71
4	65	62	43	43	32	32	32	32	32	32	33	33	46	46	60	59	77	73	78	76	88	88	72	70
5	63	61	44	43	32	32	32	32	32	32	33	33	47	46	61	59	77	76	78	76	88	87	70	70
6	62	60	43	42	32	32	32	32	32	32	33	33	47	47	61	60	77	76	78	76	87	87	70	68
7	61	61	43	43	32	32	32	32	32	32	33	33	47	46	61	61	77	76	78	75	88	85	70	68
8	61	59	43	39	32	32	32	32	32	32	33	33	49	47	61	59	77	77	75	73	89	87	71	69
9	59	56	39	36	32	32	32	32	32	32	33	33	49	48	63	61	77	75	73	72	88	88	73	71
10	56	55	36	35	34	32	32	32	33	32	33	33	50	48	65	63	78	77	72	71	88	88	74	71
11	55	53	39	36	34	32	32	32	33	33	33	33	51	50	67	65	78	73	73	72	88	88	71	70
12	53	53	40	37	32	32	32	32	33	33	33	33	52	51	69	67	73	71	74	73	89	88	71	69
13	55	53	41	40	32	32	32	32	33	33	33	33	52	51	69	69	71	71	75	74	89	86	71	71
14	55	55	41	40	32	32	32	32	33	33	33	33	53	52	69	69	71	70	76	75	87	86	71	70
15	57	55	41	41	32	32	32	32	33	33	33	33	55	53	69	68	71	70	76	76	86	84	71	69
16	58	57	41	39	32	32	32	32	33	33	33	33	56	55	69	68	72	71	76	75	84	83	70	69
17	57	54	39	38	32	32	32	32	33	33	33	33	--	--	72	69	73	72	76	76	83	83	69	67
18	54	52	38	36	32	32	32	32	33	33	33	33	--	--	72	71	73	72	77	75	83	83	68	67
19	53	52	36	35	32	32	32	32	33	33	33	33	--	--	73	71	75	73	79	77	83	83	69	68
20	53	51	35	35	32	32	32	32	34	33	34	33	--	--	72	71	75	75	79	79	83	81	70	69
21	51	51	35	34	32	32	32	32	33	33	35	34	--	--	72	71	75	74	79	79	81	78	70	68
22	52	51	34	34	32	32	32	32	33	33	35	35	55	55	73	72	75	74	79	79	78	78	70	68
23	52	51	34	33	32	32	32	32	33	33	36	35	55	51	73	73	74	72	82	79	77	75	73	70
24	51	47	35	34	32	32	32	32	33	33	38	36	51	49	74	73	73	73	82	82	75	73	73	73
25	47	44	36	35	32	32	32	32	33	33	38	36	50	49	74	74	73	69	82	82	73	71	73	69
26	44	43	36	35	32	32	32	32	33	33	39	36	50	50	76	74	71	68	83	82	73	71	69	68
27	43	43	36	36	32	32	32	32	33	33	41	39	51	50	76	76	73	71	83	82	74	72	68	65
28	44	43	36	36	32	32	32	32	33	33	41	39	51	51	76	75	74	72	82	82	74	72	66	65
29	46	44	36	34	32	32	32	32	--	--	39	39	51	50	77	75	77	74	83	82	76	73	65	65
30	46	46	34	33	32	32	32	32	--	--	41	39	53	50	79	77	80	77	83	83	76	74	65	59
31	47	46	--	--	32	32	32	32	--	--	42	41	--	--	78	78	--	--	83	82	74	69	--	--
Average	55	53	39	38	32	32	32	32	33	33	35	35	50	49	69	68	75	73	79	78	83	81	70	68

MISCELLANEOUS ANALYSES OF STREAMS IN JAMES RIVER BASIN

Chemical analyses, in parts per million, water year October 1957 to September 1958

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180° C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate					
6A-4700. JAMES RIVER AT JAMESTOWN, N. DAK.																							
Oct. 1, 1957	16	31	0.03	50	27	71	10	318	116	17	0.3	3.6	0.24	489	0.67		236	0	38	2.0	747	7.5	--
Jan. 29, 1958	6.43	35	.01	101	47	171	9.7	554	266	61	.2	5.0	.50	977	1.33		444	0	45	3.5	1,450	7.3	5
Feb. 28	495	9.5	.09	16	6.6	10	14	72	25	4.1	.1	15	.00	151	.21		67	8	20	.5	218	6.8	90
Mar. 28	102	14	.31	29	13	22	11	154	50	9.0	.2	.7	.16	237	.32		126	0	26	.9	368	7.1	50
Apr. 24	37.6	--	--	--	--	77	--	334	142	19	--	--	--	536	.73		280	6	37	2.0	821	7.3	--
June 23	13.2	--	--	--	--	100	--	394	157	33	--	--	--	633	.86		309	0	31	2.5	986	7.2	--

Periodic determinations of suspended-sediment discharge, water year October 1957 to September 1958

Date	Discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Discharge (tons per day)
6A-4735. WEST BRANCH SNAKE CREEK NEAR ATHOL, S. DAK.			
Mar. 3, 1958, 12:00 m	a 1.0	23	0.06
Mar. 24	9.0	76	1.85
Mar. 26, 6:40 a.m	26.0	35	2.46
Apr. 1, 9:40 a.m	8.0	32	.69
Apr. 8, 1:55 p.m	11.7	32	1.01
Apr. 29, 2:25 p.m	2.8	26	.20
May 20, 9:50 a.m	.1	40	.01

a Daily mean discharge.

PART 6B. MISSOURI RIVER BASIN BELOW SIOUX CITY, IOWA

LITTLE SIOUX RIVER BASIN

6B-6066. LITTLE SIOUX RIVER AT CORRECTIONVILLE, IOWA

LOCATION.--At gaging station at bridge on State Highway 31, 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.
RECORDS AVAILABLE.--Chemical analyses: November 1954 to June 1955.
Water temperatures: May 1951 to September 1958.
Sediment records: May 1950 to September 1958.
EXTREMES, 1957-58.--Water temperatures: Maximum, 82°F Aug. 9, 11, 12; minimum, freezing point on many days during November to March.
Sediment concentrations: Maximum daily, 9,570 ppm June 3; minimum daily, not determined.
Sediment loads: Maximum daily, 42,300 tons June 3; minimum daily, 1 ton Sept. 27-30.
EXTREMES, 1950-58.--Water temperatures (1951-58): Maximum, 84°F July 31, 1955; minimum, freezing point on many days during winter months.
Sediment concentrations: Maximum daily, 13,300 ppm June 22, 1957; minimum daily, not determined.
Sediment loads: Maximum daily, 257,000 tons June 19, 1954; minimum daily, less than 0.50 ton Feb. 18-25, 1957.
REMARKS.--Maximum observed sediment concentration during water year, 29,200 ppm June 3. Flow affected by ice Nov. 30 to Dec. 3, Dec. 10 to Feb. 27. Records of discharge for water year October 1957 to September 1958 given in WSP 1560.

Temperature (° F) of water, water year October 1957 to September 1958
/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	--	--	32	a 32	--	32	50	54	69	78	72	68
2	58	46	a 33	a 32	a 32	32	47	58	66	76	74	73
3	--	--	a 33	a 32	--	32	50	59	66	78	76	76
4	57	40	33	a 32	a 32	34	49	56	70	77	80	70
5	--	40	33	--	a 33	34	48	54	70	72	80	70
6	56	39	32	a 32	a 32	34	46	56	70	70	78	67
7	--	42	a 33	a 32	--	36	41	58	71	70	78	68
8	57	36	--	--	32	32	45	52	70	71	81	70
9	--	a 35	a 33	a 33	--	32	48	58	70	72	82	73
10	48	33	32	--	a 32	32	46	61	72	72	80	69
11	--	34	a 32	a 34	--	32	47	66	68	70	82	66
12	50	40	a 32	--	a 32	35	52	68	64	74	82	66
13	--	41	a 34	33	--	37	52	68	68	72	76	68
14	54	43	a 35	--	a 32	37	54	69	66	76	78	68
15	57	43	33	32	--	36	57	68	67	70	78	64
16	--	41	33	--	a 32	34	61	68	68	68	74	64
17	52	38	33	32	--	33	60	68	70	68	76	58
18	--	33	33	--	a 32	32	62	66	69	68	77	61
19	47	32	a 35	32	--	34	60	64	70	70	76	64
20	--	33	a 35	--	a 32	38	60	62	70	70	80	69
21	49	33	a 36	--	--	38	52	64	68	69	72	60
22	--	a 32	33	32	35	40	52	66	65	70	70	62
23	54	33	a 35	32	--	40	50	61	65	74	70	70
24	--	32	a 33	--	34	42	46	64	67	75	64	72
25	39	a 35	33	32	34	43	48	63	62	72	63	64
26	--	a 35	a 35	--	35	44	48	67	64	74	65	62
27	36	35	a 33	a 32	35	50	49	68	66	74	70	55
28	--	34	a 33	--	33	44	41	64	70	74	73	52
29	40	33	a 32	a 32	--	46	48	66	74	74	77	58
30	--	a 34	a 32	--	--	46	49	70	78	71	76	52
31	44	--	a 32	a 32	--	45	--	62	--	70	66	--
Average	--	37	33	--	--	37	51	63	68	72	75	65

a Measurement between 11 a.m. and 2 p.m.

LITTLE SIOUX RIVER BASIN--Continued

6B-6066. LITTLE SIOUX RIVER AT CORRECTIONVILLE, IOWA--Continued

Suspended sediment, water year October 195? to September 1958

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	95	--		272	440	sa 400	275	48	36
2	91	56		432	775	904	300	115	93
3	87	--		405	440	a 480	350	140	132
4	85	61	e 13	379	280	287	372	125	126
5	82	--		379	170	174	410	86	95
6	81	52		379	132	135	446	143	172
7	86	100	sa 24	405	142	155	392	115	122
8	110	82	s 25	392	150	159	328	95	a 85
9	109	36	a 11	366	125	124	304	83	68
10	103	30	8	340	130	119	250	125	84
11	98	40	a 11	328	100	89	200	125	68
12	98	48	13	304	101	83	230	100	a 60
13	102	70	a 19	304	97	80	250	78	53
14	107	92	27	328	127	112	270	102	74
15	137	170	sb 70	340	124	114	280	70	53
16	240	480	a 320	366	112	111	270	70	51
17	226	180	110	392	129	137	260		
18	174	80	a 38	405	110	120	260		
19	155	52	22	392	93	98	270	51	37
20	165	55	a 24	418	93	105	280		
21	202	128	70	366	83	82	260		
22	221	260	a 160	316	88	75	250		
23	237	166	106	356	40	38	240		
24	237	95	a 60	440	170	202	230	55	34
25	231	75	47	460	225	279	210		
26	231	--		460	145	180	200		
27	233	65		474	143	183	190	31	16
28	237	--		474	126	161	190	52	27
29	237	64	e 44	474	140	179	180	28	14
30	233	--		310	142	119	170	14	6
31	226	82		--	--	--	160	22	10
Total	4,956	--	1,507	11,456	--	5,484	8,277	--	1,800

Day	January			February			March		
1	160	24	10	100	--		618	1,000	s 1,720
2	160	59	25	100	9		392	275	291
3	150	69	28	95	--	e 2	366	230	227
4	150	75	30	95	7		366	228	225
5	140	99	37	95	7		340	175	161
6	130	78	27	90	35		328	100	89
7	130	72		90	--		292	120	95
8	120	--		85	31	e 8	260	85	60
9	120	62		80	--		219		
10	110	--	e 22	75	39		200		
11	110	66		70	--		240		
12	110	--		65	23		233	65	40
13	120	33	11	60	--	e 4	240		
14	130	--		55	30		231		
15	130	18		50	--		219		
16	130	--		50	19		206	35	19
17	130	14		50	--		186		
18	130	--	e 5	50	40	e 4	175	32	15
19	130	11		50	--		168		
20	130	--		50	26		170		
21	130	--		50	32	a 4	175		
22	130	12		60	55	9	178		
23	130	8		100	110	a 30	178		
24	130	--		160	88	38	178		
25	120	9		200	55	30	176		
26	120	--		300	1,000	sb 1,600	178	45	22
27	110	11	e 3	1,300	5,900	sb 21,000	176		
28	110	--		1,000	3,010	s 8,430	176		
29	110	7		--	--	--	176		
30	100	--		--	--	--	178		
31	100	8		--	--	--	181		
Total	3,910	--	372	4,625	--	31,231	7,399	--	3,469

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

6B-6066. LITTLE SIOUX RIVER AT CORRECTIONVILLE, IOWA--Continued

Suspended sediment, water year October 1957 to September 1958--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	184	102	51	558	279	420	248	340	b 220
2	199	96	52	558	281	423	191	210	108
3	212	120	69	488	254	335	1,110	9,570	s 42,300
4	250	160	b 110	460	263	327	1,070	5,120	s 15,900
5	379	750	b 750	418	234	264	1,180	2,750	8,760
6	432	435	507	392	217	230	1,220	1,850	6,090
7	516	352	490	366	200	198	998	1,300	3,500
8	601	495	803	366	182	180	768	1,020	2,120
9	661	643	1,150	340	198	182	646	800	1,400
10	691	695	1,300	328	185	164	572	720	1,110
11	661	610	1,090	304	190	156	516	660	920
12	616	500	832	281	203	154	460	530	658
13	586	433	685	260	204	143	439	800	b 950
14	572	380	587	248	201	135	379	450	461
15	544	371	545	231	175	109	328	413	366
16	516	357	497	216	166	97	292	400	315
17	488	347	457	209	160	90	270	327	238
18	460	349	433	207	160	89	260	250	176
19	446	297	358	194	143	75	240	195	126
20	432	277	323	192	130	67	233	137	86
21	418	244	275	189	127	65	219	103	61
22	405	196	214	183	163	81	206	96	53
23	408	220	b 240	172	100	46	195	83	44
24	481	243	316	165	108	48	189	86	44
25	502	235	319	180	129	63	181	81	40
26	502	230	312	178	141	68	180	80	b 38
27	537	220	sb 340	175	115	54	174	84	39
28	601	330	535	159	90	39	165	98	44
29	601	365	592	151	100	41	155	105	44
30	572	305	471	141	93	35	145	118	46
31	--	--	--	160	200	sb 95	--	--	--
Total	14,473	--	14,703	8,469	--	4,473	13,229	--	86,257

Day	July			August			September		
1	133			86	260	b 60	18		
2	132			87	190	sb 46	17		
3	128			70	183	35	17		
4	122			63	130	22	17		
5	116	108	36	58	110	17	16		
6	114			57	105	16	18		
7	114			54	86	13	17		
8	118	150	sb 50	50	81	11	17	77	3
9	136	220	81	47	77	10	15		
10	124	92	31	43	103	12	15		
11	160	190	sb 110	42	96	11	14		
12	168	500	s 250	40	94	10	14		
13	128	242	84	39	107	11	14		
14	134	210	76	37	110	11	14		
15	134	175	63	35	102	10	17		
16	124	130	44	33	109	10	16		
17	116	114	36	32	92	8	15		
18	112	105	32	29	103	8	14		
19	115	200	b 60	28			14		
20	112	180	54	27			14		
21	105	129	37	25			13	71	3
22	101	128	35	24			13		
23	95	124	32	27			12		
24	91	126	31	27			12		
25	86	132	31	33	82	6	13		
26	81	130	28	26			14		
27	77	129	27	23			12		
28	73	117	23	22			11	41	1
29	69	102	19	21			11		
30	74	145	29	19			9.1	38	1
31	81	160	sb 40	19			--	--	--
Total	3,473	--	1,555	1,223	--	399	433.1	--	82

Total discharge for year (cfs-days) 81,923.1
Total load for year (tons) 151,332

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

6B-6066. LITTLE SIOUX RIVER AT CORRECTIONVILLE, IOWA--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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. 27, 1958....	4:05 p.m.	1,600	35	5,370	3,730	33	41	45	61	83	93	95	99		100		SPWCM
June 3.....	4:00 p.m.	2,020	66	10,500	4,720	--	37	--	75	--	98	99	100				SPWCM
June 4.....	1:00 p.m.	864	70	3,990	4,350	47	70	74	86	96	99	99	100				SPWCM
June 4.....	1:00 p.m.	864	70	3,990	3,920	26	52	54	84	95	99	99	100				SPNM
June 5.....	6:55 a.m.	1,220	60	3,480	2,940	--	53	--	78	--	97	98	100				SPWCM

PLATTE RIVER BASIN

6B-6379.1. ROCK CREEK AT ATLANTIC CITY, WYO.

LOCATION.--At gaging station, 500 feet below Slate Creek and 1.4 miles northwest of Atlantic City, Fremont County.
DRAINAGE AREA.--21.3 square miles.
RECORDS AVAILABLE.--Chemical analyses: April to June 1957, November 1957 to September 1958.
Water temperatures: June to September 1957, May to September 1958.
Sediment records: June 1957 to September 1958.
EXTREMES, 1957-58.--Water temperatures: Maximum, 68°F July 9, Aug. 2.
Sediment concentrations: Maximum daily, 99 ppm May 17; minimum daily, not determined.
Sediment loads: Maximum daily, 14 tons May 17; minimum daily, less than 0.05 ton on many days.
EXTREMES, June 1957 to September 1958.--Water temperatures: Maximum, 68°F Aug. 8, 1957, July 9, Aug. 2, 1958.
Sediment concentrations: Maximum daily, 99 ppm May 17, 1958; minimum daily, not determined.
Sediment loads: Maximum daily, 14 tons May 17, 1958; minimum daily, less than 0.05 ton on many days.
REMARKS.--Flow affected by ice Nov. 2 to Mar. 5. Records of discharge for water year October 1957 to September 1958 given in WSP 1560.

Chemical analyses, in parts per million, November 1957 to September 1958

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180° C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate					
Nov. 21, 1957.....	4.2	17	0.37	16	3.2	3.6	1.3	70	3.0	0.1	0.1	0.1	0.00	77	0.10		53	0	13	0.2	121	7.2	17
Jan. 28, 1958.....	2.9	17	.42	16	3.2	4.4	1.2	72	5.8	.1	.0	.1	.00	84	.11		53	0	15	.3	121	7.4	18
Feb. 24	4.5	17	.40	16	2.7	3.7	1.6	70	4.5	.1	.0	.1	.00	77	.10		51	0	13	.2	119	7.5	18
Apr. 29	4.0	14	.37	13	2.8	3.7	1.5	60	7.5	.1	.0	.5	.01	72	.10		44	0	15	.2	107	7.7	19
May 21.....	72	11	.07	6.5	.4	1.9	1.1	24	2.5	.5	.1	.3	.02	46	.06		18	0	18	.2	51.2	6.8	10
Sept. 26.....	2.4	15	.02	22	3.4	4.3	1.4	92	4.3	.2	.1	.2	.03	95	.13		69	0	12	.2	151	7.4	3

PLATTE RIVER BASIN--Continued

6B-6379.1. ROCK CREEK AT ATLANTIC CITY, WYO.--Continued

Temperature (° F) of water, water year October 1957 to September 1958
/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	--	--						--	47	a 57	51	a 59
2	--	--						--	a 58	57	a 68	--
3	--	a 32						--	50	56	a 64	--
4	--	--						--	46	54	57	--
5	--	--						--	50	a 61	57	a 52
6	--	--						a 45	56	54	a 64	a 62
7	a 43	--						36	54	a 65	57	--
8	--	--						a 42	53	54	a 59	a 62
9	--	--						36	49	a 68	58	--
10	--	--						36	47	57	a 65	53
11	--	--						a 46	49	a 66	58	--
12	--	a 33						40	50	a 67	a 66	53
13	--	--						36	44	55	58	--
14	a 45	--						a 34	49	54	a 63	45
15	--	--						a 34	48	50	a 60	--
16	--	--						a 54	50	--	57	--
17	--	--						46	48	a 59	57	--
18	--	--						44	51	--	a 58	a 53
19	--	--						44	52	--	57	--
20	a 41	--						a 56	53	--	a 58	a 53
21	--	a 32				32		46	53	--	54	--
22	--	--						44	52	--	57	a 54
23	--	--						44	53	--	54	--
24	--	--			a 33			44	56	a 59	52	a 48
25	--	--						44	50	55	53	--
26	--	--						44	47	--	a 59	a 50
27	--	--						45	53	--	a 58	--
28	--	--		a 32				48	55	--	54	42
29	--	--					a 37	47	55	--	a 60	--
30	--	--						48	53	a 57	53	a 46
31	--	--						46	--	50	51	--
Average	--	--						43	51	--	58	--

a Measurement between 10 a.m. and 8 p.m.

PLATTE RIVER BASIN--Continued

6B-6379.1. ROCK CREEK AT ATLANTIC CITY, WYO.--Continued

Suspended sediment, water year October 1957 to September 1958

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	4.9	--		4.8	--		4.0		
2	4.4	--		4.3	--		4.0		
3	5.6	--		4.2	4		4.0		
4	7.8	--		4.1	--		4.0		
5	5.0	--		4.0	--		3.9		
6	5.2	--		4.2	--		4.0		
7	4.8	6		4.4	--		4.0		
8	4.4	--		4.5	--		4.1		
9	4.2	--		4.6	--		4.1		
10	4.0	--		4.7	--		3.6	25	
11	3.8	--		4.7	--		3.3		
12	4.2	--		4.7	6		3.5		
13	4.2	--		4.7	--		3.7		
14	4.8	--		4.7	--		3.8		
15	6.5	--		4.7	--		3.6		
16	6.2	--	e 0.1	4.6	--	e 0.1	3.7		e 0.1
17	5.4	--		4.6	--		3.8		
18	5.2	--		4.6	--		3.7		
19	5.2	--		4.5	--		3.6		
20	5.4	5		4.5	--		3.7		
21	5.4	--		4.5	8		3.8		
22	5.4	--		4.5	--		3.6		
23	5.2	--		4.5	--		3.3		
24	5.0	--		4.5	--		3.4		
25	5.2	--		4.5	--		3.5		
26	4.8	--		4.5	--		3.6		
27	4.6	--		4.3	--		3.4		
28	4.8	--		4.1	--		3.5		
29	4.6	--		3.8	--		3.5		
30	5.0	--		4.0	--		3.2		
31	5.0	--		--	--	--	3.0		
Total	156.4	--	3.1	133.3	--	3.0	113.9		3.1

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	2.9			2.9			3.2	--	
2	3.0			2.8			3.0	--	
3	3.1			2.9			3.1	--	
4	3.2			3.0			3.1	2	
5	3.3			3.0			3.0	--	
6	3.3			3.0			2.9	--	
7	3.3			3.0			2.8	--	
8	3.3			3.0			2.9	--	
9	3.3			3.0			2.9	--	
10	3.3			3.0			2.9	--	
11	3.3			2.9			2.8	--	
12	3.3			2.8			2.8	--	
13	3.3			3.0			2.8	--	
14	3.3			3.2			2.8	--	
15	3.3			3.5		(t)	2.8	--	
16	3.3		e 0.1	3.7			2.9	--	(t)
17	3.3			3.9			3.1	--	
18	3.2			4.1			3.2	--	
19	2.9			4.3			3.2	--	
20	2.7			4.4			3.1	--	
21	2.8			4.5			3.2	3	
22	2.9			4.5			3.4	--	
23	2.9			4.5			3.8	--	
24	2.9			4.5	3		4.2	--	
25	2.9			4.3			4.2	--	
26	2.9			4.0			4.0	--	
27	2.9			3.7			4.0	--	
28	2.9	6		3.5			3.8	--	
29	2.9			--			4.0	--	
30	2.9			--			3.8	--	
31	2.9			--			3.8	--	
Total	95.7		3.1	98.9		1.1	101.5	--	0.9

e Estimated.
t Less than 0.050 ton.

PLATTE RIVER BASIN--Continued

• 6B-6379.1. ROCK CREEK AT ATLANTIC CITY, WYO.--Continued

Suspended sediment, water year October 1957 to September 1958--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	4.2			6.4	--	e 0.1	50	9	1.2
2	3.8			9.0	--	e .1	46	6	.7
3	3.6			14	--	e .2	39		
4	3.4			19	--	e .4	35	5	.5
5	3.6			27	--	e .6	32		
6	3.4			34	8	.7	30		
7	3.6			42	9	1.0	31		
8	4.0		(t)	38	6	.6	32		
9	4.0			33	9	a .8	28		
10	3.8			41	12	sa 1.7	24	4	.3
11	3.8			54	16	a 2.3	23		
12	3.8			54	19	2.8	22		
13	4.2			46	4	.5	24		
14	4.8			48	3	.4	22		
15	5.6			38	2	.2	19		
16	7.0			44	60	a 7.0	17		
17	10			50	99	s 14	16		
18	12			58	28	s 4.7	15		
19	9.7			71	19	s 4.4	14	4	.2
20	10		e 0.2	84	20	s 5.0	14		
21	9.3			89	16	3.8	14		
22	8.8			90	10	2.4	12		
23	5.8			91	8	2.0	12		
24	6.1			96	15	sa 4.8	16	8	s .4
25	6.4			111	24	s 7.6	25	9	s .7
26	5.8		(t)	91	9	2.2	18	4	.2
27	5.6			88	5	1.2	12	10	.3
28	5.3			80	9	1.9	8.7		
29	5.1	3		75	8	1.6	8.2	4	.1
30	5.3			66	5	.9	8.2		
31	--		--	60	4	.6	--	--	--
Total	171.8		2.4	1,747.4	--	76.5	667.1	--	9.8

Day	July			August			September		
1	8.2			4.2			2.2		
2	7.8			3.8			2.0		
3	7.4			3.6			2.0		
4	8.2			3.4			2.3		
5	10	4	0.1	2.9			2.3		
6	12			2.8			2.2	3	(t)
7	8.7			2.8			2.3		
8	7.8			2.8			1.9		
9	7.1			2.6			1.9		
10	6.5			2.8			2.5		
11	6.2			2.6			2.4	--	(t)
12	5.9	2	(t)	2.5			2.5	30	a 0.2
13	5.4			2.4			3.0	--	(t)
14	5.4			2.9			2.6		
15	5.9			2.6			2.5		
16	9.2	--	e .5	2.9	3	(t)	2.4		
17	6.8	5	a .1	2.6			2.3		
18	6.5			2.6			2.3		
19	5.9	--	e .1	2.6			2.2		
20	5.6			2.6			2.2		
21	8.7	--	e .6	2.6			2.2	2	(t)
22	9.7	--	e .5	2.4			2.0		
23	6.2	--	e .3	2.8			2.0		
24	5.4	13	.2	3.2			2.2		
25	5.4	2		3.0			2.2		
26	5.6	--		2.6			2.3		
27	6.8	--		2.4			2.4		
28	5.4	--	(t)	2.5			2.4		
29	4.4	--		2.5			2.4		
30	4.4	2		2.6			2.4		
31	4.6	2		2.2			--	--	--
Total	213.1	--	3.7	86.8		0.6	68.5	--	0.6

Total discharge for year (cfs-days) 3,654.4
Total load for year (tons) 107.9

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

PLATTE RIVER BASIN--Continued

6B-6430. BATES CREEK NEAR ALCOVA, WYO.

LOCATION.--At gaging station, 2.8 miles above mouth and 10.5 miles northeast of Alcova, Natrona County.
DRAINAGE AREA.--377 square miles.
RECORDS AVAILABLE.--Water temperatures: November 1957 to June 1958 (discontinued).
Sediment records: October 1956 to September 1958 (discontinued).
EXTREMES, 1957-58.--Water temperatures: Minimum, freezing point Dec. 10, Jan. 3, Feb. 3, and on several other days during December to February.
Sediment concentrations: Maximum daily, 99,100 ppm June 6; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 33,000 tons Apr. 17; minimum daily, 0 tons on many days.
EXTREMES, 1956-58.--Water temperatures: Minimum, freezing point on several days each year.
Sediment concentrations: Maximum daily, 99,100 ppm June 6, 1958; minimum daily, no flow on many days each year.
Sediment loads: Maximum daily, 33,000 tons Apr. 17, 1958; minimum daily, 0 tons on many days each year.
REMARKS.--Flow affected by ice Nov. 9, 10, 16, Nov. 18 to Dec. 6, Dec. 8-14, 18-20, Dec. 23 to Feb. 10, Feb. 12-15, 18-21, Mar. 12-19. Records of discharge for water year October 1957 to September 1958 given in WSP 1560.

Temperature (° F) of water, water year October 1957 to September 1958
/Once-daily measurement between 2 p.m. and 6 p.m. Many days of no flow/

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

a Measurement between 8 a.m. and 1 p.m.

PLATTE RIVER BASIN--Continued

6B-6430. BATES CREEK NEAR ALCOVA, WYO.--Continued

Suspended sediment, water year October 1957 to September 1958

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.....	0.9	184		3.2			6.5		
2.....	1.0	--		3.2			7.0		
3.....	1.1	--		3.3			7.0		
4.....	1.1	--		3.2			7.5		
5.....	1.4	--		3.3			8.5		
6.....	1.4	348		3.2			8.5		
7.....	1.3	--	e 1	3.3			8.0		
8.....	1.4	--		3.3			8.0		
9.....	1.4	--		3.2			8.0		
10.....	1.5	--		3.7			6.5		
11.....	1.5	272		4.0			7.0		
12.....	1.5	--		4.2	233	2	8.0		
13.....	1.5	--		4.2			8.0		
14.....	2.2	--		4.2			8.0		
15.....	3.5	--		4.3			7.7		
16.....	2.6	--		4.3			7.7	359	7
17.....	2.6	--		4.2			8.7		
18.....	2.6	--		4.0			8.0		
19.....	3.2	--		3.8			7.0		
20.....	3.5	--		3.5			7.5		
21.....	4.0	--		3.2			8.0		
22.....	3.0	378		4.0			8.0		
23.....	3.0	--	e 3	5.0	433	6	6.0		
24.....	3.2	--		7.0	820	15	7.0		
25.....	3.2	--		9.0	1,180	29	7.0		
26.....	3.2	--		9.0	990	24	7.0		
27.....	3.2	--		8.0	920	20	5.0		
28.....	3.2	--		7.0			6.0		
29.....	3.2	--		6.0	252	4	6.0		
30.....	3.2	--		6.0			4.5		
31.....	3.3	--		--	--	--	4.0		
Total.	72.9	--	65	137.8	--	150	221.6		217

Day	January			February			March		
1.....	5.5			5.5			5.0	--	e 6
2.....	5.5			5.5			10		
3.....	5.0			7.0			14		
4.....	5.0			8.0			13		
5.....	5.5			8.0			10		
6.....	5.5			7.0			11		
7.....	5.5			6.0			12	214	7
8.....	6.0			6.0			13		
9.....	6.0			7.0			13		
10.....	6.0			7.0	413	8	11		
11.....	5.0			6.6			10		
12.....	5.0			6.0			9.0		
13.....	5.0			6.0			8.0		
14.....	5.0			6.0			7.0		
15.....	5.5			7.0			6.0		
16.....	6.0	251	4	8.0			5.0	128	2
17.....	6.0			9.4			5.0		
18.....	6.0			11	2,600	77	6.0		
19.....	5.0			15	10,400	421	8.0		
20.....	4.5			30	9,200	745	7.7		
21.....	5.0			20	6,800	367	16	5,600	sa 2,200
22.....	4.5			6.1	3,100	sa 90	121	37,000	sa 17,000
23.....	5.0			5.3	4,100	sa 75	51	48,000	sa 9,100
24.....	5.5			20	13,000	sa 1,100	20	20,200	s 1,500
25.....	5.5			56	10,000	sa 1,800	12	12,500	s 599
26.....	5.5			25	3,400	sa 340	8.4	--	e 150
27.....	5.0			10	1,300	sa 60	5.8	1,100	a 17
28.....	5.0			6.0	340	sa 7	4.5	630	7
29.....	5.0			--	--	--	4.2	370	4
30.....	5.5			--	--	--	4.5	260	3
31.....	5.5			--	--	--	9.0	25,700	s 949
Total.	165.5	--	124	320.4	--	5,218	440.1	--	31,623

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

PLATTE RIVER BASIN--Continued

6B-6430. BATES CREEK NEAR ALCOVA, WYO.--Continued

Suspended sediment, water year October 1957 to September 1958--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	3.2	2,300	sa 30	7.7	54	1	0.3	--	
2	2.2	850	sa 6	15	263	s 14	.2	--	
3	1.8	440	2	32	413	s 40	.1	17	(t)
4	2.0	151	1	55	792	s 130	.1	--	
5	2.0	125	1	79	890	190	.1	--	
6	2.2	320	a 2	98	700	185	30	99,100	s 13,900
7	1.9	300	a 2	113	700	214	1.2	2,110	s 22
8	3.0	2,000	sa 19	146	970	382	.5	218	
9	2.9	2,540	20	170	710	326	.4	--	
10	4.2	7,000	s 139	147	490	194	.3	132	
11	3.2	2,790	s 31	126	490	167	.2	--	
12	3.5	6,820	s 71	102	400	110	.1	--	
13	7.5	15,500	s 458	86	420	98	.1	146	
14	7.2	22,100	s 662	84	--	e 90	.1	--	
15	28	25,600	s 2,670	86	337	78	.1	--	(t)
16	124	39,100	s 12,600	70	--	e 50	.1	--	
17	286	41,000	a 33,000	51	--	e 30	.1	--	
18	310	16,000	a 13,000	34	--	e 10	.2	--	
19	292	6,390	s 5,860	24	84	5	.1	--	
20	150	1,480	599	18	87	4	.1	--	
21	110	1,130	336	14	83	3	.1	270	
22	84	790	179	11	82	2	7.2	16,500	s 631
23	68	--	e 120	12	8,220	s 320	.1	480	
24	46	--	e 75	5.2	2,130	s 58	.1	--	
25	50	510	69	5.1	28,500	s 670	.1	--	(t)
26	37	260	26	2.5	5,020	s 48	.1	--	
27	26	224	16	1.0	285	1	.1	--	
28	17	122	6	.8	121		.1	--	
29	11	90	3	.6	--	(t)	0	--	0
30	9.0	80	2	.5	--		0	--	0
31	--	--	--	.4	--		--	--	--
Total	1,694.8	--	70,005	1,596.8	--	3,421	42.3	--	14,555

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	0		0	0	--	0	0.1		
2	0		0	0	--	0	.1		
3	.1		(t)	0	--	0	.1		
4	.1		(t)	0	--	0	.1		(t)
5	0		0	0	--	0	.1		
6	0		0	0	--	0	.1		
7	0		0	0	--	0	.1		
8	0		0	0	--	0	0		0
9	0		0	0	--	0	0		0
10	0		0	0	--	0	0		0
11	0		0	20	98,500	s 11,200	0		0
12	0		0	.2	--	e 17	0		0
13	0		0	0	--	0	0		0
14	0		0	0	--	0	0		0
15	0		0	0	--	0	0		0
16	0		0	0	--	0	0		0
17	.1			0	--	0	0		0
18	.1			0	--	0	0		0
19	.1		(t)	.2	--	e 320	0		0
20	.1			5.0	--	e 1,100	.1		
21	0		0	.1	--	(t)	.1		(t)
22	0		0	.1	--	(t)	.1		
23	0		0	5.0	35,000	sa 900	0		0
24	0		0	1.0	--	e 3	.1		
25	0		0	.5			.1		
26	0		0	.3			.1		
27	0		0	.2			.1		(t)
28	0		0	.2	--	(t)	.1		
29	0		0	.1			.1		
30	0		0	.1			.1		
31	0		0	.1			--		--
Total	0.6		1	33.1	--	13,542	1.7		1

Total discharge for year (cfs-days) 4,727.6
Total load for year (tons) 138,922

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

6B-6430. BATES CREEK NEAR ALCOVA, WYO.--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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. 19, 1958....	3:45 p.m.	10	44	1,700	2,530	--	46		72		96	99	100		--	--	VBWCM
Feb. 19	5:20 p.m.	e 15	39	12,700	4,390	--	57		85		99	100	--		--	--	VPWCM
Feb. 19	8:00 p.m.	e 20	34	24,900	4,710	--	48		75		98	100	--		--	--	VPWCM
Feb. 19	10:30 p.m.	e 25	34	29,100	4,480	--	50		78		99	100	--		--	--	VPWCM
Feb. 24	9:40 a.m.	9.0	38	16,000	2,820	--	85		100		--	--	--		--	--	PWCM
Feb. 24	4:30 p.m.	34	36	16,000	5,350	--	65		89		99	100	--		--	--	VPWCM
Feb. 25	4:20 p.m.	86	37	11,000	3,500	--	50		68		91	98	100		--	--	VPWCM
Mar. 21.....	5:30 p.m.	20	48	595	2,300	--	24		48		93	100	--		--	--	VPWCM
Mar. 22.....	1:30 p.m.	150	38	27,600	4,210	--	42		61		91	98	99		100	--	VPWCM
Mar. 23.....	12:20 p.m.	64	41	33,600	3,500	0	2		71		89	92	93		95	99	VPN
Mar. 23.....	12:20 p.m.	64	41	33,600	3,890	32	43		66		89	92	93		95	99	VPWC
Mar. 31.....	1:15 p.m.	12	45	64,600	3,490	--	68		97		100	--	--		--	--	PWCM
Apr. 12	6:10 p.m.	3.6	47	5,960	4,450	--	85		100		--	--	--		--	--	PWCM
Apr. 16	3:40 p.m.	180	55	31,000	2,970	--	39		62		94	99	100		--	--	VPWCM
Apr. 16	5:15 p.m.	208	52	19,800	3,950	--	43		65		93	99	100		--	--	VPWCM
Apr. 17	1:05 p.m.	302	52	19,000	3,220	--	38		57		87	95	97		98	100	VPWCM
Apr. 17	5:00 p.m.	383	54	8,700	2,940	--	41		60		89	97	100		--	--	VPWCM
May 23.....	12:40 p.m.	14	63	18,500	3,360	--	81		99		100	--	--		--	--	PWCM
May 25.....	1:40 p.m.	6.4	74	75,200	5,390	--	71		98		100	--	--		--	--	PWCM
June 6.....	6:00 a.m.	68	52	146,000	2,970	--	59		83		99	100	--		--	--	VPWCM
June 6.....	7:30 p.m.	5.8	67	40,600	4,210	--	83		100		--	--	--		--	--	PWCM

e Estimated.

PLATTE RIVER BASIN--*Continued*

6B-6435. NORTH PLATTE RIVER NEAR GOOSE EGG, WYO.

LOCATION.--At gaging station, 0.3 mile downstream from Cottonwood Creek, 2½ miles downstream from Poison Spring Creek, 4 miles southwest of Goose Egg, Natrona County, and 13 miles southwest of Casper.
DRAINAGE AREA.--11,500 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: October 1950 to August 1951, October 1957 to September 1958.
Water temperatures: June 1950 to September 1952, April to September 1953, August 1956 to September 1958.
Sediment records: June 1950 to September 1953, August 1956 to September 1958 (discontinued).
EXTREMES, 1957-58.--Dissolved solids: Maximum, 1,710 ppm Jan. 1; minimum, 269 ppm June 1-15.
Hardness: Maximum, 740 ppm Jan. 1; minimum, 156 ppm June 1-15.
Specific conductance: Maximum daily, 2,030 micromhos Nov. 22; minimum daily, 413 micromhos May 27, 28.
Water temperatures: Maximum, 71°F Aug. 6, 8; minimum, freezing point on many days during November to March.
Sediment concentrations: Maximum daily, 28,000 ppm Mar. 22; minimum daily, not determined.
Sediment loads: Maximum daily, 36,100 tons Apr. 17; minimum daily, not determined.
EXTREMES, 1950-53, 1956-58.--Water temperatures (1950-52, 1956-58): Minimum, freezing point on many days during winter months each year.
Sediment concentrations: Maximum daily, 28,000 ppm Mar. 22, 1958; minimum daily, 1 ppm Oct. 5, 9, 1952.
Sediment loads: Maximum daily, 191,000 tons May 29, 1953; minimum daily, less than 0.50 ton on several days during 1951-53, 1956-57.
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. 21-23, Nov. 27 to Dec. 5, Dec. 8, 11, 12, 21, 22, Dec. 24 to Feb. 3. Records of discharge for water year October 1957 to September 1958 given in WSP 1560.

Chemical analyses, in parts per million, water year October 1957 to September 1958

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. 1-26, 1957	55.5	10	0.00	149	45	150	6.0	174	630	35	0.5	9.0	0.26	1,190	1,120	1.62	178	555	412	37	2.8	1,540	7.5	6
Oct. 27-Nov. 20	34.6	15	.02	184	52	176	6.8	207	770	40	.6	13	.19	1,450	1,360	1.97	135	673	503	36	2.9	1,830	7.7	5
Nov. 21-Dec. 31	30.7	17	.00	201	58	188	7.4	228	825	45	.5	15	.24	1,600	1,470	2.18	133	738	551	35	3.0	1,910	7.7	5
Jan. 1, 1958	58	18	.00	203	57	200	7.8	204	890	45	.5	12	.16	1,710	1,530	2.33	268	740	573	37	3.2	1,950	7.7	10
Jan. 2	140	18	.01	97	3.6	71	4.5	156	225	29	.5	3.7	.18	534	--	.73	203	257	129	37	1.9	780	7.7	5
Jan. 3	950	13	.00	50	13	28	3.6	146	111	9.5	.4	1.4	.21	341	--	.46	867	180	60	25	.9	483	8.0	5
Jan. 4-5	315	15	.01	75	22	52	4.5	174	225	13	.3	4.4	.20	520	--	.71	444	276	133	29	1.4	736	7.7	5
Jan. 6-11	69.3	14	.00	127	35	107	5.7	212	450	20	.4	8.0	.11	938	--	1.28	176	460	286	33	2.2	1,210	7.8	5
Jan. 12-31	33.0	15	.00	175	49	146	6.8	232	670	38	.5	12	.08	1,340	1,230	1.82	119	636	446	33	2.5	1,650	7.9	5
Feb. 1-18	32.1	14	.01	175	47	140	6.6	217	678	39	.5	9.7	.18	1,310	1,220	1.78	113	628	450	32	2.4	1,630	7.9	7
Feb. 19-25	44.3	13	.01	149	41	118	6.2	189	582	26	.4	8.1	.14	1,120	1,040	1.52	134	540	385	32	2.2	1,400	7.7	9
Feb. 26-Mar. 1	38.2	13	.00	129	35	114	6.3	177	507	23	.4	.9	.13	955	--	1.30	99	466	321	34	2.3	1,260	7.6	14
Mar. 2-12	33.5	14	.00	171	48	152	6.9	215	683	31	.4	8.0	.15	1,270	1,220	1.73	115	623	447	34	2.6	1,620	7.7	12
Mar. 13-17	34.4	14	.00	181	52	162	6.7	211	755	45	.6	8.5	.17	1,410	1,330	1.92	131	666	493	34	2.7	1,780	7.7	6
Mar. 18-22	52.4	21	.06	169	45	126	9.0	219	642	36	.5	5.6	.19	1,230	1,160	1.67	174	608	428	31	2.2	1,550	7.9	12
Mar. 23-28	53.5	15	.00	--	--	102	7.3	169	502	26	.5	5.4	.13	957	--	1.30	138	468	329	32	2.0	1,260	7.6	11
Mar. 29-Apr. 1	36.0	14	.03	151	39	138	6.5	192	616	33	.5	7.1	.18	1,150	1,100	1.56	111	538	381	35	2.6	1,500	7.8	12
Apr. 2	249	14	.04	131	33	107	6.2	169	490	46	.6	4.0	.15	964	--	1.31	647	464	325	33	2.2	1,300	7.8	6
Apr. 3-4	304	14	.02	60	15	40	3.9	155	157	11	.4	1.4	.07	398	--	.54	326	210	83	29	1.2	583	8.0	11

Apr. 5-8	926	14	.00	52	14	32	3.5	154	120	8.5	.4	1.1	.05	338	--	.46	845	189	63	26	1.0	504	7.7	13
Apr. 9-10	2,200	15	.00	52	13	31	3.5	158	113	7.9	.4	.5	.03	328	--	.45	1,960	185	55	26	1.0	492	7.9	11
Apr. 11-30	3,960	13	.01	48	13	28	3.5	145	103	7.7	.4	1.3	.11	301	--	.41	3,220	175	56	25	.9	463	7.3	11
May 1-31	4,077	12	.01	42	13	25	2.9	133	92	6.8	.4	.3	.05	276	--	.38	3,070	157	48	25	.9	422	7.4	8
June 1-15	4,065	12	.03	42	12	25	3.3	134	92	6.5	.4	.5	.07	269	--	.37	2,980	156	46	25	.9	419	7.4	11
June 16	4,220	13	--	57	14	28	3.8	164	111	4.8	.4	.8	.04	330	--	.45	3,770	198	64	23	.9	498	7.5	--
June 17-30	4,158	12	.01	43	13	25	3.0	135	93	6.4	.4	.7	.06	276	--	.38	3,130	160	49	25	.9	427	7.5	13
July 1-29	4,156	12	.00	44	14	26	3.0	140	95	8.0	.5	.4	.05	287	--	.39	3,210	168	53	25	.9	439	6.9	12
July 30	4,220	13	.02	78	16	30	3.6	216	131	9.5	.7	.2	.07	392	--	.53	4,440	261	84	20	.8	583	7.1	17
July 31-Aug. 22	3,914	12	.02	45	14	26	3.5	144	96	7.7	.4	.6	.07	300	--	.41	3,180	171	53	24	.9	449	7.0	8
Aug. 23-31	1,181	12	.02	55	17	35	3.7	158	135	9.9	.4	.9	.08	363	--	.49	1,150	207	77	26	1.1	548	7.0	7
Sept. 1-22	601	11	.01	56	19	41	3.9	153	165	12	.4	3.3	.08	405	--	.55	656	218	93	29	1.2	606	7.3	8
Sept. 23-30	2,396	12	.02	47	16	30	3.9	148	116	8.7	.4	2.4	.06	316	--	.43	2,040	182	61	26	1.0	492	6.8	8
Weighted average a	1,656	12	0.01	46	14	28	3.3	141	106	7.8	0.4	0.8	0.07	304	--	0.41	1,350	172	57	26	0.9	461	--	--

a Represents 100 percent of runoff for water year October 1957 to September 1958.

PLATTE RIVER BASIN--Continued

6B-6435. NORTH PLATTE RIVER NEAR GOOSE EGG, WYO.--Continued

Temperature (° F) of water, water year October 1957 to September 1958
/Once-daily measurement between 5 p.m. and 8 p.m./

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

a Measurement between 9 p.m. and 11 p.m.

PLATTE RIVER BASIN--Continued

6B-6435. NORTH PLATTE RIVER NEAR GOOSE EGG, WYO.--Continued

Suspended sediment, water year October 1957 to September 1958

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	70			37	--		26	27	
2	79			37	--		25	--	
3	68			39	39		24	13	
4	61			37	--		26	--	
5	61			39	28		28	--	
6	59			35	--		39	--	
7	57	22	3	36	--		37	--	
8	55			36	--		36	--	
9	54			34	--		39	141	
10	49			33	40		36	--	
11	47			33	--		33	--	
12	47			33	--		35	--	
13	49			33	--		35	--	
14	57	100	sa 17	33	--		35	--	
15	63	104	18	32	--	e 3	35	46	
16	72	80	16	32	--		36	--	e 6
17	54			33	49		36	--	
18	47			30	22		34	--	
19	52			30	--		27	--	
20	49	66	9	27	--		26	--	
21	54			26	--		25	--	
22	55			27	--		25	62	
23	47	--		27	--		24	--	
24	47	--		29	--		30	--	
25	46	--		29	29		29	--	
26	44	--		32	--		33	--	
27	39	20	e 2	28	--		31	--	
28	39	--		27	--		36	--	
29	37	--		27	--		33	105	
30	35	--		28	--		32	--	
31	36	--		--	--	--	32	--	
Total	1,629	--	162	959	--	90	978	--	186

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	58	40	6	32	--		28		
2	140	420	159	33	34		30		
3	950	102	262	36	--		35		
4	450	20	24	37	12		33		
5	180	22	11	35	--		29		
6	80			33	--		32		
7	90			34	--		33		
8	75	20	4	33	--		30		
9	65			30	39		35		
10	56			26	--	e 3	42		
11	50			27	--		36	67	6
12	45	23	2	34	--		34		
13	31			32	--		34		
14	24			27	--		33		
15	36	--		29	--		34		
16	35	--		33	47		35		
17	33	--		33	--		36		
18	31	--		34	--		35		
19	30	37		40	--		34		
20	29	--		54	--	e 15	34		
21	29	--		57	--	e 17	34		
22	31	--	e 2	37	--		125	28,000	sa 11,000
23	30	--		29	106	e 9	72	5,440	1,060
24	31	--		30	--		55	402	60
25	33	--		59	--	e 18	47	342	43
26	35	14		61	--	e 20	55	272	40
27	36	--		35	--	e 10	52	208	29
28	37	--		29	--	e 7	40	214	23
29	36	--		--	--	--	33	122	11
30	35	--		--	--	--	30	112	9
31	33	--		--	--	--	35	140	13
Total	2,854	--	524	1,009	--	171	1,250	--	12,414

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

PLATTE RIVER BASIN--Continued

6B-6435. NORTH PLATTE RIVER NEAR GOOSE EGG, WYO.--Continued

Suspended sediment, water year October 1957 to September 1958--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	46	140	17	3,960			4,040		
2	249	1,120	753	3,980			4,040		
3	284	580	445	3,990			4,040	39	425
4	323	822	s 788	4,000			4,040		
5	758	1,210	2,480	4,050			4,050		
6	780	460	969	4,070			4,100	850	a 9,400
7	908	590	s 1,600	4,120	92	1,010	4,050	132	1,440
8	1,260	640	2,180	4,140			4,040		
9	1,600	921	s 5,010	4,160			4,050		
10	2,800	810	6,120	4,140			4,050		
11	3,190	625	s 5,700	4,130			4,090	42	463
12	3,900	480	5,050	4,090			4,080		
13	3,900	310	3,260	4,080			4,120		
14	3,880	220	2,300	4,200	174	1,970	4,100		
15	3,910	1,360	14,400	4,160	147	1,650	4,090		
16	3,910	893	9,430	4,130			4,220	666	s 8,120
17	4,270	3,130	36,100	4,120			4,140	242	2,710
18	4,250	1,880	21,600	4,120			4,170	97	1,090
19	4,200	980	11,100	4,100			4,170		
20	4,040	352	3,840	4,080			4,180		
21	4,000	330	3,560	4,080			4,170		
22	3,990	158	1,700	4,080			4,170		
23	4,000	150	1,620	4,070			4,160		
24	3,980	141	1,520	4,050	68	747	4,170	62	696
25	3,990	136	1,470	4,050			4,170		
26	3,990	130	1,400	4,070			4,160		
27	3,970			4,040			4,140		
28	3,940	90	960	4,030			4,140		
29	3,940			4,030			4,130		
30	3,940			4,040			4,140		
31	--	--	--	4,040			--	--	--
Total	88,198	--	148,252	126,400	--	28,702	123,410	--	36,941

Day	July			August			September		
1	4,130	60	669	4,130	130	1,450	552		
2	4,130			4,270	131	1,510	575		
3	4,140			4,900	152	2,010	575		
4	4,170	145	1,630	5,000	128	1,730	585		
5	4,140	68	760	5,000	118	1,590	595		
6	4,160			4,980	108	1,450	595		
7	4,160			4,790	95	1,230	605		
8	4,160			4,140			605		
9	4,160			4,160	75	844	605		
10	4,160			4,200			615		
11	4,140			4,220	750	a 8,500	610	46	74
12	4,140			4,180	300	3,390	600		
13	4,130			4,170	64	721	600		
14	4,170			4,040	51	556	600		
15	4,170			3,680	62	616	610		
16	4,140			3,680	50	497	615		
17	4,160			3,670	42	416	610		
18	4,140	43	483	3,360	39	354	605		
19	4,160			2,730	65	a 480	600		
20	4,180			2,410	400	a 2,600	605		
21	4,170			2,240	116	702	605		
22	4,170			1,910	82	423	650	36	sa 75
23	4,160			1,940	700	a 3,700	1,880	240	a 1,200
24	4,170			1,780	320	1,540	1,930	123	641
25	4,170			1,420	72	276	2,270	156	956
26	4,170			982	72	191	2,950	218	1,740
27	4,170			824	70	156	2,920	150	1,180
28	4,160			1,060	84	240	2,010	86	s 496
29	4,140			1,060	72	206	2,130	114	s 784
30	4,220	610	s 7,320	996	66	177	3,080	160	1,330
31	4,170	950	a 11,000	566	59	90	--	--	--
Total	128,910	--	34,309	96,488	--	39,333	32,387	--	9,956

Total discharge for year (cfs-days) 604,472
Total load for year (tons) 311,040

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

6B-6435. NORTH PLATTE RIVER NEAR GOOSE EGG, WYO.--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time	Discharge (cfs)	Water temperature (° F)	Suspended sediment											Methods of analysis
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters									
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
Jan. 2, 1958.....	2:20 p.m.	e 1,000	32	1,030	2,770		38		47		88	91	92		96	100	VPWCM
Jan. 3	12:05 p.m.	323	32	109	--		--		--		--	90	92		96	100	VM
Mar. 22.....	6:15 p.m.	141	44	26,700	5,130		76		99		100	--	--		--	--	PWCM
Apr. 2.....	10:40 a.m.	270	43	1,260	3,040		--		99		100	--	--		--	--	PN
Apr. 2.....	10:40 a.m.	270	43	1,260	3,140	54	71		96		100	--	--		--	--	PWC
Apr. 7.....	2:30 p.m.	802	48	323	816		54		82		100	--	--		--	--	BWCM
Apr. 13.....	10:25 a.m.	3,910	40	247	1,130		45		62		87	93	95		97	100	VBWCM

e Estimated.

PLATTE RIVER BASIN--Continued

6B-6450. NORTH PLATTE RIVER BELOW CASPER, WYO.

LOCATION.--At gaging station, 0.3 mile upstream from Claude Creek, half a mile north of U.S. Highways 20 and 87, 5½ miles east of city hall in Casper, Natrona County, and 9½ miles downstream from Casper Creek.
DRAINAGE AREA.--12,600 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: October 1950 to August 1952, August 1957 to September 1958.
Water temperatures: June 1949 to September 1952, August 1957 to September 1958.
Sediment records: April 1947 to September 1952.
EXTREMES, August 1957 to September 1958.--Dissolved solids: Maximum, 1,700 ppm Apr. 1-2; minimum, 282 ppm June 2-5.
Hardness: Maximum, 720 ppm Jan. 1-2; minimum, 162 ppm June 2-5.
Specific conductance: Maximum daily, 2,360 micromhos Nov. 29; minimum daily, 434 micromhos May 24.
Water temperatures: Maximum, 71°F Aug. 16, 1958; minimum, freezing point on several days during November, February, and March.
EXTREMES, 1949-52, 1957-58.--Water temperatures: Maximum, 76°F July 3, 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 1957 to September 1958 given in WSP 1560.

Chemical analyses, in parts per million, August 1957 to September 1958

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									
Aug. 9-Sept. 2, 1957 a	4,903	14	0.00	52	15	33	3.3	160	119	9.4	0.3	0.3	0.09	332	--	0.45	4,400	190	59	27	1.0	511	7.6	7
Sept. 3-19 a	2,439	14	.01	55	15	35	3.5	167	122	9.7	.3	.3	.10	350	--	.48	2,300	200	63	27	1.1	531	7.4	8
Sept. 20-25 a	243	14	.00	89	35	99	4.5	209	356	26	.4	1.9	.17	747	--	1.02	490	367	196	37	2.3	1,060	7.4	12
Sept. 26-30 a	139	8.1	.01	110	43	152	5.6	201	521	35	.4	3.9	.22	1,020	978	1.39	383	452	287	42	3.1	1,360	7.4	5
Oct. 1-20	101	5.3	.02	129	56	188	5.6	209	655	51	.7	9.9	.21	1,280	1,200	1.74	348	552	381	42	3.5	1,680	7.4	8
Oct. 21-Nov. 21	83.2	7.9	.02	153	63	226	6.4	235	755	72	.5	20	.24	1,520	1,420	2.07	342	640	447	43	3.9	1,980	7.5	5
Nov. 22-Dec. 31	49.2	5.5	.02	167	72	217	5.9	260	830	92	.5	24	.15	1,580	1,540	2.15	210	712	499	40	3.4	2,050	7.9	5
Jan. 1-2, 1958	46.0	9.8	.02	181	65	243	7.2	280	830	104	.4	28	.10	1,650	1,610	2.24	204	720	490	42	3.9	2,150	8.0	5
Jan. 3	694	17	.02	145	40	133	6.4	208	535	54	.6	7.8	.21	1,100	1,040	1.50	2,060	528	357	35	2.5	1,450	8.0	5
Jan. 4	330	13	.02	61	14	50	4.3	156	165	16	.5	4.2	.17	427	--	.58	380	208	80	34	1.5	645	7.7	5
Jan. 5-7	125	12	.02	81	25	90	4.7	180	283	27	.4	9.8	.14	630	--	.86	213	304	156	39	2.2	905	7.6	10
Jan. 8-11	101	12	.02	109	40	133	6.1	250	430	43	.4	12	.20	918	--	1.25	250	438	233	39	2.8	1,290	7.1	5
Jan. 12-20	54.2	12	.03	143	50	170	6.4	246	600	72	.4	20	.21	1,320	1,200	1.80	194	564	362	39	3.1	1,690	7.4	5
Jan. 21-31	57.7	13	.04	161	57	200	7.0	260	690	83	.6	19	.26	1,410	1,360	1.92	219	636	423	40	3.5	1,860	7.6	5
Feb. 1-Mar. 6	60.5	10	.04	153	57	196	6.4	236	705	72	.5	18	.27	1,380	1,330	1.88	226	614	420	41	3.4	1,840	7.9	10
Mar. 7-31	77.6	9.5	.04	157	60	200	6.8	226	780	75	.6	20	.28	1,500	1,420	2.04	314	638	453	40	3.4	1,960	7.8	10
Apr. 1-2	79.0	9.1	.03	148	74	276	7.1	234	925	60	.5	24	.33	1,700	1,640	2.31	363	673	481	47	4.6	2,170	7.9	14
Apr. 3	285	11	.04	148	59	200	6.3	224	758	53	.5	17	.24	1,440	1,360	1.96	1,110	613	429	41	3.5	1,870	7.9	15
Apr. 4	330	13	.06	125	38	135	6.5	183	511	52	.5	9.6	.13	1,020	981	1.39	910	467	317	38	2.7	1,390	7.8	9

Apr. 5	544	16	.06	83	24	69	4.3	204	259	22	.4	1.9	.11	600	--	.82	885	304	137	33	1.7	872	8.0	15
Apr. 6-9	1,035	14	.00	62	19	48	3.7	175	175	13	.4	2.5	.06	431	--	.59	1,210	232	88	31	1.4	648	7.6	10
Apr. 10-11	1,915	15	.00	58	17	37	3.5	175	142	10	.4	1.4	.05	372	--	.51	2,950	213	69	27	1.1	568	7.7	12
Apr. 12-30	4,235	13	.01	52	14	31	3.4	153	113	8.9	.4	.7	.06	327	--	.44	3,690	188	63	26	1.0	498	7.2	7
May 1-June 1	4,238	12	.01	44	14	28	3.3	138	97	7.6	.4	.9	.05	288	--	.39	3,280	166	53	26	.9	446	7.2	11
June 2-5	4,152	12	.01	43	13	25	2.8	137	97	6.9	.4	.3	.06	282	--	.38	3,130	162	50	25	.9	437	7.3	9
June 6	4,240	16	--	67	17	31	4.3	196	126	6.3	.5	1.2	.06	382	--	.52	4,370	235	74	22	.9	568	7.4	--
June 7-30	4,212	12	.01	45	13	29	3.0	142	100	6.8	.4	.3	.06	294	--	.40	3,340	168	52	27	1.0	451	7.2	14
July 1-30	4,286	12	.00	46	14	27	3.2	146	104	8.3	.5	.2	.07	303	--	.41	3,480	174	54	25	.9	459	6.8	15
July 31-Aug. 19	4,330	12	.02	49	15	30	3.9	155	102	8.7	.4	.3	.07	315	--	.43	3,690	183	56	26	1.0	479	6.9	9
Aug. 20-31	1,633	12	.02	63	19	39	4.3	175	155	12	.4	.8	.11	414	--	.56	1,810	234	90	26	1.1	612	7.0	8
Sept. 1-23	661	7.8	.02	64	24	56	4.1	167	215	16	.2	2.3	.09	487	--	.66	865	257	120	32	1.5	727	6.9	6
Sept. 24-30	2,466	13	.02	52	16	34	3.7	156	128	9.2	.3	2.0	.07	346	--	.47	2,300	197	69	27	1.1	530	6.9	6
Weighted average b	1,726	12	0.01	50	15	34	3.5	150	122	9.7	0.4	1.0	0.07	338	--	0.46	1,570	186	64	28	1.1	509	--	--

a Not included in weighted average.
b Represents 100 percent of runoff for water year October 1957 to September 1958.

PLATTE RIVER BASIN--Continued

6B-6450. NORTH PLATTE RIVER BELOW CASPER, WYO.--Continued

Temperature (° F) of water, August to September 1957
/Once-daily measurement between 3 p.m. and 7 p.m./

Day	Aug.	Day	Aug.	Day	Sept.	Day	Sept.
2	--	17	66	1	68	16	60
3	--	18	--	2	65	17	60
4	--	19	67	3	67	18	60
5	--	20	69	4	67	19	55
6	--	21	69	5	67	20	56
7	--	22	--	6	66	21	54
8	--	23	--	7	68	22	63
9	--	24	--	8	64	23	59
10	67	25	69	9	64	24	63
11	67	26	67	10	65	25	62
12	--	27	68	11	63	26	64
13	68	28	65	12	64	27	63
14	68	29	--	13	63	28	65
15	67	30	68	14	63	29	63
16	69	31	66	15	--	30	60
Average							63

Temperature (° F) of water, water year October 1957 to September 1958
/Once-daily measurement between 3 p.m. and 7 p.m./

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

a Measurement between 6 a.m. and 9 a.m.

6B-6560. 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 1958 (discontinued).
Water temperatures: October 1951, April to September 1952, March to September 1953, May 1954 to September 1958 (discontinued).
Sediment records: April 1947 to June 1953.
EXTREMES, 1957-58.--Dissolved solids: Maximum, 673 ppm Apr. 24 to May 6; minimum, 311 ppm July 21-31.
Hardness: Maximum, 323 ppm Apr. 24 to May 6; minimum, 179 ppm July 11-31.
Specific conductance: Maximum daily, 1,110 micromhos Apr. 26; minimum daily, 466 micromhos Aug. 1.
Water temperatures: Maximum, 75°F July 12, 13; minimum, 36°F Nov. 21, Dec. 7.
EXTREMES, 1951-58.--Dissolved solids: Maximum (1954-58), 1,010 ppm Mar. 1-5, 1957; minimum, 226 ppm June 27, 1955.
Hardness: Maximum (1954-58), 470 ppm Mar. 1-5, 1957; minimum, 132 ppm June 27, 1955.
Specific conductance: Maximum daily (1954-58), 1,430 micromhos Mar. 1, 1957; minimum daily, 354 micromhos June 27, 1955.
Water temperatures (1954-58): Maximum, 90°F Aug. 20, 1955; minimum, freezing point on many 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 1957 to September 1958 given in WSP 1560.

Chemical analyses, in parts per million, water year October 1957 to September 1958

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. 1-12, 1957...	12.1	--	--	--	--	51	--	162	172	--	--	--	--	419	0.57	14	218	85	34	1.5	638	7.6	--
Oct. 13-18	11.0	--	--	--	--	62	--	185	206	--	--	--	--	492	.67	15	251	99	35	1.7	734	7.8	--
Oct. 19-Nov. 30 ..	10.2	--	--	--	--	68	--	204	--	--	--	--	--	558	.76	15	281	114	34	1.8	816	7.8	--
Dec. 1-31.....	11.0	12	0.01	75	25	71	5.4	210	234	20	0.6	0.6	0.10	558	.76	17	289	117	34	1.8	831	7.8	--
Jan. 1-31, 1958...	12.5	--	--	--	--	72	--	214	--	--	--	--	--	577	.78	19	296	121	35	1.8	852	7.8	--
Feb. 1-28.....	13.0	--	--	--	--	74	--	212	--	--	--	--	--	570	.78	20	304	130	35	1.8	866	7.7	--
Mar. 1-31.....	14.0	9.5	.01	73	27	75	5.3	210	247	19	.4	.6	.12	580	.79	22	294	122	35	1.9	854	8.0	7
Apr. 1-23.....	560	--	--	--	--	70	--	194	--	--	--	--	--	572	.78	866	287	128	35	1.8	832	7.4	--
Apr. 24-May 6....	953	--	--	--	--	88	--	196	--	--	--	--	--	673	.92	1,740	323	162	37	2.1	964	7.5	--
May 7-12.....	965	--	--	--	--	75	--	179	--	--	--	--	--	589	.80	1,530	288	141	36	1.9	860	7.1	--
May 13-20.....	1,549	--	--	--	--	66	--	172	--	--	--	--	--	521	.71	2,180	261	120	35	1.8	775	7.4	--
May 21-28.....	3,055	--	--	--	--	48	--	159	--	--	--	--	--	432	.59	3,580	225	95	32	1.4	645	7.4	--
May 29-June 30 ...	2,168	12	.01	52	16	39	3.9	150	135	11	.3	.4	.10	360	.49	2,110	194	71	30	1.2	543	7.3	10
July 1-10.....	4,353	--	--	--	--	30	--	154	--	--	--	--	--	315	.43	3,710	181	55	27	1.0	481	7.6	--
July 11-20.....	4,818	--	--	--	--	29	--	159	--	--	--	--	--	312	.42	4,020	179	49	26	.9	474	7.9	--
July 21-31.....	4,425	--	--	--	--	29	--	158	--	--	--	--	--	311	.42	3,690	179	49	26	.9	474	7.8	--
Aug. 1-31.....	4,824	--	--	--	--	30	--	156	--	--	--	--	--	316	.43	4,120	180	52	27	1.0	479	7.4	--
Sept. 1-30.....	3,240	--	--	--	--	32	--	165	--	--	--	--	--	347	.47	3,020	197	62	26	1.0	521	7.2	--
Weighted average [a]	1,449	--	--	--	--	36	--	160	--	--	--	--	--	355	0.48	1,380	196	65	29	1.1	535	--	--

a Represents 100 percent of runoff for water year October 1957 to September 1958.

PLATTE RIVER BASIN--Continued

6B-6560. NORTH PLATTE RIVER BELOW GUERNSEY RESERVOIR, WYO.--Continued

Temperature (° F) of water, water year October 1957 to September 1958
/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	67	51	43	37	41	43	60	55	65	74	68	65
2	65	45	41	37	44	44	60	55	65	74	69	63
3	64	42	43	37	--	45	62	55	65	73	69	62
4	60	45	39	39	39	47	59	59	65	70	71	62
5	60	45	43	40	44	50	50	58	67	72	70	62
6	63	41	41	37	48	52	52	56	65	72	69	62
7	55	40	36	41	41	50	52	58	65	74	69	64
8	53	41	41	41	39	55	50	58	65	74	69	64
9	53	40	43	42	42	48	50	59	65	72	--	63
10	60	40	43	43	43	52	49	60	65	74	--	63
11	59	40	40	42	39	49	49	60	65	71	69	62
12	53	41	43	43	43	48	49	60	67	75	70	62
13	55	40	39	42	43	50	53	62	67	75	70	63
14	56	43	39	42	39	52	53	63	67	74	69	63
15	53	43	42	43	40	52	--	63	71	73	68	59
16	57	41	46	43	43	49	--	65	67	69	69	62
17	59	41	46	44	39	52	--	65	71	69	67	59
18	58	41	44	40	41	52	55	65	71	70	67	59
19	55	40	41	40	45	52	55	65	71	69	67	55
20	53	37	43	43	49	52	59	66	70	69	67	55
21	52	36	42	41	50	53	55	67	71	69	65	55
22	52	37	42	40	53	53	57	65	72	70	69	55
23	45	40	40	43	50	53	56	65	72	69	65	55
24	41	43	41	40	57	55	56	65	72	68	67	55
25	43	43	40	40	54	49	56	65	71	70	65	54
26	52	39	40	44	53	50	55	65	71	69	65	50
27	52	39	39	43	42	55	55	65	71	68	65	53
28	52	40	39	43	43	50	55	65	73	69	68	53
29	51	39	40	45	--	60	55	67	74	68	67	50
30	55	43	39	40	--	60	55	67	74	69	65	--
31	53	--	37	43	--	60	--	67	--	68	65	--
Average	55	41	41	41	45	51	55	62	69	71	68	59

6B-6698.5 CHUGWATER CREEK NEAR UVA, WYO.

LOCATION.--Lat 42°07'12", long 104°51'05", in SE¼SE¼ sec. 23, T. 25 N., R. 67 W., at bridge on county road, half a mile above mouth and 3½ miles east of Uva, Platte County.
RECORDS AVAILABLE.--Chemical analyses: May to September 1958.
REMARKS.--No discharge records available for this station.

Chemical analyses, in parts per million, May to September 1958

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180° C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate					
May 14, 1958.....	41.1	32	0.01	65	42	70	7.5	312	196	19	0.7	4.5	0.13	616	0.84	68	333	77	31	1.7	892	7.8	17
June 18.....	12.9	40	.01	101	27	63	7.0	328	192	19	.6	3.9	.11	628	.85	22	362	93	27	1.4	913	7.5	5
July 10	32.2	37	.01	105	25	54	6.7	320	194	19	.6	6.9	.10	630	.86	55	364	102	24	1.2	909	7.6	5
Aug. 4	16.4	37	.02	103	26	64	6.5	320	204	18	.7	5.0	.12	636	.86	28	365	103	27	1.5	903	7.7	4
Sept. 3	19.1	36	.00	104	27	63	6.5	a 339	204	21	.8	3.9	.10	638	.87	33	369	91	27	1.4	907	8.5	5
Sept. 30	19.7	36	.02	103	27	65	7.3	326	203	20	.6	5.3	.13	642	.87	34	368	101	27	1.5	911	7.8	3

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

PLATTE RIVER BASIN--Continued

6B-6700. 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.--Chemical analyses: October 1956 to June 1957, September 1957, May to September 1958.
Water temperatures: October 1952 to September 1957.
Sediment records: October 1952 to September 1957.
REMARKS.--Records of discharge for October 1957, June to September 1958 given in WSP 1560.

Chemical analyses, in parts per million, May to September 1958

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180° C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate					
May 14, 1958.....	302	22	0.02	52	33	45	5.0	231	152	15	0.6	2.9	0.13	470	0.64	--	265	76	27	1.2	690	7.5	23
June 18.....	50	33	.02	85	28	56	5.9	301	169	18	.6	1.8	.12	564	.77	76	326	79	27	1.4	825	7.5	10
July 10.....	104	29	.01	85	27	54	5.4	288	163	17	.6	3.2	.12	549	.75	149	323	87	26	1.3	803	7.6	6
Aug. 4.....	50	30	.02	75	27	55	5.1	256	180	17	.7	2.0	.12	532	.72	66	298	88	28	1.4	773	7.7	4
Sept. 3.....	27	34	.02	90	30	61	6.1	310	194	20	.7	2.7	.14	605	.82	34	346	92	27	1.4	871	7.5	4
Sept. 30.....	38	35	.02	86	28	60	6.1	288	190	21	.7	2.7	.13	587	.80	52	331	95	28	1.4	846	7.5	5

PLATTE RIVER BASIN--Continued

6B-7580. KIOWA CREEK AT ELBERT, COLO.

LOCATION.--At gaging station, a quarter of a mile southeast of Elbert, Elbert County, and half a mile upstream from West Kiowa Creek.
DRAINAGE AREA.--28.6 square miles.
RECORDS AVAILABLE.--Sediment records: April 1956 to September 1958.
EXTREMES, 1957-58.--Sediment concentrations: Maximum daily, 1,890 ppm July 20; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 113 tons July 20; minimum daily, 0 tons on many days.
EXTREMES, 1956-58.--Sediment concentrations: Maximum daily, 6,500 ppm July 31, 1957; minimum daily, no flow on many days each year.
Sediment loads: Maximum daily, 1,320 tons July 31, 1957; minimum daily, 0 tons on many days each year.
REMARKS.--No flow during period October to June; record is omitted. Records of discharge for water year October 1957 to September 1958 given in WSP 1560.

Suspended sediment, July to September 1958

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
2	0	--	0				0		0
3	0	--	0				0		0
4	0	--	0				0		0
5	0	--	0				.1		e 2.0
6	0	--	0				.1		e 1.2
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	1.0	335	s 18				0		0
20	8.3	1,890	s 113				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	9.3	--	131	0		0	0.2		3.2

Total discharge for year (cfs-days) 9.5
Total load for year (tons) 134.2

e Estimated.
s Computed by subdividing day.

PLATTE RIVER BASIN--Continued

6B-7580. KIOWA CREEK AT ELBERT,COLO.--Continued

Particle-size analyses of suspended sediment, July to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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 20, 1958....	6:20 a.m.	12		2,580	1,740	81	88		99		100						PWCM
July 20	8:25 a.m.	5.5		2,070	2,330	79	86		92		98	98	98		99	100	VPWCM

PLATTE RIVER BASIN--Continued

6B-7582. 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 1956 to September 1958.
EXTREMES, 1957-58.--Sediment concentrations: Maximum daily, 6,140 ppm May 25; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 763 tons May 15; minimum daily, 0 tons on many days.
EXTREMES, 1956-58.--Sediment concentrations: Maximum daily, 15,000 ppm Aug. 1, 1956; minimum daily, no flow on many days each year.
Sediment loads: Maximum daily, 43,000 tons July 31, 1956; minimum daily, 0 tons on many days each year.
REMARKS.--Maximum observed sediment concentration during water year 19,700 ppm Aug. 20. Flow affected by ice Nov. 6, 7, 14-21, 26-29, Dec. 1-7, Dec. 9 to Feb. 20, Mar. 10-18, 22, 23. Records of discharge for water year October 1957 to September 1958 given in WSP 1560.

Suspended sediment, water year October 1957 to September 1958

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	0.5		(t)	3.4		e 3	0.8		
2				6.6		e 12	.9		
3				2.6		e 3	1.1		
4				6.6			1.3		
5				6.6		e 12	1.6		
6				6.6			1.7		
7				6.0			1.2		
8				4.2		e 3	.8		
9				4.2					
10				5.0		e 4			
11				5.0					
12				5.0	230				
13	1.3		e 2	1.8					
14				2.5					
15				2.3					
16				2.0					e 1
17				1.7		e 1			
18				1.7					
19				1.6					
20				1.5			2.5		
21				1.5					
22				3.4					
23				3.4		e 2			
24	2.6		e 2	2.6					
25	3.4		e 3	1.0					
26	1.0			1.0					
27	1.0			.9		e 1			
28	1.0		e 1	.8					
29	1.0			.8					
30	2.6			.8					
31	2.6		e 3	--		--			
Total	44.3		59	93.1		105	66.9		31

e Estimated.
t Less than 0.50 ton.

PLATTE RIVER BASIN--Continued

6B-7582. KIOWA CREEK AT KIOWA, COLO.--Continued

Suspended sediment, water year October 1957 to September 1958--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							1	--	e 1
2							3	--	e 4
3							6.6	--	e 15
4							1.8	--	e 2
5							1.0	--	e 1
6							3.4	--	e 5
7							2.6	--	e 4
8				0.7	--	(t)	.6	--	
9							.4	--	
10							.5	--	
11							.6	--	
12							.6	--	
13							.6	--	e 2
14							.7	--	
15							.8	--	
16	1.5		e 1	1	--	e 1	.7	--	
17				2	--	e 1	.7	1,180	
18				4	--	e 3	2	540	a 3
19				6	--	e 6	11	--	e 15
20				8	--	e 14	6.6	520	a 9
21				6.6	--	e 12	8.2	800	a 18
22				2.6	--		14	1,400	a 53
23				1.0	--		9.6	1,000	b 26
24				2.6	1,400	e 8	7.4	900	b 18
25				.9	1,280		4.2	800	b 9
26				.8	--		4.2	750	a 8
27				.6	--	e 1	5.8		
28				.7			7.4		
29				--	--	--	7.4	--	e 14
30				--	--	--	6.6		
31				--	--	--	7.4		
Total	46.5		31	47.3	--	82	127.4	--	281

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	7.4	580		5.0	--	e 10	1.8	--	e 4
2	4.2	--		1.0	--		1.8		
3	4.2	360	e 10	1.0	--		.6	--	(t)
4	5.8	--		1.0	--		.6		
5	5.0	--		1.0	--	1	6.6	2,310	sa 57
6	8.2			1.0	140		4.3	1,380	s 112
7	7.4	--	e 18	1.8	140		6.6	3,180	57
8	5.8			13	1,170	sa 48	.2		
9	13	--	e 60	28	5,180	a 392	.1		
10	9.0	--	e 36	5.8	4,300	b 67	.1	--	(t)
11	9.0	--	e 30	4.2	1,400	a 16	.1		
12	16	--	e 100	4.2	700	a 8	0	--	0
13	7.4	--	e 20	3.4	600	b 6	0	--	0
14	5.0	--	e 12	4.2	1,000	b 11	0	--	0
15	2.6	--		27	3,650	s 763	0	--	0
16	3.4	230		18	4,610	sa 269	0	--	0
17	2.6	--		5.8	2,000	b 30	.3	13	
18	3.4	--		5.8	1,300	b 20	.3	--	(t)
19	2.6	--		2.6	600	4	.5	--	
20	2.6	--	e 3	2.6	--	e 4	.8	--	
21	3.4	--		2.6	--	e 3	.6	350	e 1
22	1.0	--		3.4	400	4	.4	--	
23	2.6	--		1.8	750	4	0	--	0
24	2.6	--		.9	1,860	sa 56	.1	--	(t)
25	2.6	--		5.8	6,140	sa 188	1.0		
26	11	--	e 55	3.4	1,050	a 10	1.0	--	1
27	4.2			6.6	600	a 11	.6		
28	1.8	--	e 4	2.6	--	e 3	.4	--	(t)
29	3.4			1.0			.2		
30	4.2			1.0	--	e 1	0	--	0
31	--	--	--	1.0			--	--	--
Total	161.4	--	466	166.5	--	1,936	29.0	--	242

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.

PLATTE RIVER BASIN--Continued

6B-7582. KIOWA CREEK AT KIOWA, COLO.--Continued

Suspended sediment, water year October 1957 to September 1958--Continued

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	0	--	0	0		0	0		0
2	0	--	0	0		0	0		0
3	0	--	0	0		0	0		0
4	0	--	0	0		0	0		0
5	4.2	3,480	sa 34	0		0	0		0
6	.7	--	e 1	0		0	.2		e 2
7	.2			0		0	0		0
8	.3			0		0	0		0
9	.2	--	(t)	0		0	0		0
10	.1			0		0	0		0
11	0	--	0	0		0	0		0
12	0	--	0	0		0	0		0
13	0	--	0	0		0	0		0
14	0	--	0	0		0	0		0
15	0	--	0	0		0	.1		e 1
16	0	--	0	0		0	.1		
17	0	--	0	0		0	0		0
18	0	--	0	0		0	0		0
19	0	--	0	0		0	0		0
20	.1	--		.5	2,700	s 13	0		0
21	.3	440	(t)	.2		e 1	0		0
22	.2	--		0		0	0		0
23	.1	--		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	.3	--	(t)	0		0	0		0
28	.2			0		0	0		0
29	0	--	0	0		0	0		0
30	0	--	0	0		0	0		0
31	0	--	0	0		0	--		--
Total	6.9	--	37	0.7		14	0.4		4

Total discharge for year (cfs-days) 790.4
Total load for year (tons) 3,288

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

6B-7582. KIOWA CREEK AT KIOWA, COLO.--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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, 1958.....	9:05 a.m.	39	50	5,150	3,140	43	50		73		89	95	100		--	--	VPWCM
May 15	7:45 p.m.	106	50	19,100	7,090	34	40		62		87	91	96		99	100	VPWCM
May 15	7:45 p.m.	106	50	19,100	7,170	19	29		57		87	91	96		99	100	VPN
May 16	11:05 a.m.	18	58	3,810	--	47	56		77		94	96	99		100	--	VPWCM
June 5	7:05 a.m.	15	--	4,930	4,690	50	59		78		92	94	98		100	--	VPWCM
June 6	10:30 p.m.	50	57	13,600	7,750	37	46		69		94	98	100		--	--	VPWCM
Aug. 20.....	1:45 a.m.	4.2	55	19,700	5,440	71	85		99		100	--	--		--	--	VPWCM
Aug. 20.....	2:35 a.m.	1.8	55	16,100	5,800	72	85		97		99	99	99		100	--	VPWCM
Aug. 20.....	4:15 a.m.	.8	55	8,340	2,110	78	90		98		100	--	--		--	--	VPWCM

6B-7640. SOUTH PLATTE RIVER AT JULESBURG, COLO.

LOCATION.--At gaging station at bridge on State Highway 51, 0.9 mile southeast of Julesburg, Sedgwick County, 3 miles 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 1958.
Water temperatures: October 1945 to September 1958.
EXTREMES, 1957-58.--Dissolved solids: Maximum, 1,560 ppm Nov. 1-30; minimum, 560 ppm May 25.
Hardness: Maximum, 740 ppm Nov. 1-30; minimum, 288 ppm May 25.
Specific conductance: Maximum daily, 2,000 micromhos Oct. 16-18; minimum daily, 807 micromhos June 1-2.
Water temperatures: Maximum, 85°F Aug. 16, 19, 20; minimum, 33°F on several days during December to February.
EXTREMES, 1945-58.--Dissolved solids: Maximum, 1,860 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, 1950-58), 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 1957 to September 1958 given in WSP 1560.

Chemical analyses, in parts per million, water year October 1957 to September 1958

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, 1957	259	--	--	--	--	180	--	304	--	--	--	--	--	1,550	--	2.11	1,080	720	471	35	2.9	1,960	7.7	--
Nov. 1-30	376	--	--	--	--	188	--	322	--	--	--	--	--	1,560	--	2.12	1,580	740	476	36	3.0	1,970	7.5	--
Dec. 1-Jan. 2, 1958	479	26	0.01	195	58	181	15	334	710	61	0.8	2.6	0.22	1,480	1,410	2.01	1,910	724	450	35	2.9	1,890	7.7	--
Jan. 3-31	949	--	--	--	--	165	--	338	--	--	--	--	--	1,420	--	1.93	3,640	704	427	34	2.7	1,840	7.8	--
Feb. 1-18	855	--	--	--	--	169	--	312	--	--	--	--	--	1,400	--	1.90	3,230	694	438	35	2.8	1,800	8.0	--
Feb. 19-Mar. 7	607	--	--	--	--	173	--	304	--	--	--	--	--	1,460	--	1.99	2,390	706	457	35	2.8	1,840	7.5	--
Mar. 8-31	854	19	.00	175	61	164	11	301	681	57	.9	5.8	.24	1,430	1,320	1.94	3,300	688	441	34	2.7	1,790	7.8	4
Apr. 1-17	1,104	--	--	--	--	160	--	278	--	--	--	--	--	1,340	--	1.82	3,990	638	410	35	2.8	1,720	7.4	--
Apr. 18-22	669	--	--	--	--	184	--	292	--	--	--	--	--	1,470	--	2.00	2,660	694	455	37	3.0	1,860	7.5	--
Apr. 23-27	693	--	--	--	--	150	--	257	--	--	--	--	--	1,250	--	1.70	2,340	592	381	36	2.7	1,630	7.5	--
Apr. 28	1,360	--	--	--	--	166	--	285	--	--	--	--	--	1,410	--	1.92	5,180	664	430	35	2.8	1,800	7.6	--
Apr. 29-May 6	1,638	--	--	--	--	133	--	241	--	--	--	--	--	1,070	--	1.46	4,730	520	322	36	2.5	1,430	7.4	--
May 7-10	1,238	--	--	--	--	148	--	263	--	--	--	--	--	1,210	--	1.65	4,040	588	372	35	2.7	1,590	7.3	--
May 11-24	4,918	--	--	--	--	88	--	188	--	--	--	--	--	757	--	1.03	10,050	382	228	33	2.0	1,060	7.3	--
May 25	6,470	--	--	--	--	64	--	174	--	--	--	--	--	560	--	.76	9,780	288	145	33	1.6	809	7.4	--
May 26-June 7	5,228	--	--	--	--	71	--	178	--	--	--	--	--	606	--	.82	8,550	312	166	33	1.8	879	7.5	--
June 8-14	1,049	--	--	--	--	112	--	222	--	--	--	--	--	902	--	1.23	2,550	450	268	35	2.3	1,250	7.5	--
June 15-23	617	20	.04	138	50	143	12	248	566	47	.7	.8	.22	1,170	1,100	1.59	1,950	551	348	35	2.7	1,520	7.4	7
June 24	552	--	--	--	--	77	--	182	--	--	--	--	--	676	--	.92	1,010	332	183	34	1.8	937	7.4	--

PLATTE RIVER BASIN--Continued

6B-7640. SOUTH PLATTE RIVER AT JULESBURG, COLO.--Continued

Chemical analyses, in parts per million, water year October 1957 to September 1958--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 25-30, 1958	537	--	--	--	--	161	--	217	--	--	--	--	--	1,230	--	1.67	1,780	568	390	38	2.9	1,610	7.4	--
July 1-2	621	--	--	--	--	117	--	197	--	--	--	--	--	941	--	1.28	1,580	445	283	36	2.4	1,270	7.5	--
July 3-25	456	--	--	--	--	159	--	245	--	--	--	--	--	1,200	--	1.63	1,480	568	367	38	2.9	1,580	7.4	--
July 26	468	--	--	--	--	91	--	212	--	--	--	--	--	740	--	1.01	935	354	180	36	2.1	1,030	7.3	--
July 27-31	269	--	--	--	--	158	--	238	--	--	--	--	--	1,260	--	1.71	915	582	387	37	2.9	1,630	7.3	--
Aug. 1-28.....	56.0	--	--	--	--	143	--	240	--	--	--	--	--	1,220	--	1.66	184	574	377	35	2.6	1,600	7.4	--
Aug. 29-Sept. 19	55.5	--	--	--	--	150	--	242	--	--	--	--	--	1,260	--	1.71	189	588	390	36	2.7	1,630	7.2	--
Sept. 20-30	126	30	0.01	167	54	166	15	262	671	61	0.8	2.6	0.25	1,380	1,300	1.88	469	639	424	35	2.9	1,770	7.5	6
Weighted average a.....	908	--	--	--	--	126	--	244	--	--	--	--	--	1,060	--	1.44	2,600	518	318	35	2.4	1,400	--	--

a Represents 100 percent of runoff for water year October 1957 to September 1958.

PLATTE RIVER BASIN--Continued

6B-7640. SOUTH PLATTE RIVER AT JULESBURG, COLO.--Continued

Temperature (° F) of water, water year October 1957 to September 1958
/Once-daily measurement between 3 p.m. and 5 p.m./

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

a Measurement between 12 m. and 2 p.m.
b Measurement between 6 p.m. and 7 p.m.

6B-7657. 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 1958.
Water temperatures: March 1951 to September 1958.
EXTREMES, 1957-58.--Dissolved solids: Maximum, 1,010 ppm Mar. 1-4; minimum, 478 ppm Oct. 1-31.
Hardness: Maximum, 492 ppm Mar. 1-4; minimum, 211 ppm Oct. 1-31.
Specific conductance: Maximum daily, 1,440 micromhos Mar. 1; minimum daily, 641 micromhos Oct. 20.
Water temperatures: Maximum, 82°F Aug. 11, 15; minimum, 33°F on many days during November to March.
EXTREMES, 1951-58.--Dissolved solids: Maximum, 1,010 ppm Mar. 1-4, 1958; minimum, 368 ppm May 15, 1951.
Hardness: Maximum, 492 ppm Mar. 1-4, 1958; minimum, 171 ppm May 15, 1951.
Specific conductance: Maximum daily, 1,440 micromhos Mar. 1, 1958; minimum daily, 403 micromhos Jan. 9, 1957.
Water temperatures: Maximum, 85°F June 13, 15, 1952, July 27, 31, 1957; 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 at Lincoln, Nebr. Records of discharge for water year October 1957 to September 1958 given in reports of State Engineer.

Chemical analyses, in parts per million, water year October 1957 to September 1958

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, 1957...	1,187	--	--	--	--	68	--	219	--	--	--	--	--	478	0.65	1,530	211	31	41	2.0	706	7.7	--
Nov. 1-30.....	1,062	--	--	--	--	71	--	217	--	--	--	--	--	500	.68	1,430	229	51	40	2.0	727	7.8	--
Dec. 1-9.....	1,132	--	--	--	--	75	--	226	--	--	--	--	--	574	.78	1,750	263	78	38	2.0	825	7.6	--
Dec. 10-12.....	1,140	--	--	--	--	97	--	246	--	--	--	--	--	713	.97	2,190	328	126	39	2.3	1,020	7.8	--
Dec. 13-31.....	1,220	31	0.00	84	22	83	11	236	255	26	0.5	1.4	0.11	647	.88	2,130	302	108	36	2.1	925	7.7	5
Jan. 1-5, 1958....	814	--	--	--	--	112	--	268	--	--	--	--	--	803	1.09	1,760	374	154	39	2.5	1,120	8.1	--
Jan. 6-31.....	1,279	--	--	--	--	87	--	245	--	--	--	--	--	675	.92	2,330	318	117	37	2.1	959	7.9	--
Feb. 1-5.....	1,314	--	--	--	--	84	--	240	--	--	--	--	--	689	.94	2,440	328	131	36	2.0	974	7.6	--
Feb. 6-11.....	1,360	--	--	--	--	112	--	262	--	--	--	--	--	822	1.12	3,020	400	185	38	2.4	1,160	7.8	--
Feb. 12-15.....	1,230	--	--	--	--	121	--	274	--	--	--	--	--	912	1.24	3,030	448	223	37	2.5	1,270	7.7	--
Feb. 16-17.....	1,375	--	--	--	--	102	--	258	--	--	--	--	--	800	1.09	2,970	394	182	36	2.2	1,120	7.6	--
Feb. 18-20.....	1,370	--	--	--	--	111	--	276	--	--	--	--	--	931	1.27	3,440	462	236	34	2.3	1,280	7.8	--
Feb. 21-26.....	1,470	--	--	--	--	102	--	256	--	--	--	--	--	842	1.15	3,340	412	202	35	2.3	1,170	7.5	--
Feb. 27-28.....	863	--	--	--	--	67	--	218	--	--	--	--	--	584	.79	1,360	290	111	33	1.7	835	7.6	--
Mar. 1-4	708	--	--	--	--	125	--	268	--	--	--	--	--	1,010	1.37	1,930	492	272	36	2.5	1,360	7.5	--
Mar. 5-9.....	1,268	--	--	--	--	87	--	234	--	--	--	--	--	735	1.00	2,520	364	172	34	2.0	1,030	7.3	--
Mar. 10-31.....	1,455	27	.01	109	33	100	10	248	364	33	.6	1.9	.18	819	1.11	3,220	408	205	34	2.1	1,140	7.7	5
Apr. 1-22.....	1,775	--	--	--	--	110	--	223	--	--	--	--	--	885	1.20	4,240	430	247	36	2.3	1,220	7.1	--
Apr. 23-25.....	1,790	--	--	--	--	117	--	205	--	--	--	--	--	921	1.25	4,450	437	269	37	2.4	1,260	7.4	--
Apr. 26-May 12...	1,403	--	--	--	--	98	--	203	--	--	--	--	--	773	1.05	2,930	368	202	37	2.2	1,080	7.2	--

May 13-16.....	1,748	--	--	--	--	89	--	195	--	--	--	--	--	702	.95	3,310	336	176	37	2.1	997	7.2	--
May 17-19.....	1,930	--	--	--	--	87	--	211	--	--	--	--	--	773	1.05	4,030	390	217	33	1.9	1,070	7.3	--
May 20-31.....	1,971	--	--	--	--	89	--	206	--	--	--	--	--	764	1.04	4,070	380	211	34	2.0	1,070	7.4	--
June 1-11	1,828	34	.00	93	30	84	8.7	201	318	29	.7	.4	.16	704	.96	3,470	357	192	33	1.9	997	7.2	8
June 12-27	1,269	--	--	--	--	80	--	206	--	--	--	--	--	652	.89	2,230	320	151	35	1.9	939	7.5	--
June 28-July 4....	1,316	--	--	--	--	88	--	205	--	--	--	--	--	757	1.03	2,690	361	193	35	2.0	1,050	7.1	--
July 5-8.....	1,583	--	--	--	--	82	--	196	--	--	--	--	--	704	.96	3,010	335	174	35	2.0	991	7.4	--
July 9-10.....	1,550	--	--	--	--	83	--	192	--	--	--	--	--	706	.96	2,950	340	183	35	2.0	1,010	7.3	--
July 11-31.....	1,638	--	--	--	--	76	--	198	--	--	--	--	--	660	.90	2,920	317	155	34	1.9	938	7.2	--
Aug. 1-4.....	1,858	--	--	--	--	87	--	195	--	--	--	--	--	731	.99	3,670	346	186	35	2.0	1,030	7.4	--
Aug. 5-20.....	2,043	--	--	--	--	85	--	208	--	--	--	--	--	687	.93	3,790	315	144	37	2.1	985	7.4	--
Aug. 21-Sept. 10..	1,609	--	--	--	--	77	--	212	--	--	--	--	--	572	.78	2,480	263	89	39	2.1	848	7.1	--
Sept. 11-30.....	1,361	29	.00	62	18	67	10	219	176	20	.5	1.3	.12	497	.68	1,830	228	48	38	1.9	739	7.4	0
Weighted average a	1,425	--	--	--	--	86	--	221	--	--	--	--	--	685	0.93	2,640	327	146	36	2.1	972	--	--

a Represents 100 percent of runoff for water year October 1957 to September 1958.

PLATTE RIVER BASIN--Continued

6B-7657. SUPPLY CANAL (TRI-COUNTY DIVERSION) NEAR MAXWELL, NEBR.--Continued

Temperature (° F) of water, water year October 1957 to September 1958
/Once-daily measurement at 4 p.m./

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

a Measurement made at 8 a.m.

6B-7660. 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 1958.
Water temperatures: March 1951 to September 1958.
EXTREMES, 1957-58.--Dissolved solids: Maximum, 817 ppm Mar. 1-4; minimum, 350 ppm May 13-16.
Hardness: Maximum, 404 ppm Mar. 1-4; minimum, 179 ppm May 13-16.
Specific conductance: Maximum daily, 1,240 micromhos Mar. 3 (chan. 1); minimum daily, 313 micromhos July 19 (chan. 4).
Water temperatures: Maximum, 84°F June 17 (chan. 1); minimum, freezing point on many days during November to March.
EXTREMES, 1951-58.--Dissolved solids: Maximum, 896 ppm Feb. 19-22, 1953; minimum, 278 ppm Nov. 26, 1952.
Hardness: Maximum, 404 ppm Mar. 1-4, 1958; minimum, 151 ppm June 8, 1951.
Specific conductance: Maximum daily, 1,240 micromhos Mar. 3, 1958 (chan. 1); minimum daily, 305 micromhos Jan. 13, 1956, Jan. 10, 1957 (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 for 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 1957 to September 1958 given in WSP 1560.

Chemical analyses, in parts per million, water year October 1957 to September 1958

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, 1957	211	--	--	--	--	--	--	230	--	--	--	--	--	438	0.60	250	214	25	34	1.5	640	7.6	--
Nov. 1-30	196	--	--	--	--	50	--	236	--	--	--	--	--	440	.60	233	223	29	33	1.5	648	8.0	--
Dec. 1-9	173	--	--	--	--	52	--	241	--	--	--	--	--	455	.62	213	238	40	32	1.5	680	7.8	--
Dec. 10-12	172	--	--	--	--	59	--	257	--	--	--	--	--	517	.70	240	261	50	33	1.6	757	8.0	--
Dec. 13-31	209	40	0.01	64	15	48	10	222	130	16	0.5	1.7	0.07	436	.59	246	222	40	31	1.4	642	7.9	6
Jan. 1-5, 1958	384	--	--	--	--	67	--	248	--	--	--	--	--	548	.75	568	268	65	35	1.8	794	7.9	--
Jan. 6-31	232	--	--	--	--	45	--	218	--	--	--	--	--	424	.58	266	214	35	31	1.3	624	7.8	--
Feb. 1-5	199	--	--	--	--	53	--	224	--	--	--	--	--	488	.66	262	244	60	32	1.5	706	7.6	--
Feb. 6-11	209	--	--	--	--	51	--	226	--	--	--	--	--	474	.64	267	236	51	32	1.5	685	7.7	--
Feb. 12-15	253	--	--	--	--	65	--	244	--	--	--	--	--	571	.78	390	288	88	33	1.7	820	7.7	--
Feb. 16-17	190	--	--	--	--	43	--	220	--	--	--	--	--	431	.59	221	220	40	30	1.3	623	7.3	--
Feb. 18-20	255	--	--	--	--	43	--	208	--	--	--	--	--	412	.56	284	208	37	31	1.3	600	7.5	--
Feb. 21-26	360	--	--	--	--	41	--	190	--	--	--	--	--	383	.52	372	196	40	31	1.3	565	7.3	--
Feb. 27-28	230	--	--	--	--	79	--	256	--	--	--	--	--	682	.93	424	348	138	33	1.8	975	7.7	--
Mar. 1-4	731	--	--	--	--	100	--	256	--	--	--	--	--	817	1.11	1,610	404	194	35	2.2	1,140	7.5	--
Mar. 5-9	385	--	--	--	--	56	--	220	--	--	--	--	--	517	.70	537	262	82	32	1.5	751	7.4	--
Mar. 10-31	420	34	.00	65	15	45	9.2	219	122	14	.5	1.8	.09	427	.58	484	225	45	29	1.3	627	7.6	6
Apr. 1-22	390	--	--	--	--	52	--	218	--	--	--	--	--	468	.64	493	238	59	32	1.5	685	7.5	--
Apr. 23-25	497	--	--	--	--	50	--	212	--	--	--	--	--	458	.62	615	232	58	32	1.4	670	7.3	--
Apr. 26-May 12	281	--	--	--	--	50	--	221	--	--	--	--	--	457	.62	347	235	54	32	1.4	676	7.5	--

PLATTE RIVER BASIN--Continued

6B-7660. PLATTE RIVER AT BRADY, NEBR.--Continued

Chemical analyses, in parts per million, water year October 1957 to September 1958--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 13-16, 1958...	887	--	--	--	--	37	--	194	--	--	--	--	--	350	0.48	838	179	20	31	1.2	523	7.3	--
May 17-19	1,046	--	--	--	--	61	--	219	--	--	--	--	--	536	.73	1,510	270	90	33	1.6	777	7.3	--
May 20-31	3,503	--	--	--	--	84	--	210	--	--	--	--	--	724	.98	6,850	366	194	33	1.9	1,020	7.5	--
June 1-11.....	2,784	35	0.01	86	26	73	15	199	278	26	0.7	0.7	0.15	640	.87	4,810	323	160	32	1.8	914	7.2	15
June 12-27.....	240	--	--	--	--	55	--	210	--	--	--	--	--	483	.66	313	246	74	33	1.5	712	7.3	--
June 28-July 4.....	184	--	--	--	--	69	--	206	--	--	--	--	--	607	.83	302	303	134	33	1.7	867	7.3	--
July 5-8	193	--	--	--	--	55	--	216	--	--	--	--	--	512	.70	267	251	74	32	1.5	739	7.4	--
July 9-10	270	--	--	--	--	66	--	190	--	--	--	--	--	596	.81	434	289	133	33	1.7	859	7.4	--
July 11-31	403	--	--	--	--	47	--	207	--	--	--	--	--	437	.59	476	222	52	31	1.4	646	7.3	--
Aug. 1-4	235	--	--	--	--	58	--	242	--	--	--	--	--	518	.70	329	253	55	33	1.6	755	7.7	--
Aug. 5-20.....	1,257	--	--	--	--	63	--	239	--	--	--	--	--	473	.64	1,610	211	15	39	1.9	702	7.6	--
Aug. 21-Sept. 10 ..	181	--	--	--	--	58	--	212	--	--	--	--	--	476	.65	233	221	47	36	1.7	705	7.2	--
Sept. 11-30	189	35	.00	64	17	58	11	218	155	19	.5	1.5	.11	477	.65	243	230	51	34	1.7	696	7.4	6
Weighted average a.....	508	--	--	--	--	64	--	216	--	--	--	--	--	555	0.75	761	277	100	33	1.7	801	--	--

a Represents 100 percent of runoff for water year October 1957 to September 1958.

PLATTE RIVER BASIN--Continued

6B-7660. PLATTE RIVER AT BRADY, NEBR.--Continued

CHANNEL I

Temperature (° F) of water, water year October 1957 to September 1958
/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	57	49	33	a 32	a 33	--	41	52	69	73	71	65
2	57	42	33	a 32	a 32	b 39	44	56	69	72	73	66
3	56	a 39	32	a 32	32	b 35	46	57	73	72	75	67
4	56	38	33	a 32	32	a 34	45	55	73	71	74	64
5	59	40	35	a 32	32	a 32	44	56	69	70	76	67
6	60	40	34	a 32	32	a 32	39	56	66	71	76	66
7	59	43	34	a 32	32	a 34	40	57	69	67	73	65
8	52	34	a 33	32	32	32	42	56	72	70	76	67
9	49	33	34	32	a 32	32	45	56	70	71	75	66
10	48	34	a 34	32	a 32	a 32	44	57	73	68	76	63
11	47	a 39	a 32	32	32	a 34	42	62	65	71	82	62
12	49	43	a 32	a 34	a 32	32	44	61	62	a 67	72	64
13	53	37	32	a 34	a 32	a 32	45	62	--	69	77	64
14	53	38	a 34	a 32	a 32	a 32	48	a 59	b 76	70	75	65
15	50	41	a 35	32	a 32	32	50	57	a 69	66	74	58
16	51	38	a 36	a 34	a 32	a 32	54	59	a 69	66	72	a 58
17	50	a 35	a 39	34	a 32	a 32	55	60	b 84	65	72	55
18	49	a 33	39	a 34	a 32	a 32	57	61	--	74	72	58
19	49	a 32	a 37	a 33	a 32	32	54	63	a 77	78	76	63
20	a 46	33	a 33	a 32	32	a 34	49	64	b 61	71	75	62
21	47	32	34	a 32	a 35	a 34	52	67	b 76	a 74	68	53
22	52	32	a 35	32	a 35	34	48	69	a 70	71	66	61
23	50	33	32	a 34	a 35	35	50	67	--	72	67	66
24	44	35	32	a 33	a 35	35	40	70	a 70	73	64	68
25	35	a 36	32	34	35	38	44	68	b 74	69	65	56
26	36	a 37	32	a 33	38	36	43	69	--	68	63	56
27	35	a 35	a 34	a 32	35	39	47	71	b 83	a 71	65	50
28	39	a 33	a 32	32	--	39	46	69	66	65	68	55
29	40	a 32	32	34	--	38	40	68	74	69	69	56
30	42	a 32	32	a 33	--	a 40	48	70	71	70	67	50
31	46	--	a 32	32	--	41	--	74	--	71	61	--
Average	49	37	34	33	33	35	46	62	71	70	71	61

a Measurement between 10 a.m. and 1 p.m.
b Measurement between 2 p.m. and 6 p.m.

PLATTE RIVER BASIN--Continued

6B-7660. PLATTE RIVER AT BRADY, NEBR.--Continued

CHANNEL 4

Temperature (° F) of water, water year October 1957 to September 1958
/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	58	49	34	a 32	a 37	--	44	54	65	72	72	64
2	58	43	34	a 32	a 34	b 34	45	58	60	72	74	67
3	58	a 40	35	a 32	32	b 35	48	56	67	71	74	68
4	58	38	36	a 32	35	a 35	47	56	69	71	76	65
5	60	40	36	32	35	35	45	56	65	69	75	67
6	62	41	35	a 32	36	a 35	41	57	64	70	72	65
7	62	44	36	a 32	32	a 38	40	59	66	67	70	65
8	55	37	a 35	32	32	35	44	58	70	69	73	68
9	51	34	34	35	a 33	35	45	56	67	71	73	67
10	50	34	36	34	32	a 38	45	56	70	67	73	65
11	50	37	32	35	34	a 40	42	61	69	70	a 81	63
12	52	42	32	36	a 32	35	44	62	62	a 66	72	64
13	54	37	34	a 36	32	35	46	63	b 75	67	77	65
14	53	37	36	a 35	a 32	a 34	49	a 59	b 74	70	71	65
15	51	42	a 37	33	a 32	32	51	57	a 65	67	71	59
16	53	39	a 40	36	a 32	36	54	58	a 68	66	70	a 60
17	50	37	a 43	37	32	a 36	56	58	b 78	64	72	56
18	50	a 34	37	a 36	a 34	a 34	58	60	--	72	69	59
19	50	34	a 38	a 36	a 34	36	54	61	a 74	68	73	62
20	a 47	34	35	34	35	38	50	63	b 62	69	73	62
21	47	33	37	a 32	39	37	54	65	b 73	a 73	67	61
22	52	32	40	33	40	39	49	67	a 70	70	65	61
23	52	34	35	a 36	41	41	50	64	75	71	66	65
24	45	35	35	37	44	40	40	67	a 70	71	63	68
25	37	36	36	37	43	41	44	64	b 71	68	65	58
26	37	37	32	a 36	45	40	43	65	--	69	63	58
27	36	a 36	37	35	40	42	47	69	b 80	70	65	51
28	39	33	32	35	--	40	46	65	66	65	68	56
29	42	32	35	37	--	42	40	65	73	70	69	57
30	43	32	35	a 36	--	a 41	48	68	71	72	67	51
31	46	--	a 34	35	--	42	--	70	--	71	61	--
Average	50	37	36	34	36	37	47	61	69	69	70	62

a Measurement between 10 a.m. and 1 p.m.
b Measurement between 2 p.m. and 6 p.m.

6B-7915. CEDAR RIVER NEAR SPALDING, NEBR.

LOCATION.--At gaging station at highway bridge, 10½ miles northwest of Spalding, Greeley County.
DRAINAGE AREA.--794 square miles, of which about 50 square miles contributes directly to surface runoff.
RECORDS AVAILABLE.--Chemical analyses: September 1957 to August 1958 (discontinued).
REMARKS.--Records of discharge for water year October 1957 to September 1958 given in WSP 1560.

Chemical analyses, in parts per million, February 1949 to August 1958

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
Feb. 28, 1949...	a 130	42	0.12	27	6.8	3.9		117	5.6	0.5	0.2	1.1	0.01	148		0.20		96	0	8	0.3	195	7.6	
Sept. 20, 1957 ..	57	44	.01	27	3.8	6.2	5.7	116	5.5	.0	.2	.8	.07	148		.20		83	0	13	.3	196	7.6	10
Oct. 29.....	70	--	--	--	--	7.0	--	109	--	--	--	--	--	--		--		76	0	16	.3	188	7.1	
Nov. 26.....	103	46	.04	26	4.4	6.3	5.6	118	8.3	.1	.2	.8	.03	156		.21		83	0	13	.3	198	7.8	
Dec. 17.....	92	--	--	--	--	6.3	--	103	--	--	--	--	--	--		--		73	0	16	.3	180	7.4	
Jan. 29, 1958...	123	--	--	--	--	5.8	--	100	--	--	--	--	--	--		--		70	0	15	.3	172	7.5	
Feb. 18.....	246	--	--	--	--	6.1	--	112	--	--	--	--	--	--		--		80	0	14	.3	193	7.5	
Mar. 18.....	64	--	--	--	--	6.1	--	108	--	--	--	--	--	--		--		78	0	15	.3	185	7.5	
Apr. 16.....	131	--	--	--	--	8.1	--	110	--	--	--	--	--	--		--		78	0	18	.4	194	7.2	
May 26.....	59	--	--	--	--	7.2	--	124	--	--	--	--	--	--		--		87	0	15	.3	210	7.6	
June 9.....	66	--	--	--	--	6.1	--	118	--	--	--	--	--	--		--		86	0	13	.3	205	7.2	
Aug. 18.....	61	--	--	--	--	6.2	--	124	--	--	--	--	--	--		--		90	0	13	.3	212	7.0	

a Daily mean discharge.

PLATTE RIVER BASIN--Continued

6B-7915. CEDAR RIVER NEAR SPALDING, NEBR.--Continued

Periodic determinations of suspended-sediment discharge, September 1957 to September 1958

Date	Discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Discharge (tons per day)
Sept. 20, 1957, 3:35 p.m...	57	38	5.8
Oct. 29, 11:55 a.m.....	86	38	8.8
Nov. 13, 1:55 p.m.....	68	21	3.9
Nov. 26, 4:45 p.m.....	56	18	2.7
Dec. 17, 10:25 a.m.....	107	72	21
Jan. 29, 1958, 10:05 a.m ..	123	123	41
Feb. 18, 3:25 p.m.....	a 85	62	14
Mar. 18, 2:10 p.m	58	31	4.9
Apr. 2, 9:10 a.m.....	235	396	251
Apr. 16, 10:10 a.m.....	154	213	89
Apr. 28, 5:30 p.m.....	309	438	365
May 26, 3:00 p.m.....	59	35	5.6
June 9, 4:40 p.m	66	88	16
June 24, 2:10 p.m	53	36	5.2
July 8, 4:45 p.m	52	46	6.5
July 22, 2:10 p.m.....	91	94	23
Aug. 5, 12:15 p.m.....	306	294	243
Aug. 18, 4:30 p.m.....	61	56	9.2
Sept. 9, 10:05 a.m	70	65	12

a Daily mean discharge.

6B-7915. CEDAR RIVER NEAR SPALDING, NEBR.--Continued

Particle-size analyses of suspended sediment, September 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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	
Sept. 20, 1957....	3:35 p.m.	57	57	38							92	100	--		--		V
Oct. 29.....	11:55 a.m.	86	46	38							69	83	100		--		V
Nov. 13.....	1:55 p.m.	68	45	21							100	--	--		--		V
Nov. 26.....	4:45 p.m.	56	45	18							100	--	--		--		V
Dec. 17.....	10:25 a.m.	107	38	72							54	65	98		100		V
Jan. 29, 1958	10:05 a.m.	123	32	123							40	52	94		100		V
Feb. 18.....	3:25 p.m.	a 85	32	62							72	85	100		--		V
Mar. 18	2:10 p.m.	58	44	31							90	99	100		--		V
Apr. 2	9:10 a.m.	235	44	396							24	44	94		100		V
Apr. 16.....	10:10 a.m.	154	57	213							47	68	99		100		V
Apr. 28.....	5:30 p.m.	309	54	438							16	45	89		100		V
May 26	3:00 p.m.	59	80	35							96	100	--		--		V
June 24.....	2:10 p.m.	53	70	36							96	100	--		--		V
July 22	2:10 p.m.	91	76	94							80	94	100		--		V
Aug. 5.....	12:15 p.m.	306	78	294							37	65	98		100		V
Aug. 18.....	4:30 p.m.	61	79	56							92	100	--		--		V
Sept. 9	10:05 a.m.	70	71	65							82	95	100		--		V

a Daily mean discharge.

PLATTE RIVER BASIN--Continued

6B-7915. CEDAR RIVER NEAR SPALDING, NEBR.--Continued

Particle-size analyses of bed material, September 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time	Discharge (cfs)	Number of sampling points	Bed material: Percent finer than indicated size, in millimeters												Methods of analysis
				0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	4.000	8.000	16.000	32.000	
Sept. 20, 1957	3:35 p.m.	57	13			3	14	58	96	99	100	--	--			SV
Oct. 29	11:55 a.m.	86	11			5	15	56	93	99	100	--	--			SV
Nov. 13	1:55 p.m.	68	10			0	6	50	95	99	100	--	--			SV
Nov. 26	4:45 p.m.	56	10			2	10	50	93	98	99	100	--			SV
Dec. 17	10:25 a.m.	107	13			2	8	50	94	98	99	100	--			SV
Jan. 29, 1958	10:05 a.m.	123	9			1	8	59	94	99	99	100	--			SV
Feb. 18	3:25 p.m.	a 85	7			0	29	84	96	98	100	--	--			SV
Mar. 18	2:10 p.m.	58	8			0	1	42	92	99	99	100	--			SV
Apr. 2	9:10 a.m.	235	12			0	2	45	96	99	99	100	--			SV
Apr. 16	10:10 a.m.	154	12			1	12	70	98	100	--	--	--			V
Apr. 28	5:30 p.m.	309	7			0	2	42	92	99	99	100	--			SV
May 26	3:00 p.m.	59	9			0	4	46	97	100	--	--	--			V
June 9	4:40 p.m.	66	11			0	11	49	97	100	--	--	--			V
June 24	2:10 p.m.	53	10			1	9	48	96	100	--	--	--			V
July 8	4:45 p.m.	52	15			0	4	44	96	99	99	99	100			SV
July 22	2:10 p.m.	91	9			0	3	41	96	100	--	--	--			V
Aug. 5	12:15 p.m.	306	8			0	5	42	80	85	86	88	90	95	100	SV
Aug. 18	4:30 p.m.	61	10			4	11	58	95	99	100	--	--			SV
Sept. 9	10:05 a.m.	70	10			1	9	63	98	100	--	--	--			V

a Daily mean discharge.

6B-7920. CEDAR RIVER NEAR FULLERTON, NEBR.

LOCATION.--At gaging station at bridge on State Highway 52, 3 miles northwest of Fullerton, Nance County, and 5¾ miles upstream from mouth.
DRAINAGE AREA.--1,220 square miles, approximately, of which about 480 square miles contributes directly to surface runoff.
RECORDS AVAILABLE.--Chemical analyses: September 1957 to August 1958 (discontinued).
REMARKS.--Records of discharge for water year October 1957 to September 1958 given in WSP 1560.

Chemical analyses, in parts per million, September 1957 to August 1958

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									
Sept. 20, 1957..	253	--	--	--	--	7.2	--	167	--	--	--	--	--	--		--		121	0	11	0.3	274	7.6	--
Oct. 30.....	210	43	0.03	37	4.7	8.6	7.0	154	6.8	0.5	0.3	1.6	0.12	184		0.25		112	0	13	.3	259	7.7	15
Nov. 27.....	208	45	.04	38	5.4	7.5	6.4	162	9.3	.1	.3	1.2	.03	193		.26		117	0	12	.3	268	7.9	--
Dec. 17.....	256	--	--	--	--	7.1	--	157	--	--	--	--	--	--		--		117	0	12	.3	266	7.7	--
Feb. 19, 1958..	150	--	--	--	--	7.7	--	164	--	--	--	--	--	--		--		119	0	12	.3	274	7.7	--
Mar. 19.....	228	--	--	--	--	6.9	--	160	--	--	--	--	--	--		--		118	0	11	.3	274	7.6	--
Apr. 15.....	277	--	--	--	--	9.6	--	168	--	--	--	--	--	--		--		124	0	14	.4	293	7.4	--
May 13	203	--	--	--	--	8.5	--	169	--	--	--	--	--	--		--		122	0	13	.3	282	7.7	--
June 10.....	216	--	--	--	--	7.2	--	156	--	--	--	--	--	--		--		118	0	12	.3	271	7.1	--
Aug. 19.....	148	42	.02	37	6.9	7.2	7.6	162	6.3	.2	.3	1.3	.05	196		.27		121	0	11	.3	278	7.1	14

PLATTE RIVER BASIN--Continued

6B-7920. CEDAR RIVER NEAR FULLERTON, NEBR.--Continued

Periodic determinations of suspended-sediment discharge, water year October 1957 to September 1958

Date	Discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Discharge (tons per day)
Oct. 1, 1957, 11:00 a.m.	156	287	121
Oct. 16, 9:35 a.m.	231	526	328
Oct. 30, 10:10 a.m.	208	392	220
Nov. 14, 10:35 a.m.	195	437	230
Nov. 27, 12:05 p.m.	208	419	235
Dec. 17, 5:10 p.m.	a 256	1,710	1,180
Jan. 28, 1958, 3:40 p.m.	a 126	154	52
Feb. 19, 1:40 p.m.	a 151	114	46
Mar. 19, 11:05 a.m.	a 228	618	380
Apr. 2, 5:30 p.m.	342	1,250	1,150
Apr. 15, 3:00 p.m.	277	705	527
Apr. 30, 10:20 a.m.	402	1,200	1,300
May 13, 3:10 p.m.	203	299	164
May 27, 11:30 a.m.	174	426	200
June 11, 6:45 p.m.	213	808	465
June 25, 9:40 a.m.	157	354	150
July 9, 11:45 a.m.	383	16,900	17,500
July 20, 12:10 p.m.	486	4,750	6,230
July 23, 11:00 a.m.	342	1,520	1,400
Aug. 5, 7:45 p.m.	356	945	908
Aug. 19, 11:10 a.m.	148	298	119
Sept. 9, 4:15 p.m.	174	368	173

a Daily mean discharge.

6B-7920. CEDAR RIVER NEAR FULLERTON, NEBR.--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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, 1957	11:00 a.m.	156	--	287	1,770	28	31		46		85	91	100		--		VPWCM
Oct. 16	9:35 a.m.	231	57	526	2,710	16	21		33		81	91	100		--		VPWCM
Nov. 27	12:05 p.m.	208	39	419	--	--	--		--		73	81	100		--		V
Dec. 17	5:10 p.m.	a 256	32	1,710	--	--	--		--		68	79	99		100		V
Jan. 28, 1958	3:40 p.m.	a 126	33	154	--	--	--		--		74	83	96		99	100	V
Feb. 19	1:40 p.m.	a 151	32	114	--	--	--		--		73	83	100		--		V
Mar. 19	11:05 a.m.	a 228	37	618	--	--	--		--		79	87	100		--		V
Apr. 15	3:00 p.m.	277	64	705	--	--	--		--		75	85	99		100		V
Apr. 30	10:20 a.m.	402	51	1,200	--	--	--		--		69	83	98		100		V
May 13	3:10 p.m.	203	70	299	--	--	--		--		74	87	100		--		V
May 27	11:30 a.m.	174	75	426	--	--	--		--		86	97	100		--		V
June 11	6:45 p.m.	213	79	808	--	--	--		--		89	94	99		100		V
June 25	9:40 a.m.	157	60	354	--	--	--		--		86	93	100		--		V
July 9	11:45 a.m.	383	69	16,900	15,300	37	50		78		98	99	100		--		VPWCM
July 20	12:10 p.m.	486	73	4,750	5,290	38	44		56		95	98	100		--		VPWCM
July 23	11:00 a.m.	342	73	1,520	3,260	43	50		62		94	96	99		100		VPWCM
Aug. 5	7:45 p.m.	356	--	945	4,060	16	19		--		83	92	99		100		VPWCM
Aug. 19	11:10 a.m.	148	--	298	--	--	--		--		91	96	99		100		V
Sept. 9	4:15 p.m.	174	84	368	--	--	--		--		87	93	100		--		V

a Daily mean discharge.

PLATTE RIVER BASIN--Continued

6B-7920. CEDAR RIVER NEAR FULLERTON, NEBR.--Continued

Particle-size analyses of bed material, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time	Discharge (cfs)	Number of sampling points	Bed material: Percent finer than indicated size, in millimeters												Methods of analysis
				0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	4.000	8.000	16.000	32.000	
Oct. 1, 1957	11:00 a.m.	156	8			5	7	55	95	99	99	100	--			SV
Oct. 16	9:35 a.m.	231	24			0	2	61	94	99	99	100	--			SV
Oct. 30	10:10 a.m.	208	10			0	2	42	88	95	96	99	100			SV
Nov. 14	10:35 a.m.	195	16			1	3	44	87	96	97	99	100			SV
Nov. 27	12:05 p.m.	208	10			22	48	89	98	99	99	100	--			SV
Dec. 17	5:10 p.m.	a 256	10			4	11	74	97	99	99	100	--			SV
Mar. 19, 1958	11:05 a.m.	a 228	25			3	9	63	94	98	99	100	--			SV
Apr. 2	5:30 p.m.	342	20			0	5	75	98	99	99	99	100			SV
Apr. 15	3:00 p.m.	277	20			2	8	75	98	99	99	100	--			SV
Apr. 30	10:20 a.m.	402	10			12	20	76	97	98	98	100	--			SV
May 13	3:10 p.m.	203	10			3	8	73	96	98	98	99	100			SV
May 27	11:30 a.m.	174	8			2	3	51	95	99	99	100	--			SV
June 11	6:45 p.m.	213	19			4	8	45	93	96	97	99	100			SV
June 25	9:40 a.m.	157	15			4	9	62	96	97	98	99	100			SV
July 9	11:45 a.m.	383	19			8	14	79	97	99	99	99	100			SV
July 20	12:10 p.m.	486	10			1	9	82	99	100	--	--	--			V
July 23	11:00 a.m.	342	8			0	4	50	97	99	100	--	--			SV
Aug. 5	7:45 p.m.	356	8			0	3	56	96	98	100	--	--			SV
Aug. 19	11:10 a.m.	148	20			11	25	64	97	99	99	100	--			SV
Sept. 9	4:15 p.m.	174	20			18	30	75	97	99	99	99	100			SV

a Daily mean discharge.

MISCELLANEOUS ANALYSES OF STREAMS IN PLATTE RIVER BASIN

Chemical analyses, in parts per million, water year October 1957 to September 1958

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180° C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate					
6B-6655. WHEATLAND CANAL NO.1 NEAR WHEATLAND, WYO.																							
May 14, 1958.....	187	7.4	0.00	67	26	38	3.8	183	188	15	0.4	1.1	0.09	456	0.62	218	275	125	23	1.0	680	7.6	15
June 18.....	322	11	.02	58	26	33	2.8	174	161	11	.4	.8	.09	412	.56	366	252	109	22	.9	622	7.5	5
July 10	255	6.2	.01	57	24	36	2.9	159	158	11	.4	.8	.08	402	.55	298	241	111	24	1.0	610	7.8	10
Aug. 5	245	4.1	.02	61	28	43	3.7	165	202	13	.5	.4	.09	458	.62	301	268	133	26	1.1	684	7.2	8
6B-6660. WHEATLAND CANAL NO. 2 NEAR WHEATLAND, WYO.																							
May 14, 1958.....	62	12	0.01	85	33	54	4.6	234	239	17	0.5	1.4	0.11	590	0.80	102	349	157	25	1.3	847	7.8	18
June 18.....	110	15	.02	73	28	38	2.8	218	180	13	.6	.8	.17	476	.65	142	298	119	21	1.0	710	7.4	5
July 10	130	9.5	.01	70	26	40	2.9	205	173	12	.5	.8	.07	453	.62	168	282	114	23	1.0	679	7.5	6
Aug. 5.....	118	8.6	.02	71	27	41	3.0	204	185	13	.6	.6	.09	473	.64	142	288	121	23	1.0	701	7.7	6
6B-7080. SOUTH PLATTE RIVER AT WATERTON, COLO.a/																							
Feb. 7, 1958.....	18	9.8	0.06	25	7.8	18	1.6	77	35	24	1.0	0.6		178			94	31	29	0.8	281	7.8	0
Apr. 9.....	113	10	.00	29	8.8	23	1.6	94	39	28	1.1	.0		164			109	32	31	1.0	324	7.5	0
6B-7105. BEAR CREEK AT MORRISON, COLO.a/																							
Feb. 7, 1958.....	13	12	0.57	13	2.9	5.8	2.0	52	12	2.0	0.3	1.0		98			44	2	21	0.4	120	7.5	1
Apr. 9.....	21	13	.06	15	3.4	6.0	1.4	60	11	2.0	.4	.9		69			51	2	20	.4	133	7.2	0
6B-7195. CLEAR CREEK NEAR GOLDEN, COLO.a/																							
Feb. 7, 1958.....	58	7.6	0.00	24	8.3	9.2	1.6	33	81	2.0	0.5	1.8		167			94	67	17	0.4	243	6.9	1
Apr. 9.....	66	12	2.0	27	8.8	7.6	1.8	40	82	2.0	.4	1.4		140			104	71	14	.3	262	6.9	0
6B-7240. ST. VRAIN CREEK AT LYONS, COLO.a/																							
Feb. 7, 1958.....	9.0	9.0	0.15	9.6	2.9	4.0	0.0	36	12	1.0	0.1	1.4		74			36	6	20	0.3	92.8	7.4	0
Apr. 9.....	14	12	.09	14	2.4	5.5	.0	42	19	1.0	.4	1.1		62			45	10	21	.4	123	7.3	0
LEFT HAND CREEK NEAR BOULDER, COLO.a/																							
Feb. 7, 1958.....		11	0.00	32	8.3	19	1.6	56	95	4.0	2.4	0.7		222			114	68	26	0.8	322	7.4	0
Apr. 9.....	13	14	.00	22	6.8	23	1.6	58	73	1.0	3.6	.7		154			83	35	37	1.1	281	7.1	0

a Some records of aluminum, manganese, and phosphate available in district office at Lincoln, Nebr.

PLATTE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN PLATTE RIVER BASIN--Continued

Chemical analyses, in parts per million, water year October 1957 to September 1958--Continued

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180° C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate					
6B-7270. BOULDER CREEK NEAR ORODELL, COLO.a/																							
Feb. 7, 1958.....	8	4.2	0.11	7.2	1.5	2.2	0.8	25	8.2	0.0	0.1	0.4		56			24	4	16	0.2	60.7	7.3	1
Apr. 9.....	54	8.8	.06	8.0	1.9	2.5	.4	32	7.4	.0	.2	.0		18			28	2	16	.2	71.6	7.4	0
6B-7295. SOUTH BOULDER CREEK NEAR ELDORADO SPRINGS, COLO.a/																							
Feb. 7, 1958.....	4.2	5.8	0.42	10	2.4	4.2	1.2	38	12	1.0	0.2	0.7		72			35	4	20	0.3	96.9	7.4	1
Apr. 9.....	6.8	5.9	.31	8.0	1.0	4.0	.0	27	5.1	3.0	.2	.0		20			24	2	27	.4	73.9	7.3	0
COAL CREEK NEAR PLAINVIEW, COLO.a/																							
Feb. 7, 1958.....		9.6	0.00	6.4	3.4	4.8	1.2	32	9.5	3.0	0.3	0.0		66			30	4	25	0.4	82.2	7.1	0
Apr. 9.....		11	.00	10	1.9	4.8	.6	38	9.1	2.0	.3	.0		37			33	2	24	.4	95.1	7.4	0
6B-7725. WOOD RIVER NEAR CHAPMAN, NEBR.																							
Sept. 20, 1957....	12.2	25	0.01	51	9.5	26	13	186	59	17	0.4	4.5	0.07	296	0.40		166	13	24	0.9	474	7.4	
Dec. 17.....	18	31	.17	75	13	36	41	388	58	2.7	.4	.2	.13	441	.60		240	0	21	1.0	806	7.6	
Mar. 19, 1958....	10	27	.01	58	13	32	11	190	58	20	.5	36	.12	363	.49		196	40	25	1.0	548	7.0	
June 10.....	b 17	28	.02	62	13	33	12	212	75	20	.5	11	.14	373	.51		210	36	24	1.0	591	7.3	
July 23.....	452	17	.05	17	3.3	3.0	12	69	12	.4	.4	4.0	.09	102	.14		56	0	8	.2	158	6.8	
DANE CREEK NEAR ORD, NEBR.																							
Nov. 13, 1957.....	0.66					22		493	46	8.3				--	--		400	0	10	0.5	816	7.7	
Jan. 28, 1958.....	.56					20		488						521	0.71		386	0	10	.4	787	7.6	
Apr. 1.....	1.69					17		422						530	.72		414	68	8	.4	853	7.6	
July 25.....	--					2.7		82						165	.22		63	0	8	.1	195	7.1	
MIRA CREEK NEAR NORTH LOUP, NEBR.																							
May 18, 1956.....	0.11	37	0.22	141	29	21	20	612	25	9.2	0.4	0.3	0.14	595	0.81		471	0	8	0.4	936	7.8	20
Nov. 13, 1957.....	b 5					8.2		212	31	3.7				--	--		177	3	9	.3	405	7.4	
Jan. 28, 1958.....	b .1					26		566	--	--				604	.82		464	0	11	.5	928	7.6	
Apr. 1.....	5.20					11		276	--	--				353	.48		244	18	9	.3	551	7.3	
July 25.....	--					2.3		80	--	--				145	.20		57	0	8	.1	171	7.0	

a Some records of aluminum, manganese, and phosphate available in district office at Lincoln, Nebr.
b Estimated.

PLATTE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN PLATTE RIVER BASIN--Coantinued

Periodic determinations of suspended-sediment discharge, water year October 1957 to September 1958

Date	Discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Discharge (tons per day)
6B-7840. SOUTH LOUP RIVER AT ST. MICHAEL, NEBR.			
Oct. 1, 1957, 5:30 p.m....	143	306	118
Oct. 15, 11:00 a.m	175	407	192
Oct. 28, 3:35 p.m	188	408	207
Nov. 12, 2:50 p.m	180	385	187
Nov. 26, 12:25 p.m.....	202	416	227
Dec. 16, 4:40 p.m.....	a 215	580	337
Jan. 27, 1958, 3:10 p.m...	a 200	244	132
Feb. 18, 11:15 a.m.....	a 130	157	55
Mar. 18, 10:10 a.m.....	a 220	935	555
Mar. 31, 6:35 p.m.....	440	1,390	1,650
Apr. 14, 3:30 p.m.....	292	684	539
Apr. 29, 9:40 a.m.....	330	1,060	944
May 12, 3:35 p.m.....	199	517	278
May 28, 11:00 a.m.....	774	4,030	8,420
June 10, 12:20 p.m	218	572	337
June 24, 10:30 a.m	193	477	249
July 8, 11:10 a.m.....	172	396	184
July 19, 8:35 p.m.....	7,320	6,940	137,000
July 20, 4:55 p.m.....	3,210	5,410	46,900
July 22, 9:50 a.m.....	690	2,260	4,210
Aug. 6, 1:15 p.m.....	160	292	126
Aug. 18, 7:40 a.m.....	158	891	380
Sept. 8, 2:30 p.m.....	145	286	112
6B-7843. OAK CREEK NEAR LOUP CITY, NEBR.			
July 1, 1958, 1:30 p.m....	69	49,400	9,540
July 3, 12:40 p.m.....	109	39,900	12,200
July 3, 12:50 p.m.....	158	15,200	6,480
July 3, 1:00 p.m.....	208	20,200	11,300
July 3, 1:40 p.m.....	263	15,300	10,900
July 3, 3:25 p.m.....	346	11,000	10,300
July 3, 6:15 p.m.....	310	8,800	7,730
July 9, 7:20 p.m.....	16	7,780	336
July 11, 9:40 a.m.....	34	6,050	555
July 11, 9:45 a.m.....	69	15,900	2,960
July 17, 5:25 a.m.....	37	14,800	1,480
July 17, 8:15 a.m.....	109	44,100	13,500
July 19, 5:50 a.m.....	158	7,030	3,000
July 24, 5:35 a.m.....	206	17,700	9,850
July 24, 6:25 a.m.....	260	22,800	16,000
July 24, 7:35 a.m.....	320	13,400	11,600
July 24, 8:00 a.m.....	380	6,740	6,920
July 24, 9:30 a.m.....	440	9,220	11,000
July 24, 9:45 a.m.....	450	9,670	11,700
July 24, 1:20 p.m.....	510	5,910	8,140
6B-7850. MIDDLE LOUP RIVER AT ST. PAUL, NEBR.			
Oct. 14, 1957, 2:35 p.m...	1,100	636	1,890
Oct. 28, 10:20 a.m	1,140	1,060	3,260
Nov. 12, 11:55 a.m.....	1,120	1,030	3,110
Nov. 25, 11:25 a.m.....	995	1,160	3,120
Dec. 16, 11:20 a.m.....	a 1,350	2,560	9,330
Jan. 27, 1958, 12:45 p.m..	a 1,320	792	2,820
Feb. 17, 5:25 p.m	a 500	484	653
Mar. 17, 3:25 p.m.....	1,650	1,640	7,310
Mar. 31, 10:35 a.m.....	1,680	1,880	8,530
Apr. 14, 12:45 p.m.....	1,340	1,180	4,270
Apr. 28, 2:10 p.m.....	1,750	1,280	6,050
May 12, 11:10 a.m.....	956	560	1,440
May 26, 12:20 p.m.....	956	560	1,440
June 9, 1:00 p.m	995	542	1,460
June 23, 4:15 p.m	1,480	702	2,810

a Daily mean discharge.

PLATTE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN PLATTE RIVER BASIN--Continued

Periodic determinations of suspended-sediment discharge, water year October 1957 to September 1958--Continued

Date	Discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Discharge (tons per day)
6B-7850. MIDDLE LOUP RIVER AT ST. PAUL, NEBR.--Continued			
July 7, 1958, 11:40 a.m....	1,140	468	1,440
July 19, 4:30 p.m	9,950	10,200	274,000
July 20, 6:30 a.m	10,800	7,320	213,000
July 21, 12:00 m	2,100	3,910	22,100
Aug. 4, 2:25 p.m.....	956	367	947
Aug. 18, 11:10 a.m.....	670	596	1,080
Sept. 8, 10:50 a.m	810	358	783
6B-7905. NORTH LOUP RIVER NEAR ST. PAUL, NEBR.			
Oct. 14, 1957, 11:40 a.m ..	1,020	343	945
Oct. 28, 12:35 p.m.....	992	430	1,150
Nov. 12, 10:10 a.m.....	980	356	942
Nov. 25, 3:05 p.m.....	1,070	526	1,520
Dec. 16, 12:40 p.m.....	955	866	2,230
Jan. 27, 1958, 10:50 a.m ..	950	260	667
Feb. 17, 1:50 p.m.....	a 639	194	335
Mar. 17, 12:20 p.m	1,130	1,040	3,170
Mar. 31, 1:15 p.m	1,600	956	4,130
Apr. 14, 10:45 a.m.....	1,300	606	2,130
Apr. 28, 11:35 a.m.....	1,700	830	3,810
May 12, 12:40 p.m	824	226	503
May 26, 10:45 a.m	813	313	687
June 9, 11:10 a.m	813	278	610
June 23, 12:50 p.m.....	918	291	721
July 7, 6:10 p.m	758	771	1,580
July 9, 3:00 p.m	2,200	11,200	66,500
July 20, 9:25 a.m	1,790	3,700	17,900
July 21, 2:55 p.m	2,060	2,740	15,200
Aug. 4, 11:15 a.m.....	824	257	572
Aug. 18, 12:30 p.m.....	476	150	193
Sept. 8, 12:10 p.m	685	350	647
6B-7918. CEDAR RIVER AT BELGRADE, NEBR.			
Oct. 15, 1957, 3:35 p.m ...	253	790	540
Oct. 29, 3:00 p.m.....	232	676	423
Nov. 14, 9:15 a.m.....	208	458	257
Nov. 27, 9:30 a.m.....	220	755	448
Dec. 17, 2:45 p.m.....	251	924	626
Jan. 28, 1958, 1:45 p.m ...	213	300	173
Feb. 19, 9:00 a.m.....	e 190	140	72
Mar. 18, 4:30 p.m	e 230	1,010	627
Apr. 2, 12:40 p.m.....	366	724	716
Apr. 15, 11:10 a.m.....	253	639	437
Apr. 29, 4:10 p.m.....	387	1,200	1,250
May 13, 11:25 a.m	205	671	371
May 27, 9:30 a.m	214	521	301
June 11, 9:25 a.m.....	202	546	298
June 24, 4:50 p.m.....	163	420	185
July 9, 7:55 a.m	187	442	223
July 22, 6:10 p.m	331	2,190	1,960
Aug. 5, 4:20 p.m.....	376	778	790
Aug. 19, 8:40 a.m.....	210	480	272
Sept. 9, 12:50 p.m	167	346	156

e Estimated.
a Daily mean discharge.

MISCELLANEOUS ANALYSES OF STREAMS IN PLATTE RIVER BASIN--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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	
6B-7840. SOUTH LOUP RIVER AT ST. MICHAEL, NEBR.																
Oct. 1, 1957	5:30 p.m.	143	71	306	1,700	29	37		57		80	87	100		--		VPWCM
Oct. 15	11:00 a.m.	175	60	407	--	--	--		--		73	85	100		--		V
Oct. 28	3:35 p.m.	188	48	408	--	--	--		--		60	72	98		100		V
Nov. 12	2:50 p.m.	180	43	385	--	--	--		--		54	70	99		100		V
Nov. 26	12:25 p.m.	202	41	416	--	--	--		--		55	65	99		100		V
Dec. 16	4:40 p.m.	a 215	33	580	3,340	15	20		35		71	84	100		--		VPWCM
Jan. 27, 1958	3:10 p.m.	a 200	32	244	--	--	--		--		64	78	100		--		V
Feb. 18	11:15 a.m.	a 130	32	157	--	--	--		--		51	63	100		--		V
Mar. 18	10:10 a.m.	a 220	32	935	--	--	--		--		49	72	99		100		V
Mar. 31	6:35 p.m.	440	49	1,390	3,550	17	20		28		59	81	98		100		VPWCM
Apr. 14	3:30 p.m.	292	64	684	--	--	--		--		72	90	100		--		V
Apr. 29	9:40 a.m.	330	46	1,060	--	--	--		--		67	87	100		--		V
May 12	3:35 p.m.	199	74	517	--	--	--		--		66	88	100		--		V
May 28	11:00 a.m.	774	68	4,030	6,180	26	32		44		80	91	99		100		VPWCM
June 24	10:30 a.m.	193	68	477	--	--	--		--		72	87	100		--		V
July 8	11:10 a.m.	172	74	396	--	--	--		--		72	85	100		--		V
July 19	8:35 p.m.	7,320	68	6,940	4,210	36	39		45		62	73	95		99	100	VPWCM
July 20	4:55 p.m.	3,210	73	5,410	4,420	37	41		53		81	91	99		100		VPWCM
July 22	9:50 a.m.	690	70	2,260	3,480	55	61		74		95	99	100		--		VPWCM
Aug. 6	1:15 p.m.	160	--	292	--	--	--		--		73	84	100		--		V
Aug. 18	7:40 a.m.	158	72	891	3,050	45	51		66		85	93	100		--		VPWCM
Sept. 8	2:30 p.m.	145	82	286	--	--	--		--		70	82	99		100		V
6B-7843. OAK CREEK NEAR LOUP CITY, NEBR.																
July 1, 1958	1:30 p.m.	69		49,400	15,900	29	37		59		100	--					VPWCM
July 3	12:40 p.m.	109		39,900	12,600	33	40		58		100	--					VPWCM
July 3	1:00 p.m.	208		20,200	8,250	46	56		80		100	--					VPWCM
July 3	1:40 p.m.	263		15,300	9,710	46	55		78		100	--					VPWCM
July 3	3:25 p.m.	346		11,000	3,300	70	70		89		100	--					VPWCM
July 3	6:15 p.m.	310		8,800	5,340	66	73		89		100	--					VPWCM
July 9	7:20 p.m.	16		7,780	4,790	75	88		97		100	--					VPWCM

a Daily mean discharge.

MISCELLANEOUS ANALYSES OF STREAMS IN PLATTE RIVER BASIN--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958--Continued
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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	
6B-7843. OAK CREEK NEAR LOUP CITY, NEBR.--Continued																	
July 11, 1958.....	9:45 a.m.	69		15,900	4,680	58	64		80		100	--					VPWCM
July 17	5:25 a.m.	37		14,800	5,460	54	60		78		100	--					VPWCM
July 17	8:15 a.m.	109		44,100	11,200	26	28		39		98	100					VPWCM
July 19	5:50 a.m.	158		7,030	1,560	71	74		93		100	--					VPWCM
July 24	5:35 a.m.	206		17,700	6,360	37	41		58		99	100					VPWCM
July 24	6:25 a.m.	260		22,800	5,370	42	46		66		99	100					VPWCM
July 24	9:30 a.m.	440		9,220	3,320	61	68		86		99	100					VPWCM
July 24	9:45 a.m.	450		9,670	3,180	56	61		82		99	100					VPWCM
July 24	1:20 p.m.	510		5,910	3,220	74	82		95		100	--					VPWCM
6B-7850. MIDDLE LOUP RIVER AT ST. PAUL, NEBR.																	
Oct. 14, 1957	2:35 p.m.	1,100	56	636	--	--	--		--		28	51	86		100	--	V
Oct. 28	10:20 a.m.	1,140	42	1,060	--	--	--		--		23	46	91		100	--	V
Nov. 12.....	11:55 a.m.	1,120	44	1,030	--	--	--		--		20	39	83		100	--	V
Nov. 25.....	11:25 a.m.	995	39	1,160	--	--	--		--		19	43	84		100	--	V
Dec. 16.....	11:20 a.m.	a 1,350	33	2,560	--	--	--		--		10	32	79		99	100	V
Jan. 27, 1958	12:45 p.m.	a 1,320	32	792	--	--	--		--		78	81	92		98	100	V
Feb. 17.....	5:25 p.m.	a 500	32	484	--	--	--		--		9	23	85		100	--	V
Mar. 17	3:25 p.m.	1,650	33	1,640	--	--	--		--		26	55	90		100	--	V
Mar. 31	10:35 a.m.	1,680	45	1,880	--	--	--		--		28	51	90		100	--	V
Apr. 14	12:45 p.m.	1,340	61	1,180	--	--	--		--		29	59	96		100	--	V
Apr. 28	2:10 p.m.	1,750	55	1,280	--	--	--		--		27	56	97		100	--	V
May 12	11:10 a.m.	956	73	560	--	--	--		--		23	56	94		100	--	V
May 26	12:20 p.m.	956	77	560	--	--	--		--		17	31	66		85	100	V
June 9	1:00 p.m.	995	78	542	--	--	--		--		42	58	94		100	--	V
June 23.....	4:15 p.m.	1,480	78	702	--	--	--		--		54	71	93		100	--	V
July 7	11:40 a.m.	1,140	76	468	--	--	--		--		48	65	90		100	--	V
July 19	4:30 p.m.	9,950	68	10,200	6,540	38	41		50		74	84	95		100	--	VPWCM
July 20	6:30 a.m.	10,800	68	7,320	3,630	31	34		39		59	70	88		99	100	VPWCM
July 21	12:00 m.	2,100	75	3,910	3,550	33	36		44		60	71	91		100	--	VPWCM

Aug. 4	2:25 p.m.	956	85	367	--	--	--	--	54	71	99	100	--	V
Aug. 18	11:10 a.m.	670	74	596	--	--	--	--	82	88	99	100	--	V
Sept. 8	10:50 a.m.	810	75	358	--	--	--	--	48	64	93	100	--	V
6B-7905. NORTH LOUP RIVER NEAR ST. PAUL, NEBR.														
Oct. 14, 1957	11:40 a.m.	1,020	55	343	--	--	--	--	43	58	73	100	--	V
Oct. 28	12:35 p.m.	992	45	430	--	--	--	--	26	46	82	--	--	V
Nov. 12	10:10 a.m.	980	43	356	--	--	--	--	25	42	77	99	100	V
Nov. 25	3:05 p.m.	1,070	46	526	--	--	--	--	23	42	77	100	--	V
Dec. 16	12:40 p.m.	955	33	866	--	--	--	--	19	49	89	99	100	V
Jan. 27, 1958	10:50 a.m.	950	32	260	--	--	--	--	14	19	45	96	100	V
Feb. 17	1:50 p.m.	a 639	32	194	--	--	--	--	38	49	73	100	--	V
Mar. 17	12:20 p.m.	1,130	33	1,040	--	--	--	--	17	34	71	92	100	V
Mar. 31	1:15 p.m.	1,600	49	956	--	--	--	--	28	50	82	100	--	V
Apr. 14	10:45 a.m.	1,300	55	606	--	--	--	--	36	55	84	99	100	V
Apr. 28	11:35 a.m.	1,700	49	830	--	--	--	--	27	48	84	99	100	V
May 12	12:40 p.m.	824	75	226	--	--	--	--	35	53	78	100	--	V
May 26	10:45 a.m.	813	73	313	--	--	--	--	44	56	80	98	100	V
June 9	11:10 a.m.	813	76	278	--	--	--	--	48	63	92	100	--	V
June 23	12:50 p.m.	918	74	291	--	--	--	--	58	72	92	100	--	V
July 7	6:10 p.m.	758	82	771	3,260	45	53	68	89	94	98	100	--	VPWCM
July 9	3:00 p.m.	2,200	75	11,200	7,570	42	54	69	93	96	98	100	--	VPWCM
July 20	9:25 a.m.	1,790	71	3,700	8,380	27	30	41	88	92	97	100	--	VPWCM
July 21	2:55 p.m.	2,060	77	2,740	7,540	11	12	17	71	79	91	100	--	VPWCM
Aug. 4	11:15 a.m.	824	85	257	--	--	--	--	77	86	99	100	--	V
Aug. 18	12:30 p.m.	476	81	150	--	--	--	--	83	90	98	100	--	V
Sept. 8	12:10 p.m.	685	78	350	--	--	--	--	68	77	94	100	--	V
6B-7918. CEDAR RIVER AT BELGRADE, NEBR.														
Oct. 15, 1957	3:35 p.m.	253	64	790	--	--	--	--	74	83	96	100		V
Oct. 29	3:00 p.m.	232	51	676	--	--	--	--	53	66	98	100		V
Nov. 14	9:15 a.m.	208	44	458	--	--	--	--	51	64	94	100		V
Nov. 27	9:30 a.m.	220	38	755	--	--	--	--	53	66	95	100		V
Dec. 17	2:45 p.m.	251	33	924	--	--	--	--	66	79	100	--		V
Jan. 28, 1958	1:45 p.m.	213	32	300	--	--	--	--	75	85	100	--		V
Feb. 19	9:00 a.m.	e 190	32	140	--	--	--	--	66	76	99	100		V
Mar. 18	4:30 p.m.	e 230	44	1,010	--	--	--	--	48	59	93	99	100	V
Apr. 2	12:40 p.m.	366	50	724	4,700	15	18	26	78	88	99	100		VPWCM
Apr. 15	11:10 a.m.	253	59	639	3,170	16	17	24	65	79	97	100		VPWCM
Apr. 29	4:10 p.m.	387	58	1,200	3,590	12	12	16	57	72	95	100		VPWCM
May 13	11:25 a.m.	205	70	671	--	--	--	--	77	87	99	100		V
May 27	9:30 a.m.	214	72	521	--	--	--	--	59	84	98	100		V
June 11	9:25 a.m.	202	66	546	--	--	--	--	63	78	98	100		V
June 24	4:50 p.m.	163	70	420	--	--	--	--	83	90	100	--		V

e Estimated.
a Daily mean discharge.

PLATTE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN PLATTE RIVER BASIN--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958--Continued
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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
6B-7918. CEDAR RIVER AT BELGRADE, NEBR.--Continued																
July 9, 1958.....	7:55 a.m.	187	70	442	--	--	--		--		68	77	96		100		V
July 22	6:10 p.m.	331	76	2,190	3,550	34	38		45		81	91	99		100		VPWCM
Aug. 5.....	4:20 p.m.	376	80	778	2,710	16	20		--		75	85	99		100		VPWCM
Aug. 19.....	8:40 a.m.	210	--	480	--	--	--		--		74	84	98		100		V
Sept. 9	12:50 p.m.	167	--	346	--	--	--		--		80	90	99		100		V

Particle-size analyses of bed material, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time	Discharge (cfs)	Number of sampling points	Bed material											Methods of analysis
				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	32.000	
6B-7840. SOUTH LOUP RIVER AT ST. MICHAEL, NEBR.																
Oct. 1, 1957.....	5:30 p.m.	143	7			0	12	73	93	98	100	--				SV
Oct. 15	11:00 a.m.	175	21			0	7	83	98	99	100	--				SV
Oct. 28	3:35 p.m.	188	12			3	13	66	94	98	99	100				SV
Nov. 12.....	2:50 p.m.	180	12			2	12	73	97	100	--	--				SV
Nov. 26.....	12:25 p.m.	202	13			3	22	78	96	99	99	100				SV
Dec. 16.....	4:40 p.m.	a 215	26			6	25	87	98	100	--	--				V

Mar. 18, 1958.....	10:10 a.m.	a 220	6			1	14	86	100	--	--	--				V
Mar. 31	6:35 p.m.	440	22			7	32	81	96	99	100	--				SV
Apr. 14.....	3:30 p.m.	292	19			7	31	92	100	--	--	--				V
Apr. 29.....	9:40 a.m.	330	21			1	15	84	99	100	--	--				V
May 12	3:35 p.m.	199	13			4	18	87	98	100	--	--				SV
May 28	11:00 a.m.	774	5			0	6	68	98	100	--	--				V
June 10.....	12:20 p.m.	218	23			4	22	85	98	99	100	--				SV
June 24.....	10:30 a.m.	193	12			0	11	81	98	99	100	--				SV
July 8	11:10 a.m.	172	20			0	12	80	98	99	100	--				SV
July 19	8:35 p.m.	7,320	5			0	4	25	60	86	97	100				SV
July 22	9:50 a.m.	690	12			0	4	60	97	99	100	--				SV
Aug. 6	1:15 p.m.	160	11			20	35	83	96	99	99	100				SV
Aug. 18.....	7:40 a.m.	158	13			0	5	74	94	98	99	100				SV
Sept. 8	2:30 p.m.	145	18			5	15	70	96	99	99	100				SV
6B-7850. MIDDLE LOUP RIVER AT ST. PAUL, NEBR.																
Nov. 25, 1957.....	11:25 a.m.	995	13			1	16	70	97	99	100	--				SV
Mar. 17, 1958.....	3:25 p.m.	1,650	3			0	4	35	86	98	99	100				SV
Mar. 31	10:35 a.m.	1,680	16			1	15	58	92	98	99	100				SV
Apr. 28.....	2:10 p.m.	1,750	4			0	2	64	98	100	--	--				V
May 26	12:20 p.m.	956	7			1	9	23	70	92	98	100				SV
June 9.....	1:00 p.m.	995	33			2	10	66	98	100	--	--				V
July 7	11:40 a.m.	1,140	22			0	2	47	91	98	99	100				SV
July 19	4:30 p.m.	9,950	5			0	4	32	78	86	87	94	96			SV
Aug. 4	2:25 p.m.	956	24			0	4	59	96	99	100	--				SV
Aug. 18.....	11:10 a.m.	670	43			1	5	47	89	97	98	100				SV
6B-7905. NORTH LOUP RIVER NEAR ST. PAUL, NEBR.																
Nov. 12, 1957.....	10:10 a.m.	980	5			0	1	15	63	87	92	98	100	--		SV
Nov. 25.....	3:05 p.m.	1,070	9			0	3	23	68	87	92	97	100	--		SV
Mar. 17, 1958.....	12:20 p.m.	1,130	4			--	0	10	53	84	92	98	99	100		SV
Mar. 31	1:15 p.m.	1,600	11			0	2	43	82	90	94	98	100	--		SV
Apr. 28	11:35 a.m.	1,700	4			--	0	14	52	79	87	95	99	100		SV
May 26	10:45 a.m.	813	8			0	1	16	64	88	95	97	100	--		SV
June 9	11:10 a.m.	813	12			1	2	31	81	94	96	98	100	--		SV
June 23.....	12:50 p.m.	918	21			0	3	27	74	92	96	99	100	--		SV
July 7	6:10 p.m.	758	26			0	1	30	79	93	96	98	99	100		SV
July 9	3:00 p.m.	2,200	13			0	3	20	65	90	95	97	100	--		SV
July 20	9:25 a.m.	1,790	6			0	8	44	88	97	100	--	--	--		SV
Aug. 4	11:15 a.m.	824	23			6	8	27	66	85	91	96	98	100		SV
Aug. 18.....	12:30 p.m.	476	27			0	1	23	75	93	95	98	99	100		SV

a Daily mean discharge.

PLATTE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN PLATTE RIVER BASIN--Continued

Particle-size analyses of bed material, water year October 1957 to September 1958--Continued
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time	Discharge (cfs)	Number of sampling points	Bed material: Percent finer than indicated size, in millimeters											Methods of analysis
				0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	4.000	8.000	16.000	32.000	
6B-7918. CEDAR RIVER AT BELGRADE, NEBR.															
Oct. 15, 1957	3:35 p.m.	253	13			0	2	53	96	100	--					V
Oct. 29	3:00 p.m.	232	10			6	17	73	98	100	--					V
Nov. 14	9:15 a.m.	208	17			0	7	56	95	99	100					SV
Nov. 27	9:30 a.m.	220	9			9	21	63	97	100	--					V
Dec. 17	2:45 p.m.	251	11			5	13	72	98	100	--					V
Jan. 28, 1958	1:45 p.m.	213	9			1	3	44	94	99	100					SV
Feb. 19	9:00 a.m.	e 190	17			1	5	54	98	100	--					V
Mar. 18	4:30 p.m.	e 230	12			0	1	59	98	100	--					V
Apr. 2	12:40 p.m.	366	15			1	8	82	100	--	--					V
Apr. 15	11:10 a.m.	253	15			0	3	59	99	100	--					V
Apr. 29	4:10 p.m.	387	7			0	2	70	98	100	--					V
May 13	11:25 a.m.	205	13			0	3	53	98	100	--					V
May 27	9:30 a.m.	214	15			0	6	38	94	100	--					V
June 11	9:25 a.m.	202	19			4	14	59	97	100	--					V
June 24	4:50 p.m.	163	16			0	3	48	96	100	--					V
July 9	7:55 a.m.	187	16			0	4	72	98	100	--					V
July 22	6:10 p.m.	331	6			0	5	72	98	100	--					V
Aug. 5	4:20 p.m.	376	8			0	3	48	96	100	--					V
Aug. 19	8:40 a.m.	210	19			0	2	46	94	99	99	100				SV
Sept. 9	12:50 p.m.	167	19			4	8	46	95	100	--					V

e Estimated.

LITTLE NEMAHA RIVER BASIN

MISCELLANEOUS ANALYSES OF STREAMS IN LITTLE NEMAHA RIVER BASIN IN NEBRASKA

Periodic determinations of suspended-sediment discharge, water year October 1957 to September 1958

Date	Discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Discharge (tons per day)
6B-8105. LITTLE NEMAHA RIVER NEAR SYRACUSE			
Oct. 15, 1957, 10:30 a.m..	528	9,480	13,500
Oct. 15, 11:00 a.m.....	553	13,100	19,600
Feb. 27, 1958, 11:50 a.m .	2,690	43,200	325,000
July 10, 11:35 a.m.....	24,400	10,200	672,000
July 10, 12:45 p.m.....	22,500	9,650	586,000
July 11, 9:40 a.m.....	5,290	17,200	246,000

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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	
6B-8105. LITTLE NEMAHA RIVER NEAR SYRACUSE																	
Oct. 15, 1957....	10:30 a.m.	528		9,480	4,070	42	46		69		99	99	99		100		VPWCM
Oct. 15	11:00 a.m.	553		13,100	12,100	40	49		74		99	100	--				VPWCM
Feb. 27, 1958 ...	11:50 a.m.	2,690		43,200	14,100	32	36		56		97	99	100				VPWCM
July 10.....	11:35 a.m.	24,400		10,200	3,810	51	55		75		98	99	100				VPWCM
July 10.....	12:45 p.m.	22,500		9,650	10,500	50	56		75		98	99	100				VPWCM
July 11.....	9:40 a.m.	5,290		17,200	16,400	35	40		61		97	99	100				VPWCM

6B-8070. 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 1958.
Water temperatures: May 1951 to September 1958.
EXTREMES, 1957-58.--Dissolved solids: Maximum, 499 ppm Jan. 1-12; minimum, 276 ppm Aug. 6-11.
Hardness: Maximum, 264 ppm Jan. 1-12; minimum, 141 ppm Aug. 6-11.
Specific conductance: Maximum daily, 832 micromhos Jan. 7; minimum daily, 421 micromhos Aug. 10.
Water temperatures: Maximum, 80°F Aug. 19, 20; minimum, freezing point on many days during January and February.
EXTREMES, 1951-58.--Dissolved solids: Maximum, 600 ppm Jan. 1-10, 1952; minimum, 252 ppm June 18-19, 1957.
Hardness: Maximum, 344 ppm Jan. 1-10, 1952; minimum, 141 ppm Aug. 6-11, 1958.
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 1957 to September 1958 given in WSP 1560.

Chemical analyses, in parts per million, water year October 1957 to September 1958

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, 1957	34,670	--	--	--	--	69	--	191	--	--	--	--	--	482	0.66	45,120	229	72	40	2.0	728	7.7	--
Nov. 1-30	19,370	--	--	--	--	59	--	201	--	--	--	--	--	452	.61	23,640	229	64	36	1.7	689	7.9	--
Dec. 1-24	14,020	21	0.02	66	18	55	5.5	215	146	24	0.5	3.4	0.10	450	.61	17,030	239	63	33	1.5	692	7.7	--
Dec. 25-31	14,810	--	--	--	--	50	--	199	--	--	--	--	--	411	.56	16,430	218	55	33	1.5	641	7.8	--
Jan. 1-12, 1958	9,580	--	--	--	--	64	--	236	--	--	--	--	--	499	.68	12,910	264	70	34	1.7	772	7.8	--
Jan. 13-Feb. 22	12,900	--	--	--	--	58	--	208	--	--	--	--	--	462	.63	16,090	233	62	35	1.6	696	7.8	--
Feb. 23-25	18,100	--	--	--	--	49	--	186	--	--	--	--	--	409	.56	19,990	202	49	35	1.5	617	7.9	--
Feb. 26-Mar. 5	37,810	--	--	--	--	32	--	157	--	--	--	--	--	312	.42	31,850	166	37	30	1.1	484	7.3	--
Mar. 6-23	20,000	18	.01	61	16	47	7.7	201	129	21	.4	3.9	.22	415	.56	22,410	217	52	31	1.4	618	7.6	6
Mar. 24-Apr. 5	24,650	--	--	--	--	45	--	192	--	--	--	--	--	402	.55	26,760	212	55	32	1.4	615	7.2	--
Apr. 6-16	39,280	--	--	--	--	43	--	183	--	--	--	--	--	384	.52	40,730	208	58	31	1.3	592	7.3	--
Apr. 17-May 1	34,910	--	--	--	--	52	--	192	--	--	--	--	--	427	.58	40,250	218	61	34	1.5	646	7.4	--
May 2-31	32,870	--	--	--	--	56	--	190	--	--	--	--	--	431	.59	38,250	220	64	36	1.6	660	7.5	--
June 1-30	33,530	13	.02	72	9.4	58	5.7	181	167	19	.4	1.2	.11	448	.61	40,560	218	70	36	1.7	675	7.3	7
July 1-10	36,980	--	--	--	--	53	--	190	--	--	--	--	--	420	.57	41,940	215	59	35	1.6	645	7.4	--
July 11-13	46,300	--	--	--	--	54	--	155	--	--	--	--	--	371	.50	46,380	171	44	41	1.8	578	7.5	--
July 14-19	34,730	--	--	--	--	57	--	174	--	--	--	--	--	423	.58	39,670	204	61	38	1.7	648	7.4	--
July 20-30	44,930	--	--	--	--	46	--	169	--	--	--	--	--	367	.50	44,520	186	47	35	1.5	566	7.4	--
July 31-Aug. 2	53,730	--	--	--	--	33	--	149	--	--	--	--	--	303	.41	43,960	158	36	31	1.1	475	6.8	--
Aug. 3-5	33,870	--	--	--	--	36	--	158	--	--	--	--	--	326	.44	29,810	169	39	32	1.2	507	6.8	--

Aug. 6-11	52,430	--	--	--	--	29	--	134	--	--	--	--	--	276	.38	39,070	141	31	31	1.1	434	6.7	--
Aug. 12-20	34,690	--	--	--	--	51	--	175	--	--	--	--	--	405	.55	37,930	203	59	35	1.6	623	7.0	--
Aug. 21-Sept. 5	31,640	--	--	--	--	59	--	182	--	--	--	--	--	459	.62	39,210	219	70	37	1.7	701	7.0	--
Sept. 6-7	43,900	--	--	--	--	57	--	167	--	--	--	--	--	403	.55	47,770	194	57	39	1.8	631	6.8	--
Sept. 8-30	31,720	11	.00	58	18	63	5.4	186	180	18	.6	.7	.13	456	.62	39,050	219	66	38	1.8	694	7.3	4
Weighted average a	27,810	--	--	--	--	54	--	186	--	--	--	--	--	425	0.58	31,910	213	60	36	1.6	647	--	--

a Represents 100 percent of runoff for water year October 1957 to September 1958.

MISSOURI RIVER MAIN STEM--Continued

MISSOURI RIVER AT NEBRASKA CITY, NEBR.--Continued

Temperature (° F) of water, water year October 1957 to September 1958
/Once-daily measurement at 8 a.m./

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

a Measurement at 4 a.m.
b Includes estimated temperature, 32° F, on missing days.

NISHNABOTNA RIVER BASIN

6B-8080. 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 1958.
EXTREMES, 1957-58.--Sediment concentrations: Maximum daily, 7,110 ppm Apr. 4; minimum daily, not determined.
Sediment loads: Maximum daily, 10,000 tons July 30; minimum daily, less than 0.05 ton on many days.
EXTREMES, 1954-58.--Sediment concentrations: Maximum daily, 14,000 ppm June 17, 1957; 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.--Maximum observed sediment concentration during water year, 55,100 ppm Apr. 4. Flow affected by ice Nov. 8-11, Nov. 18 to Mar. 8, Mar. 15-21. Records of discharge for water year October 1957 to September 1958 given in WSP 1560.

Suspended sediment, water year October 1957 to September 1958

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	0.55	--	(t)	3.9	--	e 10	1.0	--	
2	1.2	--	e 0.3	3.4	200	1.8	1.1	8	
3	.42			1.6	--	e .4	1.1	24	
4	.22			1.0	--		1.1	--	
5	.22	--	(t)	1.0	--		1.1	--	(t)
6	.22			1.0	15	(t)	1.1	10	
7	.99	--	e .3	1.2	--		1.1	--	
8	1.4	--	e .5	1.2	13		.95	8	
9	.61	13		1.1	--		.80	--	
10	.55	--	(t)	.80			.70	13	
11	.69	--		.95			.60	--	
12	3.8	460	sa 6.0	1.2			.60	18	
13	1.8	--	e 1.0	1.2			.64	--	(t)
14	1.3	--	e 1.0	1.2	6	(t)	.68	11	
15	2.6	326	2.3	1.2			.73	--	
16	1.4	--	e .8	1.4			.78	11	
17	4.3	--	e 20	1.4			.90	--	
18	1.7	--	e .8	3.5	--	e 1.0	1.2	190	sa 1.1
19	.84	26	.1	3.0	--	e .4	1.2	--	e 1.0
20	1.2	--	e .2	2.0	38	.2	1.2	177	.6
21	1.6	85	.4	1.7	--		1.1	--	e .3
22	3.9	--	e 8.0	1.5	12		1.1	60	
23	4.2	--	e 10	1.5	--	e .1	1.0	--	
24	2.3	--	e 2.0	1.9	13		1.0	42	
25	1.4	--		2.0	--		1.2	--	e .2
26	1.2	16		1.8	42		1.2	54	
27	1.0	--		1.7	--		1.2	--	
28	1.0	--	e .1	1.8	23	e .1	1.0	54	
29	1.0	--		1.3	--		.85	--	
30	1.0	--		.90	16		.65	20	(t)
31	1.0	22		--	--	--	.54	--	
Total	45.61	--	54.6	49.35	--	15.2	29.42	--	5.0

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

NISHNABOTNA RIVER BASIN--Continued

6B-8080. MULE CREEK NEAR MALVERN, IOWA--Continued

Suspended sediment, water year October 1957 to September 1958--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	0.52	--		0.90	--		3.5	575	5.4
2	.50	--		.96	--		3.1	--	e 3.0
3	.50	53	e 0.1	1.0	--		2.6	--	e 1.0
4	.50	--		1.1	11		1.9	200	a 1.0
5	.70	--		.86	--		3.0	650	a 5.0
6	.65	--		.70	13	(t)	3.2	500	a 4.4
7	.62	16		.60	--		3.0	485	3.9
8	.65	--		.50	11		2.9	285	2.2
9	.80	10	(t)	..40	--		2.8	261	2.0
10	.95	--		.34	14		2.8	193	1.5
11	1.1	11		.29	--		2.3	161	1.0
12	1.1	40	.1	.26	14		2.6	184	1.3
13	1.1	--		.23	--		2.3	184	1.1
14	1.0	--		.20	--		2.1	123	.7
15	.90	11	(t)	.17	25	(t)	1.8	260	a 1.3
16	.90	--		.15	--		1.7	140	a .6
17	.90	--		.15	16		1.7	62	.3
18	.90	8		.15	--		1.7	130	a .6
19	.90	60	.1	.15	18		1.7	84	.4
20	.90	--		.15	--		1.7	64	.3
21	.88	33		.90	--	e 0.7	1.6		
22	.85	--	e .1	2.5	867	5.9	1.6		
23	.82	38		5.0	1,500	a 20	1.6	45	.2
24	.86	--		8.0	1,100	b 24	1.4		
25	.92	16		3.5	750	b 7.0	1.4		
26	1.0	--		1.1	600	b 1.8	1.4	--	
27	.92	--		3.0	--	e 5.0	1.4	--	
28	.88	7		4.5	--	e 10	1.6	--	
29	.82	--	(t)	--	--	--	1.8	--	e .2
30	.78	--		--	--	--	2.1	34	
31	.84	--		--	--	--	1.8	--	
Total	25.66	--	1.8	37.76	--	74.7	66.1	--	39.2

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	110	a 0.5	1.2	17	0.1	0.84	16	
2	1.8	63	.3	1.2	25	.1	.69	--	
3	2.3	650	a 4.0	1.4	42	.2	.55	--	
4	3.9	7,110	s 220	1.4	73	.3	.42	--	
5	11	5,000	149	1.4	25	.1	.84	16	
6	4.0	580	6.3	1.8	--	e .2	.84	46	
7	2.6	160	1.1	2.1	65	.4	1.2	15	
8	2.3	148	.9	2.3	86	.5	.84	--	e 0.1
9	1.4	--	e .5	2.1	--	e .3	.84	--	
10	1.8	95	.5	1.8	47	.2	.84	--	
11	1.6	80	.3	1.6	29		.84	26	
12	1.6	45		1.2	--	e .1	1.0	--	
13	1.6	--		1.0	--		1.0	--	
14	1.6	--		.84	30		.84	--	
15	1.4	19	e .1	.84	--	e .1	.55	31	
16	1.4	45		1.0	--		.55	--	
17	1.2	27		1.4	51	.2	.42	--	
18	1.2	21		1.2	--	e .1	.42	43	
19	1.6	44		.84	--	e .1	.55	--	
20	1.8	78	.4	.69	--		.55	--	(t)
21	1.8	124	.6	.69	26		.55	8	
22	1.2	41	.1	.69	29	(t)	.84	18	
23	2.1	150	.9	.69	--		.84	--	
24	2.1	164	.9	.55	22		.84	--	
25	1.2	40	.1	.55	--		.84	24	
26	1.2	71	.2	.42			.69	--	
27	1.2	24	.1	.42			.55	--	
28	1.8	89	.4	.32	--	(t)	.32	12	(t)
29	1.4	65	.2	.32			.14	--	
30	1.2	31	.1	.69			.14	9	
31	--	--	--	.84	37	.1	--	--	--
Total	63.1	--	388.2	33.49	--	3.8	20.37	--	2.0

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

6B-8080. MULE CREEK NEAR MALVERN, IOWA--Continued

Suspended sediment, water year October 1957 to September 1958--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	0.22	--	(t)	6.2	--	e 20	1.6	24	
2	2.8	750	sa 10	4.4	575	6.8	1.6	--	e 0.1
3	1.8	--	e .7	3.4	118	1.1	1.8	--	
4	2.1	--	e 1.0	2.8	--	e 1.0	4.2	300	sb 10
5	1.2	52	.2	3.1	240	sb 6.5	27	1,900	sa 600
6	.84	--	.1	13	1,200	sa 50	41	2,200	sa 480
7	.55	23	(t)	4.4	112	1.3	5.0	244	3.3
8	.42	--	(t)	2.8	88	.7	2.8	--	e 2.4
9	1.2	67	.2	2.3	44	.3	2.8	80	
10	3.6	360	sa 4.0	2.1	45	.3	2.8	--	
11	2.6	--	e 2.0	2.1	28	.2	2.3	--	e .5
12	1.8	50	.2	2.1	26	.2	2.1	--	
13	1.2	57	.2	9.4	1,160	s 47	1.8	73	
14	1.2	--	e .2	5.9	253	4.0	14	1,270	s 85
15	.84	--	(t)	2.8	78	.6	6.2	101	1.7
16	.84	22	(t)	2.3	36	.2	2.8	140	1.1
17	11	1,720	s 77	2.1			2.3	82	.5
18	4.0	250	b 2.8	1.8			2.1	--	e .3
19	79	4,500	sa 1,800	1.6			2.1	--	e .3
20	6.8	2,800	51	1.6	30	.1	2.6	--	e 2.0
21	3.7	--	e 5.0	1.6			3.4	27	.2
22	2.3	--	e 2.0	1.6			2.3	--	e .1
23	1.8	49	.2	2.3	79	.5	8.5	900	sa 36
24	2.3	56	.3	2.3			4.4	50	.6
25	1.8	--	e .2	2.1			2.1	--	
26	1.6	29	.1	2.1			1.8	--	
27	2.5	170	sa 1.4	2.1	27	.2	1.6	11	e .1
28	1.8	--	e .2	2.1			1.4	22	
29	1.6	50	sa .3	2.1			1.4	--	
30	378	7,000	sa10,000	2.1			1.8	--	
31	13	850	sa 34	1.6			--	--	--
Total	534.41	--	11,993.5	98.2	--	142.9	157.6	--	1,226.9

Total discharge for year (cfs-days) 1,161.07
Total load for year (tons) 13,947.8

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

6B-8080. MULE CREEK NEAR MALVERN, IOWA--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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 10, 1958	8:00 a.m.	5.3	66	1,040	2,770		58		83		99	100	--				SPWCM
July 17	7:45 a.m.	13	60	7,130	2,690		45		72		98	99	100				SPWCM
July 30	7:30 a.m.	1,060	72	10,100	3,540		33		52		98	100	--				SPWCM
July 30	7:30 a.m.	1,060	72	10,100	3,190		19		44		98	100	--				SPNM
Aug. 6	7:00 a.m.	21	72	1,300	3,790		47		69		99	100	--				SPWCM
Sept. 5	6:05 a.m.	16	80	978	3,350		45		69		98	100	--				SPWCM
Sept. 5	11:30 p.m.	222	70	9,100	3,440		31		48		99	100	--				SPWCM
Sept. 6	6:15 a.m.	57	71	2,280	3,430		28		49		98	99	100				SPWCM
Sept. 14	1:00 p.m.	178	64	3,310	4,820		39		57		98	99	100				SPWCM
Sept. 14	2:30 p.m.	47	64	4,930	3,300		36		53		97	99	100				SPWCM
Sept. 14	3:45 p.m.	49	68	2,760	3,970		38		57		98	100	--				SPWCM
Sept. 14	5:00 p.m.	40	68	2,060	3,830		41		58		99	100	--				SPWCM
Sept. 23	12:45 p.m.	30	68	3,710	4,540		45		63		99	100	--				SPWCM

NISHNABOTNA RIVER BASIN--Continued

6B-8090. DAVIDS CREEK NEAR HAMLIN, IOWA

LOCATION.--At gaging station on downstream side of bridge on State Highway 64, 5.2 miles east of Hamlin, Audubon County, and 8 miles upstream from mouth and East Nishnabotna River.
DRAINAGE AREA.--26.0 square miles.
RECORDS AVAILABLE.--Water temperatures: July 1952 to September 1953.
Sediment records: July 1952 to September 1958.
EXTREMES, 1957-58.--Sediment concentrations: Maximum daily, 10,000 ppm July 2; minimum daily, not determined.
Sediment loads: Maximum daily, 99,000 tons July 2; minimum daily, less than 0.05 ton Oct. 1-5.
EXTREMES, 1952-58.--Sediment concentrations: Maximum daily, 10,700 ppm Apr. 23, 1955; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 99,000 tons July 2, 1958; minimum daily, 0 tons on many days.
REMARKS.--Maximum observed sediment concentration during water year, 14,800 ppm June 13. Flow affected by ice Nov. 9, 10, Nov. 18 to Dec. 16, Dec. 26 to Feb. 24. Records of discharge for water year October 1957 to September 1958 given in WSP 1560.

Suspended sediment, water year October 1957 to September 1958

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	0.92	--		7.6	--	e 3.0	13	--	e 2.8
2	.83	--		14	168	6.4	13	--	
3	.83	--	(t)	9.0	--	e 2.4	13	40	
4	.83	--		8.5	--	e 2.0	13	54	
5	.83	26		7.6	22		12	--	e 1.8
6	4.3	--	e 0.9	7.6	--		13	--	
7	5.1	70	1.0	7.6	--		12	55	
8	28	458	s 46	7.2	--		10	--	
9	11	95	2.8	5.0	46		8.0	--	
10	6.4	58	1.0	5.6	--	e .6	7.0	60	
11	4.9	--		6.4	--		8.2	--	
12	4.6	96	e 1.3	6.4	--		9.0	42	e 1.3
13	5.6	--		8.0	29		9.6	--	
14	5.3	--		7.6	--		10	62	
15	8.1	100	2.2	8.5	--		11	--	
16	7.6	--	e 1.2	15	72	2.9	12	--	
17	6.0	--		12	--	e 2.0	13	54	
18	4.9	--		8.0	--	e 1.5	15	62	e 2.0
19	4.6	25		6.0	--	e 1.0	15	--	
20	4.2	--	e .3	13	--		13	52	
21	4.2	--		11	--		12	41	
22	7.2	--	e 3.0	11	--		13	--	
23	14	--	e 4.0	11	63	e 1.9	13	35	
24	12	43	1.4	11	--		12	--	
25	9.5	--	e 1.0	11	--		13	--	
26	8.0	26	.6	12	--		11	45	e 1.2
27	7.2	--		13	109		12	--	
28	7.2	--		14	--		10	--	
29	6.8	--	e .4	11	--	e 3.6	9.0	--	
30	6.4	21		10	118		8.0	--	
31	5.6	--		--	--	--	7.2	42	
Total	202.94	--	74.0	285.6	--	55.5	350.0	--	46.3

e Estimated.
s Computed by subdividing day.
t Less than 0.050 ton.

NISHNABOTNA RIVER BASIN--Continued

6B-8090. DAVIDS CREEK NEAR HAMLIN, IOWA--Continued

Suspended sediment, water year October 1957 to September 1958--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	6.6	--		4.5	32		27	222	16
2	6.2	--		4.2	--		23	140	8.7
3	5.8	--		4.1	--		21		
4	5.6	44		3.9	36		21		
5	5.7	--	e 0.7	3.8	--	e 0.3	21	128	7.1
6	5.8	--		3.7	--		22		
7	6.0	--		3.5	--		20		
8	6.0	43		3.4	--		19	150	7.7
9	6.0	--		3.3	--		19	--	e 6.5
10	6.2	--		3.1	--		17	100	4.6
11	6.4	82		3.0	--		18	70	3.4
12	6.6	--	e 1.5	2.8	--		20	80	4.3
13	6.7	87		2.7	47		20	90	4.9
14	6.8	--		2.7	--		19	76	3.9
15	7.0	50		2.6	36		17		
16	7.0	--		2.6	--	e .3	16	--	e 3.0
17	6.8	--	e .9	2.6	--		15		
18	6.6	50		2.6	39		14		
19	6.3	--		2.6	--		14		
20	6.0	--		2.6	--		14		
21	6.2	--		2.6	--		14	63	2.4
22	7.0	43		3.0	95	sa 1.0	13		
23	6.8	--		30	442	s 58	13		
24	6.6	--		100	1,010	s 321	13		
25	6.3	37		53	850	a 120	13		
26	6.2	--	e .7	30	560	45	13		
27	5.8	--		83	2,730	s 845	13	40	1.4
28	5.6	--		39	450	47	13		
29	5.4	48		--	--	--	13		
30	5.0	--		--	--	--	13		
31	4.7	--		--	--	--	12		
Total	191.7	--	25.5	404.9	--	1,443.3	520	--	130.5

Day	April			May			June		
1	15	146	5.9	6.4			4.2	--	e 0.9
2	15	48	1.9	6.4			3.4	--	
3	15	73	3.0	6.8			3.1	24	
4	19	110	5.6	6.4			3.1	30	
5	19	80	4.1	6.0			2.8	--	
6	17	35	1.6	6.5			2.6	--	e .3
7	13			7.2			2.6	58	
8	13			7.6	48	0.8	2.6	--	
9	12			6.8			2.4	--	
10	13			6.4			2.1	35	
11	12	31	1.0	6.4			1.8	--	
12	11			6.0			4.9	80	sa 1.2
13	11			5.3			43	4,200	sa 850
14	10			5.6			8.6	300	s 7.3
15	9.5			6.0			6.4	163	2.8
16	9.0			6.0	--		4.9	140	1.9
17	9.0			6.4	45		4.6	122	1.5
18	8.5			5.3	--		4.0	--	e 1.2
19	9.0			4.9	--		4.0	94	1.0
20	9.0			4.9	20		3.4	--	e .8
21	8.0			4.6	--		3.4	67	.6
22	7.6			4.6	23		4.5	--	e 2.0
23	9.0	36	.8	4.0	--	e .3	6.0	530	s 21
24	8.5			4.0	34		5.8	175	s 3.0
25	7.2			3.6	--		3.6	62	.6
26	7.2			3.4	--		2.6	52	.4
27	7.2			3.1	25		2.4	70	.5
28	9.0			2.6	--		2.1	42	.2
29	6.4			2.6	--		1.8	33	.2
30	6.4			2.8	--		1.6	30	b .1
31	--	--	--	5.0	85	1.1	--	--	--
Total	326.5	--	43.1	163.6	--	17.6	148.3	--	900.2

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

NISHNABOTNA RIVER BASIN--Continued

6B-8090. DAVIDS CREEK NEAR HAMLIN, IOWA--Continued

Suspended sediment, water year October 1957 to September 1958--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.....	78	2,700	sb 9,400	50	1,000	sa 170	7.3	138	2.7
2.....	1,620	10,000	sb30,000	33	360	sa 36	6.9	123	2.3
3.....	407	4,400	sa 7,300	24	280	b 18	6.2	65	1.1
4.....	291	1,200	sa 1,300	21	242	14	6.0	84	1.4
5.....	55	340	50	21	--	e 13	88	700	sb 260
6.....	43	420	49	20	237	13	114	500	sa 200
7.....	36	300	29	18	--	e 10	19	207	11
8.....	32	185	16	18	169	8.2	16	150	6.5
9.....	30	--	e 14	17	206	9.5	16	114	4.9
10.....	29	153	12	16	232	10	14	123	4.6
11.....	28	--	e 11	16	190	8.2	13	109	3.8
12.....	26	123	8.6	15	202	8.2	12	115	3.7
13.....	25	--	e 7.0	16	165		12	72	2.3
14.....	24	90	5.8	16	172		21	190	sa 14
15.....	22	--		15	--		22	260	sa 15
16.....	20	--	e 4.4	13	178	e 6.5	15	157	6.4
17.....	21	78		12	--		14	166	6.3
18.....	21	--		12	--		12	--	e 3.6
19.....	282	2,100	sa 2,100	11	--		11	71	2.1
20.....	49	330	44	11	218	6.5	11	106	3.1
21.....	34	220	20	11	--	e 6.0	12	--	e 3.6
22.....	28	170	b 13	10	--	e 5.0	10	119	3.2
23.....	26	164	12	13	177	6.2	11	135	4.0
24.....	29	260	sa 24	15	144	5.8	12	73	2.4
25.....	24	170	10	11	138	4.1	9.7	--	e 2.2
26.....	22	145	8.6	11	--	e 3.4	9.3	132	3.3
27.....	22	160	a 9.5	10	103	2.8	8.5	93	2.1
28.....	20	110	b 6.0	9.1	--	e 2.8	8.3	--	e 1.8
29.....	19	102	5.2	8.9	114	2.7	8.3	71	1.6
30.....	50	850	sa 120	9.1	122	3.0	7.3	--	e 1.0
31.....	48	1,100	sb 340	7.3	159	3.1	--	--	--
Total.	3,461	--	119,932.3	490.4	--	415.0	532.8	--	580.0

Total discharge for year (cfs-days)..... 7,077.74
Total load for year (tons)..... 123,663.3

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

NISHNABOTNA RIVER BASIN--Continued

6B-8090. DAVIDS CREEK NEAR HAMLIN, IOWA--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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. 8, 1957.....	9:15 a.m.	43	54	1,320	2,820	31	40	53	65	90	98	99	100		--		SPWCM
Feb. 23, 1958 ...	5:15 p.m.	60	34	1,350	2,720		34		56		92	95	98		99	100	SPWCM
Feb. 24.....	4:30 p.m.	200	35	2,510	3,370		30		57		92	95	98		100		SPWCM
June 13	7:30 a.m.	150	64	14,800	2,880		65		95		99	100	--		--		SPWCM
June 13	5:00 p.m.	30	64	1,250	1,890		72		90		99	99	100		--		SPWCM
June 23	8:30 p.m.	24	68	8,410	5,890		53		90		100	--	--		--		SPWCM
July 2.....	4:15 p.m.	329	70	2,710	2,340		72		90		98	99	100		--		SPWCM
July 19.....	10:45 a.m.	503	62	1,900	3,540		43		78		99	100	--		--		SPWCM

6B-8387. REPUBLICAN RIVER ABOVE MEDICINE CREEK AT CAMBRIDGE, NEBR.

LOCATION.--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 1958 (discontinued).
Water temperatures: December 1950 to September 1958 (discontinued).
EXTREMES, 1957-58.--Dissolved solids: Maximum, 432 ppm Jan. 1-5; minimum, 233 ppm July 20-25.
Hardness: Maximum, 267 ppm Jan. 1-5; minimum, 150 ppm July 20-25.
Specific conductance: Maximum daily, 658 micromhos Jan. 4; minimum daily, 331 micromhos July 23.
Water temperatures: Maximum, 91°F Aug. 3; minimum, freezing point on many days during November to March.
EXTREMES, 1950-58.--Dissolved solids: Maximum (1951-58), 444 ppm Nov. 26 to Dec. 3, 1952; minimum, 186 ppm May 14, 1957.
Hardness: Maximum, 272 ppm Nov. 26 to Dec. 3, 1952; minimum, 113 ppm Sept. 1-5, 1953.
Specific conductance: Maximum daily (1951-58), 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 below Harry Strunk Lake from that of Republican River at Cambridge. Records of discharge for Medicine Creek below Harry Strunk Lake and Republican River at Cambridge for water year October 1957 to September 1958 given in WSP 1560.

Chemical analyses, in parts per million, water year October 1957 to September 1958

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, 1957....	144	--	--	--	--	23	--	258	--	--	--	--	--	320	0.44	124	197	0	20	0.7	485	7.8	--
Nov. 1-30.....	217	--	--	--	--	25	--	280	--	--	--	--	--	335	.46	196	214	0	20	.7	524	7.6	--
Dec. 1-31.....	166	50	0.01	62	18	27	13	296	38	8.5	1.0	2.4	0.09	361	.49	162	228	0	19	.8	549	7.5	16
Jan. 1-5, 1958.....	126	--	--	--	--	32	--	343	--	--	--	--	--	432	.59	147	267	0	21	.9	638	7.8	--
Jan. 6-31	255	--	--	--	--	24	--	266	--	--	--	--	--	338	.46	233	206	0	20	.7	507	7.6	--
Feb. 1-28.....	437	--	--	--	--	26	--	238	--	--	--	--	--	311	.42	367	188	0	23	.8	493	7.2	--
Mar. 1-31.....	601	32	.01	52	16	26	13	250	46	7.7	.9	2.8	.09	332	.45	539	197	0	21	.8	506	7.6	9
Apr. 1-30.....	675	--	--	--	--	29	--	249	--	--	--	--	--	335	.46	611	200	0	24	.9	514	7.2	--
May 1-13.....	596	--	--	--	--	29	--	245	--	--	--	--	--	331	.45	533	197	0	24	.9	514	7.4	--
May 14-16.....	1,141	--	--	--	--	18	--	201	--	--	--	--	--	258	.35	795	159	0	20	.6	402	7.3	--
May 17-June 16....	503	--	--	--	--	29	--	243	--	--	--	--	--	331	.45	450	191	0	25	.9	514	7.5	--
June 17-23	440	26	.01	47	14	24	14	220	47	7.8	.9	2.8	.12	293	.40	348	176	0	21	.8	459	7.1	10
June 24-July 3.....	280	--	--	--	--	28	--	240	--	--	--	--	--	324	.44	245	188	0	24	.9	499	7.6	--
July 4-10	348	--	--	--	--	20	--	213	--	--	--	--	--	286	.39	269	169	0	20	.7	439	7.5	--
July 11-19.....	225	--	--	--	--	26	--	234	--	--	--	--	--	314	.43	191	183	0	24	.8	482	7.3	--
July 20-25.....	1,008	--	--	--	--	9.2	--	194	--	--	--	--	--	233	.32	634	150	0	12	.3	358	7.4	--
July 26-28.....	220	--	--	--	--	18	--	231	--	--	--	--	--	290	.39	172	176	0	18	.6	449	7.5	--
July 29-Aug. 15....	153	--	--	--	--	26	--	229	--	--	--	--	--	317	.43	131	184	0	23	.8	494	7.1	--
Aug. 16-Sept. 14...	198	--	--	--	--	27	--	218	--	--	--	--	--	309	.42	165	175	0	25	.9	486	7.0	--
Sept. 15-30.....	272	29	.01	48	15	28	14	229	51	7.2	.9	3.5	.11	312	.42	229	181	0	23	.9	485	7.5	6
Weighted average a	360	--	--	--	--	.6	--	244	--	--	--	--	--	321	0.44	312	192	0	23	0.8	495	--	--

a Represents 100 percent of runoff for water year October 1957 to September 1958.

KANSAS RIVER BASIN--Continued

6B-8387. REPUBLICAN RIVER ABOVE MEDICINE CREEK AT CAMBRIDGE, NEBR.--Continued

Temperature (° F) of water, water year October 1957 to September 1958
/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	66	54	a 32	b 32	38	b 32	46	58	b 82	a 78	82	b 88
2	a 60	46	a 32	32	b 38	32	48	a 55	77	a 76	89	a 68
3	b 69	42	b 42	32	32	32	--	b 63	82	b 89	b 91	77
4	--	40	b 44	32	b 38	33	49	b 65	a 72	a 81	a 75	72
5	73	42	b 42	32	35	b 35	45	b 72	68	b 81	a 75	79
6	63	45	37	b 33	a 34	32	b 46	b 71	b 70	b 81	84	a 68
7	54	47	33	35	a 32	33	44	67	a 68	81	b 89	77
8	50	42	a 32	35	32	34	b 45	67	b 78	80	87	a 68
9	54	40	41	34	b 32	b 35	a 45	b 65	a 75	83	a 75	a 71
10	61	40	37	34	--	35	a 45	69	76	83	a 75	a 68
11	54	a 39	32	34	b 32	33	46	a 58	74	85	a 75	b 74
12	61	b 49	33	a 33	b 32	36	58	a 65	68	72	b 90	a 66
13	55	a 39	35	b 34	32	39	a 54	65	b 80	b 85	a 77	a 67
14	52	a 40	36	a 32	32	b 41	b 63	63	b 72	a 73	88	a 68
15	61	45	34	32	32	b 42	60	b 63	a 71	a 69	86	65
16	60	37	39	a 32	a 32	a 33	63	b 61	a 68	a 68	a 72	63
17	55	b 39	41	a 32	32	a 33	63	b 71	--	a 67	b 85	60
18	50	37	46	a 32	32	a 33	b 60	b 72	81	a 75	b 87	64
19	50	36	39	a 32	32	35	60	a 65	80	a 72	a 72	a 68
20	48	38	34	32	32	36	a 53	68	69	b 74	80	a 67
21	50	35	a 32	34	33	a 33	60	69	70	75	72	b 71
22	54	43	a 33	b 35	33	b 42	58	72	69	b 79	68	73
23	49	39	a 32	34	41	a 41	52	a 66	a 65	76	70	75
24	b 47	a 35	a 32	32	39	44	48	b 69	a 69	77	b 70	74
25	37	39	a 32	35	a 44	46	48	a 67	a 60	a 75	72	62
26	37	44	32	b 38	a 46	46	45	81	a 61	78	77	67
27	42	42	a 35	36	a 36	b 52	a 47	81	a 65	b 81	81	63
28	47	a 32	32	37	--	a 44	48	71	a 69	78	80	a 62
29	52	37	a 32	b 38	--	43	49	81	--	88	81	a 58
30	53	b 38	32	39	--	a 40	58	a 72	77	80	77	52
31	52	--	32	36	--	b 44	--	79	--	87	a 65	--
Average	54	41	35	34	35	38	52	68	72	78	79	69

a Measurement between 7 a.m. and 10 a.m.
b Measurement between 2 p.m. and 6 p.m.

KANSAS RIVER BASIN--Continued

6B-8390. MEDICINE CREEK AT MAYWOOD, NEBR.

LOCATION.--At bridge on county road, 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 contributes directly to surface runoff.
RECORDS AVAILABLE.--Water temperatures: April 1951 to September 1958 (discontinued).
Sediment records: April 1951 to September 1958 (discontinued).
EXTREMES, 1957-58.--Water temperatures: Maximum, 78°F June 30; minimum, freezing point Jan. 4.
Sediment concentrations: Maximum daily, 5,650 ppm July 19; minimum daily, 105 ppm Aug. 12.
Sediment loads: Maximum daily, 1,920 tons July 19; minimum daily, 4 tons Aug. 7, 8, 12.
EXTREMES, 1951-58.--Water temperatures: Maximum, 86°F July 13, 1953; minimum, freezing point on many 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, 2 tons Oct. 27, 28, 1952, Sept. 1, 1956.
REMARKS.--Flow affected by ice Dec. 11-13, Dec. 31 to Jan. 8, Feb. 3, 7, 8, 10-19, Feb. 28 to Mar. 6, Mar. 11,12, 14, 15, 19. Records of discharge for water year October 1957 to September 1958 given in WSP 1560.

Temperature (° F) of water, water year October 1957 to September 1958
(Once-daily measurement between 7 a.m. and 12 m.)

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

a Measurement between 6 p.m. and 9 p.m.
b Measurement between 1 p.m. and 5 p.m.

KANSAS RIVER BASIN--Continued

6B-8390. MEDICINE CREEK AT MAYWOOD, NEBR.--Continued

Suspended sediment, water year October 1957 to September 1958

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	20			25	--		25	--	
2	19			25	--		26	--	
3	20			24	--		26	--	
4	20			24	--		26	170	
5	20			24	--		27	--	
6	20	--	e 12	24	170		28	--	
7	22			24	--		28	--	
8	23			24	--		29	205	
9	23			23	--		28	--	
10	23			23	--		28	--	
11	24			24	--		23	--	
12	24	220	14	25	--		25	--	
13	25	400	27	25	--		28	--	
14	34	750	69	24	--		24	280	
15	31	--	e 42	28	205		24	--	
16	26	--		42	--	e 14	26	--	a 14
17	24	--		34	--		28	285	
18	24	--	e 23	32	--		29	--	
19	25	3ɔɔ		29	--		29	--	
20	34	5ɔ0	50	28	--		28	--	
21	32	--	e 34	27	--		27	175	
22	29	--		25	--		26	--	
23	26	290		25	--		26	--	
24	25	--		28	215		25	--	
25	26	--		28	--		24	--	
26	26	185	e 16	28	--		25	145	
27	26	200		27	--		25	--	
28	26	--		26	--		25	--	
29	26	--		25	175		24	175	
30	25	--		26	--		25	--	
31	25	--		--	--	--	24	--	
Total	773	--	620	796	--	420	811	--	434

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	23	--		28	--		40	230	25
2	22	--		27	155		40	240	26
3	22	--		26	320		38		
4	23	285		26	--		38	--	e 24
5	25	--		28	160		36		
6	26	--		28	--		36	470	46
7	27	--		27	--		33	480	43
8	29	505		25	145		33	400	36
9	29	--		25	--		32	400	35
10	28	235		24	--	a 12	32	400	35
11	28	--		24	--		30	410	33
12	28	255		18	175		31	340	28
13	28	--	a 16	20	--		31	310	26
14	28	210		20	--		29	445	35
15	27	--		22	--		28	405	31
16	26	--		24	185		32	305	26
17	27	240		26	--		31	280	23
18	28	--		26	--		31	235	20
19	27	--		28	335		30	290	23
20	27	--		27	--		31	360	30
21	27	--		29	--		33	370	33
22	27	185		34	465	a 40	33	360	32
23	27	--		36	--		35	390	37
24	27	--		37	580		39	450	47
25	27	185		37	--		41	690	76
26	28			45	1,560	190	45	650	79
27	28			67	--	e 360	52	1,950	s 335
28	27	--	e 13	42	--	e 55	56	1,600	242
29	28			--	--	--	64	2,460	s 465
30	28			--	--	--	57	1,620	249
31	28			--	--	--	50	1,340	181
Total	830	--	478	826	--	1,101	1,167	--	2,369

e Estimated.
s Computed by subdividing day.
a Computed from samples obtained about two times a week.

KANSAS RIVER BASIN--Continued

6B-8390. MEDICINE CREEK AT MAYWOOD, NEBR.--Continued

Suspended sediment, water year October 1957 to September 1958--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	44	760	90	28	415	31	19	335	17
2	41	700	77	37	1,070	107	19	330	17
3	37	550	55	33	650	58	18	315	15
4	36	480	47	29	460	36	18	290	14
5	46	890	111	27	430	31	17	275	13
6	49	800	106	26	390	27	17	280	13
7	37	540	54	25	410	28	19	365	19
8	32	470	41	25	380	26	20	440	24
9	32	590	51	26	430	30	21	690	39
10	33	410	37	25	430	29	26	1,200	84
11	31	345	29	24	440	29	36	1,850	180
12	30	305	25	23	405	25	32	1,580	s 148
13	29	255	20	26	630	44	28	1,140	86
14	28	265	20	54	2,480	362	23	560	35
15	27	295	22	68	2,150	395	21	430	24
16	26	300	21	44	1,100	131	22	430	26
17	25	255	17	34	790	73	21	430	24
18	25	250	17	28	580	44	23	1,440	s 151
19	25	265	18	26	520	37	66	4,900	873
20	25	220	15	25	445	30	44	1,630	194
21	25	215	15	25	375	25	33	1,000	89
22	25	220	15	24	330	21	28	620	47
23	40	920	99	22	315	19	24	425	28
24	41	730	81	22	300	18	21	335	19
25	32	425	37	22	250	15	20	255	14
26	34	520	48	20	225	12	19	230	12
27	42	750	85	22	345	20	19	250	13
28	63	4,450	s 813	24	540	35	18	250	12
29	37	710	71	22	495	29	17	220	10
30	30	460	37	21	360	20	16	200	9
31	--	--	--	20	370	20	--	--	--
Total	1,027	--	2,174	877	--	1,807	725	--	2,249

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	15	210	9	20	155	8	15	195	8
2	15	280	11	19	145	7	15	205	8
3	59	3,250	s 616	18	135	7	14	200	8
4	34	1,140	s 111	17	125	6	15	190	8
5	26	540	38	16	130	6	15	200	8
6	23	335	21	15	120	5	16	215	9
7	26	880	62	15	110	4	16	200	9
8	33	1,160	103	15	110	4	16	195	8
9	24	445	29	15	125	5	17	260	12
10	21	305	17	15	145	6	16	255	11
11	20	260	14	16	150	6	17	200	9
12	25	980	s 79	15	105	4	18	250	12
13	37	1,760	176	22	340	20	19	335	s 18
14	28	750	57	11	170	5	33	1,070	95
15	23	385	24	10	185	5	33	770	69
16	36	2,230	s 255	15	160	6	25	380	26
17	43	1,940	225	21	285	16	22	295	18
18	40	2,460	s 526	19	220	11	22	280	17
19	126	5,650	1,920	16	180	8	34	1,680	s 175
20	153	2,750	1,140	16	175	8	40	1,590	s 184
21	114	2,350	723	16	160	7	39	960	101
22	42	810	92	15	135	5	26	420	29
23	29	430	34	16	145	6	22	330	20
24	24	285	18	18	175	8	20	275	15
25	22	220	13	18	170	8	19	210	11
26	21	215	12	16	165	7	19	165	8
27	22	230	14	16	130	6	19	165	8
28	26	340	24	15	140	6	19	165	8
29	23	205	13	14	135	5	19	170	9
30	20	195	11	14	125	5	19	160	8
31	20	170	9	15	125	5	--	--	--
Total	1,170	--	6,396	499	--	215	639	--	929

Total discharge for year (cfs-days) 10,128

Total load for year (tons) 19,192

s Computed by subdividing day.

KANSAS RIVER BASIN--Continued

6B-8390. MEDICINE CREEK AT MAYWOOD, NEBR.--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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. 27, 1958...	5:00 p.m.	78	41	9,590	10,500	--	24	--	41	--	97	100					VPWCM
Mar. 30	8:08 p.m.	64	40	3,070	9,590	--	23	--	36	--	97	100					VPWCM
May 14	10:00 p.m.	70	60	3,080	3,410	17	20	--	36	--	93	100					VPWCM
June 19	9:18 a.m.	70	65	6,000	2,440	15	26	33	41	61	94	100					SPWCM
June 19	9:18 a.m.	70	65	6,000	2,270	8	16	26	37	58	94	100					SPNM
July 16	8:20 a.m.	38	65	5,130	5,790	23	30	--	53	--	98	100					VPWCM
July 16	10:15 p.m.	60	65	3,450	2,900	12	14	--	23	--	95	100					VPWCM
July 19	12:05 a.m.	128	69	14,800	8,200	28	36	--	55	--	96	100					VPWCM
July 20	10:15 p.m.	192	66	7,470	3,330	24	29	--	45	--	95	100					VPWCM

KANSAS RIVER BASIN--Continued

6B-8395. BRUSHY CREEK NEAR MAYWOOD, NEBR.

LOCATION.--At bridge on U.S. Highway 83, 420 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 73 square miles contributes directly to surface runoff.
RECORDS AVAILABLE.--Water temperatures: April 1951 to September 1958 (discontinued).
Sediment records: April 1951 to September 1958 (discontinued).
EXTREMES, 1957-58.--Water temperatures: Maximum, 75°F June 19; minimum, freezing point Jan. 4.
Sediment concentrations: Maximum daily, 7,840 ppm May 2; minimum daily, not determined.
Sediment loads: Maximum daily, 4,600 tons July 19; minimum daily, less than 0.05 ton on many days.
EXTREMES, 1951-58.--Water temperatures: Maximum, 89°F Aug. 1, 1953; minimum, freezing point on many days during winter months.
Sediment concentrations: Maximum daily, 22,700 ppm June 8, 1951; minimum daily, no flow on many days during 1951, 1953-57.
Sediment loads: Maximum daily, 58,000 tons Sept. 2, 1951; minimum daily, 0 tons on many days during 1951, 1953-57.
REMARKS.--Flow affected by ice Dec. 11, 12, Dec. 31 to Jan. 11, Jan. 24, Feb. 7-20, Feb. 28 to Mar. 6, Mar. 10. Records of discharge for water year October 1957 to September 1958 given in WSP 1560.

Temperature (° F) of water, water year October 1957 to September 1958
/Once-daily measurement between 6 a.m. and 12 m./

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

a Measurement between 2 p.m. and 6 p.m.

KANSAS RIVER BASIN--Continued

6B-8395. BRUSHY CREEK NEAR MAYWOOD, NEBR.--Continued

Suspended sediment, water year October 1957 to September 1958

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	0.2	--		0.5	--		0.6	--	
2	.2	--		.5	--		.5	4	
3	.4	--		.5	--		.4	--	
4	.5	15		.5	--		.4	4	
5	.6	--		.6	--		.4	--	
6	.5	14		.6	4		.5	--	
7	.4	--			--		.7	--	
8	.4	--			--		.6	--	
9	.3	--			--		.6	8	
10	.3	--		.6	6		.9	--	
11	.2	--			--		.8	--	
12	.2	10			--		.7	14	
13	.3	11			--		.7	--	
14	.3	--			--		.5	--	
15	.1	--			--	(t)	.5	--	
16	.2	--	(t)		--		.6	6	(t)
17	.1	--			--		.6	--	
18	.2	--			--		.7	--	
19	.3	--		.7	4		.7	--	
20	.4	15			--		.7	--	
21	.4	--			--		.7	--	
22	.3	14			--		.7	--	
23	.4	--			--		.7	11	
24	.4	--		.7	5		.7	--	
25	.4	--		.7	--		.7	--	
26	.4	8		.7	--		.7	12	
27	.3	--		.7	--		.7	--	
28	.4	16		.7	5		.7	--	
29	.4	--		.7	--		.7	--	
30	.4	--		.7	--		.7	--	
31	.4	--		--	--		.7	--	
Total	10.3	--	0.3	19.3	--	0.3	19.8	--	0.3

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	0.7	--		0.6	--		1.0	160	0.4
2	.6	--		.6	--		.9	140	.3
3	.6	--		.7	2		.7		
4	.6	14		.7	9		.7		
5	.6	5		.7	--		.7		
6	.6	--		.7	--		.7	44	.1
7	.6	--		.7	--		.7		
8	.7	--		.6	--		.7		
9	.8	--		.6	--		.7		
10	.8	--		.6	--		.7		
11	.9	--		.6	--		.7		
12	.9	--		.6	14		.7		
13	.7	10		.6	--	(t)	.7		
14	.7	--		.6	--		.6		
15	.7	--		.6	--		.6		
16	.7	--	(t)	.6	--		.7		
17	.7	--		.6	--		.7	18	(t)
18	.7	--		.6	7		.7		
19	.7	--		.6	6		.7		
20	.7	11		.7	--		.7		
21	.7	--		.7	--		.7		
22	.7	--		.7	--		.9		
23	.7	--		.7	--		.9		
24	.7	--		.7	--		1.0	28	.1
25	.7	8		1.0	--		1.2	120	.4
26	.6	--		1.6	82	0.4	1.2	55	.2
27	.6	--		1.4	--	e .4	3.0	850	sa 12
28	.5	9		1.0	--	e .5	1.5	200	.8
29	.5	--		--	--	--	1.6	650	sa 3.2
30	.5	--		--	--	--	2.5	--	e 12
31	.5	--		--	--	--	3.2	1,800	sa 19
Total	20.7	--	0.3	20.4	--	1.6	32.0	--	49.6

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

KANSAS RIVER BASIN--Continued

6B-8395. BRUSHY CREEK NEAR MAYWOOD, NEBR.--Continued

Suspended sediment, water year October 1957 to September 1958--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	1.5	485	2.0	1.4	130	sa 0.8	0.6		
2	1.0			7.6	7,840	s 328	.6		
3	1.0			1.0	620	1.7	.6		
4	1.0			.9	150	.4	.7	36	0.1
5	1.2			.7	92	.2	.6		
6	1.0	40	.1	.9	110	.3	.6		
7	1.0			.9	100	.2	.6		
8	.9			.9	130	.3	.4	33	(t)
9	1.0			.7	43	.1	.4	41	(t)
10	.9			.7	32	.1	.9	500	1.2
11	.9			.7	52	.1	.3	50	(t)
12	.7			.9	28	.1	7.2	3,440	s 240
13	.7			.9	80	.2	.7	170	.3
14	.7			6.6	6,400	sa 150	.6	--	e .1
15	.7			1.5	1,200	4.9	.5	57	.1
16	.7	20	(t)	.9	160	.4	.5	55	.1
17	.7			.9	73	.2	.5	39	.1
18	.7			.9	84	.2	7.2	1,570	s 112
19	.7			.7	110	.2	12	3,600	sa 260
20	.7			.9	50	.1	.7	400	.8
21	.7			.7			.7	180	.3
22	.7	140	a .3	.6			.9	100	.2
23	1.5	300	1.2	.5			.7	150	.3
24	.7	28	.1	.7			.5	68	.1
25	.7	92	.2	.7			.5	55	.1
26	1.0	110	.3	.7	24	(t)	.5	29	(t)
27	2.3	500	sa 22	.7			.5	48	.1
28	7.9	5,100	sa 170	.5			.5	32	(t)
29	1.0	670	1.8	.6			.5	30	(t)
30	.9	120	.3	.6			.5	23	(t)
31	--	--	--	.6			--	--	--
Total	35.1	--	199.5	37.5	--	488.9	42.0	--	616.8

Day	July			August			September		
1	0.5	43	0.1	0.4	88	0.1	0.2	100	0.1
2	.6	30	(t)	.2			.2	95	.1
3	1.1	240	sa 1.0	.2			.2	120	.1
4	.5	51	.1	.2			.2	70	(t)
5	1.0	650	sa 2.4	.2			.2	89	(t)
6	.6	320	.5	.2	64	(t)	.2	72	(t)
7	.4	130	.1	.2			.2	45	(t)
8	.4	59	.1	.2			.2	76	(t)
9	.4	54	.1	.2			.4	280	s .9
10	.4	--	e .1	.2			.4	270	.3
11	.4	37	(t)	13	6,470	s 1,120	.2	94	.1
12	7.1	2,600	sa 85	1.4	1,590	s 11	.2	160	.1
13	1.0	1,310	3.5	.4	270	.3	9.1	2,610	s 411
14	.4	350	.4	9.0	--	e 1,000	8.5	2,550	s 136
15	.3	240	.2	4.4	3,600	sa 140	.5	440	.6
16	28	3,740	s 449	2.6	990	s 9.0	.5	170	.2
17	1.4	1,100	4.2	.6	380	.6	.5	110	.1
18	44	1,800	sa1,500	.4	280	.3	.4	110	.1
19	128	7,300	sa4,600	.4	110	.1	.4	100	.1
20	46	2,520	s 1,470	.4	100	.1	.4	86	.1
21	36	4,560	s 1,590	.2	72	(t)	.4	70	.1
22	2.0	1,080	5.8	.2	56	(t)	.4	74	.1
23	1.3	260	.9	.3	92	.1	.3	76	.1
24	1.0	160	.4	.2	42	(t)	.4	74	.1
25	.7	120	.2	.2	64	(t)	.2	51	(t)
26	.7	87	.2	13	3,500	sa1,400	.3	38	(t)
27	.5	59	.1	7.4	3,420	s 212	.3	36	(t)
28	.5	200	.3	.6	460	.7	.4	55	.1
29	.5	99	.1	.3	180	.1	.3	50	(t)
30	.5	52	.1	.2	170	.1	.3	28	(t)
31	.4	43	(t)	.2	100	.1	--	--	--
Total	306.6	--	9,715.0	57.6	--	3,894.9	26.4	--	550.7

Total discharge for year (cfs-days) 627.7

Total load for year (tons) 15,518.2

e Estimated.

s Computed by subdividing day.

t Less than 0.050 ton.

a Computed from partly estimated concentration graph.

6B-8395. *BRUSHY CREEK NEAR MAYWOOD, NEBR.*--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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. 27, 1958....	3:45 p.m.	4.5	44	2,530	3,350	--	36		49		91	100					VPWCM
Apr. 28.....	2:05 p.m.	2.3	--	4,080	2,550	--	88		93		100	--					SPWCM
May 2	8:10 a.m.	8.8	51	6,460	4,640	--	76		91		100	--					SPWCM
May 14	3:00 a.m.	5.8	42	10,700	4,040	--	28		46		98	100					SPWCM
June 12.....	10:15 a.m.	18	60	4,600	3,660	--	71		89		98	100					SPWCM
June 18.....	11:10 p.m.	52	58	9,500	2,970	--	47		79		--	--					PWCM
July 16	9:25 a.m.	50	63	4,400	5,700	42	56		77		98	100					VPWCM
July 16	3:30 p.m.	31	64	4,420	6,530	54	72		92		99	100					VPWCM
July 19	2:05 a.m.	840	67	12,100	6,050	29	39		58		97	100					VPWCM
July 19	3:25 a.m.	395	67	10,600	5,670	32	41		59		98	100					VPWCM
July 20	11:10 p.m.	370	63	15,400	5,840	22	27		40		93	100					VPWCM
July 21	1:00 a.m.	270	63	13,200	7,530	23	30		43		90	100					VPWCM

KANSAS RIVER BASIN--Continued

6B-8400. 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 1958 (discontinued).
Sediment records: April 1951 to September 1958 (discontinued).
EXTREMES, 1957-58.--Water temperatures: Maximum, 79°F June 29, Aug. 14.
Sediment concentrations: Maximum daily, 6,640 ppm Apr. 28; minimum daily, not determined.
Sediment loads: Maximum daily, 1,610 tons Sept. 19; minimum daily, not determined.
EXTREMES, 1951-58.--Water temperatures: Maximum (1951-52, 1953-58), 86°F July 18, 1954; minimum (1951-52, 1955, 1957), 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.
REMARKS.--Flow affected by ice Dec. 31, Jan. 2, 15, Feb. 6-19. Flow affected by backwater from Medicine Creek July 21. Records of discharge for water year October 1957 to September 1958 given in WSP 1560.

Temperature (° F) of water, water year October 1957 to September 1958
/Once-daily measurement between 11 a.m. and 3 p.m./

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

a Measurement between 8 a.m. and 10 a.m.
b Measurement between 4 p.m. and 9 p.m.

KANSAS RIVER BASIN--Continued

6B-8400. FOX CREEK AT CURTIS, NEBR.--Continued

Suspended sediment, water year October 1957 to September 1958

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	5.6	80		6.7	--		8.1	--	
2	5.6	--		6.5	--		8.3	--	
3	5.8	--		6.2	--		8.1	52	
4	6.0	--		6.3	--		8.1	27	
5	6.2	--		6.2	29		8.3	--	
6	6.2	--		6.5	--		7.9	--	
7	6.7	--		6.5	--		7.9	--	
8	6.9	42		6.3	--		7.7	--	
9	6.2	--		6.3	--		7.5	--	
10	6.7	--			--		7.5	39	
11	6.7	--			--		7.3	--	
12	6.5	47			23		7.5	--	
13	6.9	--		6.7	--		7.5	57	
14	7.9	--			--		7.5	--	
15	6.9	47			--		7.7	--	
16	6.3	--	a 1.0		--	e 0.4	7.9	--	a 1.0
17	6.3	--		7.1	--		8.7	44	
18	6.3	--		7.3	--		9.1	--	
19	7.1	75		7.1	19		9.1	--	
20	9.1	50		6.9	--		7.7	--	
21	8.1	--		6.9	--		7.7	--	
22	7.5	66		6.9	--		7.7	--	
23	7.5	--		7.3	--		7.7	--	
24	6.7	--		7.5	13		7.3	54	
25	7.5	--		7.5	--		7.3	--	
26	7.5	31		7.7	14		7.3	50	
27	7.5	--		7.5	--		7.5	--	
28	7.3	--		7.7	--		7.3	--	
29	7.1	30		7.9	--		7.3	--	
30	7.1	--		7.3	--		7.3	--	
31	6.7	--		--	--	--	7.3	50	
Total	212.4	--	31.0	207.0	--	12.0	241.1	--	31.0

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	7.3	--		7.7	--		8.9		
2	7.3	--		7.5	--		8.7	--	e 1.2
3	7.3	--		7.3	--		8.5		
4	7.3	--		7.5	36		8.1		
5	7.3	58		7.7	--		7.9		
6	7.7	--		7.5	--		8.1		
7	7.7	26		7.4	--		8.1		
8	7.7	--		7.4	--		8.1		
9	7.9	--		7.5	--		8.1		
10	7.9	--		7.6	--		8.3		
11	8.1	--		7.6	--	a 0.9	7.9		
12	8.1	--		7.0	28		7.7		
13	8.1	--		7.2	--		7.9		
14	7.9	48		7.2	--		7.7	37	.8
15	7.5	--		7.2	--		7.5		
16	7.5	--	a 1.0	7.2	92		7.7		
17	7.5	--		7.3	--		7.7		
18	7.7	--		7.5	24		7.7		
19		--		7.5	--		7.5		
20		--		7.9	40		7.9		
21	7.8	28		8.5	--	e 1.2	8.3		
22		--		10	--	e 5.0	7.9		
23		--		8.5	--	e 3.6	8.3		
24		--		8.3	--	e 2.2	8.3		
25	7.9	68		8.3	76	1.7	8.5	60	1.4
26	7.9	--		9.1	110	2.7	9.9	150	4.0
27	7.9	--		11	--	e 3.8	13	240	s 13
28	7.9	50		7.7	--	e 1.3	22	1,240	s 84
29	7.9	--		--	--	--	15	530	21
30	7.7	--		--	--	--	14	455	17
31	7.9	--		--	--	--	12	420	14
Total	239.7	--	31.0	220.1	--	39.5	287.2	--	174.8

e Estimated.
s Computed by subdividing day.
a Computed from samples obtained about two times a week.

KANSAS RIVER BASIN--Continued

6B-8400. FOX CREEK AT CURTIS, NEBR.--Continued

Suspended sediment, water year October 1957 to September 1958--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	8.9	325	7.7	8.3	210	4.7	6.9	220	4.1
2	11	340	10	11	630	19	6.9	250	4.7
3	8.5	310	7.1	8.3	260	5.8	6.9	250	4.7
4	8.7	210	5.0	7.7	180	3.7	6.3	240	4.1
5	8.9	170	4.1	7.5	190	3.8	6.2	180	3.0
6	8.5	130	3.0	7.7	210	4.4	6.7	160	2.9
7	7.9	110	2.3	7.9	200	4.3	7.3	210	4.1
8	8.3	100	2.2	7.7	160	3.3	7.1	--	e 4.2
9	8.5	110	2.5	7.9	120	2.6	7.3	250	4.9
10	8.7	110	2.6	7.7	160	3.3	7.3	240	4.7
11	8.5	120	2.8	7.5	170	3.4	6.9	190	3.5
12	8.5	140	3.2	7.3	180	3.5	19	2,600	s 242
13	8.5	140	3.2	8.1	240	5.2	10	1,700	46
14	8.5	130	3.0	13	720	25	7.3	400	7.9
15	8.1	130	2.8	9.5	250	6.4	7.3	300	5.9
16	8.1	140	3.1	8.9	170	4.1	7.3	280	5.5
17	8.1	150	3.3	8.9	210	5.0	7.1	260	5.0
18	7.7	110	2.3	8.1	230	5.0	7.5	460	9.3
19	7.9	120	2.6	8.1	180	3.9	19	2,890	s 226
20	7.7	110	2.3	7.7	230	4.8	7.5	470	9.5
21	7.3	100	2.0	7.7	230	4.8	8.1	210	4.6
22	7.5	70	1.4	7.5	200	4.1	7.5	240	4.9
23	9.3	400	10	7.3	210	4.1	6.9	210	3.9
24	8.9	300	7.2	7.1	190	3.6	7.1	200	3.8
25	7.7	74	1.5	6.9	160	3.0	7.1	120	2.3
26	9.1	85	2.1	6.7	180	3.3	6.9	130	2.4
27	9.7	240	6.3	9.7	390	s 12	7.1	160	3.1
28	25	6,640	s 786	6.9	280	5.2	6.9	170	3.2
29	9.1	530	13	6.7	240	4.3	6.7	140	2.5
30	8.5	260	6.0	6.9	230	4.3	6.2	190	3.2
31	--	--	--	6.9	270	5.0	--	--	--
Total	271.6	--	910.6	249.1	--	174.9	238.3	--	635.9

	July			August			September		
1	6.5	210	3.7	6.7	220	4.0	4.1	200	2.2
2	6.2	170	2.8	6.2	--	e 3.4	4.1	220	2.4
3	9.3	--	e 7.5	6.2	200	3.3	3.6	--	e 1.9
4	7.3	200	3.9	5.8	250	3.9	3.4	190	1.7
5	6.3	190	3.2	3.8	--	e 2.0	4.3	320	3.7
6	6.2	160	2.7	3.4	180	1.7	4.5	270	3.3
7	6.3	150	2.6				3.6	--	e 2.8
8	6.3	180	3.1				3.8	310	3.2
9	5.8	170	2.7				3.4	270	2.5
10	6.0	160	2.6				3.8	250	2.6
11	6.0	190	3.1	3.4	210	1.9	4.3	220	2.6
12	8.1	220	4.8				5.0	300	4.1
13	7.5	240	4.9				11	1,030	s 136
14	6.5	250	4.4				19	--	e 180
15	6.0	220	3.6	5	270	3.6	6.2	460	7.7
16	9.3	530	s 14	7	210	4.0	4.5	280	3.4
17	7.7	300	6.2	6	--	e 3.4	5.0	290	3.9
18	23	1,160	s 356	5.2	200	2.8	4.8	300	3.9
19	80	--	e 1,400	5.4	240	3.5	79	3,430	s 1,610
20	25	2,220	s 347	4.7	--	e 3.0	8.9	1,110	27
21	17	--	e 240	4.8	230	3.0	5.8	580	9.1
22	8.3	670	15	3.8	180	1.8	5.6	330	5.0
23	6.9	300	5.6	3.8	230	2.4	5.2	260	3.7
24	6.3	--	e 4.6	5.6	--	e 4.0	5.0	240	3.2
25	6.2	250	4.2	5.6	260	3.9	4.8	220	2.9
26	6.3	200	3.4	5.0	190	2.6	5.0	210	2.8
27	6.3	--	e 3.2	3.9	350	3.7	5.0	270	3.6
28	6.3	180	3.1	4.1	360	4.0	5.2	--	e 2.8
29	6.2	210	3.5	3.9	330	3.5	5.0	170	2.3
30	6.5	170	3.0	3.9	290	3.1	5.0	130	1.8
31	6.7	200	3.6	3.8	--	e 2.6	--	--	--
Total	328.3	--	2,468.0	140.8	--	88.4	237.9	--	2,042.1

Total discharge for year (cfs-days) 2,873.5
Total load for year (tons) 6,639.2

e Estimated.
s Computed by subdividing day.

6B-8400. FOX CREEK AT CURTIS, NEBR.--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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. 28, 1958....	8:05 a.m.	24	47	10,600	2,980	--	65	--	83	--	100	--					SPWCM
June 12.....	5:00 p.m.	49	65	8,650	4,260	4	6	21	34	74	98	100					SPNM
June 12.....	5:00 p.m.	49	65	8,650	4,510	29	37	47	57	73	98	100					SPWCM
July 19.....	1:25 a.m.	247	68	9,240	5,200	26	36	--	67	--	99	100					VPWCM
July 19.....	4:50 a.m.	e 152	68	6,480	3,010	30	41	--	67	--	100	--					VPWCM
July 19.....	6:45 a.m.	e 106	68	7,310	3,620	34	47	--	73	--	100	--					VPWCM
July 19.....	7:50 a.m.	e 83	68	6,660	3,240	30	44	--	69	--	99	100					VPWCM
July 19.....	8:55 a.m.	e 69	68	7,520	4,360	36	46	--	70	--	99	100					VPWCM
Sept. 19.....	2:05 p.m.	375	63	6,750	6,200	28	37	--	61	--	98	100					VPWCM
Sept. 19.....	4:30 p.m.	192	59	7,920	7,760	28	36	--	61	--	98	100					VPWCM

e Estimated.

KANSAS RIVER BASIN--Continued

6B-8405. 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 1958 (discontinued).
EXTREMES, 1957-58.--Sediment concentrations: Maximum daily, 5,700 ppm Apr. 28; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 2,000 tons July 18; minimum daily, 0 tons on many days.
EXTREMES, 1951-58.--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.--No flow during period October to December; record is omitted. Records of discharge for water year October 1957 to September 1958 given in WSP 1560.

Suspended sediment, January to September 1958

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							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							0		0
25							13		e 750
26							12		e 650
27							11		e 600
28							3.5		e 110
29							4.5		e 160
30							1.3		e 30
31							0		0
Total	0		0	0		0	45.3		2,300

e Estimated.

KANSAS RIVER BASIN--Continued

6B-8405. DRY CREEK NEAR CURTIS, NEBR.--Continued

Suspended sediment, January to September 1958--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	0		0
2	0	--	0	1.8	--	e 48	0		0
3	0	--	0	0	--	0	0		0
4	0	--	0	0	--	0	0		0
5	.2	--	e 2	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	0		0
14	0	--	0	1.9	2,750	s 24	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	2.8		e 90
20	0	--	0	0	--	0	0		0
21	0	--	0	0	--	0	0		0
22	0	--	0	0	--	0	0		0
23	.9	--	e 18	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	5.9	5,490	s 488	5.6	4,700	s 198	0		0
28	4.3	5,700	s 212	0	--	0	0		0
29	0	--	0	0	--	0	0		0
30	0	--	0	0	--	0	0		0
31	--	--	--	0	--	0	--		--
Total	11.3	--	720	9.3	--	270	2.8		90

	July			August			September		
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				1.6	--	e 40
10	0	--	0				0	--	0
11	0	--	0				0	--	0
12	0	--	0				0	--	0
13	0	--	0				6.4	1,630	s 460
14	0	--	0				8.0	4,300	s 216
15	0	--	0				0	--	0
16	.2	--	e 2				0	--	0
17	0	--	0				0	--	0
18	23	2,900	s 2,000				0	--	0
19	19	4,240	s 504				.8	--	e 16
20	20	2,720	s 1,130				.2	--	e 2
21	10	3,220	s 153				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	72.2	--	3,789	0		0	17.0	--	734

Total discharge for year (cfs-days) 157.9
Total load for year (tons) 7,903

e Estimated.
s Computed by subdividing day.

6B-8405. DRY CREEK NEAR CURTIS, NEBR.--Continued

Particle-size analyses of suspended sediment, January to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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. 28, 1958....	12:10 a.m.	35	45	24,200	4,670	33	43	50	62	78	99	100					SPWCM
Apr. 28	12:10 a.m.	35	45	24,200	4,750	4	12	41	56	76	99	100					SPNM
Apr. 28	8:35 a.m.	1.7	39	5,660	1,690	--	94	--	99	--	100	--					SPWCM
May 14.....	10:00 a.m.	5.2	58	6,010	4,160	--	71	--	94	--	99	100					SPWCM
May 27.....	4:40 a.m.	27	61	12,600	4,750	38	53	69	82	92	99	100					SPWCM
May 27.....	4:40 a.m.	27	61	12,600	4,590	10	22	62	81	93	99	100					SPNM
July 18.....	11:45 p.m.	166	67	18,200	4,980	29	37	--	60	--	99	100					VPWCM
July 19.....	12:35 a.m.	108	67	14,000	4,880	32	46	--	71	--	100	--					VPWCM
July 20.....	9:20 p.m.	282	65	38,600	9,620	19	24	--	38	--	97	100					VPWCM
July 20.....	9:50 p.m.	238	65	23,000	6,400	24	33	--	52	--	98	100					VPWCM

KANSAS RIVER BASIN--Continued

6B-8410. 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 1958 (discontinued). Sediment records: April 1951 to September 1958 (discontinued).
EXTREMES, 1957-58.--Water temperatures: Maximum, 88°F June 3, 7; minimum, freezing point on several days during December to February.
Sediment concentrations: Maximum daily, 13,100 ppm July 21; minimum daily, not determined.
Sediment loads: Maximum daily, 36,100 tons July 21; minimum daily, not determined.
EXTREMES, 1951-58.--Water temperatures: Maximum (1956-58), 88°F June 3, 7, 1958; minimum (1952-58), freezing point on many days during winter months.
Sediment concentrations: Maximum daily (1952-58), 20,000 ppm May 16, 1954; 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, 32,300 ppm Aug. 11. Flow affected by ice Nov. 22, 30, Dec. 8, 10-13, 24-26, 28, 29, Dec. 31 to Jan. 12, Jan. 15, 22-24, Feb. 2-4, 7-21, Feb. 27 to Mar. 6. Records of discharge for water year October 1957 to September 1958 given in WSP 1560.

Temperature (° F) of water, water year October 1957 to September 1958
/Once-daily measurement between 8 a.m. and 12 m./

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

a Measurement between 1 p.m. and 5 p.m.
b Measurement between 6 p.m. and 9 p.m.

KANSAS RIVER BASIN--Continued

6B-8410. MEDICINE CREEK ABOVE HARRY STRUNK LAKE, NEBR.--Continued

Suspended sediment, water year October 1957 to September 1958

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	43	160		54	260		57	310	
2	43	210		54	--		57	--	
3	42	--		55	190		57	--	
4	37	--		55	--		57	--	
5	34	--		55	--		58	320	
6	49	--		55	--	a 36	59	--	
7	48	260	a 24	58	--		60	--	
8	48	--		57	270		58	420	
9	49	--		57	--		60	390	
10	49	190		57	--		58	--	
11	49	--		57	--		56	--	
12	43	--		59	--		56	--	
13	46	--		59	490		58	350	
14	58	610	96	59	510	a 73	61	--	
15	59	--	e 80	58	380		59	--	
16	55	440	65	59	--		58	--	a 59
17	53	395	57	70	--		59	480	
18	52	--		66	480		63	--	
19	53	--		63	--		64	--	
20	59	280		60	--	e 80	63	420	
21	63	--		59	--		61	--	
22	61	380		57	710	109	60	400	
23	63	--		58	--		59	--	
24	59	--		58	360		47	170	
25	58	--	a 45	60	--		50	--	
26	57	240		61	410	a 62	54	270	
27	55	--		61	440		58	--	
28	55	220		59	--		56	--	
29	51	230		58	350		56	--	
30	57	--		56	--		58	--	
31	55	--		--	--	--	56	590	
Total	1,603	--	1,240	1,754	--	1,766	1,793	--	1,829

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	--		60	--		65	105	18
2	56	--		58	440		67	140	25
3	54	--		57	--		68	180	33
4	53	140		58	330	a 66	70	235	44
5	55	--	a 25	59	--		74	810	162
6	53	--		59	480		79	2,350	501
7	52	200		57	--		85	2,100	482
8	55	180		55	--		77	1,180	245
9	56	--		57	190		75	930	188
10	58	315	49	58	--		75	820	166
11	61	--	e 60	57	87		73	920	181
12	62	1,050	176	55	--		72	810	157
13	63	--	e 75	56	--	a 20	72	820	159
14	61	--		56	--		71	750	144
15	60	--		56	140		70	680	128
16	59	--		57	120		71	740	142
17	59	420		56	--		71	690	132
18	59	--		55	--		70	670	127
19	60	--		58	240	38	69	610	114
20	59	400		60	490	79	70	720	136
21	59	--		62	--	e 85	71	660	127
22	58	--	a 63	65	--	e 200	71	720	138
23	55	--		69	1,120	209	73	790	156
24	55	360		69	--		75	820	166
25	59	--		70	--		77	960	200
26	59	470		73	--	e 55	87	1,380	324
27	60	290		68	--		100	2,080	s 593
28	60	--		64	140		146	6,010	2,370
29	59	430		--	--	--	116	3,100	971
30	59	--		--	--	--	126	2,550	868
31	60	--		--	--	--	103	2,200	612
Total	1,793	--	1,719	1,684	--	1,522	2,489	--	9,809

e Estimated.
s Computed by subdividing day.
a Computed from samples obtained about three times a week.

KANSAS RIVER BASIN--Continued

6B-8410. MEDICINE CREEK ABOVE HARRY STRUNK LAKE, NEBR.--Continued

Suspended sediment, water year October 1957 to September 1958--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	94	1,930	490	84	830	188	51	375	52
2	87	1,430	336	102	3,400	s 1,000	51	395	54
3	82	1,200	266	87	3,100	728	51	430	59
4	78	1,000	211	69	1,060	197	48	365	47
5	84	1,380	313	64	750	130	45	325	39
6	85	1,360	312	60	600	97	48	460	60
7	82	1,110	246	60	540	87	48	780	101
8	73	770	152	58	530	83	47	520	66
9	72	680	132	58	500	78	46	465	58
10	72	690	134	61	500	82	60	1,310	s 231
11	71	690	132	61	510	84	57	850	131
12	71	650	125	63	485	82	67	1,240	224
13	69	600	112	63	510	87	82	3,000	664
14	66	570	102	90	2,140	s 558	63	1,500	255
15	65	580	102	117	4,740	1,500	54	780	114
16	64	550	95	103	2,730	759	52	610	86
17	63	510	87	84	1,570	356	50	570	77
18	61	465	77	75	1,040	205	55	1,170	s 275
19	63	480	82	65	770	135	153	7,450	3,080
20	64	460	79	61	640	105	109	3,650	1,070
21	63	420	71	59	570	91	103	3,900	1,080
22	61	370	61	59	550	88	80	2,300	497
23	75	860	174	58	435	68	64	1,020	176
24	84	1,120	254	57	395	61	54	680	99
25	80	1,000	216	53	385	55	51	520	72
26	76	720	148	54	440	64	48	435	56
27	80	890	192	59	850	135	46	380	47
28	127	5,660	s 2,060	59	850	135	45	365	44
29	117	3,750	1,180	55	495	74	41	330	37
30	90	1,340	326	55	410	61	40	305	33
31	--	--	--	53	380	54	--	--	--
Total	2,319	--	8,267	2,104	--	7,427	1,809	--	8,884
	July			August			September		
1	38	270	28	46	145	18	29	185	14
2	37	275	27	45	120	15	30	160	13
3	103	5,450	s 2,860	43	110	13	29	150	12
4	138	8,300	s 3,380	41	120	13	31	160	13
5	70	1,860	s 373	40	140	15	31	185	15
6	52	740	104	40	130	14	31	200	17
7	47	490	62	41	110	12	31	190	16
8	74	4,850	s 2,380	42	115	13	32	210	18
9	96	5,000	s 1,920	41	110	12	32	210	18
10	53	530	76	43	110	13	58	1,800	s 352
11	47	415	53	218	5,950	s 8,540	36	595	58
12	47	430	55	93	4,050	s 1,090	34	210	19
13	60	860	139	45	1,650	s 213	34	255	23
14	61	820	135	40	600	65	257	9,870	s 10,700
15	51	550	76	39	700	s 88	82	3,350	742
16	59	1,120	s 195	37	960	96	60	840	136
17	109	4,850	1,430	36	485	47	51	375	52
18	82	1,860	412	41	370	41	47	240	30
19	586	11,900	s 21,500	42	265	30	71	2,720	s 1,350
20	265	8,750	s 6,780	43	225	26	102	4,500	s 1,700
21	955	13,100	s 36,100	35	200	19	65	1,000	176
22	189	4,350	s 2,460	37	165	16	60	660	107
23	95	1,200	308	38	160	16	51	350	48
24	72	560	109	38	180	18	47	255	32
25	59	395	63	38	190	19	43	255	30
26	52	320	45	38	185	19	42	210	24
27	42	240	27	45	1,240	s 201	42	170	19
28	40	210	23	38	2,010	206	41	170	19
29	47	220	28	31	570	48	40	165	18
30	45	210	26	30	295	24	39	170	18
31	47	155	20	29	220	17	--	--	--
Total	3,718	--	81,194	1,453	--	10,977	1,578	--	15,789
Total discharge for year (cfs-days)									24,097
Total load for year (tons)									150,423

s Computed by subdividing day.

6B-8410. MEDICINE CREEK ABOVE HARRY STRUNK LAKE, NEBR.--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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. 30, 1958	9:20 a.m.	128	41	2,540	5,170	16	19	22	28	41	85	100	--				VBWCM
Apr. 28	11:50 a.m.	156	50	8,780	6,310	--	30		51		94	99	100				SPWCM
Apr. 29	3:20 p.m.	113	--	3,480	4,910	--	43		56		91	99	100				SPWCM
May 14	3:45 p.m.	98	61	2,290	2,570	24	31		45		95	100	--				VPWCM
May 15	8:30 a.m.	118	57	5,470	3,410	26	34		50		95	100	--				VPWCM
June 13	10:25 a.m.	87	71	3,620	5,130	27	37		59		97	100	--				VPWCM
June 19	12:30 a.m.	228	65	16,000	5,170	--	35		54		96	100	--				SPWCM
July 3	5:10 p.m.	213	77	13,000	8,500	24	34		60		97	100	--				VPWCM
July 19	10:35 a.m.	777	69	13,700	8,510	21	29		45		92	99	100				VPWCM
July 19	2:35 p.m.	922	73	14,300	7,350	28	36		53		90	99	99		100		VPWCM
July 19	5:35 p.m.	1,010	72	12,400	7,270	26	36		52		88	99	100				VPWCM
July 21	12:45 a.m.	534	65	23,500	9,820	14	19		32		89	99	100				VPWCM
July 21	3:40 a.m.	1,270	64	15,600	9,530	28	38		60		94	99	100				VPWCM
July 23	10:30 a.m.	95	73	1,230	2,290	29	39		61		97	100	--				VPWCM
Aug. 11	4:00 p.m.	546	73	30,600	11,100	13	17		28		89	100	--				VPWCM

KANSAS RIVER BASIN--Continued

6B-8480. PRAIRIE DOG CREEK AT NORTON, KANS.

LOCATION.--At gaging station at bridge on U.S. Highway 283, half a mile south of Norton, Norton County.
DRAINAGE AREA.--721 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1948 to September 1949, September 1957 to June 1958 (discontinued).
Water temperatures: December 1948 to September 1952.
Sediment records: March 1947 to September 1952.
REMARKS.--Records of discharge for water year October 1957 to September 1958 given in WSP 1560.

Chemical analyses, in parts per million, September 1957 to June 1958

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									
Sept. 30, 1957..	6.4	36	0.00	71	12	12	16	285	24	6.9	0.5	4.3	0.07	323		0.44		226	0	10	0.3	510	7.7	
Oct. 17.....	5.3	34	.09	75	15	15	13	318	25	7.7	.4	.7	.07	337		.46		248	0	11	.4	538	7.9	
Nov. 17.....	4.5	25	.08	76	16	16	12	322	25	7.2	.5	.3	.08	331		.45		255	0	11	.4	544	7.8	
Dec. 17.....	a 5.3	29	.09	74	18	18	11	320	28	8.8	.5	1.3	.10	342		.47		258	0	13	.5	561	7.9	
Jan. 16, 1958 ..	a 4.9	38	.01	66	15	18	8.9	288	25	8.0	.2	1.2	.09	325		.44		228	0	14	.5	505	8.1	15
Feb. 18.....	a 5.0	38	.01	83	20	21	11	356	30	9.0	.5	2.7	.00	385		.52		288	0	13	.5	619	7.6	
Mar. 17	a 6.0	32	.01	71	16	17	10	304	28	10	.5	3.1	.07	334		.45		242	0	13	.5	534	7.7	
Apr. 17.....	12	28	.01	73	17	20	11	320	28	10	.7	1.1	.09	350		.48		252	0	14	.6	564	7.8	
May 19	38	36	.05	48	8.8	12	15	202	20	5.5	.6	6.0	.06	263		.36		156	0	13	.4	382	7.4	
June 16.....	6.8	39	.01	79	18	21	12	336	29	9.0	.7	3.5	.08	377		.51		272	0	14	.6	597	7.4	

a Daily mean discharge.

Particle-size analyses of suspended sediment, May to June 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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 3, 1958.....	2:25 p.m.	21	60	1,290	4,210		61		79		96	96	98		100		SPWCM
June 19.....	11:05 a.m.	411	55	6,520	5,260		65		88								PWCM

6B-8545. REPUBLICAN RIVER AT SCANDIA, KANS.

LOCATION.--At gaging station at bridge on U.S. Highway 36 at Scandia, Republican County, 4 miles downstream from Dry Creek.
DRAINAGE AREA.--22,930 square miles, approximately, of which a large area does not contribute directly to surface runoff.
RECORDS AVAILABLE.--Chemical analyses: October 1957 to September 1958 (discontinued).
Water temperatures: October 1957 to September 1958 (discontinued).
EXTREMES, 1957-58.--Dissolved solids: Maximum, 375 ppm Nov. 1-30; minimum, 140 ppm July 17-18.
Hardness: Maximum, 238 ppm Nov. 1-30; minimum, 79 ppm July 17-18.
Specific conductance: Maximum daily, 574 micromhos Jan. 3; minimum daily, 190 micromhos July 17.
Water temperatures: Maximum, 90°F Aug. 12; minimum, freezing point on several days during December 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 1957 to September 1958 given in WSP 1560.

Chemical analyses, in parts per million, water year October 1957 to September 1958

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, 1957....	93.8	32	0.02	68	15	25	12	a 264	56	12	0.5	0.4	0.01	356	0.48	90.2	230	14	18	0.7	544	8.3	--
Nov. 1-30.....	159	43	.00	73	14	23	11	274	59	12	.3	2.0	.00	375	.51	161	238	13	17	.6	557	8.0	--
Dec. 1-31.....	242	23	.02	65	9.0	19	16	235	42	8.5	.5	2.8	.06	299	.41	195	199	6	16	.6	477	7.7	--
Jan. 1-31, 1958....	247	24	.01	58	12	19	13	230	43	7.7	.4	2.6	.06	294	.40	196	193	4	17	.6	466	7.7	--
Feb. 1-18.....	311	21	.01	59	13	20	14	239	43	8.0	.6	2.9	.10	314	.43	264	200	4	17	.6	486	8.1	--
Feb. 19-26.....	423	20	.01	51	12	17	11	205	39	6.0	.5	2.3	.08	272	.37	311	176	8	16	.6	425	7.9	--
Feb. 27-Mar. 3....	215	22	.01	67	13	21	12	254	52	11	.5	2.0	.06	330	.45	192	222	14	16	.6	525	7.5	--
Mar. 4-31	989	19	.02	52	12	17	14	213	41	7.0	.5	1.9	.06	272	.37	726	178	3	16	.6	438	7.7	5
Apr. 1-3.....	526	27	.02	63	15	20	12	233	59	11	.3	2.2	.08	324	.44	460	217	26	16	.6	515	7.5	--
Apr. 4-5.....	720	25	.07	45	8.6	13	10	160	41	7.2	.4	5.7	.18	238	.32	463	148	17	15	.5	369	7.5	--
Apr. 6-8.....	688	24	.05	62	13	19	11	232	52	8.6	.4	3.3	.08	308	.42	572	208	18	16	.6	492	7.8	--
Apr. 9-30.....	1,681	18	.02	52	13	19	14	215	44	6.6	.6	1.0	.07	285	.39	1,290	182	6	17	.6	451	7.4	--
May 1-13.....	682	18	.00	55	13	20	14	226	48	7.9	.5	.4	.08	297	.40	547	192	7	17	.6	476	7.4	--
May 14-31.....	622	19	.00	53	13	20	14	219	48	7.9	.6	.6	.08	291	.40	489	184	4	18	.6	466	7.4	--
June 1-17	763	19	.00	51	13	19	14	221	46	8.4	.6	.7	.09	285	.39	587	182	1	17	.6	458	7.2	--
June 18-21	1,089	17	.00	40	9.5	12	11	166	28	6.2	.5	4.8	.07	218	.30	641	139	3	15	.4	348	7.2	--
June 22-July 3	466	17	.00	53	14	21	14	224	45	9.4	.6	1.0	.09	287	.39	361	188	4	18	.7	469	7.3	10
July 4-7.....	719	16	.02	34	8.5	11	11	142	27	5.8	.5	4.7	.07	200	.27	388	120	4	15	.4	311	7.0	--
July 8-10.....	309	21	.01	54	14	20	13	224	45	9.6	.6	2.6	.15	295	.40	246	192	8	17	.6	469	7.5	--
July 11-16.....	753	18	.02	36	8.5	11	11	144	27	6.1	.5	6.0	.07	204	.28	415	125	7	15	.4	324	7.2	--
July 17-18.....	2,235	16	.06	22	5.9	5.4	8.8	94	12	6.0	.4	4.8	.18	140	.19	845	79	2	12	.3	203	7.4	--
July 19-23.....	855	17	.01	42	7.8	11	11	162	26	4.8	.5	4.5	.07	211	.29	487	137	4	14	.4	338	7.1	--
July 24	841	15	.06	26	6.4	6.4	9.0	102	13	6.6	.4	6.6	.08	156	.21	354	91	7	12	.3	220	7.1	--

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

KANSAS RIVER BASIN--Continued

6B-8545. REPUBLICAN RIVER AT SCANDIA, KANS.--Continued

Chemical analyses, in parts per million, water year October 1957 to September 1958--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 25-Aug. 5, 1958	790	18	0.00	53	14	20	14	220	48	7.6	0.6	1.5	0.09	291	0.40	621	188	8	17	0.6	461	7.2	--
Aug. 6-8.....	1,957	16	.00	47	8.6	12	12	186	31	4.2	.5	3.7	.07	236	.32	1,250	153	0	13	.4	367	7.4	--
Aug. 9-16.....	693	17	.01	51	13	18	14	217	43	7.2	.7	1.5	.07	281	.38	526	180	2	16	.6	448	7.4	--
Aug. 17-23.....	1,436	16	.01	44	7.8	13	11	170	26	3.9	.5	4.8	.06	217	.30	841	142	3	15	.5	345	7.2	--
Aug. 24-Sept. 4 ...	828	18	.01	50	12	18	15	211	42	7.1	.6	2.4	.07	275	.37	615	176	3	17	.6	441	7.3	--
Sept. 5-7	8,563	12	.02	32	4.9	4.5	9.0	117	15	.5	.3	4.3	.04	152	.21	3,510	100	4	8	.2	231	7.2	--
Sept. 8-30	606	16	.00	53	12	17	13	214	46	7.8	.5	1.7	.06	278	.38	455	182	7	16	.5	446	7.3	6
Weighted average b.....	669	18	0.01	50	11	16	13	200	39	6.5	0.5	2.3	0.07	262	0.36	473	169	5	16	0.5	414	--	--

b Represents 100 percent of runoff for water year October 1957 to September 1958.

KANSAS RIVER BASIN--Continued

6B-8545. REPUBLICAN RIVER AT SCANDIA, KANS.--Continued

Temperature (° F) of water, water year October 1957 to September 1958
/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	--	56	42	--	a 36	32	58	62	78	85	86	82
2	--	47	38	--	32	33	56	63	81	82	88	82
3	--	45	39	32	--	38	54	a 60	89	82	89	79
4	70	44	42	--	--	33	57	66	--	80	86	71
5	71	47	42	--	--	a 33	51	a 63	75	--	b 80	--
6	a 70	45	--	--	--	b 34	45	70	78	--	84	b 71
7	66	47	41	--	--	a 35	50	68	80	84	83	72
8	58	40	38	33	--	b 35	48	a 64	83	85	85	79
9	57	44	44	33	--	37	46	b 64	82	85	86	83
10	57	50	31	34	--	39	49	a 74	83	86	86	77
11	58	44	--	a 34	--	40	a 54	75	73	81	87	75
12	a 65	45	--	35	--	a 37	54	77	79	75	90	72
13	--	48	--	34	--	40	53	74	80	84	87	75
14	--	52	--	32	--	40	57	72	74	86	88	--
15	--	49	34	33	31	43	60	67	79	82	88	72
16	--	a 45	35	a 39	--	--	64	66	81	74	83	65
17	--	37	35	34	--	42	59	72	79	73	a 80	70
18	--	43	45	34	--	42	61	78	80	79	78	70
19	--	a 33	a 42	32	--	42	61	79	80	71	82	69
20	--	38	b 33	32	--	45	62	73	72	70	81	75
21	--	36	41	--	--	b 38	59	81	77	75	80	71
22	--	33	a 42	--	33	a 41	52	74	75	78	72	75
23	57	40	45	--	--	45	53	a 71	77	84	74	75
24	52	41	37	--	--	47	52	--	71	--	71	78
25	46	45	41	33	36	48	55	75	68	85	73	70
26	42	50	39	--	44	49	55	81	75	84	72	73
27	a 52	42	a 44	35	34	50	55	80	80	a 83	a 76	68
28	54	b 36	37	33	32	50	b 55	78	80	80	81	65
29	57	38	43	35	--	45	58	79	83	82	82	70
30	56	39	a 31	34	--	50	a 60	86	82	81	79	59
31	58	--	--	--	--	52	--	80	--	81	78	--
Average	--	43	39	--	--	41	55	72	78	81	82	73

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

KANSAS RIVER BASIN--Continued

6B-8566. REPUBLICAN RIVER AT CLAY CENTER, KANS.

LOCATION.--At gaging station at bridge on State Highway 15, 1 mile south of Clay Center, Clay County, and 4 miles downstream from Five Creeks.
DRAINAGE AREA.--24,570 square miles, approximately, of which a large area is noncontributing.
RECORDS AVAILABLE.--Water temperatures: October 1957 to September 1958.
Sediment records: October 1957 to September 1958.
EXTREMES, 1957-58.--Water temperatures: Maximum, 94°F Aug. 12; minimum, freezing point on several days during November to February.
Sediment concentrations: Maximum daily, 4,930 ppm Sept. 22; minimum daily, not determined.
Sediment loads: Maximum daily, 277,000 tons Sept. 6; minimum daily, not determined.
REMARKS.--Flow affected by ice Dec. 11-14, Dec. 30 to Jan. 12, Jan. 20 to Feb. 20.
Records of discharge for water year October 1957 to September 1958 given in WSP 1560.

Temperature (° F) of water, water year October 1957 to September 1958
/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	64	--	--	a 32	--	a 36	50	56	b 76	77	b 82	--
2	--	50	--	--	--	b 35	51	61	71	77	81	--
3	64	--	--	--	--	a 39	55	62	72	73	83	--
4	--	--	34	--	--	a 42	53	59	76	73	a 91	--
5	62	--	--	--	a 35	a 41	53	57	75	76	81	69
6	--	a 48	--	--	a 32	38	a 48	60	72	76	80	72
7	68	--	35	--	--	38	45	62	72	72	83	72
8	--	--	--	a 35	--	38	47	63	a 87	74	80	74
9	56	--	--	--	--	35	48	63	b 82	74	81	74
10	--	--	--	--	a 32	38	47	65	77	74	80	75
11	56	--	a 32	35	--	35	47	70	75	--	80	72
12	--	--	--	--	a 32	a 37	51	68	76	74	a 94	70
13	53	a 47	--	--	--	a 42	56	67	78	75	83	--
14	--	--	32	--	--	a 42	54	69	b 72	78	82	--
15	60	--	--	a 34	--	a 41	55	68	69	75	84	67
16	--	42	--	--	--	--	57	66	71	72	80	68
17	55	--	--	--	--	a 40	61	65	73	70	75	66
18	--	--	a 43	34	--	a 42	62	65	73	72	75	65
19	53	--	38	--	a 32	a 41	63	66	75	76	a 85	65
20	--	a 38	35	--	--	a 48	59	70	b 75	74	78	65
21	54	--	34	--	--	a 46	61	70	71	73	81	a 65
22	--	--	39	a 33	--	a 43	55	72	72	72	74	67
23	a 55	32	--	--	--	a 47	55	69	67	73	72	70
24	--	--	--	--	--	a 51	52	67	71	72	73	74
25	42	--	37	33	a 48	a 51	53	71	74	76	69	68
26	--	--	--	--	45	43	53	71	63	77	69	67
27	b 38	42	--	--	40	47	55	74	67	79	72	65
28	--	--	33	--	--	47	55	71	70	78	75	b 65
29	45	--	--	a 37	--	47	52	71	74	b 82	74	60
30	--	32	--	--	--	b 47	54	a 86	75	b 85	74	60
31	43	--	--	--	--	45	--	77	--	80	--	--
Average	--	--	--	--	--	42	54	67	73	75	79	68

a Measurement between 5 p.m. and 6 p.m.
b Measurement between 10 a.m. and 12 m.

KANSAS RIVER BASIN--Continued

6B-8566. REPUBLICAN RIVER AT CLAY CENTER, KANS.--Continued

Suspended sediment, water year October 1957 to September 1958

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	219	110	65	137			192	--	
2	212	120	a 70	137	--	e 40	188	--	
3	205	120	66	134			188	220	
4	202	140	a 75	137			202	180	
5	199	160	86	160	--		216	--	
6	192	170	a 90	176	130		227	--	
7	192	160	83	179	--		230	130	
8	202	150	a 80	182	--		238	--	
9	182	150	74	182	140		238	--	e 80
10	176	160	a 75	182	--		246	--	
11	173	180	84	182	--		180	100	
12	170	180	a 85	179	--	e 55	170	--	
13	173	160	75	179	100		200	--	
14	166	160	a 70	179	--		220	130	
15	160	180	78	176	--		253	--	
16	154	170	a 70	173	100		246	--	
17	146	150	59	176	--		265	--	
18	148	130	a 50	195	--		304	280	230
19	148	130	52	182	--		322	290	252
20	140	160	a 60	176	110		304	260	213
21	134	160	58	192	--		282	210	160
22	143	140	a 55	192	--		278	180	135
23	143	130	50	192	150		278	--	
24	140	120	a 45	185	--		278	--	
25	137	130	48	192	--		282	170	
26	134	140	a 50	195	--	e 70	278	--	e 120
27	132	140	50	192	150		278	--	
28	132	140	a 50	192	--		274	140	
29	134	130	47	195	--		274	--	
30	140	130	a 50	192	100		250	--	
31	137	120	44	--	--	--	185	--	e 60
Total	5,065	--	1,994	5,322	--	1,740	7,566	--	3,370

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	150	100		260	--		467	640	807
2	150	--		260	240		395	440	469
3	165	--		240	--		365	360	355
4	170	80		250	--		313	240	203
5	185	--		310	210	e 180	390	540	s 624
6	170	--	e 50	350	--		874	1,670	3,940
7	160	--		310	--		1,240	1,980	6,630
8	195	120		320	--		1,740	2,390	11,200
9	205	--		250	--		1,260	1,410	4,800
10	220	--		210	60		1,080	950	2,770
11	245	90		270	--		1,010	770	2,100
12	325	--		260	70		970	730	1,910
13	345	--		240	--		970	690	1,810
14	340	--		230	--		978	620	1,640
15	336	210		230	--	e 65	970	550	1,440
16	308	--	e 160	230	200		978	520	1,370
17	295	--		230	--		994	470	1,260
18	336	170		240	--		994	420	1,130
19	345	--		260	50		986	460	1,220
20	300	--		270	--		986	530	a 1,400
21	175	--		395	--	e 110	994	450	1,210
22	85	100		500	100	135	994	460	1,230
23	140	--	e 46	530	--	e 200	1,010	440	1,200
24	160	--		660	--	e 950	1,030	440	1,220
25	200	120		612	630	1,040	1,190	820	s 2,820
26	250	--		618	600	1,000	1,570	2,040	8,650
27	290	--		592	630	1,010	1,420	1,100	4,220
28	270	--	e 160	732	730	a 1,400	1,360	1,070	a 3,900
29	260	230		--	--	--	1,220	800	2,640
30	250	--		--	--	--	978	550	1,450
31	270	--		--	--	--	866	520	1,220
Total	7,295	--	3,180	9,859	--	8,065	30,592	--	76,838

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

KANSAS RIVER BASIN--Continued

6B-8566. REPUBLICAN RIVER AT CLAY CENTER, KANS.--Continued

Suspended sediment, water year October 1957 to September 1958--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.....	930	750	1,880	1,340	310	1,120	536	200	289
2.....	898	1,130	2,740	1,250	280	945	484	190	248
3.....	718	670	1,300	1,810	2,010	sb 12,800	440	170	202
4.....	632	460	785	2,080	2,330	13,100	425	170	195
5.....	646	400	698	1,430	1,000	3,860	580	280	438
6.....	866	850	1,990	1,180	510	1,620	810	380	831
7.....	702	2,200	4,170	1,070	390	1,130	962	460	1,190
8.....	586	1,350	2,140	1,000	280	756	1,010	510	1,390
9.....	646	860	1,500	890	200	481	2,130	2,520	s 15,500
10.....	1,050	1,410	4,000	802	170	368	1,910	2,250	11,600
11.....	1,220	1,100	3,620	695	140	263	1,140	1,150	3,540
12.....	1,290	770	2,680	653	130	229	1,030	480	1,330
13.....	1,440	800	3,110	606	120	196	938	390	988
14.....	1,660	910	4,080	667	430	sb 1,230	1,620	2,360	s 12,000
15.....	1,770	900	4,300	906	1,190	2,910	2,130	3,420	19,700
16.....	1,800	740	3,600	1,250	1,980	6,680	1,400	3,460	13,100
17.....	1,830	700	3,460	5,170	4,320	s 64,500	842	1,600	3,640
18.....	1,840	670	3,330	7,250	4,080	79,900	732	700	1,380
19.....	1,840	700	3,480	3,520	2,900	27,600	695	520	976
20.....	2,220	1,530	9,170	2,070	2,030	11,300	718	590	1,140
21.....	1,940	1,100	5,760	1,480	980	3,920	1,260	2,010	6,840
22.....	1,940	760	3,980	1,110	550	1,650	1,410	3,700	14,100
23.....	1,940	600	3,140	1,000	480	1,300	986	2,050	5,460
24.....	1,930	540	a 2,800	986	650	1,730	770	1,330	2,770
25.....	1,900	520	2,670	1,160	570	1,790	660	780	1,390
26.....	1,900	490	2,510	1,280	500	1,730	592	520	831
27.....	1,920	460	2,380	1,280	440	1,520	548	440	651
28.....	1,960	520	2,750	1,060	370	1,060	530	410	587
29.....	1,900	440	2,260	858	300	695	518	400	559
30.....	1,570	350	1,480	725	250	489	500	380	513
31.....	--	--	--	625	210	354	--	--	--
Total.	43,484	--	91,763	47,203	--	247,226	28,306	--	123,378

Day	July			August			September		
1.....	484	300	392	1,040	880	2,470	1,010	410	1,120
2.....	467	300	378	1,110	1,080	3,240	986	390	1,040
3.....	889	1,720	sb 5,210	1,000	700	1,890	882	380	905
4.....	1,060	1,790	sb 5,740	946	600	1,530	762	350	720
5.....	1,110	2,590	sb 9,700	914	530	1,310	22,500	4,530	s 276,000
6.....	1,510	3,080	12,600	914	500	1,230	32,100	3,200	277,000
7.....	1,060	1,870	5,350	1,040	620	1,740	22,000	2,330	138,000
8.....	740	1,290	2,580	1,350	1,500	5,470	14,300	2,290	88,400
9.....	674	1,450	2,640	2,270	2,280	14,000	5,760	2,120	33,000
10.....	566	700	1,070	1,690	1,800	8,210	4,040	1,530	16,700
11.....	842	3,280	s 8,120	1,010	1,100	3,000	3,460	1,850	17,300
12.....	914	3,100	7,650	748	650	1,310	2,640	1,380	9,840
13.....	1,160	4,000	12,500	890	580	1,390	2,360	920	5,860
14.....	1,300	4,310	15,100	946	650	1,660	2,120	900	5,150
15.....	1,210	4,570	14,900	930	520	1,310	1,940	1,000	5,240
16.....	2,180	3,800	22,400	1,240	970	3,250	1,620	1,380	6,040
17.....	3,830	3,780	39,100	2,220	2,350	14,100	1,450	690	2,700
18.....	5,000	3,510	47,400	1,230	1,050	3,490	1,470	660	2,620
19.....	4,900	3,900	51,600	1,740	1,220	5,730	1,470	620	2,460
20.....	3,070	2,970	24,600	2,260	2,450	14,900	1,270	560	1,920
21.....	1,960	2,210	11,700	1,500	2,100	8,500	3,410	3,940	s 38,200
22.....	1,640	1,700	7,530	1,400	2,000	7,560	3,740	4,930	49,800
23.....	1,380	2,000	7,450	1,160	1,520	4,760	2,660	2,820	20,300
24.....	1,060	1,680	4,810	1,580	1,830	7,810	2,900	3,580	28,000
25.....	954	1,300	3,350	1,560	1,800	7,580	1,670	1,700	7,670
26.....	1,380	2,000	7,450	1,320	1,150	4,100	1,270	800	2,740
27.....	1,120	2,050	6,200	1,260	800	2,720	1,110	480	1,440
28.....	1,500	2,260	9,150	1,180	600	1,910	1,040	400	1,120
29.....	1,360	2,480	9,110	1,110	540	1,620	930	390	979
30.....	994	1,400	3,760	1,060	500	1,430	850	270	620
31.....	1,170	1,420	4,490	1,030	490	1,360	--	--	--
Total.	47,484	--	364,030	39,648	--	140,580	143,720	--	1,042,884

Total discharge for year (cfs-days)..... 415,544
Total load for year (tons)..... 2,105,048

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

6B-8566. REPUBLICAN RIVER AT CLAY CENTER, KANS.--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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. 18, 1957....	1:15 p.m.	304	44	252	1,670	46	57		73		96	98	99		100		VPWCM
Jan. 15, 1958....	1:15 p.m.	360	--	203	--	--	--		--		94	97	100		--		V
Feb. 5	5:15 p.m.	a 310	32	209	--	--	--		--		96	100	--		--		V
Mar. 2.....	3:40 p.m.	380	33	435	1,610	75	80		86		96	98	99		100		VPWCM
Mar. 8.....	6:00 a.m.	2,030	38	2,720	3,880	55	58		72		93	96	99		100		VPWCM
Mar. 8.....	5:15 p.m.	1,510	33	1,720	2,280	53	58		72		93	96	98		100		VPWCM
Mar. 26.....	3:10 p.m.	1,480	49	2,040	2,790	53	55		70		85	86	87		94	100	VPWCM
May 18.....	2:20 p.m.	7,000	68	3,940	7,730	71	78		87		94	96	99		100		VPWCM
June 9.....	2:45 p.m.	2,310	--	2,780	5,710	54	61		76		96	98	99		100		VPWCM
July 18.....	1:45 p.m.	4,310	77	2,840	3,000	68	74		85		95	98	100		--		VPWCM
July 22.....	2:15 p.m.	1,660	--	1,540	6,020	70	79		90		97	98	100		--		VPWCM
Sept. 10.....	2:00 p.m.	3,820	75	1,610	2,950	66	67		81		99	100	--		--		VPWCM

a Daily mean discharge.

Particle-size analyses of bed material, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time	Discharge (cfs)	Number of sampling points	Bed material												Methods of analysis
				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	64.000	
Mar. 8, 1958.....	5:15 p.m.	1,510	6			0	10	59	84	91	97	99	99	100		SV
Mar. 26	3:10 p.m.	1,480	6			0	10	56	80	88	96	99	100			SV
May 18	2:20 p.m.	7,000	7			0	11	62	90	95	99	100	--			SV

KANSAS RIVER BASIN--Continued

6B-8570. 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 is noncontributing.
RECORDS AVAILABLE.--Chemical analyses: October 1955 to September 1958 (discontinued).
Water temperatures: October 1955 to September 1958 (discontinued).
EXTREMES, 1957-58.--Dissolved solids: Maximum, 456 ppm Jan. 1-11; minimum, 114 ppm Sept. 5-9.
Hardness: Maximum, 286 ppm Jan. 1-11; minimum, 67 ppm Sept. 5-9.
Specific conductance: Maximum daily, 770 micromhos Jan. 8; minimum daily, 157 micromhos Sept. 6, 7.
Water temperatures: Maximum, 83°F Aug. 15; minimum, 33°F on several days during December to February.
EXTREMES, 1955-58.--Dissolved solids: Maximum, 596 ppm Oct. 1-13, 1956; minimum, 114 ppm Sept. 5-9, 1958.
Hardness: Maximum, 376 ppm Oct. 1-13, 1956; minimum, 67 ppm Sept. 5-9, 1958.
Specific conductance: Maximum daily, 925 micromhos Dec. 11, 1955; minimum daily, 157 micromhos Sept. 6, 7, 1958.
Water temperatures: Maximum, 85°F July 20, 1957; minimum (1955-56, 1957-58), 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 1957 to September 1958 given in WSP 1560.

Chemical analyses, in parts per million, water year October 1957 to September 1958

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. 1-24, 1957.	194	31	0.00	76	16	40	11	264	79	39	0.5	0.5	0.07	420		0.57	220	254	38	25	1.1	678	7.6	--
Oct. 25-Nov. 30.	171	31	.01	79	16	39	10	272	82	38	.5	.9	.06	432		.59	199	264	41	23	1.0	691	7.7	--
Dec. 1-17.....	196	24	.00	75	15	34	11	271	73	29	.5	1.7	.08	397		.54	210	250	28	22	.9	635	7.9	8
Dec. 18-31.....	265	24	.00	64	15	28	12	244	57	20	.5	2.8	.06	341		.46	244	220	20	21	.8	552	7.7	--
Jan. 1-11, 1958.	155	27	.00	86	17	40	13	306	83	33	.6	2.8	.09	456		.62	191	286	35	22	1.0	717	7.9	--
Jan. 12-31	307	23	.01	63	13	28	12	240	57	21	.4	2.5	.09	341		.46	283	212	15	21	.8	542	7.8	--
Feb. 1-22.....	301	21	.00	72	15	30	14	272	62	21	.6	2.2	.09	383		.52	311	242	19	20	.8	605	7.9	--
Feb. 23-24.....	515	19	.01	58	13	22	13	229	47	11	.7	2.7	.10	310		.42	431	196	8	18	.7	489	8.1	--
Feb. 25-Mar. 2.	654	18	.02	49	9.6	18	9.4	183	42	12	.4	3.2	.04	253		.34	447	162	12	18	.6	406	7.5	--
Mar. 3-5.....	378	19	.01	63	12	31	11	223	59	29	.4	1.9	.07	337		.46	344	206	23	23	.9	546	7.8	--
Mar. 6-10.....	1,295	15	.02	43	7.7	16	9.0	158	32	11	.5	4.3	.05	237		.32	829	139	9	19	.6	356	7.7	--
Mar. 11-31.....	1,006	18	.01	53	11	22	13	206	56	14	.5	2.5	.06	291		.40	790	176	7	20	.7	455	7.8	5
Apr. 1-10.....	748	21	.01	56	12	23	12	201	53	18	.4	3.0	.07	309		.42	624	189	24	20	.7	490	7.4	--
Apr. 11-30.....	1,704	18	.01	52	12	20	14	211	45	8.8	.5	3.0	.07	293		.40	1,350	180	7	18	.6	462	7.4	--
May 1-3.....	1,430	16	.01	53	13	22	14	224	50	12	.4	.3	.08	301		.41	1,160	186	2	19	.7	484	7.7	--
May 4-6.....	2,043	13	.05	37	11	13	10	152	36	6.9	.5	3.9	.06	212		.29	1,170	138	13	16	.5	343	7.7	--
May 7-16.....	805	17	.01	59	13	27	13	229	57	20	.5	.3	.07	334		.45	726	202	14	21	.8	535	7.4	--
May 17.....	3,520	11	.08	34	8.3	15	9.4	132	33	9.3	.2	4.2	.05	198		.27	1,880	119	11	20	.6	317	7.7	--
May 18-19.....	6,490	12	.14	20	5.4	7.6	7.9	87	14	5.0	.2	4.6	.08	146		.20	2,560	72	1	17	.4	195	7.3	--
May 20-21.....	2,200	13	.06	32	3.9	13	8.2	114	19	10	.3	4.7	.06	174		.24	1,030	96	3	21	.6	266	7.5	--

May 22-June 9...	894	17	.02	57	12	34	13	213	59	33	.6	1.1	.08	335		.46	809	193	18	26	1.1	549	7.4	--
June 10-11.....	1,990	12	.02	37	9.6	16	11	160	34	9.5	.4	2.3	.08	212		.29	1,140	132	1	19	.6	348	7.5	--
June 12-14.....	1,080	13	.02	49	13	22	14	210	44	11	.6	.6	.08	275		.37	802	174	2	20	.7	449	7.6	--
June 15-17.....	1,833	11	.04	32	7.8	13	11	134	28	7.0	.4	3.5	.06	188		.26	930	112	2	18	.5	302	7.2	--
June 18-22.....	1,002	15	.02	50	11	23	12	200	46	18	.5	2.4	.08	281		.38	760	172	8	21	.8	460	7.5	9
June 23-25.....	1,290	13	.03	36	7.8	11	10	144	24	8.0	.4	5.3	.07	190		.26	662	122	4	15	.4	310	7.6	--
June 26-July 5...	1,310	13	.01	43	9.4	16	10	167	38	11	.5	2.9	.07	232		.32	821	146	9	18	.6	379	7.4	--
July 6-15	1,090	15	.01	44	8.3	19	11	160	39	17	.5	3.5	.07	239		.33	703	144	13	21	.7	392	7.1	--
July 16-22	3,701	12	.07	24	4.4	7.8	8.8	92	15	6.7	.4	4.8	.06	145		.20	1,450	78	3	16	.4	214	7.0	--
July 23-27	1,234	15	.01	48	7.3	31	11	158	38	44	.5	2.7	.08	282		.38	940	150	20	29	1.1	473	7.2	--
July 28-Aug. 17 .	1,147	16	.01	50	10	18	13	190	44	14	.5	2.1	.07	266		.36	824	166	10	18	.6	428	7.1	--
Aug. 18.....	1,550	11	.05	30	4.9	11	9.6	108	23	5.5	.4	6.0	.05	--	155	.21	649	95	6	18	.5	259	7.0	--
Aug. 19-20.....	1,680	16	.02	49	8.4	21	13	190	41	15	.6	3.4	.08	276		.38	1,250	157	1	21	.7	427	7.5	--
Aug. 21-23.....	1,607	15	.01	39	6.2	9.6	11	146	23	5.0	.4	2.7	.06	186		.25	807	123	3	13	.4	300	7.3	--
Aug. 24-Sept. 4 .	1,184	17	.00	52	9.4	18	13	198	42	11	.6	2.2	.07	268		.36	857	168	6	17	.6	430	7.2	--
Sept. 5-9	20,540	10	.05	22	2.9	4.7	6.4	80	10	2.6	.2	3.7	.04	114		.16	6,320	67	1	12	.2	174	6.8	--
Sept. 10-15	4,167	14	.01	47	7.2	16	10	158	35	18	.4	2.3	.06	234		.32	2,630	147	17	18	.6	381	7.1	--
Sept. 16-19	2,268	18	.00	64	12	28	11	216	59	29	.6	1.8	.06	338		.46	2,070	208	31	22	.8	546	7.3	--
Sept. 20-25	4,215	12	.01	40	6.8	17	8.5	139	36	16	.5	3.6	.05	217		.30	2,470	128	14	21	.7	353	7.1	7
Sept. 26-30	1,452	16	.00	68	13	31	11	228	63	32	.3	.6	.06	357		.49	1,400	223	36	22	.9	579	7.1	--
Weighted average a.....	1,258	15	0.03	42	8.3	17	10	158	35	13	0.4	3.0	0.06	230		0.31	781	139	9	20	0.6	366	--	--

a Represents 100 percent of runoff for water year October 1957 to September 1958.

KANSAS RIVER BASIN--Continued

6B-8570. REPUBLICAN RIVER AT MILFORD, KANS.--Continued

Temperature (° F) of water, water year October 1957 to September 1958
/Once-daily measurement between 6 a.m. and 8 a.m./

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

a Measurement between 10 a.m. and 12 m.

6B-8633. BIG CREEK NEAR OGALLAH, KANS.

LOCATION.--At gaging station at bridge on State Highway 147, 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 1958 (discontinued).
Water temperatures: October 1955 to September 1958.
Sediment records: October 1955 to September 1958.
EXTREMES, 1957-58.--Dissolved solids: Maximum, 322 ppm Oct. 1-31, May 24-30; minimum, 124 ppm May 18-19.
Hardness: Maximum, 238 ppm Oct. 1-31; minimum, 72 ppm May 18-19.
Specific conductance: Maximum daily, 563 micromhos Apr. 15; minimum daily, 167 micromhos May 18.
Water temperatures: Maximum, 79°F July 30, Aug. 15, 16; minimum, freezing point Mar. 1.
Sediment concentrations: Maximum daily, 3,530 ppm July 17; minimum daily, 2 ppm Jan. 16, Feb. 7, 10.
Sediment loads: Maximum daily, 12,700 tons May 17; minimum daily, less than 0.05 ton on many days during January and February.
EXTREMES, 1955-58.--Dissolved solids: Maximum, 372 ppm Jan. 11-13, 15-22, 25, 1957; minimum, 122 ppm May 16-21, 1957.
Hardness: Maximum, 282 ppm Jan. 11-13, 15-22, 25, 1957; minimum, 72 ppm May 18-19, 1958.
Specific conductance: Maximum daily, 655 micromhos Jan. 18, 1957; minimum daily, 146 micromhos Sept. 15, 1957.
Water temperatures: Maximum 82°F Aug. 18, 1955; minimum, freezing point on several days during winter months.
Sediment concentrations: Maximum daily, 9,630 ppm June 30, 1957; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 139,000 tons June 17, 1957; 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 Jan. 20-21, Feb. 28, Mar. 1-3, 5-7. Records of discharge for water year October 1957 to September 1958 given in WSP 1560.

Chemical analyses, in parts per million, water year October 1957 to September 1958

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, 1957...	6.48	37	0.01	67	17	12	8.3	282	23	10	0.4	3.2	0.09	322	0.44	5.63	238	7	9	0.3	505	7.8	--
Nov. 1-30.....	3.68	23	.00	76	10	13	6.6	276	23	11	.3	1.1	.06	301	.41	2.99	232	6	11	.4	493	7.8	8
Dec. 1-31.....	3.25	24	.01	66	12	13	5.9	254	25	10	.3	1.4	.00	280	.38	2.46	212	4	11	.4	458	7.7	5
Jan. 1-30, 1958...	2.83	14	.03	61	11	13	5.3	234	23	10	.4	2.0	.08	266	.36	2.03	198	6	12	.4	431	7.6	--
Jan. 31-Feb. 21..	2.89	17	.01	64	10	13	4.8	240	21	11	.4	1.6	.05	256	.35	2.00	201	4	12	.4	441	7.9	5
Feb. 22-27.....	3.00	13	.01	52	8.9	11	4.6	197	18	8.5	.3	.8	.04	211	.29	1.71	166	4	12	.4	369	7.7	5
Feb. 28-Mar. 31..	6.60	19	.00	61	12	12	5.9	232	18	10	.4	3.0	.04	264	.36	4.70	200	10	11	.4	433	7.4	6
Apr. 1-4.....	72.3	15	.03	47	6.0	7.2	7.5	168	23	4.8	.3	5.2	.04	212	.29	41.4	142	4	9	.3	329	7.9	--
Apr. 5-6.....	126	14	.04	43	3.8	5.9	9.0	146	18	3.2	.3	5.4	.04	188	.26	64.0	123	3	9	.2	289	7.8	--
Apr. 7-9.....	30.7	17	.04	55	5.6	8.1	8.8	183	21	5.4	.3	6.5	.08	224	.30	18.6	160	10	9	.3	358	7.9	--
Apr. 10-27.....	15.1	20	.01	75	9.7	14	8.6	260	32	9.6	.4	5.2	.08	312	.42	12.7	227	14	11	.4	502	7.7	--
Apr. 28-May 15...	13.5	18	.03	64	12	14	8.4	232	31	12	.3	4.7	.05	283	.38	10.3	207	17	12	.4	466	7.4	--
May 16-17.....	837	17	.07	43	1.8	2.2	9.8	150	8.0	1.0	.2	1.7	.05	172	.23	389	115	0	4	.1	260	7.8	--
May 18-19.....	447	12	.07	27	1.1	.8	9.0	94	7.3	.0	.1	4.7	.02	124	.17	150	72	0	2	.0	176	7.5	--
May 20-21.....	102	16	.06	38	4.1	2.5	10	136	10	.7	.2	4.6	.03	162	.22	44.6	112	0	4	.1	255	7.6	--
May 22-23.....	43.5	21	.04	56	6.0	6.9	11	198	15	3.3	.3	6.9	.04	236	.32	27.7	164	2	8	.2	372	7.7	--
May 24-30.....	27.3	25	.04	77	10	11	11	267	26	8.6	.4	7.8	.10	322	.44	23.7	234	15	9	.3	505	7.5	--

KANSAS RIVER BASIN--Continued

6B-8633. BIG CREEK NEAR OGALLAH, KANS.--Continued

Chemical analyses, in parts per million, water year October 1957 to September 1958--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 31, 1958.....	34	--	--	70	1.3	15	11	198	36	11	0.4	5.7	0.06	284	0.39	26.1	180	18	14	0.5	430	7.4	--
June 1-7.....	16.1	24	0.02	84	1.3	13	10	245	31	9.8	.4	4.0	.07	303	.41	13.2	215	14	11	.4	474	7.4	8
June 8-24.....	11.5	22	.03	83	1.9	14	8.8	247	30	11	.4	3.1	.05	301	.41	9.35	215	12	12	.4	479	7.3	--
June 25.....	12	22	.02	78	2.3	13	8.2	234	27	10	.4	3.0	.05	288	.39	9.33	204	12	12	.4	451	7.4	--
June 26-July 4.....	9.72	27	.00	58	10	14	9.0	214	30	11	.4	3.8	.08	271	.37	7.11	186	11	13	.4	425	7.2	--
July 5-9.....	162	18	.01	35	3.0	2.9	11	127	8.5	.6	.1	4.4	.04	154	.21	67.4	100	0	5	.1	232	7.2	--
July 10-14.....	19.2	26	.02	45	6.4	5.5	12	165	18	4.9	.3	4.5	.05	203	.28	10.5	139	4	7	.2	319	7.2	--
July 15-22.....	125	20	.02	36	3.9	2.3	9.4	133	7.0	.1	.2	4.3	.04	150	.20	50.6	106	0	4	.1	238	7.2	--
July 23-26.....	16.3	29	.02	61	7.1	7.3	9.2	216	19	4.8	.3	4.1	.06	252	.34	11.1	181	4	8	.2	393	7.3	--
July 27-28.....	51.5	22	.00	48	2.4	3.4	10	160	11	.5	.2	4.8	.05	192	.26	26.7	130	0	5	.1	286	7.4	--
July 29-31.....	12.3	32	.02	71	8.0	10	11	258	21	2.0	.4	2.7	.07	298	.41	9.90	210	0	9	.3	459	7.5	--
Aug. 1.....	106	18	.02	50	5.6	2.9	14	180	10	1.0	.4	6.4	.04	198	.27	56.7	148	0	4	.1	312	7.2	--
Aug. 2-5.....	14.1	24	.02	47	5.5	5.8	10	172	13	.2	.4	4.5	.06	198	.27	7.54	140	0	8	.2	318	7.2	--
Aug. 6-7.....	112	19	.02	38	3.6	2.6	12	138	6.3	.2	.3	6.0	.05	162	.22	50.0	110	0	4	.1	253	7.1	--
Aug. 8-15.....	12.4	27	.01	54	6.2	6.5	12	196	14	4.0	.4	2.5	.05	223	.30	7.47	160	0	7	.2	354	7.0	--
Aug. 16-17.....	55.0	23	.02	48	4.9	5.7	10	166	16	1.4	.5	6.2	.07	204	.28	30.3	140	4	8	.2	319	7.2	--
Aug. 18-Sept. 14..	6.16	28	.00	66	10	12	8.4	246	22	9.4	.5	2.6	.05	282	.38	4.69	207	5	11	.4	446	7.7	--
Sept. 15-30.....	2.14	7.8	.01	65	12	13	7.2	247	22	11	.4	2.5	.06	287	.39	1.66	212	9	11	.4	465	7.4	8
Weighted average a.....	22.8	19	0.04	47	5.0	5.6	9.4	168	14	3.5	0.3	3.9	0.05	199	0.27	12.3	138	0	7	0.2	311	--	--

a Includes estimates where data are missing. Represents 100 percent of runoff for water year October 1957 to September 1958.

KANSAS RIVER BASIN--Continued

6B-8633. BIG CREEK NEAR OGALLAH, KANS.--Continued

Temperature (° F) of water, water year October 1957 to September 1958
/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	62	52	35	38	36	32	41	55	a 72	74	70	69
2	61	44	35	34	34	34	42	59	69	74	--	67
3	73	44	35	33	34	a 40	45	59	73	74	73	--
4	61	43	37	33	34	34	44	56	72	77	76	73
5	64	42	39	34	35	33	45	58	71	61	77	74
6	64	42	40	34	34	33	a 42	53	71	70	68	68
7	64	44	47	35	34	33	41	63	72	--	74	70
8	60	42	34	34	34	34	44	59	72	70	74	72
9	56	36	38	34	33	35	44	57	72	72	75	71
10	54	43	38	34	34	--	43	59	75	73	75	70
11	64	44	34	35	34	33	42	65	68	74	75	69
12	55	45	34	37	35	34	43	a 71	70	74	78	70
13	57	45	34	39	34	34	44	65	71	73	77	70
14	56	43	34	36	34	34	53	64	70	73	78	72
15	59	46	36	34	34	33	55	64	78	62	79	70
16	57	42	36	35	34	33	58	a 68	71	68	79	70
17	56	40	38	36	34	34	60	a 69	70	68	a 78	70
18	55	35	40	35	34	34	50	63	70	74	73	64
19	53	33	39	35	34	34	47	64	71	76	74	63
20	52	34	38	34	35	34	55	69	73	71	73	63
21	51	34	39	34	34	34	57	68	73	70	69	64
22	55	33	37	34	36	34	55	70	69	72	74	68
23	56	34	36	34	38	34	55	66	66	75	73	72
24	50	37	35	34	43	35	57	66	70	77	73	69
25	43	37	35	35	44	37	50	68	69	76	65	68
26	36	39	35	34	49	35	48	67	64	74	78	68
27	40	41	38	34	40	35	53	67	71	67	70	69
28	42	35	34	35	33	34	51	70	72	72	70	70
29	46	33	35	35	--	34	51	70	74	75	71	58
30	47	34	35	34	--	39	54	72	78	79	70	63
31	50	--	34	34	--	41	--	71	--	74	73	--
Average	55	40	37	35	36	35	49	64	71	72	74	68

a Measurement between 12 m. and 4 p.m.

KANSAS RIVER BASIN--Continued

6B-8633. BIG CREEK NEAR OGALLAH, KANS.--Continued

Suspended sediment, water year October 1957 to September 1958

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.....	10	270	7.3	5.0	39	0.5	4.2	16	0.2
2.....	8.7	130	3.1	4.8	40	.5	2.8	46	.3
3.....	8.2	210	4.6	4.0	29	.3	2.2	36	.2
4.....	7.6	140	2.9	4.2	36	.4	3.8	34	.3
5.....	7.9	69	1.5	4.2	29	.3	3.4	32	.3
6.....	7.6	81	1.7	4.0	19	.2	3.8	35	.4
7.....	7.1	82	1.6	4.2	27	.3	4.0	28	.3
8.....	7.1	81	1.6	4.2	31	.4	3.6	14	.1
9.....	5.0	62	.8	3.8	24	.2	3.6	30	.3
10.....	6.0	60	1.0	3.8	21	.2	3.6	32	.3
11.....	6.5	66	1.2	3.6	27	.3	1.5	42	.2
12.....	6.5	84	1.5	3.6	30	.3	2.2	33	.2
13.....	6.5	100	1.8	3.6	27	.3	2.2	34	.2
14.....	7.6	110	2.3	3.6	35	.3	3.6	32	.3
15.....	7.3	150	3.0	4.0	35	.4	3.8	23	.2
16.....	7.6	87	1.8	3.6	23	.2	3.6	25	.2
17.....	6.2	97	1.6	4.8	20	.3	3.6	54	.5
18.....	5.0	130	1.8	4.8	14	.2	3.4	20	.2
19.....	6.5	85	1.5	4.0	15	.2	3.6	46	.4
20.....	6.5	60	1.0	4.0	23	.2	3.2	25	.2
21.....	6.8	77	1.4	4.2	23	.3	3.4	26	.2
22.....	5.2	94	1.3	1.9	11	.1	3.4	14	.1
23.....	6.5	120	2.1	1.9	14	.1	3.2	14	.1
24.....	5.8	89	1.4	3.6	12	.1	3.2	17	.1
25.....	5.5	67	1.0	4.0	11	.1	3.6	11	.1
26.....	5.0	42	.6	4.0	14	.2	3.2	24	.2
27.....	4.8	58	.8	3.6	12	.1	3.6	26	.2
28.....	5.0	45	.6	1.7	22	.1	2.6	12	.1
29.....	5.0	58	.8	1.7	29	.1	3.6	21	.2
30.....	5.0	68	.9	1.9	17	.1	3.6	8	.1
31.....	5.0	90	1.2	--	--	--	1.7	20	.1
Total.	201.0	--	55.7	110.3	--	7.3	100.8	--	6.8
	January			February			March		
1.....	1.6	13	0.1	3.4	10	0.1	3.0	18	0.1
2.....	1.6	33	.1	2.8	11	.1	3.3	14	.1
3.....	1.1	35	.1	3.4	11	.1	2.5	19	.1
4.....	2.4	9	.1	3.2	7	.1	2.0	18	.1
5.....	2.6	10	.1	3.0	4	(t)	5.0	8	.1
6.....	3.6	4	(t)	3.2	5	(t)	5.0	10	.1
7.....	2.8	17	.1	3.2	2	(t)	5.4	12	.2
8.....	1.7	13	.1	2.2	6	(t)	6.8	11	.2
9.....	1.9	6	(t)	2.4	12	.1	7.9	7	.1
10.....	3.0	6	(t)	2.6	2	(t)	5.2	13	.2
11.....	4.0	3	(t)	2.2	30	.2	4.0	13	.1
12.....	3.8	5	.1	2.4	24	.2	3.8	10	.1
13.....	3.8	3	(t)	2.0	8	(t)	1.6	12	.1
14.....	4.0	3	(t)	2.2	22	.1	2.0	25	.1
15.....	3.8	3	(t)	2.8	4	(t)	4.5	9	.1
16.....	3.8	2	(t)	3.0	12	.1	4.2	7	.1
17.....	3.6	5	(t)	3.0	4	(t)	2.8	9	.1
18.....	3.2	4	(t)	2.8	9	.1	3.2	12	.1
19.....	3.4	10	.1	3.4	7	.1	3.6	9	.1
20.....	3.1	9	.1	3.0	6	(t)	4.2	7	.1
21.....	2.4	11	.1	4.2	8	.1	3.8	7	.1
22.....	1.6	31	.1	2.2	10	.1	4.8	7	.1
23.....	2.0	7	(t)	2.4	5	(t)	4.8	5	.1
24.....	2.0	10	.1	3.4	11	.1	4.0	6	.1
25.....	3.4	8	.1	3.0	14	.1	6.2	10	.2
26.....	2.4	12	.1	3.2	26	.2	5.2	11	.2
27.....	3.4	9	.1	3.8	26	.3	6.8	19	.3
28.....	3.2	7	.1	3.5	31	.3	12	60	1.9
29.....	3.4	8	.1	--	--	--	20	58	3.1
30.....	2.2	17	.1	--	--	--	20	41	2.2
31.....	3.2	10	.1	--	--	--	40	140	s 20
Total.	88.0	--	2.4	81.9	--	2.8	207.6	--	30.6

s Computed by subdividing day.
t Less than 0.050 ton.

KANSAS RIVER BASIN--Continued

6B-8633. BIG CREEK NEAR OGALLAH, KANS.--Continued

Suspended sediment, water year October 1957 to September 1958--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	68	480	s 158	11	88	2.6	22	430	26
2	96	1,270	s 367	10	150	4.1	18	300	14
3	55	420	62	36	670	65	16	220	9.5
4	70	400	s 96	17	530	24	15	280	11
5	135	1,390	s 527	19	200	10	15	250	10
6	117	910	287	12	240	7.8	14	200	7.6
7	36	600	58	10	200	5.4	13	160	5.6
8	29	380	30	10	230	6.2	13	180	6.3
9	27	210	15	9.3	170	4.3	13	170	6.0
10	24	160	10	9.0	190	4.6	13	150	5.3
11	22	130	7.7	8.5	210	4.8	12	190	6.2
12	21	200	11	8.7	300	7.0	12	190	6.2
13	21	230	13	7.9	200	4.3	11	170	5.0
14	16	220	9.5	8.7	230	5.4	11	160	4.8
15	17	200	9.2	21	300	17	11	180	5.3
16	17	200	9.2	403	2,200	s 2,610	11	160	4.8
17	15	220	8.9	1,270	3,340	s12,700	10	200	5.4
18	12	240	7.8	565	1,700	2,600	9.2	170	4.2
19	14	240	9.1	328	1,790	1,580	11	160	4.8
20	13	300	11	131	1,310	463	11	230	6.8
21	12	220	7.1	72	900	175	12	--	e 7
22	12	180	5.8	49	510	67	11	--	e 7
23	12	210	6.8	38	420	43	10	170	4.6
24	10	89	2.4	34	360	33	14	410	15
25	10	130	3.5	30	320	26	12	170	5.5
26	11	130	3.9	27	300	22	9.8	410	11
27	12	140	4.5	25	240	16	8.8	--	e 8
28	21	470	27	22	270	16	8.0	220	4.8
29	12	150	4.9	23	260	16	7.5	210	4.3
30	11	110	3.3	30	280	23	9.2	200	5.0
31	--	--	--	34	380	35	--	--	--
Total	948	--	1,775.6	3,279.1	--	20,596.5	363.5	--	227.0

Day	July			August			September		
1	9.2	180	4.5	106	1,970	s 865	4.8	230	3.0
2	10	150	4.1	25	900	61	4.8	230	3.0
3	14	310	12	12	420	14	3.9	--	e 2.5
4	11	210	s 7.1	11	250	7.4	3.9	200	2.1
5	249	2,990	s 2,310	8.5	230	5.3	4.1	200	2.2
6	285	3,220	2,480	133	2,110	s 1,000	7.3	610	12
7	154	2,520	1,050	90	2,410	s 640	4.1	240	2.7
8	72	1,850	360	20	1,210	65	3.7	190	1.9
9	52	1,440	202	16	570	25	3.4	200	1.8
10	27	980	71	14	440	17	2.8	190	1.4
11	18	580	28	12	340	11	2.7	180	1.3
12	16	430	18	10	290	7.8	2.7	180	1.3
13	21	1,120	64	11	270	8.0	2.7	200	1.5
14	14	400	15	8.2	280	6.2	2.8	120	.9
15	109	2,640	s 901	7.8	220	4.6	2.7	110	.8
16	59	1,700	271	82	2,890	s 772	2.3	120	.7
17	352	3,530	s 3,600	28	1,410	s 116	2.7	96	.7
18	234	2,160	1,360	20	650	35	2.5	150	1.0
19	123	2,220	737	12	420	14	2.5	130	.9
20	60	2,060	334	10	310	8.4	1.8	130	.6
21	34	1,120	103	9.0	290	7.0	2.5	140	.9
22	25	780	53	9.2	240	6.0	2.7	120	.9
23	21	530	30	8.0	210	4.5	2.2	110	.7
24	16	460	20	7.5	200	4.1	1.8	120	.6
25	14	390	15	7.0	200	3.8	1.5	110	.4
26	14	410	16	6.4	220	3.8	1.5	100	.4
27	85	1,960	s 554	5.9	240	3.8	1.5	79	.3
28	18	520	25	6.1	230	3.8	2.3	84	.5
29	14	320	12	5.9	240	3.8	1.6	84	.4
30	12	260	8.4	5.9	210	3.3	2.2	75	.4
31	11	210	6.2	5.9	220	3.5	--	--	--
Total	2,153.2	--	14,671.3	713.3	--	3,730.1	88.0	--	47.8

Total discharge for year (cfs-days)	8,334.7
Total load for year (tons)	41,153.9

e Estimated.

s Computed by subdividing day.

KANSAS RIVER BASIN--Continued

6B-8633. BIG CREEK NEAR OGALLAH, KANS.--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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. 1, 1957	12:20 p.m.	5.0	--	978	1,470	--	99		99		100	--					SPWCM
Apr. 2, 1958	12:30 p.m.	91	42	1,080	1,250	87	92	97	99	100	--	--					BWCM
Apr. 5	9:00 a.m.	156	45	1,890	2,090	--	84		96		100	--					SPWCM
July 5	7:00 a.m.	588	61	4,100	2,100	71	80		96		100	--					SPWCM
July 5	10:00 a.m.	371	--	3,390	2,190	77	84		95		100	--					SPWCM
July 5	3:30 p.m.	119	--	2,760	4,130	68	82		92		--	--					PWCM
July 6	2:00 p.m.	430	--	3,960	2,820	77	85		97		--	--					PWCM
July 17	11:25 a.m.	577	69	4,490	3,240	56	64		77		98	100					VPWCM
July 17	1:35 p.m.	648	--	4,640	3,360	70	78		90		99	100					VPWCM
July 17	3:30 p.m.	529	--	4,300	3,010	73	89		95		99	100					VPWCM

6B-8645. SMOKY HILL RIVER AT ELLSWORTH, KANS.

LOCATION.--At gaging station at bridge on State Highway 14 in Ellsworth, Ellsworth County, 2 miles downstream from Turkey Creek.
DRAINAGE AREA.--7,580 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: September 1957 to September 1958.
REMARKS.--Records of discharge for water year October 1957 to September 1958 given in WSP 1560.

Chemical analyses, in parts per million, May 1950 to September 1958

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									
May 6, 1950....	289			--	--	45		142	55	71		4.2	0.30	356		0.48		181	65	35	1.4	564	7.6	
Sept. 11, 1957..	554			--	--	40		189	--	--				416		.57		241	86	27	1.1	667	7.5	
Oct. 2.....	1,540			--	--	19		152	--	--				360		.49		229	104	15	.5	555	7.6	
Oct. 21.....	216			--	--	123		205	--	--				762		1.04		336	168	44	2.9	1,240	7.6	
Nov. 15	136			124	20	164		233	205	264				--		--		393	202	46	3.6	1,530	7.9	
Dec. 12.....	93			--	--	183		248	--	--				1,060		1.44		433	230	48	3.8	1,710	7.7	
Jan. 14, 1958 ..	112			--	--	244		255	--	--				1,230		1.67		469	260	53	4.9	1,990	7.7	
Feb. 3.....	38			--	--	225		272	--	--				1,170		1.59		468	245	51	4.5	1,900	7.7	
Mar. 9	150			118	18	144		204	--	--				887		1.21		370	203	46	3.3	1,420	7.6	
Mar. 29	8,710			--	--	20		148	--	--				278		.38		162	41	21	.7	434	7.5	
May 6	493			--	--	77		177	--	--				680		.92		336	191	33	1.8	1,050	7.6	
June 5.....	451			--	--	79		182	--	--				672		.91		329	180	34	1.9	1,010	7.1	
July 13	505			--	--	70		166	--	--				546		.74		258	122	37	1.9	862	7.2	
Aug. 2.....	1,230			--	--	34		146	--	--				432		.59		242	122	23	1.0	653	7.3	
Sept. 30	130			--	--	240		258	--	--				1,230		1.67		450	238	54	4.9	2,020	7.1	

6B-8669. 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 1958 (discontinued).
Water temperatures: October 1955 to September 1958.
Sediment records: October 1955 to September 1958.
EXTREMES, 1957-58.--Dissolved solids: Maximum, 439 ppm Feb 11-20; minimum, 172 ppm May 16-18.
Hardness: Maximum, 314 ppm Feb. 11-20; minimum, 127 ppm May 16-18.
Specific conductance: Maximum daily, 696 micromhos Apr. 26; minimum daily, 263 micromhos May 16.
Water temperatures: Maximum, 89°F July 31, Aug. 4, 5, 12, 13; minimum, freezing point Feb. 13-16.
Sediment concentrations: Maximum daily, 4,080 ppm July 17; minimum daily, 5 ppm Feb. 12, 13.
Sediment loads: Maximum daily, 15,400 tons May 17; minimum daily, 0.1 ton on several days during October, November, and February.
EXTREMES, 1955-58.--Dissolved solids: Maximum, 475 ppm Jan. 19-27, 1956; minimum, 148 ppm May 15-23, 1957.
Hardness: Maximum, 334 ppm Jan. 19-27, 1956; minimum, 104 ppm May 15-23, 1957.
Specific conductance: Maximum daily, 726 micromhos Jan. 25, 26, 1956; minimum daily, 205 micromhos May 15, 1957.
Water temperatures: Maximum, 89°F July 31, Aug. 4, 5, 12, 13, 1958; minimum (1955-56, 1958), freezing point Jan. 30, 1956, Feb. 13-16, 1958, and on several days during winter months.
Sediment concentrations: Maximum daily, 8,400 ppm May 30, 1956; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 140,000 tons June 17, 1957; 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. Maximum observed sediment concentration during water year, 8,510 ppm July 5. Flow affected by ice Nov. 18-21, Dec. 11-14, Dec. 31 to Jan. 9, Jan. 20-25, Feb. 6-22, Feb. 28 to Mar. 6, Mar. 12-23. Records of discharge for water year October 1957 to September 1958 given in WSP 1560.

Chemical analyses, in parts per million, water year October 1957 to September 1958

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, 1957....	10.2	25	0.02	87	16	18	13	300	71	15	0.5	1.6	0.09	400	0.54	11.0	284	38	11	0.5	622	7.9	--
Nov. 1-30.....	7.19	25	.01	83	18	22	10	306	66	17	.4	2.1	.02	394	.54	7.65	280	29	14	.6	624	7.8	--
Dec. 1-29.....	9.20	20	.01	79	19	23	9.6	294	69	18	.5	1.2	.01	386	.52	9.59	276	35	15	.6	625	7.7	5
Dec. 30-Jan. 12, 1958	9.31	18	.00	85	18	25	10	298	79	18	.6	1.0	.07	398	.54	10.0	284	40	16	.6	642	7.9	--
Jan. 13-29	9.64	17	.01	78	18	24	9.2	282	66	16	.6	.4	.06	373	.51	9.71	267	36	16	.6	599	7.8	--
Jan. 30-Feb. 10 ...	9.00	15	.00	80	19	24	9.4	291	69	18	.6	.4	.09	390	.53	9.48	276	37	15	.6	625	7.9	--
Feb. 11-20.....	7.10	20	.00	91	21	27	9.5	326	75	19	.7	1.2	.09	439	.60	8.42	314	47	15	.7	685	8.1	--
Feb. 21-Mar. 5....	10.1	17	.00	75	16	22	8.8	274	59	16	.7	.5	.08	361	.49	9.84	252	27	15	.6	576	7.7	--
Mar. 6-31.....	17.3	19	.01	70	15	19	9.0	248	58	14	.6	1.4	.05	338	.46	15.8	237	34	14	.5	538	7.9	6
Apr. 1-5.....	55.8	20	.01	76	17	21	9.4	266	76	15	.6	2.4	.06	378	.51	56.9	261	43	14	.6	578	7.8	--
Apr. 6-21.....	38.6	22	.01	80	21	25	10	300	79	18	.7	2.1	.10	408	.55	42.5	286	40	15	.6	647	7.8	--
Apr. 22-May 5.....	23.8	22	.01	80	22	31	10	310	76	19	.8	1.1	.11	420	.57	27.0	289	35	18	.8	665	7.7	--
May 6-8	34.3	19	.04	57	14	18	11	217	47	10	.6	2.6	.07	291	.40	26.9	198	20	16	.6	469	7.8	--
May 9-14.....	20.7	24	.01	80	18	25	12	297	65	15	.7	1.9	.09	398	.54	22.2	272	28	16	.7	622	7.8	--

May 15	36	19	.05	57	6.3	6.8	11	192	30	.5	.4	2.6	.13	248	.34	24.1	168	11	8	.2	374	7.9	--
May 16-18	844	13	.05	43	4.7	2.4	10	154	14	.2	.2	3.2	.04	172	.23	392	127	1	3	.1	273	8.0	--
May 19-21	126	18	.03	55	7.3	9.6	11	187	38	1.0	.4	2.9	.06	252	.34	85.7	167	14	10	.3	388	8.0	--
May 22-June 1	50.5	25	.02	80	15	21	12	274	66	14	.5	2.8	.08	384	.52	52.4	263	38	14	.6	596	7.5	--
June 2-19	18.2	27	.02	89	17	24	12	299	80	17	.6	2.1	.09	429	.58	21.1	292	47	14	.6	663	7.3	7
June 20-27	62.5	19	.02	56	9.4	10	11	187	40	8.0	.4	3.6	.05	259	.35	43.7	178	25	10	.3	408	7.5	--
June 28-July 4	13.1	28	.00	84	16	21	12	278	79	14	.5	1.4	.10	403	.55	14.3	276	48	14	.5	625	7.4	--
July 5-9	137	20	.00	53	3.4	4.5	11	170	22	2.0	.3	4.2	.06	208	.28	76.9	146	7	6	.3	327	7.6	--
July 10-14	23.4	25	.01	68	11	13	12	221	56	9.4	.3	2.4	.07	316	.43	20.0	214	33	11	.4	484	7.4	--
July 15-16	78.5	22	.01	52	5.5	6.2	11	176	26	4.5	.4	3.4	.06	222	.30	47.1	152	8	8	.2	343	7.7	--
July 17-18	893	22	.00	53	3.4	2.5	10	180	13	.5	.2	6.7	.08	208	.28	502	146	0	3	.1	311	7.3	--
July 19-21	109	27	.00	50	7.1	6.5	12	178	28	4.2	.4	3.6	.22	232	.32	68.3	154	8	8	.2	347	7.4	--
July 22-25	46.8	25	.01	55	9.5	11	12	198	39	7.0	.4	2.9	.07	260	.35	32.9	176	14	11	.4	406	7.5	--
July 26-31	16.3	28	.01	74	14	17	12	254	62	12	.5	.9	.08	351	.48	15.4	241	33	13	.5	537	7.3	--
Aug. 1-2	134	21	.02	59	6.6	6.2	12	189	31	5.2	.5	5.9	.06	256	.35	92.6	174	19	7	.2	385	7.3	--
Aug. 3-5	22.0	25	.01	71	11	14	13	240	53	11	.5	3.6	.08	326	.44	19.4	221	24	11	.4	500	7.7	--
Aug. 6-8	149	19	.02	51	5.8	3.6	10	164	18	.6	.4	10	.05	204	.28	82.1	151	17	5	.1	314	7.6	--
Aug. 9-15	17.4	27	.01	78	13	17	12	257	64	12	.5	3.0	.09	365	.50	17.1	250	39	12	.5	556	7.5	--
Aug. 16-19	99.3	21	.01	52	6.2	5.3	13	178	22	3.8	.4	6.1	.06	228	.31	61.1	155	9	6	.2	347	7.6	--
Aug. 20-31	11.1	28	.01	77	14	17	12	261	62	12	.5	3.0	.07	359	.49	10.8	250	36	12	.5	554	7.6	--
Sept. 1-30	3.52	25	.01	85	18	22	11	274	92	16	.5	1.3	.08	410	.56	3.90	287	62	14	.6	630	7.6	8
Weighted average a	35.5	20	0.02	60	9.6	11	10	209	38	7.0	0.4	3.5	0.07	269	0.37	25.8	189	18	11	0.3	420	--	--

a Represents 100 percent of runoff for water year October 1957 to September 1958.

KANSAS RIVER BASIN--Continued

6B-8669. SALINE RIVER NEAR WAKEENEY, KANS.--Continued

Temperature (° F) of water, water year October 1957 to September 1958
/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	68	54	42	35	37	--	54	68	a 70	b 85	a 70	a 78
2	70	55	43	34	38	--	b 52	68	a 76	a 78	b 85	79
3	69	54	44	33	37	--	50	a 68	b 87	a 77	a 82	b 79
4	70	55	43	34	38	--	b 53	a 59	a 81	a 80	89	82
5	71	53	42	36	37	--	b 45	74	a 69	a 68	89	b 77
6	65	52	42	35	36	--	b 48	74	b 76	a 67	b 77	78
7	58	51	43	35	34	--	52	71	a 77	77	86	83
8	57	52	44	36	34	--	45	61	a 75	82	88	a 74
9	56	52	45	37	33	--	44	69	85	87	a 79	86
10	57	53	43	38	33	-	44	a 60	85	a 78	a 81	b 75
11	65	54	38	39	33	33	48	73	80	b 80	b 84	76
12	66	55	37	40	33	33	50	a 70	81	80	89	b 74
13	a 62	54	37	39	32	33	52	a 65	80	a 75	89	b 72
14	61	53	38	38	32	34	56	68	75	87	87	a 68
15	60	51	39	40	32	34	60	57	a 70	a 69	b 84	a 67
16	58	50	40	42	32	33	61	a 60	78	72	a 71	64
17	62	48	42	40	33	34	62	--	b 82	a 68	--	66
18	62	45	43	41	33	35	61	a 68	82	79	84	a 64
19	62	42	40	36	33	35	a 59	a 66	a 74	b 77	a 80	b 79
20	61	40	41	36	33	36	a 62	75	a 75	b 75	a 79	80
21	58	39	40	36	35	38	63	a 67	a 66	b 82	a 75	a 68
22	59	41	42	37	37	36	a 57	b 73	a 69	b 80	a 69	b 77
23	58	44	39	36	38	36	a 53	72	a 68	83	a 68	b 78
24	55	46	39	36	47	39	a 59	79	a 67	80	a 67	b 79
25	50	48	40	38	45	48	a 48	78	a 63	a 76	a 67	a 60
26	45	50	42	39	37	46	a 49	a 71	77	a 79	b 79	73
27	42	45	39	38	--	45	a 51	a 74	80	b 82	b 80	68
28	48	48	40	40	--	44	a 55	78	a 76	b 83	84	a 63
29	50	44	42	39	--	a 40	a 52	a 69	a 78	a 77	85	67
30	51	--	a 34	38	--	41	a 54	a 78	a 82	b 85	79	a 50
31	52	--	34	a 34	--	45	--	a 79	--	89	b 76	--
Average	59	49	41	37	35	--	53	70	76	79	80	73

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

KANSAS RIVER BASIN--Continued

6B-8669. SALINE RIVER NEAR WAKEENEY, KANS.--Continued

Suspended sediment, water year October 1957 to September 1958

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	21	--	e 2.8	7.3	7	0.1	8.8	68	1.6
2	18	--	e 2.4	6.9	8	.1	7.6	19	.4
3	15	46	1.9	6.5	11	.2	8.8	21	.5
4	12	46	1.5	6.9	27	.5	8.8	12	.3
5	12	27	.9	6.5	8	.1	8.8	22	.5
6	11	26	.8	6.5	7	.1	8.8	30	.7
7	11	35	1.0	6.5	11	.2	9.1	20	.5
8	11	35	1.0	6.9	10	.2	9.1	30	.7
9	10	24	.6	6.9	10	.2	9.1	28	.7
10	9.5	22	.6	6.5	10	.2	9.1	249	6.1
11	9.5	61	1.6	6.5	9	.2	8.5	152	3.5
12	9.5	41	1.1	6.2	10	.2	8.0	66	1.4
13	9.5	52	1.3	6.2	21	.4	9.0	34	.8
14	10	43	1.2	6.2	13	.2	9.5	55	1.4
15	10	30	.8	6.5	19	.3	9.1	42	1.0
16	9.5	40	1.0	6.5	9	.2	9.1		
17	9.1	23	.6	6.5	18	.3	9.5	--	e 1.2
18	9.1	30	.7	6.4	12	.2	9.5		
19	9.1	40	1.0	6.0	26	.4	9.5	54	1.4
20	8.8	56	1.3	7.0	17	.3	9.5	55	1.4
21	8.8	144	3.4	8.0	25	.5	9.5	57	1.5
22	8.8	103	2.4	8.4	14	.3	9.5	57	1.5
23	8.8	46	1.1	8.4	18	.4	9.5	70	1.8
24	8.4	9	.2	8.4	23	.5	9.5	43	1.1
25	8.4	13	.3	8.4	7	.2	9.5	55	1.4
26	8.4	30	.7	8.4	13	.3	10	49	1.3
27	8.0	158	3.4	8.4	22	.5	10	28	.8
28	8.0	86	1.9	8.4	21	.5	10	27	.7
29	8.0	6	.1	8.8	9	.2	10	29	.8
30	8.0	84	1.8	8.8	9	.2	8.0	46	1.0
31	7.6	18	.4	--	--	--	7.4	9	.2
Total	315.8	--	39.8	215.8	--	8.2	282.1	--	38.6

	January			February			March		
1	6.7	10	0.2	9.5	62	1.6	7.2		
2	7.4	10	.2	8.8	34	.8	7.2		
3	6.0	11	.2	9.1	16	.4	7.6		
4	7.5	13	.3	9.5	48	1.2	8.6		
5	9.0	15	.4	10	17	.5	8.6		
6	9.5	31	.8	10	18	.5	10	--	e 0.9
7	7.6	50	1.0	8.0	38	.8	13		
8	8.2	37	.8	9.0	26	.6	13		
9	11	48	1.4	8.0	29	.6	14		
10	13	44	1.5	7.0	27	.5	15		
11	16	52	2.2	7.0	6	.1	13	37	1.3
12	13	70	2.5	6.0	5	.1	11	33	1.0
13	10	30	.8	6.5	5	.1	11	89	2.6
14	9.5	29	.7	7.0	11	.2	10	70	1.9
15	9.1	46	1.1	6.5	9	.2	10	64	1.7
16	8.8	--	e .8	6.0	6	.1	11	70	2.1
17	8.8	18	.4	7.5	7	.1	10	50	1.4
18	8.4	15	.3	8.0	8	.2	10	55	1.5
19	8.8	19	.5	8.5	8	.2	9.5	40	1.0
20	7.5	--	e .6	8.0	70	1.5	10	54	1.5
21	6.0	35	.6	12	146	4.7	12	47	1.5
22	7.0	57	1.1	17	1,280	59	13	38	1.3
23	9.0	--	e 1.8	15	327	13	14	38	1.4
24	11	--	e 2.6	11	34	1.0	15	48	1.9
25	14	103	3.9	10	30	.8	18	37	1.8
26	13	57	2.0	9.5	32	.8	21	44	2.5
27	12	36	1.2	9.1	--	e .7	25	273	18
28	11	33	1.0	8.0	--	e .6	30	226	18
29	10	24	.6	--	--	--	38	241	25
30	10	19	.5	--	--	--	46	232	29
31	9.1	20	.5	--	--	--	47	237	30
Total	297.9	--	32.5	251.5	--	90.9	488.7	--	155.4

e Estimated.

KANSAS RIVER BASIN--Continued

6B-8669. SALINE RIVER NEAR WAKEENEY, KANS.--Continued

Suspended sediment, water year October 1957 to September 1958--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	50	178	24	20	138	7.5	35	150	14
2	53	172	25	21	128	7.3	34	158	14
3	55	146	22	20	191	10	30	156	13
4	66	205	37	24	169	11	25	145	9.8
5	55	127	19	34	208	19	22	124	7.4
6	46	135	17	37	249	25	21	128	7.3
7	41	101	11	36	208	20	20	135	7.3
8	42	110	12	30	180	15	18	119	5.8
9	48	99	13	26	182	13	16	148	6.4
10	47	99	13	25	199	13	16	144	6.2
11	46	135	17	21	188	11	14	127	4.8
12	42	98	11	16	189	8.2	13	112	3.9
13	41	87	9.6	15	178	7.2	12	112	3.6
14	39	92	9.7	21	168	9.5	12	118	3.8
15	37	82	8.2	360	2,570	s 4,390	12	112	3.6
16	36	101	9.8	453	2,430	s 3,200	11	102	3.0
17	34	94	8.6	1,670	3,420	15,400	11	102	3.0
18	32	98	8.5	410	1,890	2,090	11	95	2.8
19	31	118	9.9	172	920	427	30	319	s 30
20	29	125	9.8	116	490	153	36	388	38
21	27	113	8.2	91	311	76	199	2,810	s 2,710
22	25	124	8.4	74	242	48	63	1,540	s 311
23	24	134	8.7	67	234	42	34	318	29
24	23	125	7.8	62	230	38	26	272	19
25	23	143	8.9	56	216	33	94	3,120	s 943
26	23	118	7.3	50	205	28	30	595	48
27	24	115	7.5	44	191	23	18	239	12
28	27	127	9.3	40	194	21	13	164	5.8
29	23	116	7.2	45	311	38	10	146	3.9
30	22	138	8.2	44	216	26	8.4	124	2.8
31	--	--	--	38	172	18	--	--	--
Total	1,111	--	377.6	4,138	--	26,227.7	894.4	--	4,272.2

Day	July			August			September		
1	6.9	83	1.5	198	3,060	s 2,650	6.0	141	2.3
2	6.2	128	2.1	70	1,070	202	5.8	128	2.0
3	6.5	160	2.8	29	288	23	5.0	110	1.5
4	41	910	s 383	21	201	11	5.0	109	1.5
5	202	2,850	s2,430	16	192	8.3	4.8	102	1.3
6	270	2,820	s2,210	270	2,300	s 3,220	4.8	93	1.2
7	123	1,880	s 740	132	1,480	s 614	4.8	80	1.0
8	57	795	122	44	318	38	4.8	104	1.3
9	34	314	29	29	198	16	4.6	92	1.1
10	27	206	15	23	172	11	4.0	81	.9
11	22	130	7.7	18	162	7.9	3.8	91	.9
12	26	274	s 23	15	180	7.3	3.8	160	1.6
13	23	242	15	14	180	6.8	3.6	226	2.2
14	19	178	9.1	12	142	4.6	3.5	174	1.6
15	72	1,780	s 466	11	120	3.6	3.1	80	.7
16	85	1,990	457	190	3,730	s 2,360	2.9	76	.6
17	1,090	4,080	s14,800	121	2,340	764	3.1	63	.5
18	695	2,950	5,540	54	1,410	206	3.1	71	.6
19	185	1,860	929	32	540	47	3.5	51	.5
20	84	900	204	22	280	17	3.3	51	.5
21	59	420	67	16	171	7.4	3.6	95	.9
22	44	270	32	13	185	6.5	2.7	57	.4
23	78	806	a 170	12	165	5.3	2.6	56	.4
24	38	600	62	12	158	5.1	2.2	56	.3
25	27	281	20	11	148	4.4	2.0	51	.3
26	23	198	12	9.9	124	3.3	1.9	39	.2
27	20	201	11	8.5	115	2.6	1.9	71	.4
28	16	173	7.5	8.0	128	2.8	1.8	58	.3
29	14	160	6.0	7.8	132	2.8	1.8	49	.2
30	13	130	4.6	6.8	128	2.4	1.7	58	.3
31	12	131	4.2	6.0	126	2.0	--	--	--
Total	3,418.6	--	28,782.5	1,432.0	--	10,262.1	105.5	--	27.5

Total discharge for year (cfs-days) 12,951.3
Total load for year (tons) 70,315.0

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

6B-8669. SALINE RIVER NEAR WAKEENEY, KANS.--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time	Discharge (cfs)	Water temperature (° F)	Suspended sediment												Methods of analysis
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
May 15, 1958	11:00 a.m.	896	60	6,330	5,260	--	62		82		99	100	--		--		SPWCM
May 17	3:35 p.m.	1,980	67	3,160	2,920	69	76		89		99	100	--		--		SPWCM
May 17	8:05 p.m.	1,310	67	2,530	2,160	60	76		90		99	100	--		--		SPWCM
May 18	9:00 a.m.	437	68	2,100	1,790	66	75		85		98	100	--		--		SPWCM
May 19	10:55 a.m.	174	66	951	1,610	--	83		89		99	100	--		--		SPWCM
June 21	7:20 p.m.	276	65	5,190	2,230	70	76		91		99	100	--		--		SPWCM
July 5	6:15 p.m.	417	73	8,380	3,010	66	76		90		99	100	--		--		SPWCM
July 5	8:10 p.m.	538	--	6,820	3,030	61	76		91		99	100	--		--		VPWCM
July 17	10:30 a.m.	1,470	68	6,480	4,510	57	66		83		98	99	99		100		VPWCM
July 17	3:30 p.m.	2,150	73	5,520	2,960	68	80		94		100	--	--		--		SPWCM
July 17	7:55 p.m.	1,370	--	4,400	4,190	62	74		89		97	97	98		98	100	VPWCM

KANSAS RIVER BASIN--Continued

6B-8760. SOLOMON RIVER AT BELOIT, KANS.

LOCATION.--At bridge on State Highway 14 in Beloit, Mitchell County, 8½ miles upstream from gaging station, about 1½ miles upstream from Leban Creek, and 300 feet downstream from dam at city waterplant. Prior to June 10, 1958, gaging station at sampling site.
DRAINAGE AREA.--5,430 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: December 1949 to September 1952, September 1957 to September 1958 (discontinued).
Water temperatures: February 1949 to September 1952, September 1957 to September 1958 (discontinued).
Sediment records: May 1948 to September 1952.
EXTREMES, September 1957 to September 1958.--Dissolved solids: Maximum, 873 ppm Jan. 1-12; minimum, 222 ppm Oct. 24-29.
Hardness: Maximum, 405 ppm Jan. 1-12; minimum, 140 ppm Oct. 24-29.
Specific conductance: Maximum daily, 1,510 micromhos Jan. 5; minimum daily, 272 micromhos Mar. 31.
Water temperatures: Maximum, 85°F Aug. 14; minimum, freezing point on several days during December to March.
EXTREMES, 1949-52, 1957-58.--Water temperatures: Maximum, 89°F June 15, 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 1957 to September 1958 given in WSP 1560.

Chemical analyses, in parts per million, September 1957 to September 1958

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					
Sept. 12-20, 1957 a.	159	26	0.00	88	13	70	11	246	117	79	0.5	4.8	0.14	532	0.72	228	272	70	35	1.8	843	7.9	5
Sept. 21-30 a.....	364	19	.01	57	7.8	23	12	176	57	25	.4	1.5	.04	295	.40	290	174	30	21	.8	472	7.8	--
Oct. 1-5.....	310	13	.01	62	5.2	24	11	178	52	26	.3	.1	.06	280	.38	234	176	30	21	.8	472	7.7	--
Oct. 6-9.....	160	16	.01	75	9.0	46	12	218	77	54	.4	1.0	.07	421	.57	182	224	45	29	1.3	662	7.9	--
Oct. 10-23.....	87.4	21	.01	107	15	95	11	302	134	108	.3	2.8	.11	665	.90	157	328	80	38	2.3	1,060	7.8	--
Oct. 24-29.....	401	14	.06	51	3.2	13	9.4	160	28	9.4	.3	3.9	.06	222	.30	240	140	9	16	.5	352	7.7	--
Oct. 30-Nov. 2....	76.8	18	.00	95	10	79	11	264	110	93	.3	2.8	.10	562	.76	117	280	64	37	2.1	913	8.0	--
Nov. 3-30.....	65.1	20	.00	119	19	114	10	324	172	126	.3	4.3	.10	755	1.03	133	374	108	39	2.6	1,200	8.0	--
Dec. 1-31.....	58.6	12	.00	119	22	121	9.6	320	183	131	.3	4.5	.12	774	1.05	122	388	126	40	2.7	1,240	8.1	--
Jan. 1-12, 1958....	46.6	12	.01	123	24	142	11	339	215	153	.2	6.5	.21	873	1.19	110	405	127	42	3.1	1,380	7.9	--
Jan. 13-26.....	47.8	11	.00	116	22	116	9.4	322	190	131	.2	6.0	.12	778	1.06	100	381	117	39	2.6	1,240	8.0	--
Jan. 27-Feb. 4....	45.7	8.1	.00	111	22	114	9.6	306	185	127	.3	4.3	.13	764	1.04	94.3	368	117	39	2.6	1,220	7.9	--
Feb. 5-17.....	40.3	8.8	.00	119	25	132	10	326	204	137	.4	5.1	.15	823	1.12	89.6	398	131	41	2.9	1,300	7.8	--
Feb. 18-Mar. 25...	275	8.1	.01	55	9.2	24	12	162	68	23	.4	1.0	.06	292	.40	217	175	42	21	.8	471	7.5	6
Mar. 26-29.....	906	10	.01	57	9.0	15	9.4	136	88	9.8	.4	3.6	.08	287	.39	702	179	67	15	.5	422	7.5	9
Mar. 30-31.....	3,450	14	.00	53	4.9	6.6	8.0	150	44	1.2	.3	4.2	.08	224	.30	2,090	152	29	8	.2	350	7.5	--
Apr. 1-6.....	1,488	13	.02	63	7.5	16	9.0	154	70	18	.2	10	.06	303	.41	1,220	188	62	15	.5	466	7.1	--
Apr. 7-8.....	639	18	.01	91	12	36	11	184	124	47	.3	16	.17	488	.66	842	276	125	21	.9	714	7.7	--
Apr. 9-13.....	460	16	.02	116	16	48	11	220	178	61	.4	15	.08	635	.86	789	354	174	22	1.1	901	7.2	--
Apr. 14-19.....	344	17	.01	130	18	66	12	248	193	88	.3	15	.08	721	.98	670	397	194	26	1.4	1,040	7.3	--

Apr. 20-May 7.....	321	9.8	.01	92	14	50	11	195	147	62	.2	5.3	.07	515	.70	446	289	129	26	1.3	806	7.3	--
May 8-16.....	249	9.9	.01	107	19	72	12	228	184	89	.2	4.5	.10	641	.87	431	344	157	30	1.7	994	7.4	--
May 17-19.....	5,727	12	.01	56	5.5	10	8.7	154	47	8.2	.1	5.3	.05	244	.33	3,770	162	36	11	.3	385	7.2	--
May 20.....	2,120	15	.05	76	9.8	24	11	178	100	27	.1	5.3	.06	390	.53	2,230	230	84	18	.7	581	7.5	--
May 21-June 16....	406	14	.01	106	14	62	12	242	155	75	.4	6.5	.12	581	.79	637	324	126	28	1.5	896	7.3	--
June 17-21	220	19	.00	120	19	88	11	283	185	100	.3	7.0	.14	713	.97	424	379	147	33	2.0	1,090	7.4	--
June 22-27	280	16	.01	87	12	52	11	209	128	59	.4	5.2	.11	490	.67	370	267	96	29	1.4	761	7.2	10
June 28-July 3.....	154	20	.01	123	18	94	12	302	185	112	.4	7.1	.16	734	1.00	305	380	132	34	2.1	1,140	7.4	--
July 4-11.....	575	16	.01	67	7.5	23	12	182	70	25	.5	6.5	.10	320	.44	497	198	49	19	.7	510	7.4	--
July 12-16.....	203	18	.01	90	13	58	12	235	119	68	.5	4.2	.10	512	.70	281	276	83	30	1.5	809	7.2	--
July 17-23.....	1,779	14	.03	57	4.4	11	10	172	35	9.6	.4	5.0	.07	240	.33	1,150	160	19	12	.4	381	7.4	--
July 24-30.....	303	18	.01	89	12	56	12	224	119	70	.4	4.3	.12	507	.69	415	272	88	30	1.5	796	7.4	--
July 31-Aug. 6.....	585	16	.00	67	8.0	25	11	184	72	29	.1	3.5	.06	337	.46	532	200	49	20	.8	527	7.3	--
Aug. 7-16.....	161	17	.00	83	14	68	12	225	123	82	.2	1.5	.09	529	.72	230	265	80	35	1.8	842	7.5	--
Aug. 17-25.....	576	19	.00	63	8.0	19	12	184	55	20	.4	7.0	.07	306	.42	476	190	39	17	.6	476	7.3	--
Aug. 26-Sept. 5....	181	20	.01	83	14	55	12	230	111	66	.3	4.7	.11	488	.66	238	265	76	30	1.5	773	7.4	--
Sept. 6-12.....	720	18	.02	65	7.3	14	9.8	195	47	14	.4	4.8	.07	279	.38	542	192	32	13	.4	451	7.3	--
Sept. 13-21.....	142	18	.02	95	17	70	12	253	137	82	.2	3.7	.11	572	.78	219	306	99	32	1.7	910	7.5	--
Sept. 22-24.....	359	17	.03	59	8.5	21	11	184	49	23	.2	9.9	.17	296	.40	287	182	31	19	.7	476	7.5	--
Sept. 25-30.....	118	16	.02	91	16	67	12	244	134	78	.4	4.1	.11	557	.76	177	292	92	32	1.7	882	7.4	12
Weighted average b	356	14	0.01	74	9.8	34	10	192	89	38	0.3	5.5	0.08	387	0.53	372	225	68	24	1.0	603	--	--

a Not included in weighted average.
b Represents 100 percent of runoff for water year October 1957 to September 1958.

KANSAS RIVER BASIN--Continued

6B-8760. SOLOMON RIVER AT BELOIT, KANS.--Continued

Temperature (° F) of water, September 1957
/Once-daily measurement between 9 a.m. and 11 a.m./

Day	Sept.	Day	Sept.	Day	Sept.	Day	Sept.
11	65	16	65	21	a 66	26	63
12	66	17	66	22	a 64	27	65
13	67	18	69	23	60	28	65
14	68	19	67	24	61	29	65
15	65	20	62	25	63	30	65

a Measurement at 1 p.m.

Temperature (° F) of water, water year October 1957 to September 1958
/Once-daily measurement between 8 a.m. and 10 a.m./

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

a Measurement between 6 a.m. and 7 a.m.

6B-8776. SMOKY HILL RIVER AT ENTERPRISE, KANS.

LOCATION (revised).--At bridge on State Highway 43 in Enterprise, Dickinson County, 0.2 mile upstream from gaging station and 18.6 miles upstream from Chapman Creek.
DRAINAGE AREA.--19,200 square miles, approximately.
RECORDS AVAILABLE.--Chemical analyses: October 1955 to September 1958 (discontinued).
Water temperatures: October 1955 to September 1958.
Sediment records: October 1957 to September 1958.
EXTREMES, 1957-58.--Dissolved solids: Maximum, 1,480 ppm Feb. 15-20; minimum, 315 ppm May 21-24.
Hardness: Maximum, 526 ppm Feb. 15-20; minimum, 174 ppm Oct. 24-28.
Specific conductance: Maximum daily, 2,470 micromhos Feb. 19; minimum daily, 458 micromhos May 22.
Water temperatures: Maximum, 83°F Aug. 15; minimum, freezing point on several days during January and February.
Sediment concentrations: Maximum daily, 5,710 ppm Sept. 11; minimum daily, not determined.
Sediment loads: Maximum daily, 133,000 tons Oct. 24; minimum daily, not determined.
EXTREMES, 1955-58.--Dissolved solids: Maximum, 3,220 ppm Jan. 22-24, 1957; minimum, 199 ppm May 17-22, 1957.
Hardness: Maximum, 652 ppm Jan. 22-24, 1957; minimum, 124 ppm Oct 5-7, 1955.
Specific conductance: Maximum daily, 5,340 micromhos Jan. 24, 1957; minimum daily, 292 micromhos May 20, 1957.
Water temperatures: Maximum, 88°F June 21, 1956; 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 1957 to September 1958 given in WSP 1560.

Chemical analyses, in parts per million, water year October 1957 to September 1958

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. 1-11, 1957	2,576	16	0.01	70	11	57	11	167	104	77	0.4	3.1	0.07	444	--	0.60	3,090	220	83	35	1.7	716	7.6	--
Oct. 12-23	827	18	.01	99	20	172	11	245	169	240	.5	2.3	.13	857	--	1.17	1,910	328	127	52	4.1	1,440	7.5	--
Oct. 24-28	4,698	12	.01	55	9.0	70	10	158	66	96	.3	4.8	.04	421	--	.57	5,340	174	44	45	2.3	686	7.6	--
Oct. 29-Nov. 10	967	19	.01	90	17	122	6.5	208	151	160	.5	3.6	.09	689	--	.94	1,800	294	123	47	3.1	1,110	7.6	--
Nov. 11-26	782	20	.01	119	26	180	10	272	220	245	.5	3.1	.12	965	--	1.31	2,040	402	179	49	3.9	1,570	7.7	--
Nov. 27-Dec. 13	635	15	.01	123	24	194	10	288	217	285	.4	2.0	.13	1,050	1,010	1.43	1,800	405	169	50	4.2	1,730	7.6	6
Dec. 14-Jan. 12, 1958	481	13	.00	133	32	248	9.1	314	256	366	.4	1.6	.15	1,260	1,210	1.71	1,640	462	205	53	5.0	2,050	8.0	7
Jan. 13-Feb. 14	435	10	.01	138	34	268	8.8	316	276	392	.4	1.9	.18	1,330	1,280	1.81	1,560	485	226	54	5.3	2,160	7.8	--
Feb. 15-20	346	9.6	.00	149	37	313	8.8	330	309	443	.4	1.8	.19	1,480	1,430	2.01	1,380	526	255	56	5.9	2,400	8.0	--
Feb. 21-26	488	9.1	.00	140	35	270	8.8	328	285	380	.4	2.4	.17	1,330	1,290	1.81	1,750	492	223	54	5.3	2,170	8.1	--
Feb. 27-28	1,915	9.9	.00	141	34	191	8.4	304	300	250	.4	3.9	.18	1,120	1,090	1.52	5,790	490	241	45	3.8	1,750	7.8	--
Mar. 1	1,220	11	.00	69	17	59	7.6	162	111	83	.4	5.2	.08	495	--	.67	1,630	240	107	34	1.7	757	7.3	--
Mar. 2-6	1,120	9.5	.00	81	23	113	8.2	184	167	149	.4	4.9	.11	677	--	.92	2,050	296	145	45	2.9	1,090	7.6	--
Mar. 7-11	4,428	9.8	.01	53	11	39	6.3	143	72	51	.1	5.0	.05	338	--	.46	4,040	177	60	31	1.3	556	7.3	--
Mar. 12-14	1,927	9.6	.01	65	17	62	7.0	143	127	81	.3	6.4	.08	473	--	.64	2,460	231	114	36	1.8	751	7.5	--
Mar. 15-27	1,460	10	.00	87	24	95	7.6	189	181	128	.5	6.2	.09	675	--	.92	2,660	316	161	39	2.3	1,050	7.6	7
Mar. 28-29	2,875	11	.00	77	16	74	7.4	190	129	96	.4	2.9	.16	527	--	.72	4,090	256	100	38	2.0	854	7.6	--
Mar. 30-Apr. 5	8,766	10	.01	75	11	30	7.9	195	86	35	.3	2.4	.05	380	--	.52	8,990	233	73	21	.9	596	6.9	--

6B-8776. SMOKY HILL RIVER AT ENTERPRISE, KANS.--Continued

Chemical analyses, in parts per million, water year October 1957 to September 1958--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									
Apr. 6-10, 1958.	5,974	11	0.01	87	13	41	8.0	188	121	61	0.3	5.4	0.06	487	--	0.66	7,860	272	118	24	1.1	737	7.1	--
Apr. 11-18.....	3,710	11	.01	97	18	68	8.8	192	157	101	.3	4.9	.07	612	--	.83	6,130	316	159	31	1.7	941	7.2	--
Apr. 19-May 2..	3,195	10	.00	99	17	83	8.8	190	163	128	.3	3.7	.09	656	--	.89	5,660	316	160	35	2.0	1,020	7.1	--
May 3-7.....	6,380	10	.01	73	13	41	7.4	160	104	63	.2	4.3	.08	442	--	.60	7,610	235	104	27	1.2	678	7.3	--
May 8-12.....	2,408	12	.01	109	19	79	8.7	204	180	124	.3	4.4	.09	672	--	.91	4,370	351	184	32	1.8	1,060	7.4	--
May 13-18.....	1,832	11	.01	117	24	110	9.0	218	220	162	.3	4.5	.11	837	--	1.14	4,140	390	211	37	2.4	1,270	7.2	--
May 19-20.....	7,790	12	.05	74	11	66	8.0	180	98	85	.3	5.7	.12	466	--	.63	9,800	228	80	38	1.9	752	7.5	--
May 21-24.....	10,420	12	.01	64	7.4	24	8.5	158	73	29	.3	3.1	.07	315	--	.43	8,860	190	60	21	.8	502	7.3	--
May 25-26.....	4,930	14	.07	84	14	43	9.2	182	127	60	.3	5.3	.10	496	--	.67	6,600	266	117	25	1.1	728	7.5	--
May 27-June 12 .	2,866	12	.03	108	19	100	10	214	182	140	.3	4.8	.12	702	--	.95	5,430	346	171	38	2.3	1,110	7.3	--
June 13-19.....	1,310	12	.03	115	24	163	10	242	220	228	.4	5.3	.16	925	--	1.26	3,270	386	166	47	3.6	1,490	7.4	9
June 20-25.....	1,373	13	.03	123	27	190	10	255	242	260	.4	4.9	.17	1,020	996	1.39	3,780	416	207	49	4.1	1,640	7.7	--
June 26	6,460	9.2	.07	70	13	53	7.2	188	87	76	.4	5.3	.07	428	--	.58	7,470	228	74	33	1.5	705	7.3	--
June 27-July 6 ..	1,831	13	.01	93	17	102	8.8	196	166	142	.3	5.0	.12	660	--	.90	3,260	300	139	42	2.6	1,070	7.3	--
July 7-12.....	2,995	12	.04	68	10	60	9.0	166	93	83	.4	5.5	.09	433	--	.59	3,500	211	75	37	1.8	720	7.2	--
July 13-17.....	2,966	9.1	.07	85	14	83	9.4	164	143	128	.4	3.3	.10	571	--	.78	4,570	270	136	39	2.2	942	7.3	--
July 18-31.....	4,813	12	.01	67	8.5	45	9.2	160	83	66	.5	4.8	.08	390	--	.53	5,070	202	71	31	1.4	631	7.3	--
Aug. 1-16	2,909	15	.13	78	12	70	10	171	111	106	.6	2.8	.09	510	--	.69	4,010	242	102	37	2.0	835	7.0	--
Aug. 17-22	2,153	17	.00	94	17	146	11	198	163	209	.5	3.4	.13	779	--	1.06	4,530	304	142	50	3.6	1,300	7.0	--
Aug. 23-29	2,541	16	.00	79	11	63	11	177	109	93	.4	2.4	.09	486	--	.66	3,330	242	97	35	1.8	796	7.1	--
Aug. 30-Sept. 7 .	1,066	18	.00	105	19	143	11	224	173	211	.4	2.5	.14	820	--	1.12	2,360	340	156	47	3.4	1,340	7.1	--
Sept. 8-16.....	2,343	17	.01	69	11	32	9.8	172	92	85	.4	5.4	.16	452	--	.61	2,860	217	76	37	1.8	741	7.0	12
Sept. 17-22.....	1,568	15	.00	80	14	72	9.2	173	126	104	.4	4.3	.09	528	--	.72	2,240	258	116	37	1.9	851	7.1	--
Sept. 23-30.....	1,200	16	.00	95	19	129	10	209	167	189	.3	3.9	.11	764	--	1.04	2,480	316	145	46	3.2	1,240	7.3	--
Weighted average a	2,193	12	0.02	86	15	82	9.0	192	134	117	0.4	4.0	0.09	581	--	0.79	3,440	275	118	38	2.2	929	--	--

a Represents 100 percent of runoff for water year October 1957 to September 1958.

KANSAS RIVER BASIN--Continued

6B-8776. SMOKY HILL RIVER AT ENTERPRISE, KANS.--Cantinued

Temperature (° F) of water, water year October 1957 to September 1958
/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	66	48	38	35	38	39	46	53	68	76	77	74
2	66	53	38	32	33	35	46	60	68	78	78	76
3	67	49	38	32	33	35	47	61	68	77	78	78
4	66	49	39	33	36	36	49	57	69	76	79	79
5	65	48	42	34	37	37	48	56	72	77	80	75
6	65	48	42	35	36	37	47	58	72	76	80	78
7	67	49	41	33	33	38	46	60	73	76	81	78
8	67	47	37	33	33	39	46	61	74	73	78	77
9	62	44	38	34	33	39	48	58	73	77	79	76
10	62	44	42	37	33	35	45	62	76	75	79	75
11	59	44	33	37	33	36	46	62	76	76	80	74
12	59	46	34	43	32	37	46	63	75	76	81	73
13	59	46	33	43	32	37	48	64	76	75	81	75
14	61	47	36	44	35	35	48	65	77	77	82	73
15	61	47	38	35	32	35	48	65	74	77	83	72
16	61	46	40	37	32	36	50	65	74	76	82	72
17	59	44	40	38	32	36	50	66	75	74	79	67
18	57	42	43	38	32	36	52	67	75	76	81	64
19	57	40	37	42	35	37	55	65	74	78	79	64
20	56	39	38	37	35	37	55	66	74	74	79	69
21	56	38	39	35	36	40	57	67	75	72	78	66
22	58	37	39	34	38	41	53	67	73	73	80	69
23	58	37	41	34	37	41	57	67	74	76	78	74
24	--	38	38	34	37	41	53	66	74	77	78	73
25	50	40	39	34	40	41	53	67	72	76	77	70
26	48	42	38	35	42	42	53	67	68	77	75	68
27	43	44	42	35	45	43	53	68	65	77	74	68
28	43	39	38	36	32	43	55	68	69	75	75	63
29	46	42	36	37	--	44	49	68	69	77	78	63
30	46	42	36	37	--	44	54	68	73	78	79	62
31	48	--	35	38	--	43	--	68	--	79	78	--
Average	58	44	38	36	35	39	50	64	73	76	79	72

KANSAS RIVER BASIN--Continued

6B-8776. SMOKY HILL RIVER AT ENTERPRISE, KANS.--Continued

Suspended sediment, water year October 1957 to September 1958

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	2,720	580	4,260	985	1,250	3,320	663	100	179
2	2,750	530	3,940	926	590	1,480	660	120	a 220
3	2,720	500	3,670	882	350	833	652	140	246
4	2,710	500	3,660	878	300	711	642	100	
5	2,590	510	3,570	858	250	a 600	632	--	
6	2,210	460	2,740	838	--	e 700	635	--	
7	1,850	420	2,100	830	--	e 900	629	--	
8	3,980	5,080	s 59,100	790	--	e 800	623	70	
9	3,810	2,160	s 24,400	774	140	293	614	--	e 150
10	1,860	1,270	6,380	762	90	185	608	--	
11	1,140	1,150	3,540	762	90	185	587	90	
12	942	910	2,310	766	90	186	581	--	
13	870	660	1,550	758	90	184	566	--	
14	834	370	833	754	100	204	527	--	
15	810	290	634	750	100	202	512	50	
16	818	310	685	742	110	220	503	--	e 95
17	770	310	644	746	110	222	497	--	
18	730	290	572	818	--	e 300	488	80	
19	710	280	537	1,020	--	e 950	491	--	
20	702	270	512	882	300	714	572	--	e 260
21	722	260	507	806	250	a 550	533	--	e 140
22	750	260	526	770	190	a 400	524	70	99
23	1,260	1,570	s 13,000	750	140	a 280	524	60	a 85
24	9,290	5,300	133,000	738	90		512	--	
25	6,660	3,550	63,800	726	--		512	40	
26	3,680	2,760	27,400	722	--		512	--	
27	1,920	3,000	15,600	706	--	e 180	506	--	e 55
28	1,940	--	e 18,000	686	110		494	40	
29	1,720	1,350	6,270	646	--		485	--	
30	1,260	1,600	5,440	660	100		482	--	
31	1,070	1,850	5,340	--	--	--	473	50	
Total	65,798	--	414,520	23,731	--	15,679	17,239	--	3,739

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	428	--		506	--		1,220	490	1,610
2	431	50		482	50	e 65	960	690	1,790
3	418	--		455	--		862	700	1,630
4	415	--		440	--		818	710	1,570
5	485	50		434	20		942	1,850	4,710
6	476	--		425	--	e 34	2,020	1,150	6,270
7	431	--		385	--		3,140	3,710	s 37,100
8	388	60		420	--		5,780	3,500	54,600
9	467	--		372	30		5,880	2,550	40,500
10	440	--		350	--		4,530	1,820	22,300
11	434	--		375	--		2,810	1,350	10,200
12	458	50		335	30		2,210	1,050	6,270
13	461	--		314	--		1,860	700	3,520
14	449	--		335	--	e 28	1,710	500	2,310
15	443	50	e 60	335	--		1,580	420	1,790
16	452	--		325	20		1,400	360	1,360
17	452	--		335	--		1,310	310	1,100
18	452	--		345	--		1,180	300	956
19	461	60		368	30		1,120	240	726
20	467	--		368	--		1,160	250	783
21	467	--		388	--	e 55	1,220	270	889
22	422	60		402	--		1,230	330	1,100
23	455	--		425	70		1,300	340	1,190
24	446	--		545	--		1,530	620	2,560
25	452	--		563	--	e 75	1,700	660	3,030
26	467	40		605	50		1,960	900	4,760
27	464	--		1,520	--	e 3,190	2,290	1,150	7,110
28	476	--		2,310	750	4,680	2,490	1,750	11,600
29	476	60	e 80	--	--	--	3,260	2,410	21,200
30	479	--		--	--	--	6,900	4,600	85,700
31	491	60		--	--	--	7,960	3,350	72,000
Total	14,003	--	1,940	14,462	--	8,957	74,332	--	412,434

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

KANSAS RIVER BASIN--Continued

6B-8776. SMOKY HILL RIVER AT ENTERPRISE, KANS.--Continued

Suspended sediment, water year October 1957 to September 1958--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	8,480	4,500	103,000	3,420	960	8,860	3,180	1,120	9,620
2	9,250	4,800	120,000	3,590	1,170	11,300	3,320	1,050	9,410
3	10,200	3,400	93,600	6,170	4,350	s 79,300	3,250	1,160	10,200
4	9,750	2,450	64,500	8,490	3,900	89,400	3,100	950	7,950
5	8,820	2,840	67,600	7,740	2,100	43,900	2,960	1,080	8,630
6	8,040	2,850	61,900	5,980	2,200	35,500	2,830	830	6,340
7	7,300	2,420	47,700	3,520	1,950	18,500	2,750	780	5,790
8	5,960	2,100	33,800	3,040	1,260	10,300	2,770	780	5,830
9	4,540	2,000	24,500	2,710	930	6,800	2,860	740	5,710
10	4,030	1,650	18,000	2,440	760	5,010	2,360	760	4,840
11	3,960	1,400	15,000	2,110	710	4,040	1,800	640	3,110
12	4,040	1,250	13,600	1,740	540	2,540	1,510	560	2,280
13	3,860	1,150	12,000	1,600	480	2,070	1,420	490	1,880
14	3,730	1,050	10,600	1,510	450	1,830	1,290	470	1,640
15	3,790	1,000	10,200	1,470	330	1,310	1,280	510	1,760
16	3,610	930	9,060	1,500	400	1,620	1,440	1,030	4,000
17	3,390	780	7,140	2,290	1,350	8,350	1,350	510	1,860
18	3,300	770	6,860	2,620	2,700	19,100	1,250	710	2,400
19	3,260	700	6,160	6,160	4,400	73,200	1,140	720	2,220
20	3,200	780	6,740	9,420	3,850	97,900	1,060	650	1,860
21	3,260	760	6,690	10,800	3,600	105,000	1,120	540	1,630
22	3,180	800	6,870	11,400	2,900	89,300	1,150	510	1,580
23	3,130	830	7,010	10,900	2,220	65,300	1,070	500	1,440
24	3,240	850	7,440	8,580	1,850	42,900	1,160	670	2,100
25	3,190	850	7,320	6,400	1,850	32,000	2,680	2,660	s 24,400
26	3,000	770	6,240	3,460	2,230	20,800	6,460	4,550	79,400
27	2,940	910	7,220	2,920	1,750	13,800	4,160	3,150	35,400
28	2,980	770	6,200	3,140	1,520	12,900	2,460	2,900	19,300
29	3,080	650	5,410	3,430	1,500	13,900	1,650	1,950	8,690
30	3,260	720	6,340	3,340	1,500	13,500	1,310	1,180	4,170
31	--	--	--	3,210	1,150	9,970	--	--	--
Total	143,770	--	798,700	145,100	--	940,200	66,140	--	275,440

	July			August			September		
1	1,120	660	2,000	2,860	2,150	16,600	976	420	1,110
2	1,040	500	1,400	3,270	1,720	15,200	896	400	968
3	1,200	1,080	s 4,370	3,400	1,150	10,600	835	360	812
4	1,460	1,500	5,910	3,450	1,100	10,200	831	330	740
5	1,380	690	2,570	3,340	1,250	11,300	819	320	708
6	2,530	2,640	s 19,200	3,440	1,350	12,500	873	330	778
7	3,870	4,450	46,500	3,540	1,700	16,200	1,830	2,660	s 17,200
8	3,730	4,400	44,300	3,640	1,800	17,700	2,880	4,160	32,300
9	2,740	3,000	22,200	3,300	1,080	9,620	2,720	4,050	29,700
10	2,170	3,550	20,800	3,060	1,000	8,260	2,950	5,100	40,600
11	2,570	3,200	22,200	2,910	910	7,150	3,780	5,710	58,300
12	2,890	2,250	17,600	2,810	800	6,070	2,730	5,100	37,600
13	2,860	1,650	12,700	2,300	700	4,350	1,920	4,850	25,100
14	2,830	1,320	10,100	1,840	650	3,230	1,600	3,250	14,000
15	2,720	1,450	10,600	1,660	620	2,780	1,310	2,180	7,710
16	2,740	1,300	9,620	1,720	1,430	6,640	1,200	1,300	4,210
17	3,680	2,500	s 27,400	1,750	750	3,540	1,680	2,460	s 12,700
18	4,480	3,750	45,400	1,600	670	2,890	2,070	2,450	13,700
19	6,000	4,650	75,300	1,590	990	4,250	1,530	1,050	4,340
20	6,700	4,150	75,100	1,910	1,030	5,310	1,200	1,000	3,240
21	6,620	3,900	69,700	2,910	2,400	18,900	1,160	1,080	s 3,660
22	6,570	3,800	67,400	3,160	5,600	47,800	1,770	2,280	10,900
23	5,540	3,400	50,900	2,360	4,900	31,200	1,140	810	2,490
24	3,850	3,150	32,700	2,010	3,000	16,300	1,660	900	4,030
25	3,080	3,350	27,900	2,680	2,100	15,200	1,440	1,400	5,440
26	3,090	2,530	21,100	2,920	2,150	17,000	1,340	790	2,860
27	4,020	2,660	28,900	2,910	1,650	13,000	1,150	620	1,930
28	5,160	2,750	38,300	2,860	1,350	10,400	963	550	1,430
29	5,200	2,170	30,500	2,050	1,050	5,810	968	580	1,520
30	4,390	2,280	27,000	1,410	650	2,470	936	480	1,210
31	2,680	2,400	17,400	1,120	590	1,780	--	--	--
Total	108,910	--	887,070	79,780	--	354,250	47,157	--	341,286

Total discharge for year (cfs-days) 800,422
Total load for year (tons) 4,454,215

s Computed by subdividing day.

KANSAS RIVER BASIN--Continued

6B-8776. SMOKY HILL RIVER AT ENTERPRISE, KANS.--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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. 8, 1957.....	2:00 p.m.	4,790	67	6,420	773	53	53		70		98	100	--		--		VPWCM
Oct. 8	6:30 p.m.	6,090	62	5,880	2,220	58	62		77		98	100	--		--		VPWCM
Oct. 9	7:00 a.m.	4,130	62	2,280	864	70	74		79		97	99	99		100		VPWCM
Oct. 10	7:00 a.m.	2,120	62	1,290	1,020	76	77		86		100	--	--		--		VPWCM
Oct. 24	7:00 a.m.	9,800	53	6,260	2,460	50	54		70		95	98	100		--		VPWCM
Oct. 25	7:00 a.m.	7,360	50	3,750	1,550	63	63		76		96	99	100		--		VPWCM
Oct. 29	7:00 a.m.	1,860	46	1,450	1,200	64	68		92		100	--	--		--		VPWCM
Feb. 28, 1958 ...	6:00 p.m.	1,890	38	663	840	77	78		93		100	--	--		--		VPWCM
Mar. 6.....	12:15 p.m.	2,160	38	1,080	3,050	58	62		81		100	--	--		--		VPWCM
Mar. 9.....	3:00 p.m.	5,950	35	2,200	5,340	52	59		74		97	99	100		--		VPWCM
Mar. 27.....	5:00 p.m.	2,280	--	1,020	2,950	56	64		83		99	100	--		--		VPWCM
Apr. 4.....	1:30 p.m.	9,720	55	2,100	4,180	58	66		79		98	100	--		--		VPWCM
May 20.....	5:45 p.m.	9,680	74	3,720	4,130	58	65		77		97	99	100		--		VPWCM
July 21.....	5:40 p.m.	6,600	74	3,620	10,100	53	66		82		98	99	99		100		VPWCM
Aug. 25.....	12:40 p.m.	2,720	73	2,000	3,200	60	61		79		100	--	--		--		VPWCM
Sept. 9.....	12:10 p.m.	2,690	--	3,590	2,850	67	75		89		100	--	--		--		VPWCM

6B-8830. LITTLE BLUE RIVER NEAR DEWEESE, NEBR.

LOCATION.--At bridge on State Highway 14, a quarter of a mile downstream from gaging station, three-quarters of a mile upstream from Walnut Creek, 4 miles southeast of Deweese, Clay County, and 5¾ miles northwest of Angus.
RECORDS AVAILABLE.--Chemical analyses: August 1956 to September 1958 (discontinued).
Water temperatures: August 1956 to September 1958.
Sediment records: August 1956 to September 1958.
EXTREMES, 1957-58.--Dissolved solids: Maximum, 285 ppm Nov. 1 to Dec. 31; minimum, 66 ppm July 19-22.
Hardness: Maximum, 190 ppm Jan. 1-31; minimum, 28 ppm Mar. 30 to Apr. 1, July 19-22.
Specific conductance: Maximum daily, 440 micromhos Jan. 2, Feb. 9-10; minimum daily, 65.2 micromhos July 21.
Water temperatures: Maximum, 82°F June 4; minimum, 34°F on many days during December to March.
Sediment concentrations: Maximum daily, 11,600 ppm July 11; minimum daily, not determined.
Sediment loads: Maximum daily, 27,900 tons July 19; minimum daily, not determined.
EXTREMES, 1956-58.--Water temperatures: Maximum, 82°F June 4, 1958; minimum, 33°F Nov. 22, 1956.
Sediment concentrations: Maximum daily, 11,600 ppm July 11, 1958; minimum daily, not determined.
Sediment loads: Maximum daily, 129,000 tons June 16, 1957; 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 Dec. 11, 12, Dec. 31 to Jan. 9, Jan. 22, Feb. 2, 3, 7-20, Feb. 27 to Mar. 5, 7. Records of discharge for water year October 1957 to September 1958 given in WSP 1560.

Chemical analyses, in parts per million, water year October 1957 to September 1958

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. 1-31, 1957.	68.2	30	0.01	70	3.3	16	6.5	218	35	9.0	0.4	0.9	0.01	283	--	0.38	52.1	188	9	15	0.5	430	7.6	--
Nov. 1-30.....	70.9	33	.01	60	9.4	16	6.5	222	35	9.0	.3	.8	.00	285	--	.39	54.6	188	6	15	.5	427	7.8	--
Dec. 1-31.....	68.6	35	.00	60	9.4	16	6.3	220	35	10	.2	.7	.00	285	--	.39	52.8	188	8	15	.5	428	7.7	5
Jan. 1-31, 1958.	71.9	31	.05	60	9.8	15	6.6	220	33	10	.4	1.2	.01	273	--	.37	53.0	190	10	14	.5	425	7.7	--
Feb. 1-28.....	66.4	32	.02	62	7.7	15	5.8	218	28	8.5	.3	.7	.04	265	--	.36	47.5	186	7	14	.5	425	7.9	3
Mar. 1-22.....	71.8	30	.01	58	9.4	15	6.2	216	30	9.0	.4	1.1	.04	271	--	.37	52.5	183	6	15	.5	422	7.9	7
Mar. 23-27.....	149	22	.03	40	6.6	10	6.5	150	21	6.0	.3	2.1	.03	199	--	.27	80.1	127	4	14	.4	307	7.5	11
Mar. 28-29.....	339	13	.09	15	3.1	4.5	6.9	60	10	1.8	.2	3.8	.02	126	--	.17	115	50	1	14	.3	139	7.5	--
Mar. 30-Apr. 1.	891	11	--	8.8	1.5	1.9	8.0	31	9.3	.4	.3	5.1	.03	98	--	.13	236	28	3	10	.2	81.4	7.0	--
Apr. 2-4.....	523	12	--	12	4.1	3.3	8.4	55	16	.4	.3	3.0	.02	99	--	.13	140	47	2	11	.2	125	7.3	--
Apr. 5-7.....	249	17	.07	25	5.7	7.0	7.9	101	24	3.2	.3	3.8	.03	149	--	.20	100	86	3	14	.3	218	7.7	--
Apr. 8-11.....	129	26	.01	48	9.2	13	7.3	162	33	6.0	.4	2.4	.04	237	--	.32	82.6	158	7	15	.5	368	7.7	--
Apr. 12-May 8..	89.0	30	.03	59	9.0	15	6.6	211	35	9.2	.4	1.4	.06	270	--	.37	64.9	184	11	14	.5	430	7.4	--
May 9-31.....	80.0	28	.03	60	9.4	16	6.6	216	33	9.5	.3	.7	.03	272	--	.37	58.8	188	11	15	.5	435	7.5	--
June 1-11	72.7	32	.02	59	10	16	7.0	217	35	9.1	.3	.9	.04	278	--	.38	54.6	188	10	15	.5	439	7.4	3
June 12-13	600	17	.09	18	3.7	4.8	9.2	69	13	2.5	.2	6.0	.05	132	--	.18	214	60	3	13	.3	170	7.2	--
June 14-15	125	25	.02	42	7.5	11	9.0	159	25	6.5	.3	2.4	.06	214	--	.29	72.2	136	6	14	.4	329	7.6	--
June 16-July 9..	75.9	31	.01	55	8.5	14	7.3	200	34	8.2	.4	.9	.04	262	--	.36	53.7	172	8	14	.5	399	7.3	--
July 10-13.....	526	21	.15	12	2.0	2.1	10	47	9.3	1.4	.2	3.4	.05	--	85	.12	121	38	0	8	.1	112	6.9	--
July 14-16.....	139	31	.19	43	7.4	11	9.2	162	28	5.5	.3	.6	.03	228	--	.31	85.6	138	5	14	.4	325	7.5	--

6B-8830. LITTLE BLUE RIVER NEAR DEWEESE, NEBR.--Continued

Chemical analyses, in parts per million, water year October 1957 to September 1958--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 $CaCO_3$		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					
														Residue at 180°C	Sum									
July 17-18, 1958	278	27	0.01	25	4.8	6.7	8.8	101	19	3.5	0.3	0.0	0.04	141	--	0.19	106	82	0	13	0.3	214	7.3	--
July 19-22	966	16	.11	8.0	2.0	1.6	9.6	32	8.8	1.0	.3	2.7	.04	--	66	.09	172	28	2	8	.1	81.8	6.9	--
July 23-25	466	19	.22	13	2.3	3.0	9.8	54	11	1.8	.2	1.4	.04	--	89	.12	112	42	0	11	.2	121	7.0	--
July 26-27	234	25	.03	30	2.7	6.4	9.2	105	19	2.5	.2	.0	.03	156	--	.21	98.6	86	0	12	.3	218	7.4	--
July 28-Aug. 5	102	20	.01	49	8.9	13	8.1	186	31	7.9	.3	.8	.05	242	--	.33	66.6	159	6	14	.5	371	7.1	--
Aug. 6-9	165	22	.01	29	5.0	7.2	10	111	20	4.6	.4	3.8	.05	162	--	.22	72.2	93	2	13	.3	243	7.1	--
Aug. 10-14	85.0	31	.00	52	9.4	14	8.2	194	32	8.0	.4	1.1	.05	250	--	.34	57.4	168	9	15	.5	390	7.2	--
Aug. 15-19	911	17	.03	7.5	2.5	1.7	8.2	32	8.0	.8	.3	5.8	.09	72	--	.10	177	29	3	9	.1	86.1	6.7	--
Aug. 20-25	277	19	.08	18	4.4	4.4	9.4	77	13	1.8	.3	1.8	.03	125	--	.17	93.5	63	0	11	.2	165	6.8	--
Aug. 26-Sept. 4	97.4	31	.01	50	8.0	13	8.4	184	29	7.5	.3	1.2	.04	238	--	.32	62.6	158	7	14	.5	369	7.2	--
Sept. 5-8	336	19	.01	15	3.1	3.2	8.8	61	10	1.4	.3	3.7	.07	--	95	.13	86.2	50	0	10	.2	136	6.8	--
Sept. 9-30	73.6	33	.00	56	9.6	14	7.4	209	32	8.6	.4	1.1	.05	262	--	.36	52.1	179	8	14	.5	410	7.3	0
Weighted average a	132	24	0.05	36	5.6	9.0	7.8	132	22	5.2	0.3	2.3	0.04	183	--	0.25	65.2	113	5	14	0.4	270	--	--

a Includes estimates where data are missing. Represents 100 percent of runoff for water year October 1957 to September 1958.

KANSAS RIVER BASIN--Continued

6B-8830. LITTLE BLUE RIVER NEAR DEWEESE, NEBR.--Continued

Temperature (° F) of water, water year October 1957 to September 1958
/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	65	47	--	34	35	a 35	a 50	56	a 74	70	72	65
2	63	b 47	--	35	b 34	a 36	a 52	a 64	68	71	75	a 81
3	59	44	--	b 35	b 34	35	b 48	b 59	a 80	78	75	80
4	58	b 40	b 43	--	34	a 37	a 53	a 66	a 82	70	75	67
5	60	42	--	a 34	35	a 37	a 48	54	72	70	74	--
6	a 70	45	39	b 35	b 35	a 34	a 45	59	65	72	73	71
7	68	46	--	a 37	34	37	a 52	56	70	72	74	75
8	60	45	b 40	35	b 34	a 40	a 48	54	77	72	74	75
9	54	b 47	37	38	34	b 40	45	62	70	75	75	70
10	51	b 48	b 38	39	b 34	b 44	a 52	64	72	67	75	63
11	55	46	36	a 44	b 34	a 42	b 51	64	--	68	72	62
12	57	a 46	b 35	36	--	a 43	a 58	66	62	72	74	64
13	b 60	49	37	a 41	b 34	a 42	55	66	61	80	75	65
14	56	44	b 40	b 35	b 35	a 45	a 58	64	65	69	--	65
15	60	46	b 41	35	34	41	53	a 66	68	70	76	61
16	57	b 45	--	b 37	b 34	--	66	b 64	67	68	70	60
17	50	46	41	38	b 34	--	65	62	66	65	74	55
18	b 55	45	45	35	a 34	a 47	a 55	64	68	70	73	65
19	b 56	b 46	38	36	a 34	a 48	b 60	65	70	70	75	66
20	b 57	44	37	a 37	a 37	a 42	a 63	b 67	64	68	69	66
21	53	--	36	34	40	a 43	a 60	66	61	68	68	64
22	b 55	b 39	a 46	b 34	41	a 45	57	68	61	71	68	67
23	54	--	39	34	41	a 47	54	a 70	63	73	66	68
24	51	39	40	35	a 55	a 50	b 54	a 74	60	67	65	60
25	43	--	b 46	39	46	b 49	a 58	68	57	71	64	58
26	b 40	41	a 46	b 38	a 49	47	a 56	66	62	71	66	63
27	b 45	--	b 39	36	36	a 50	a 56	67	63	73	67	60
28	42	b 43	b 36	34	a 34	a 42	54	63	72	72	70	57
29	45	--	b 37	b 38	--	a 41	a 56	72	73	71	72	54
30	46	40	b 36	35	--	38	54	70	75	74	67	50
31	52	--	b 37	37	--	a 49	--	70	--	73	66	--
Average	55	44	39	36	37	42	55	64	68	71	71	65

a Measurement between 5 p.m. and 7 p.m.
b Measurement between 10 a.m. and 1 p.m.

KANSAS RIVER BASIN--Continued

6B-8830. LITTLE BLUE RIVER NEAR DEWEESE, NEBR.--Continued

Suspended sediment, water year October 1957 to September 1958

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	62	67	11	72	43	8.4	70	--	
2	62	32	5.4	71	27	5.2	70	--	
3	63	43	7.3	70	36	6.8	69	--	
4	63	24	4.1	70	54	10	69	--	
5	62	49	8.2	70	53	10	70	--	e 5.5
6	63	65	11	71	66	13	70	34	
7	63	32	5.4	71	62	12	70	--	
8	66	21	3.7	71	49	9.4	70	--	
9	66	23	4.1	71	52	10	68	--	
10	66	40	7.1	71	56	11	70	25	
11	68	43	7.9	70	62	12	66	28	5.0
12	69	30	5.6	71	64	12	67	34	6.2
13	69	27	5.0	71	70	13	67	38	6.9
14	71	40	7.7	71	73	14	67	43	7.8
15	70	43	8.1	71	62	12	67	46	8.3
16	69	48	8.9	71	49	9.4	67	48	8.7
17	68	57	10	73	36	7.1	68	48	8.8
18	69	42	7.8	75	25	5.1	69	47	8.8
19	69	47	8.8	72	23	4.5	69	34	6.3
20	69	39	7.3	71	23	4.4	68	25	4.6
21	70	39	7.4	70	23	4.3	68	22	4.0
22	72	43	8.4	70	23	4.3	68	21	3.9
23	72	46	8.9	70	24	4.5	67	25	4.5
24	71	41	7.9	70	27	5.1	67	18	3.3
25	72	41	8.0	70	45	8.5	68	15	2.8
26	71	34	6.5	71	64	12	69	13	2.4
27	71	30	5.8	71	45	8.6	70	14	2.6
28	71	31	5.9	71	30	5.8	70	16	3.0
29	72	49	9.5	71	25	4.8	69		
30	72	76	15	69	24	4.5	70	--	e 4.8
31	72	77	15	--	--	--	69		
Total	2,113	--	242.7	2,127	--	251.7	2,126	--	167.3

Day	January			February			March		
1	67	39	7.1	69	25	4.7	70	150	28
2	67	49	8.9	65	24	4.2	72	170	33
3	65	59	10	63	23	3.9	75	75	15
4	68	60	11	64	24	4.1	75	70	14
5	75	59	12	66	24	4.3	75	90	18
6	73	54	11	66	24	4.3	75	75	15
7	70	46	8.7	60	60	9.7	75	45	9.1
8	80	38	8.2	58	150	23	75	85	17
9	76	33	6.8	56	115	17	75	45	9.1
10	74	37	7.4	54	45	6.6	76	65	13
11	74	43	8.6	52	60	8.4	74	50	10
12	74	43	8.6	52	110	15	73	75	15
13	73	42	8.3	55	95	14	73	35	6.9
14	73	32	6.3	55	75	11	70	80	15
15	73	22	4.3	60	50	8.1	69	105	20
16	73	22	4.3	65	65	11	69	100	19
17	73	21	4.1	70	65	12	68	60	11
18	73	18	3.5	79	60	13	67	45	8.1
19	75	17	3.4	80	140	30	67	35	6.3
20	76	20	4.1	75	310	63	67	20	3.6
21	75	24	4.9	71	220	42	68	25	4.6
22	73	22	4.3	70	60	11	71	75	14
23	72	19	3.7	71	55	11	105	365	103
24	71	19	3.6	72	100	19	122	570	188
25	71	19	3.6	72	100	19	146	550	217
26	71	21	4.0	76	65	13	172	900	418
27	69	23	4.3	88	70	17	201	750	407
28	69	22	4.1	75	105	21	296	1,150	919
29	69	19	3.5	--	--	--	382	1,290	s 1,480
30	69	22	4.1	--	--	--	950	3,470	8,900
31	69	26	4.8	--	--	--	824	2,550	5,670
Total	2,230	--	191.5	1,859	--	420.3	4,777	--	18,606.7

e Estimated.

s Computed by subdividing day.

KANSAS RIVER BASIN--Continued

6B-8830. LITTLE BLUE RIVER NEAR DEWEESE, NEBR.--Continued

Suspended sediment, water year October 1957 to September 1958--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.....	900	2,050	4,980	84	120	27	77	220	46
2.....	666	1,600	2,880	82	180	40	73	300	59
3.....	521	1,600	2,250	84	155	35	74	400	80
4.....	382	2,050	2,110	91	85	21	73	400	79
5.....	293	2,450	1,940	88	110	26	72	250	49
6.....	254	1,570	1,080	85	110	25	73	250	49
7.....	201	1,250	678	81	110	24	73	210	41
8.....	155	660	276	81	100	22	73	185	37
9.....	132	380	135	81	105	23	71	175	34
10.....	120	250	81	79	100	21	71	200	38
11.....	109	190	56	78	75	16	70	200	38
12.....	106	150	43	77	90	19	874	8,640	s 25,400
13.....	102	120	33	79	80	17	326	5,820	s 5,420
14.....	100	120	32	82	85	19	145	3,080	1,210
15.....	97	125	33	84	75	17	104	800	225
16.....	93	120	30	84	60	14	84	350	79
17.....	92	80	20	85	70	16	77	325	68
18.....	90	75	18	84	100	23	74	260	52
19.....	90	75	18	80	210	45	73	345	68
20.....	87	65	15	80	200	43	72	620	120
21.....	86	80	19	80	180	39	117	640	202
22.....	85	80	18	80	150	32	112	640	194
23.....	93	75	19	79	210	45	92	600	149
24.....	90	65	16	79	190	41	86	335	78
25.....	86	90	21	79	150	32	81	280	61
26.....	86	140	33	80	150	32	76	210	43
27.....	87	80	19	80	175	38	73	200	39
28.....	88	50	12	78	200	42	71	170	33
29.....	86	200	46	78	300	63	69	190	35
30.....	84	200	45	77	265	55	66	225	40
31.....	--	--	--	78	225	47	--	--	--
Total.	5,461	--	16,956	2,517	--	959	3,472	--	34,066

Day	July			August			September		
1.....	65	225	40	100	310	84	84	220	50
2.....	61	240	40	90	150	36	80	440	95
3.....	67	200	36	81	180	39	78	180	38
4.....	95	710	s 194	74	150	30	77	110	23
5.....	70	190	36	71	200	38	216	1,760	1,030
6.....	62	120	20	241	1,950	s 1,790	751	5,680	s 13,100
7.....	60	120	19	169	1,900	867	232	2,210	1,380
8.....	57	120	18	139	1,200	450	144	1,320	513
9.....	62	500	84	112	920	278	106	600	172
10.....	364	6,930	s 7,230	88	330	78	91	275	68
11.....	821	11,600	25,700	74	350	70	85	230	53
12.....	544	4,000	5,880	74	650	130	81	190	42
13.....	375	2,580	2,610	91	600	147	79	180	38
14.....	189	2,630	1,340	98	575	152	76	150	31
15.....	124	800	268	124	300	100	74	250	50
16.....	104	330	93	1,350	5,200	19,000	72	240	47
17.....	335	4,440	s 5,260	1,200	4,480	14,500	72	940	183
18.....	221	2,480	s 1,670	1,260	2,940	10,000	71	630	121
19.....	1,110	8,540	s 27,900	620	2,220	3,720	69	150	28
20.....	1,190	5,400	17,400	311	1,000	840	70	300	57
21.....	1,020	2,820	7,770	244	1,010	666	71	1,000	192
22.....	543	2,300	3,370	323	1,760	1,540	68	250	46
23.....	291	1,250	982	344	1,500	1,390	70	620	117
24.....	687	3,950	s 8,310	262	840	594	69	150	28
25.....	419	2,580	2,920	176	580	276	67	380	69
26.....	250	940	635	140	420	159	66	120	21
27.....	218	980	577	122	400	132	66	250	45
28.....	153	940	388	109	490	144	67	200	36
29.....	125	320	108	101	1,620	442	65	480	84
30.....	115	300	93	95	1,650	423	65	160	28
31.....	106	550	157	88	1,070	254	--	--	--
Total.	9,903	--	121,148	8,371	--	58,369	3,282	--	17,785

Total discharge for year (cfs-days)..... 48,238
Total load for year (tons)..... 269,163.2

s Computed by subdividing day.

KANSAS RIVER BASIN--Continued

6B-8830. LITTLE BLUE RIVER NEAR DEWEESE, NEBR.--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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. 29, 1958...	6:00 p.m.	478	41	1,360	1,640	--	74		98		100	--	--		--		SPWCM
Mar. 30	10:30 a.m.	568	40	3,830	4,180	--	48		66		90	93	99		100		SPWCM
June 12.....	11:40 a.m.	995	63	14,200	8,510	44	52		74		100	--	--		--		VPWCM
June 12.....	3:45 p.m.	1,630	68	10,500	4,090	56	60		78		98	99	100		--		VPWCM
June 12.....	6:30 p.m.	1,550	67	9,390	5,840	54	61		78		97	98	100		--		VPWCM
June 13.....	8:00 a.m.	313	61	5,780	3,660	63	70		83		99	99	99		100		VPWCM
July 10	8:00 a.m.	684	67	7,390	4,450	52	58		74		99	100	--		--		VPWCM
July 11	11:00 a.m.	1,180	70	11,800	7,310	51	57		75		97	98	100		--		VPWCM
July 11	2:50 p.m.	1,200	73	8,810	5,420	57	63		78		98	99	100		--		VPWCM
July 17	7:30 p.m.	517	69	8,570	6,130	50	55		70		97	99	100		--		VPWCM
July 19	10:00 a.m.	819	72	7,880	5,050	51	56		74		100	--	--		--		VPWCM
July 19	4:30 p.m.	1,540	71	8,010	5,000	56	62		80		98	99	100		--		VPWCM
July 21	7:00 p.m.	980	70	2,450	4,500	57	62		73		94	96	100		--		VPWCM
Sept. 8	3:15 p.m.	139	76	1,260	2,200	63	83		91		100	--	--		--		VPWCM

6B-8870. 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 1958 (discontinued).
Water temperatures: October 1955 to September 1958 (discontinued).
EXTREMES, 1957-58.--Dissolved solids: Maximum, 398 ppm Feb. 1-23; minimum, 114 ppm July 26-28.
Hardness: Maximum, 254 ppm Feb. 1-23; minimum, 63 ppm July 19-20.
Specific conductance: Maximum daily, 698 micromhos Jan. 9, Feb. 17; minimum daily, 139 micromhos July 27.
Water temperatures: Maximum, 86°F Aug. 15; minimum, freezing point Dec. 13.
EXTREMES, 1955-58.--Dissolved solids: Maximum, 414 ppm May 31, 1956; minimum, 112 ppm July 5-7, 1956.
Hardness: Maximum, 254 ppm Feb. 1-23, 1958; minimum, 52 ppm July 5-7, 1956.
Specific conductance: Maximum daily, 753 micromhos Jan. 20, 1957; minimum daily, 123 micromhos June 24, 1957.
Water temperatures: Maximum, 89°F July 15, 1957; minimum, freezing point Nov. 28, 1955, Dec. 8, 12, 1956, Dec. 13, 1957.
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 1957 to September 1958 given in WSP 1560.

Chemical analyses, in parts per million, water year October 1957 to September 1958

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. 1-13, 1957....	385	16	0.01	52	9.8	27	7.7	196	34	30	0.4	1.1	0.03	274	0.37	285	170	9	25	0.9	464	7.6	--
Oct. 14-25	1,009	12	.01	34	6.6	19	6.6	130	24	19	.5	4.3	.03	190	.26	518	112	5	26	.8	324	7.4	--
Oct. 26-Nov. 25 ...	402	19	.00	58	12	30	6.7	218	39	31	.5	1.7	.04	304	.41	330	192	13	25	.9	510	7.8	--
Nov. 26-Dec. 27...	381	22	.03	66	14	38	6.0	257	48	35	.3	.6	.04	363	.49	373	223	12	26	1.1	591	7.9	8
Dec. 28-Jan. 31, 1958	348	22	.01	69	15	40	5.9	270	51	38	.3	1.0	.06	376	.51	353	232	11	27	1.1	619	7.6	--
Feb. 1-23.....	310	20	.00	74	17	42	6.0	288	56	37	.2	2.0	.12	398	.54	333	254	18	26	1.1	654	7.9	--
Feb. 24.....	1,040	19	.01	72	13	33	9.1	242	63	25	.4	3.7	.04	356	.48	1,000	232	34	23	.9	573	7.9	--
Feb. 25.....	2,880	15	.02	47	9.4	25	9.3	175	35	20	.4	5.1	.04	254	.35	1,980	156	12	24	.9	416	7.6	--
Feb. 26-Mar. 1....	5,288	14	.03	39	7.4	14	6.6	139	24	12	.4	21	.12	208	.28	2,970	128	14	18	.5	325	7.8	--
Mar. 2-12.....	4,313	11	.08	30	5.9	8.7	7.0	98	24	5.0	.3	14	.05	169	.23	1,970	99	19	15	.4	251	7.4	--
Mar. 13-16.....	1,540	13	.04	45	9.8	11	7.0	150	30	13	.3	12	.07	250	.34	1,040	153	30	13	.4	379	7.5	--
Mar. 17-27.....	1,434	17	.03	59	11	25	7.4	208	50	20	.4	7.8	.07	298	.41	1,150	194	23	21	.8	481	7.7	10
Mar. 28-31.....	3,213	12	.07	28	5.1	9.0	7.5	97	25	5.2	.3	2.7	.05	158	.21	1,370	91	11	16	.4	246	7.0	--
Apr. 1-9.....	2,794	12	.13	23	4.8	7.1	8.3	80	24	4.9	.3	6.5	.03	152	.21	1,150	77	11	15	.4	211	6.9	--
Apr. 10-14.....	1,554	12	.06	31	6.9	12	8.6	108	38	9.4	.3	6.0	.04	185	.25	776	106	17	18	.5	289	7.1	--
Apr. 15-22.....	955	14	.03	47	11	19	8.4	164	48	16	.3	3.9	.05	254	.35	655	164	30	19	.6	422	7.3	--
Apr. 23-May 16....	915	15	.01	60	14	27	7.3	215	59	23	.3	2.5	.06	317	.43	783	209	33	21	.8	527	7.3	--
May 17-21.....	4,832	12	.02	35	7.2	8.9	6.5	125	25	4.0	.4	7.2	.06	180	.24	2,350	117	14	13	.4	286	7.3	--
May 22-24.....	1,720	13	.01	43	9.6	15	7.0	167	40	9.5	.3	2.9	.08	226	.31	1,050	147	10	17	.5	363	7.4	--
May 25-June 13....	740	15	.02	65	15	31	7.5	235	61	28	.3	.7	.06	348	.47	695	224	31	22	.9	570	7.4	--

6B-8870. BIG BLUE RIVER NEAR MANHATTAN, KANS.--Continued

Chemical analyses, in parts per million, water year October 1957 to September 1958--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 14-27, 1958...	1,674	12	0.03	36	7.1	10	7.1	129	24	7.6	0.3	6.5	0.04	186	0.25	841	119	13	14	0.4	296	7.3	18
June 28-July 2.....	456	16	.01	58	13	25	7.4	208	42	25	.5	2.1	.06	300	.41	369	196	25	21	.8	490	7.0	8
July 3-6.....	2,630	14	.00	49	10	21	6.6	180	32	18	.5	4.8	.06	250	.34	1,780	164	16	21	.7	416	7.0	--
July 7-11.....	4,142	13	.01	42	6.6	8.0	7.0	148	20	6.4	.4	5.6	.08	188	.26	2,100	132	11	11	.3	307	6.9	--
July 12-16.....	17,650	11	.02	25	4.0	3.7	7.0	91	9.3	1.3	.4	7.4	.04	123	.17	5,860	79	4	8	.2	190	6.7	--
July 17-18.....	16,350	12	.02	32	6.4	4.5	6.8	120	13	.8	.4	6.5	.04	148	.20	6,530	106	8	8	.2	242	6.8	--
July 19-20.....	19,150	11	.02	18	4.4	3.0	7.0	73	9.0	.2	.4	5.2	.04	116	.16	6,000	63	3	8	.2	155	6.7	--
July 21-25.....	7,392	13	.02	26	4.9	5.1	8.3	93	17	2.8	.4	6.0	.04	137	.19	2,730	85	9	10	.2	211	7.0	--
July 26-28.....	19,000	11	.02	21	3.3	3.5	7.4	74	11	1.0	.4	5.5	.04	114	.16	5,850	66	5	9	.2	161	6.7	--
July 29-Aug. 5.....	7,094	13	.05	24	5.1	5.2	7.6	92	15	3.8	.3	3.7	.05	139	.19	2,660	81	6	11	.3	200	7.0	--
Aug. 6-17.....	1,788	17	.01	46	10	13	7.8	168	29	13	.4	3.0	.06	230	.31	1,110	156	18	15	.5	372	7.2	--
Aug. 18-26.....	2,243	15	.01	36	7.8	9.7	7.2	132	26	7.8	.4	4.8	.06	179	.24	1,080	122	14	14	.4	296	7.1	--
Aug. 27-Sept. 5....	2,264	21	.01	58	13	22	8.2	212	42	22	.2	3.2	.07	297	.40	1,820	197	23	19	.7	485	7.5	--
Sept. 6-8.....	25,030	12	.06	23	4.5	4.3	6.4	88	12	1.2	.3	5.4	.07	123	.17	8,310	76	4	10	.2	186	7.2	--
Sept. 9-17.....	7,588	12	.00	30	6.1	5.1	7.0	110	17	2.9	.3	5.3	.05	150	.20	3,070	100	10	9	.2	234	7.0	--
Sept. 18-30.....	3,086	16	.00	48	10	11	6.8	171	33	8.9	.4	5.2	.06	232	.32	1,930	161	21	12	.4	371	7.3	15
Weighted average a	2,437	13	0.03	34	7.3	10	7.1	126	23	7.9	0.4	6.0	0.05	181	0.25	1,190	115	12	15	0.4	284	--	--

a Represents 100 percent of runoff for water year October 1957 to September 1958.

KANSAS RIVER BASIN--Continued

6B-8870. BIG BLUE RIVER NEAR MANHATTAN, KANS.--Continued

Temperature (° F) of water, water year October 1957 to September 1958
/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	a 68	49	36	a 33	a 34	36	48	58	80	80	77	b 76
2	64	50	b 37	a 33	a 33	34	50	63	a 76	a 82	76	75
3	66	48	b 34	a 33	a 34	a 36	54	62	b 77	78	77	76
4	65	47	33	33	a 35	a 36	55	60	80	74	79	76
5	66	b 46	35	a 35	34	36	54	b 62	80	77	81	75
6	64	45	40	a 34	33	35	53	b 62	78	75	82	71
7	a 68	46	a 38	33	a 33	36	a 48	63	72	b 76	82	70
8	b 65	44	35	a 34	a 33	37	a 49	63	78	a 78	79	a 74
9	61	40	a 38	34	a 33	36	48	60	78	76	80	a 76
10	60	41	38	33	a 33	b 35	48	64	a 83	76	82	a 74
11	58	a 45	33	33	b 33	b 35	47	68	80	75	a 84	70
12	58	45	33	36	a 33	35	50	a 73	78	74	a 85	70
13	57	46	32	a 35	a 33	--	54	a 74	82	72	84	70
14	b 57	44	33	b 36	33	37	a 58	72	a 72	b 76	85	71
15	a 58	46	34	a 35	a 33	36	b 60	72	68	b 75	86	a 71
16	58	46	b 35	33	a 33	37	58	73	a 75	74	a 81	70
17	57	46	b 36	33	b 33	b 37	62	70	b 73	72	80	b 71
18	55	40	38	a 34	b 33	b 37	63	a 69	75	72	--	66
19	54	a 37	39	a 35	a 33	36	62	b 67	73	72	a 80	65
20	53	--	38	a 34	a 33	40	62	69	76	74	78	66
21	b 55	34	36	a 33	33	41	63	72	72	73	75	65
22	54	34	38	a 33	a 34	40	62	b 72	72	b 73	74	a 68
23	56	33	39	a 33	a 34	39	58	b 68	70	73	73	b 70
24	53	34	b 39	a 34	a 34	--	60	b 67	72	72	71	71
25	50	36	38	34	a 35	44	56	b 70	70	73	a 71	71
26	44	a 43	37	34	35	44	57	b 73	67	72	b 70	68
27	44	--	37	a 33	35	45	57	a 77	70	71	70	65
28	b 44	38	36	a 33	35	46	b 57	b 75	74	73	72	62
29	a 47	35	37	a 34	--	a 45	b 56	a 76	74	--	77	63
30	46	35	34	a 34	--	45	57	77	77	76	78	60
31	46	--	b 34	34	--	45	--	b 80	--	78	76	--
Average	56	42	36	34	34	39	56	69	75	75	78	70

a Measurement between 2 p.m. and 5 p.m.
b Measurement between 10 a.m. and 1 p.m.

KANSAS RIVER BASIN--Continued

6B-8875. KANSAS RIVER AT WAMEGO, KANS.

LOCATION.--At gaging station at bridge on State Highway 99 at Wamego, Pottawatomie County, and 3 miles downstream from Antelope Creek.
DRAINAGE AREA.--55,240 square miles, approximately, of which a large area is probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: August 1956 to September 1958 (discontinued).
Water temperatures: August 1956 to September 1958.
Sediment records: October 1957 to September 1958.
EXTREMES, 1957-58.--Dissolved solids: Maximum, 802 ppm Feb. 16-22; minimum, 160 ppm July 27-28.
Hardness: Maximum, 370 ppm Feb. 16-22; minimum, 102 ppm July 27-28.
Specific conductance: Maximum daily, 1,460 micromhos Jan 9; minimum daily, 217 micromhos Sept. 8.
Water temperatures: Maximum, 84°F Aug. 13; minimum, freezing point on many days during November to March.
Sediment concentrations: Maximum daily, 8,650 ppm July 12; minimum daily, not determined.
Sediment loads: Maximum daily, 677,000 tons July 12; minimum daily, not determined.
EXTREMES, 1956-58.--Dissolved solids: Maximum, 1,180 ppm Feb. 2, 1957; minimum, 160 ppm July 27-28, 1958.
Hardness: Maximum, 448 ppm Feb. 2, 1957; minimum, 102 ppm July 27-28, 1958.
Specific conductance: Maximum daily, 1,980 micromhos Nov. 12, 1956; minimum daily, 217 micromhos Sept. 8, 1958.
Water temperatures: Maximum, 84°F Aug. 13, 1958; 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. Flow affected by ice Dec. 10-13, Dec. 31 to Jan. 4, Jan 7-8, 21-22, Feb. 1-4, 6-23. Records of discharge for water year October 1957 to September 1958 given in WSP 1560.

Chemical analyses, in parts per million, water year October 1957 to September 1958

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. 1-24, 1957	3,053	13	0.00	66	11	60	9.4	182	0	85	76	0.5	2.9	0.06	413	0.56	3,400	208	59	37	1.8	699	7.4
Oct. 25-30	5,160	14	.01	51	8.5	36	6.5	150	0	50	51	.4	3.2	.03	304	.41	4,240	162	39	32	1.2	509	7.5
Oct. 31-Nov. 18	1,764	23	.00	81	16	80	9.6	228	0	110	107	.5	3.3	.06	549	.75	2,610	267	80	38	2.1	902	7.7
Nov. 19-Dec. 31	1,521	18	.01	94	21	100	8.3	272	0	135	144	.4	2.1	.09	674	.92	2,770	319	96	40	2.4	1,110	7.6
Jan. 1-13, 1958	1,186	18	.00	104	24	138	8.5	303	0	154	185	.4	1.8	.13	798	1.09	2,560	360	112	45	3.2	1,310	7.9
Jan. 14-31	1,472	18	.01	95	20	118	8.1	281	0	132	153	.4	2.5	.10	700	.95	2,780	321	91	44	2.9	1,150	7.7
Feb. 1-15	1,165	16	.00	98	25	108	7.7	295	0	145	150	.4	2.7	.11	723	.98	2,270	348	106	40	2.5	1,180	7.8
Feb. 16-22	1,031	16	.00	106	26	134	8.8	312	0	154	176	.4	3.0	.12	802	1.09	2,230	370	114	43	3.0	1,300	7.9
Feb. 23-24	2,080	15	.00	92	21	106	7.9	269	0	128	141	.6	2.6	.11	674	.92	3,790	316	95	41	2.6	1,100	8.1
Feb. 25	4,140	19	.01	74	11	65	8.8	254	0	73	58	.4	1.3	.06	444	.60	4,960	228	20	37	1.9	711	7.9
Feb. 26-28	4,657	15	.03	56	11	45	6.6	184	0	59	55	.4	6.2	.08	364	.50	4,580	184	33	34	1.4	580	7.5
Mar. 1	16,500	16	.05	65	9.2	29	6.6	196	0	53	35	.5	11	.13	348	.47	15,500	200	39	23	.9	526	7.5
Mar. 2-4	9,190	11	.11	35	6.9	13	7.0	116	0	31	14	.5	14	.09	222	.30	5,510	116	21	19	.5	307	7.4
Mar. 5-7	6,627	13	.09	49	9.1	28	7.8	152	0	53	33	.4	10	.20	294	.40	5,260	160	35	26	1.0	456	7.5
Mar. 8-13	11,110	11	.04	46	7.5	19	6.4	140	0	43	22	.5	8.2	.05	260	.35	7,800	146	31	21	.7	393	7.6
Mar. 14-17	5,048	13	.05	59	13	34	7.6	170	0	77	38	.4	8.3	.07	359	.49	4,890	202	63	26	1.0	553	7.6
Mar. 18-27	4,301	15	.04	75	18	48	8.6	220	0	103	56	.4	6.3	.06	445	.61	5,170	262	82	28	1.3	719	7.8
Mar. 28-Apr. 6	11,140	12	.01	56	9.8	23	8.0	167	0	56	26	.3	5.6	.05	294	.40	8,840	180	43	21	.7	476	7.6
Apr. 7-13	8,923	12	.03	64	12	29	8.4	157	0	86	39	.3	7.1	.05	376	.51	9,060	209	80	22	.9	563	7.3

Apr. 14-May 3	6,420	13	.01	77	15	48	10	193	0	110	68	.5	4.0	.07	466	.63	8,080	254	96	28	1.3	748	7.4
May 4-6	14,700	13	.02	63	12	25	7.2	182	0	63	31	.4	5.2	.09	332	.45	13,190	208	59	20	.8	524	7.5
May 7-10	7,418	12	.01	71	15	36	8.4	186	0	94	52	.4	3.5	.08	423	.58	8,470	238	85	24	1.0	652	7.4
May 11-16	3,932	13	.02	90	19	56	9.0	225	0	134	77	.4	3.8	.08	553	.75	5,870	303	118	28	1.4	851	7.3
May 17	4,360	14	.01	76	15	40	8.8	216	0	99	51	.5	4.0	.08	424	.58	4,990	252	75	25	1.1	686	7.7
May 18-20	15,300	12	.01	45	8.6	20	8.0	140	0	46	22	.4	7.2	.07	248	.34	10,240	148	33	22	.7	405	7.5
May 21-25	13,040	12	.01	59	7.3	26	8.2	160	0	59	30	.4	4.5	.07	294	.40	10,350	177	46	23	.8	482	7.4
May 26-29	6,968	14	.02	77	14	36	9.6	196	0	105	48	.4	4.4	.09	422	.57	7,940	249	88	23	1.0	665	7.4
May 30-June 8	4,758	14	.03	95	17	75	9.8	225	0	142	102	.4	2.9	.08	607	.84	7,800	308	123	34	1.9	934	7.4
June 9-14	5,918	13	.04	78	15	57	10	205	0	107	75	.4	1.7	.07	487	.66	7,780	255	87	32	1.6	765	7.2
June 15-17	7,723	11	.04	55	10	34	8.4	162	0	62	43	.4	3.9	.07	323	.44	6,740	178	45	28	1.1	524	7.3
June 18-24	3,690	12	.04	69	14	65	9.6	190	0	98	86	.4	2.8	.08	480	.65	4,780	230	74	37	1.9	767	7.1
June 25-26	7,330	11	.04	65	9.7	36	7.2	196	0	56	49	.4	4.5	.06	360	.49	7,120	202	41	27	1.1	569	7.2
June 27-July 2	5,153	13	.01	71	13	57	8.5	192	0	93	76	.4	4.7	.10	441	.60	6,140	230	73	34	1.6	728	7.2
July 3-11	10,300	12	.02	56	8.4	26	6.6	176	0	45	33	.3	4.1	.08	285	.39	7,930	174	30	24	.9	478	7.2
July 12-20	26,180	11	.02	37	5.5	9.1	6.4	122	0	23	11	.4	6.6	.06	175	.24	12,370	115	15	14	.4	286	7.1
July 21-26	17,030	12	.02	47	6.9	16	8.2	145	0	33	21	.4	5.0	.06	232	.32	10,670	146	27	18	.6	377	7.1
July 27-28	25,900	11	.15	34	4.1	7.9	7.0	114	0	17	8.6	.3	5.3	.05	160	.22	11,190	102	9	13	.3	258	7.3
July 29-Aug. 3	14,670	12	.00	44	6.6	14	7.2	139	0	32	19	.4	3.3	.06	215	.29	8,520	137	23	17	.5	351	7.0
Aug. 4-27	7,032	15	.00	64	12	37	9.2	188	0	69	51	.4	2.6	.07	361	.49	6,850	207	53	27	1.1	588	7.2
Aug. 28-Sept. 5	5,056	16	.07	70	12	43	10	203	0	80	59	.6	2.1	.08	405	.55	5,530	225	59	28	1.2	656	7.2
Sept. 6-12	33,530	11	.03	35	4.5	10	6.4	116	0	19	11	.4	5.0	.05	169	.23	15,300	106	11	16	.4	268	7.0
Sept. 13-27	10,200	13	.00	52	9.6	20	7.6	165	0	46	24	.4	4.4	.06	269	.37	7,410	169	34	20	.7	434	7.1
Sept. 28-30	5,537	16	.00	71	13	47	7.6	223	0	76	62	.6	3.0	.08	416	.57	6,220	232	49	30	1.3	678	7.6
Weighted average a.	6,563	13	0.02	58	10	33	7.9	169	--	63	44	0.4	4.7	0.07	331	0.45	5,870	187	48	27	1.1	533	--

a Represents 100 percent of runoff for water year October 1957 to September 1958.

KANSAS RIVER BASIN--Continued

6B-8875. KANSAS RIVER AT WAMEGO, KANS.--Continued

Temperature (° F) of water, water year October 1957 to September 1958
(Once-daily measurement at 7 a.m.)

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

a Measurement made at 6 a.m.
b Measurement made at 8 a.m.

KANSAS RIVER BASIN--Continued

6B-8875. KANSAS RIVER AT WAMEGO, KANS.--Continued

Suspended sediment, water year October 1957 to September 1958

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	3,610	460	4,480	2,200	1,320	7,840	1,660	140	627
2	3,530	500	4,770	2,050	1,410	7,800	1,580	120	512
3	3,480	530	4,980	1,870	1,070	5,400	1,520	100	410
4	3,460	560	5,230	1,780	840	4,040	1,460	110	434
5	3,420	550	5,080	1,760	460	2,190	1,480	--	
6	3,370	520	4,730	1,690	300	1,370	1,440	220	
7	3,150	520	4,420	1,670	260	1,170	1,470	--	e 700
8	3,290	540	4,800	1,680	240	1,090	1,480	--	
9	4,510	1,550	18,900	1,640	210	930	1,480	--	
10	5,910	3,320	53,000	1,600	190	821	1,390	--	
11	3,830	2,150	22,200	1,570	160	678	1,320	--	
12	2,570	1,630	11,300	1,610	140	609	1,200	--	
13	2,140	1,350	7,800	1,660	140	627	1,250	170	
14	2,570	1,740	12,100	1,640	150	664	1,250	--	e 600
15	4,230	2,660	30,400	1,600	150	648	1,290	--	
16	2,700	1,070	7,800	1,560	150	632	1,320	--	
17	3,130	1,100	9,300	1,570	160	678	1,340	98	
18	2,910	1,170	9,190	1,890	370	1,890	1,370	--	
19	2,380	760	4,880	1,890	380	1,940	1,380	--	
20	2,020	640	3,490	2,360	400	2,550	1,400	87	e 360
21	1,800	550	2,670	2,290	400	2,470	1,440	--	
22	1,700	500	2,300	1,970	350	1,860	1,480	--	
23	1,810	460	2,250	1,810	290	1,420	1,440	--	
24	1,760	450	2,140	1,720	240	1,110	1,410	130	
25	7,050	3,140	s 67,500	1,660	180	807	1,460	--	
26	8,410	3,840	87,200	1,640	140	620	1,440	--	e 500
27	5,960	3,250	52,300	1,610	140	609	1,420	130	
28	3,880	2,410	25,200	1,620	160	696	1,410	--	
29	2,830	1,810	13,800	1,570	180	763	1,400	--	
30	2,830	1,490	11,400	1,680	170	771	1,360	--	
31	2,480	1,320	8,840	--	--	--	1,260	--	
Total	106,720	--	504,450	52,860	--	54,693	43,600	--	16,443

Day	January			February			March		
1	1,050	--	e 320	1,550	--		16,500	3,810	170,000
2	1,040			1,400	--		14,700	6,380	253,000
3	920			1,400	--		7,540	3,940	80,200
4	860			1,420	--	e 460	5,330	2,660	38,300
5	1,280	--		1,490	130		4,470	1,960	23,700
6	1,420	--		1,360	93		5,110	2,130	29,400
7	1,180	--		1,120			10,300	3,840	107,000
8	1,090	--		1,000			12,400	3,600	121,000
9	1,300	130	e 380	900			15,600	4,040	170,000
10	1,300	--		850			13,100	3,100	110,000
11	1,260	--		990			10,300	2,210	61,500
12	1,310	100		960			8,480	1,640	37,500
13	1,410	--		890			6,800	1,250	23,000
14	1,480	110		1,120			5,790	1,060	16,600
15	1,470	--		1,020	--	e 300	5,200	860	12,100
16	1,500	90		950			4,800	760	9,850
17	1,540	88	e 420	890			4,400	690	8,200
18	1,500	--		950			4,070	570	6,260
19	1,530	--		960			3,940	550	5,850
20	1,620	--		970			3,710	500	5,010
21	1,300	--	e 320	1,000			3,590	360	3,490
22	875	--	e 200	1,500	--	e 800	3,710	360	3,610
23	1,070	--	e 320	2,100	--	e 2,800	3,690	380	3,790
24	1,310	--	e 400	2,060	--	e 5,600	3,770	400	4,070
25	1,680	120		4,140	1,750	19,600	3,880	410	4,300
26	1,700	--		4,770	1,880	24,200	5,040	480	6,530
27	1,520	--		3,810	1,230	12,700	7,610	1,830	37,600
28	1,580	--	e 480	5,390	1,480	s 23,100	8,140	3,160	69,500
29	1,620	--		--	--	--	7,930	2,540	54,400
30	1,570	100		--	--	--	8,380	2,170	49,100
31	1,640	--		--	--	--	10,800	2,680	78,100
Total	41,925	--	12,240	46,960	--	96,060	229,080	--	1,602,960

e Estimated.

s Computed by subdividing day.

KANSAS RIVER BASIN--Continued

6B-8875. KANSAS RIVER AT WAMEGO, KANS.--Continued

Suspended sediment, water year October 1957 to September 1958--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	11,800	3,140	100,000	6,170	500	8,330	5,000	820	11,100
2	12,100	2,850	93,100	5,890	610	9,700	4,840	730	9,540
3	12,700	3,180	109,000	6,650	800	14,400	4,870	690	9,070
4	13,300	3,610	130,000	12,400	3,500	s 139,000	4,690	720	9,120
5	13,500	3,100	113,000	19,300	5,300	276,000	4,450	680	8,170
6	12,700	2,620	89,800	12,400	2,550	85,400	4,160	800	8,990
7	11,600	2,680	83,900	10,200	1,850	50,900	4,290	700	8,110
8	10,900	2,560	75,300	7,590	1,450	29,700	4,580	760	9,400
9	9,750	2,100	55,300	6,220	1,250	21,000	5,910	1,220	19,500
10	8,360	1,860	42,000	5,660	1,000	15,300	6,700	1,320	23,900
11	7,420	1,630	32,700	5,020	760	10,300	6,610	1,650	29,400
12	7,250	1,540	30,100	4,430	660	7,890	5,000	1,410	19,000
13	7,180	1,450	28,100	3,920	520	5,500	4,010	1,080	11,700
14	6,970	1,260	23,700	3,500	440	4,160	7,280	2,310	s 52,200
15	6,800	1,080	19,800	3,370	420	3,820	9,620	6,400	166,000
16	6,970	1,000	18,800	3,350	420	3,800	7,690	4,200	87,200
17	6,850	920	17,000	4,360	920	10,800	5,860	2,770	43,800
18	6,610	800	14,300	13,600	5,440	s 217,000	4,450	1,680	20,200
19	6,460	710	12,400	17,500	5,580	264,000	3,990	1,350	14,500
20	6,490	670	11,700	14,800	3,960	158,000	3,610	1,020	9,940
21	6,390	750	12,900	13,300	3,370	121,000	3,420	760	7,020
22	6,580	950	16,900	13,200	2,950	105,000	3,260	700	6,160
23	6,370	940	16,200	14,000	2,480	93,700	3,550	840	8,050
24	6,220	760	12,800	13,400	2,100	76,000	3,550	1,090	10,400
25	6,080	660	10,800	11,300	1,560	47,600	6,730	3,420	62,100
26	6,150	620	10,300	9,620	1,430	37,100	7,930	3,500	74,900
27	6,030	620	10,100	7,090	1,270	24,300	9,020	4,020	97,900
28	6,270	630	10,700	5,660	1,280	19,600	7,130	2,600	50,100
29	6,290	700	11,900	5,500	1,100	16,300	5,090	1,870	25,700
30	6,170	800	13,300	5,440	960	14,100	3,790	1,500	15,300
31	--	--	--	5,260	870	12,400	--	--	--
Total	248,260	--	1,225,900	270,100	--	1,902,100	161,080	--	928,470

	July			August			September		
1	3,060	1,230	10,200	14,600	2,500	98,600	4,140	500	5,590
2	2,830	1,200	9,170	15,400	2,900	121,000	3,830	480	4,960
3	10,000	4,000	108,000	11,000	1,670	49,600	3,690	490	4,880
4	15,300	5,060	209,000	9,410	1,440	36,600	3,750	530	5,370
5	12,400	3,000	100,000	8,260	1,130	25,200	7,470	2,040	s 68,000
6	8,970	2,610	63,200	7,490	880	17,800	31,800	6,600	567,000
7	7,880	2,920	62,100	7,590	880	18,000	45,500	4,880	600,000
8	8,070	3,510	76,500	7,400	1,020	20,400	51,000	3,750	516,000
9	7,690	2,800	58,100	7,710	1,170	24,400	40,000	2,810	303,000
10	7,400	3,070	61,300	7,420	1,000	20,000	27,200	3,650	268,000
11	15,000	6,500	s 284,000	7,830	1,290	27,300	21,200	4,200	240,000
12	29,000	8,650	677,000	6,650	920	16,500	18,000	3,350	163,000
13	31,800	6,000	515,000	5,930	750	12,000	12,400	2,850	95,400
14	26,200	5,200	368,000	5,390	580	8,440	9,640	2,300	59,900
15	16,400	4,550	201,000	4,690	400	5,070	9,560	1,960	50,600
16	14,000	3,800	144,000	5,040	510	6,940	9,380	1,700	43,100
17	21,100	5,680	324,000	5,790	680	10,600	9,380	1,550	39,300
18	32,200	4,800	417,000	7,060	1,020	19,400	8,840	1,150	27,400
19	37,000	4,450	445,000	6,560	1,300	23,000	7,610	1,100	22,600
20	27,900	3,630	273,000	6,200	1,090	18,200	9,850	3,050	s 93,800
21	19,000	3,470	178,000	9,040	2,680	65,400	10,400	3,400	95,500
22	15,200	3,120	128,000	10,400	3,500	98,300	8,940	1,880	45,400
23	15,000	3,080	125,000	8,090	2,620	57,200	11,700	3,000	94,800
24	14,500	3,280	128,000	6,750	2,600	47,400	15,300	3,880	160,000
25	15,200	3,320	136,000	5,610	2,550	38,600	12,900	3,480	121,000
26	23,300	4,850	305,000	6,080	1,720	28,200	9,690	2,120	55,500
27	28,300	3,850	294,000	6,390	1,510	26,100	7,470	1,450	29,200
28	23,500	3,250	206,000	6,270	1,190	20,100	6,130	880	14,600
29	17,600	2,780	132,000	6,030	910	14,800	5,390	610	8,880
30	14,800	2,200	87,900	5,610	800	12,100	5,090	420	5,770
31	14,600	2,310	91,100	4,710	690	8,770	--	--	--
Total	535,200	--	6,216,570	232,400	--	996,020	427,250	--	3,808,550

Total discharge for year (cfs-days) 2,395,435
Total load for year (tons) 17,364,456

s Computed by subdividing day.

6B-8875. KANSAS RIVER AT WAMEGO, KANS.--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time	Discharge (cfs)	Water temperature (° F)	Suspended sediment												Methods of analysis
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000
Jan. 16, 1958....	11:10 a.m.	1,470	37	90		--	--		--		84	96	100		--		V
Mar. 3.....	2:50 p.m.	6,920	35	3,080		50	54		71		94	98	99		100		VPWCM
Mar. 8.....	10:20 a.m.	11,960	36	3,140		49	56		71		93	96	99		100		VPWCM
Mar. 27.....	10:00 a.m.	7,540	48	1,060		35	38		56		94	97	98		100		VPWCM
Aug. 11.....	5:00 p.m.	7,610	83	1,170		61	66		81		99	99	100		--		VPWCM
Sept. 9.....	2:10 p.m.	39,150	--	2,660		53	57		62		88	93	98		100		VPWCM

Particle-size analyses of bed material, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time	Discharge (cfs)	Number of sampling points	Bed material												Methods of analysis
				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	64.000	
Mar. 3, 1958.....	2:50 p.m.	6,920	9		0	2	7	44	78	89	98	100				SV
July 23.....	2:15 p.m.	15,000	9		1	4	26	61	80	88	95	98	100			SV

KANSAS RIVER BASIN--Continued

6B-8880. VERMILLION CREEK NEAR WAMEGO, KANS.

LOCATION.--At gaging station at highway bridge, 1 mile upstream from Indian Creek and 14 miles northeast of Wamego, Pottawatomie County.
DRAINAGE AREA.--243 square miles.
RECORDS AVAILABLE.--Water temperatures: April to September 1958.
Sediment records: April to September 1958.
REMARKS.--Records of discharge for water year October 1957 to September 1958 given in WSP 1560.

Temperature (° F) of water, April to September 1958
/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							--	--	76	--	73	--
2							--	66	--	a 74	73	--
3							--	60	--	75	76	--
4							--	54	a 84	75	76	74
5							--	60	68	75	--	73
6							--	--	--	70	--	--
7							--	60	72	a 75	--	--
8							--	54	--	--	--	70
9							--	62	75	--	--	--
10							--	65	75	70	76	64
11							--	68	70	70	--	65
12							--	73	--	70	--	66
13							--	75	--	74	--	--
14							--	--	70	75	--	a 70
15							--	70	68	70	77	69
16							--	68	66	72	a 75	68
17							a 66	--	--	66	73	62
18							a 65	70	a 75	73	72	62
19							--	74	70	76	76	--
20							a 65	70	--	73	76	--
21							--	68	60	71	73	65
22							a 61	--	66	--	72	68
23							--	64	68	--	70	70
24							a 60	63	66	70	70	75
25							--	68	65	73	66	69
26							--	66	60	--	65	65
27							--	76	65	74	69	--
28							--	--	--	72	71	--
29							50	68	75	75	--	58
30							--	--	--	--	75	55
31							--	--	--	74	--	--
Average							--	--	--	--	--	--

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

KANSAS RIVER BASIN--Continued

6B-8880. VERMILLION CREEK NEAR WAMEGO, KANS.--Continued

Suspended sediment, April to September 1958

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	--	--	--	29	100	8	23	255	16
2	--	--	--	29	105	8	21	250	14
3	--	--	--	321	4,340	s 4,710	20	240	13
4	--	--	--	531	3,240	s 5,410	17	230	11
5	--	--	--	209	1,020	s 612	14	220	8
6	--	--	--	120	480	a 160	12	215	7
7	--	--	--	98	300	79	16	220	b 10
8	--	--	--	89	245	59	157	1,500	sb 2,500
9	--	--	--	80	235	51	521	4,050	s 7,320
10	--	--	--	72	240	47	85	1,490	342
11	--	--	--	63	220	37	34	520	48
12	--	--	--	55	210	31	59	--	e 400
13	--	--	--	49	210	28	465	--	e 4,100
14	--	--	--	45	210	26	1,220	5,100	s 23,400
15	--	--	--	101	1,100	sa 340	1,020	3,800	10,500
16	--	--	--	132	900	321	142	1,600	613
17	39	50	5	304	--	e 3,700	92	600	149
18	37	71	7	174	2,100	sa 1,200	277	2,330	s 3,050
19	40	100	a 11	73	630	124	335	2,400	2,170
20	55	160	a 24	56	310	47	95	900	b 240
21	44	110	13	79	800	sa 300	235	2,480	s 1,770
22	37	97	10	152	--	e 1,000	109	500	147
23	36	90	9	56	640	97	75	300	61
24	35	86	8	49	335	44	67	500	90
25	31	85	7	45	285	35	364	4,800	sa 6,000
26	28			39	275	29	193	3,030	s 1,980
27	29			34	275	25	74	610	122
28	40	150	b 16	30	270	22	56	330	50
29	39	135	14	27	265	19	48	235	30
30	33	110	10	26	265	18	41	190	21
31	--	--	--	25	260	18	--	--	--
Total	523	--	148	3,192	--	18,605	5,887	--	65,182

	July			August			September		
1	35	175	17	2,050	3,000	s 11,500	21	100	b 6
2	111	1,450	s 1,140	1,270	3,990	s 12,600	21		
3	149	1,970	s 884	370	1,600	b 1,600	20		
4	134	1,500	a 550	200	1,150	621	424	2,200	sa 4,800
5	65	430	75	151	1,000	b 400	227	2,300	1,410
6	41	250	28	144	900	b 350	57	1,900	b 300
7	33	200	18	130	800	b 280	81	1,700	b 380
8	29	165	13	105	600	b 170	31	400	33
9	25	135	9	92	400	b 100	22	150	9
10	661	3,810	s 9,320	82	265	59	1,390	5,120	19,200
11	2,460	5,600	37,200	75	285	58	344	3,200	2,970
12	1,950	3,350	s 16,000	70	235	44	86	900	209
13	177	1,450	693	64	165	28	67	320	b 60
14	132	650	232	59	160	25	99	1,390	s 781
15	362	4,500	s 6,440	54	210	31	1,030	3,980	s 10,500
16	352	2,600	2,470	165	2,630	s 1,380	178	980	471
17	2,190	4,880	s 34,900	218	1,550	912	138	830	309
18	2,040	2,700	14,900	70	1,000	189	141	610	232
19	260	1,750	1,230	52	290	41	90	220	53
20	187	650	328	47	225	29	82	180	40
21	166	450	202	45	200	24	162	800	350
22	156	400	b 170	41	210	23	151	750	306
23	142	400	b 150	39	245	26	755	2,970	s 8,490
24	226	1,790	1,090	39	160	17	1,140	2,350	7,230
25	337	2,150	1,960	37	125	12	172	750	348
26	136	1,200	b 440	39	115	12	110	315	94
27	321	2,100	a 1,800	36	125	12	90	210	51
28	289	1,500	1,170	32	170	15	78	150	32
29	127	550	189	29	110	9	74	120	24
30	108	450	131	26	110	8	80	110	24
31	3,470	4,370	s 35,800	23	110	b 7	--	--	--
Total	16,871	--	169,549	5,854	--	30,582	7,361	--	58,724

Total discharge for period Apr. 17 to Sept. 30, 1958 (cfs-days) 39,688
Total load for period Apr. 17 to Sept. 30, 1958 (tons) 342,790

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

6B-8880. VERMILLION CREEK NEAR WAMEGO, KANS.--Continued

Particle-size analyses of suspended sediment, April to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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 31, 1958.....	7:10 p.m.	5,640	74	3,120	6,950	65	74		88		99	100					VPWCM
Aug. 1.....	3:05 p.m.	638	75	4,560	9,740	42	51		83		100						VPWCM
Aug. 2.....	2:30 p.m.	1,900	--	3,370	3,080	31	50		84		100						VPWCM

6B-8890. 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.
DRAINAGE AREA.--56,710 square miles, approximately, of which a large area is probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: November 1955 to September 1958 (discontinued).
Water temperatures: November 1955 to September 1958 (discontinued).
EXTREMES, 1957-58.--Dissolved solids: Maximum, 729 ppm Jan. 1-15; minimum, 212 ppm July 11-21.
Hardness: Maximum, 358 ppm Feb. 10-23; minimum, 134 ppm Sept. 6-13.
Specific conductance: Maximum daily, 1,290 micromhos Jan. 11; minimum daily, 237 micromhos Sept. 8.
Water temperatures: Maximum, 87°F Aug. 13, 15; minimum, freezing point on many days during December to February.
EXTREMES, 1955-58.--Dissolved solids: Maximum, 1,180 ppm Aug. 19, 1956; minimum, 139 ppm July 6-8, 1956.
Hardness: Maximum, 358 ppm Feb. 10-23, 1958; minimum, 86 ppm July 6-8, 1956.
Specific conductance: Maximum daily, 2,000 micromhos Aug. 19, 1956; minimum daily, 202 micromhos July 7, 1956.
Water temperatures: Maximum, 87°F Aug. 13, 15, 1958; 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 and some records of strontium available in district office at Lincoln, Nebr. Records of discharge for water year October 1957 to September 1958 given in WSP 1560.

Chemical analyses, in parts per million, water year October 1957 to September 1958

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. 1-17, 1957....	3,628	17	0.01	63	10	42	9.6	176	73	54	0.4	3.0	0.04	359	0.49	3,520	200	56	30	1.3	604	7.5	--
Oct. 18-26	3,296	18	.01	63	12	65	8.1	182	78	87	.4	3.8	.05	424	.58	3,770	208	59	39	2.0	725	7.5	--
Oct. 27-31	4,498	14	.01	56	7.9	37	6.4	164	53	49	.3	4.0	.04	308	.42	3,740	172	38	31	1.2	529	7.5	--
Nov. 1-18.....	2,164	15	.02	84	15	76	8.5	231	105	97	.4	2.2	.05	520	.71	3,040	270	81	37	2.0	872	7.6	9
Nov. 19-20.....	4,710	12	.08	61	9.7	37	6.6	182	56	49	.3	3.3	.10	330	.45	4,200	192	43	29	1.2	555	7.9	25
Nov. 21-27.....	2,526	15	.02	94	17	76	7.9	255	121	102	.4	2.5	.18	574	.78	3,910	306	97	34	1.9	944	7.7	7
Nov. 28-Dec. 31...	1,662	16	.01	97	20	98	7.9	284	131	134	.4	1.4	.09	661	.90	2,970	324	91	39	2.4	1,080	7.8	9
Jan. 1-15, 1958....	1,380	16	.01	102	24	117	8.1	300	143	158	.4	.8	.10	729	.99	2,720	352	106	41	2.7	1,200	7.8	--
Jan. 16-Feb. 9	1,704	14	.00	98	22	97	7.0	288	130	125	.4	1.3	.08	653	.89	3,000	334	98	38	2.3	1,070	7.7	--
Feb. 10-23.....	1,422	14	.00	104	24	108	7.7	314	137	137	.5	2.8	.10	702	.95	2,700	358	101	39	2.5	1,150	7.9	--
Feb. 24-25.....	3,125	13	.00	85	19	82	6.3	254	115	109	.2	2.8	.09	575	.78	4,850	292	84	37	2.1	952	8.1	--
Feb. 26-27.....	4,900	14	.01	66	16	51	6.5	220	75	60	.4	4.3	.08	411	.56	5,440	229	49	32	1.5	682	8.0	--
Feb. 28-Mar. 1....	9,425	13	.02	58	11	37	5.8	177	60	43	.4	7.1	.10	336	.46	8,550	190	45	29	1.2	547	7.5	--
Mar. 2-5	10,760	12	.02	46	8.3	18	6.4	144	42	18	.3	11	.08	245	.33	7,120	149	31	20	.6	389	7.7	16
Mar. 6-16.....	10,810	11	.01	52	11	22	6.2	162	52	24	.3	7.7	.06	280	.38	8,170	173	40	21	.7	450	7.3	13
Mar. 17-23.....	4,977	12	.01	73	18	38	7.4	221	93	42	.4	5.5	.06	416	.57	5,590	256	75	24	1.0	664	7.5	9
Mar. 24-28.....	5,460	14	.00	77	20	49	7.4	235	107	53	.4	5.1	.09	465	.63	6,860	275	82	27	1.3	742	7.8	8
Mar. 29-Apr. 1....	9,538	13	.01	64	11	36	7.6	180	75	40	.3	7.3	.07	365	.50	9,400	206	58	27	1.1	578	7.7	--
Apr. 2-7.....	13,170	12	.01	59	9.0	22	7.8	169	60	24	.3	7.4	.05	295	.40	10,490	184	45	20	.7	478	7.7	--
Apr. 8-12.....	9,436	11	.01	69	12	28	8.2	170	87	38	.3	7.4	.06	372	.51	9,480	220	81	21	.8	578	7.6	--

6B-8890. KANSAS RIVER AT TOPEKA, KANS.--Continued

Chemical analyses, in parts per million, water year October 1957 to September 1958--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					
Apr. 13-29, 1958..	6,724	12	0.01	77	16	50	9.4	200	107	64	0.4	4.8	0.08	467	0.64	8,480	258	94	29	1.4	736	7.8	--
Apr. 30-May 3....	6,485	13	.01	76	16	49	9.8	203	109	68	.4	2.5	.08	460	.63	8,050	254	88	29	1.3	746	7.4	--
May 4-5.....	14,950	14	.01	77	14	36	7.9	216	76	50	.4	5.2	.07	418	.57	16,870	248	71	23	1.0	657	7.8	--
May 6-7.....	15,300	12	.01	55	15	25	6.5	172	60	33	.4	5.2	.06	310	.42	12,810	200	59	21	.8	503	7.4	--
May 8-10.....	8,107	16	.04	69	14	34	7.5	186	89	47	.4	4.1	.28	386	.52	8,450	231	78	24	1.0	618	7.4	--
May 11-18.....	5,136	13	.01	91	19	52	8.4	230	129	71	.4	3.0	.10	515	.70	7,140	304	115	26	1.3	824	7.6	--
May 19-26.....	14,380	12	.01	62	9.1	28	8.1	175	62	32	.4	4.4	.06	322	.44	12,500	192	48	23	.9	520	7.3	--
May 27-30.....	7,063	14	.01	78	14	38	9.6	197	110	47	.4	3.1	.08	429	.58	8,180	253	91	24	1.0	671	7.4	--
May 31-June 9	5,236	13	.01	93	18	70	10	226	138	99	.4	3.0	.11	576	.78	8,140	306	121	32	1.7	910	7.3	--
June 10-14.....	6,492	13	.00	75	14	45	9.2	194	97	64	.4	2.9	.09	434	.59	7,610	244	85	28	1.3	694	7.2	10
June 15-18.....	9,235	13	.01	60	11	29	8.3	185	56	39	.4	5.0	.09	329	.45	8,200	195	43	23	.9	531	7.4	--
June 19-July 3	6,243	13	.01	70	13	49	7.8	196	82	67	.4	3.5	.08	417	.57	7,030	226	65	31	1.4	680	7.1	--
July 4-8.....	12,190	14	.01	55	10	27	7.8	170	49	36	.3	5.2	.07	298	.41	9,810	179	40	24	.9	488	7.2	--
July 9-10.....	9,090	14	.00	66	13	50	9.2	183	86	70	.4	4.4	.10	424	.58	10,410	218	68	32	1.5	679	7.5	--
July 11-21.....	33,150	11	.01	45	6.9	11	6.3	148	26	14	.4	4.9	.07	212	.29	18,980	141	20	14	.4	342	7.2	15
July 22-26.....	17,880	13	.01	53	8.0	20	8.1	163	39	27	.4	4.5	.08	270	.37	13,030	165	31	20	.7	427	7.4	--
July 27-Aug. 5....	20,040	12	.00	49	6.7	14	7.1	161	34	15	.6	3.0	.05	228	.31	12,340	150	18	16	.5	372	7.2	--
Aug. 6-20.....	7,213	14	.02	65	12	33	8.6	192	71	46	.4	2.0	.07	360	.49	7,010	210	53	25	1.0	583	7.3	--
Aug. 21-23.....	12,100	13	.00	56	9.4	28	7.1	169	52	37	.7	5.0	.07	300	.41	9,800	178	39	25	.9	491	7.5	--
Aug. 24-Sept. 5...	5,577	16	.00	67	12	42	9.8	196	76	57	.4	2.9	.08	390	.53	5,870	216	55	29	1.2	636	7.6	--
Sept. 6-13.....	32,780	12	.02	43	6.4	18	7.3	143	30	23	.5	4.1	.05	223	.30	19,740	134	17	21	.7	364	7.2	15
Sept. 14-30.....	10,980	13	.13	55	9.7	21	7.1	176	49	25	.3	4.1	.06	280	.38	8,300	177	33	20	.7	451	7.3	--
Weighted average a.....	7,581	13	0.02	61	11	33	7.6	181	63	42	0.4	4.3	0.07	337	0.46	6,900	197	49	26	1.0	546	--	--

a Represents 100 percent of runoff for water year October 1957 to September 1958.

KANSAS RIVER BASIN--Continued

6B-8890. KANSAS RIVER AT TOPEKA, KANS.--Continued

Temperature (° F) of water, water year October 1957 to September 1958
/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	68	52	40	--	32	37	49	60	77	81	79	--
2	67	52	38	32	32	36	51	62	74	82	a 81	76
3	68	a 49	36	32	32	37	52	63	a 76	81	a 83	78
4	65	48	38	32	32	37	56	59	80	--	84	77
5	64	48	40	33	32	39	52	58	79	77	83	79
6	68	47	43	32	32	38	--	60	74	a 77	84	77
7	66	49	39	32	32	38	47	62	74	77	84	a 75
8	65	45	37	32	32	38	49	62	80	79	83	75
9	60	42	38	33	32	37	48	62	76	80	a 83	75
10	58	44	38	33	32	37	48	66	82	78	--	76
11	58	45	32	33	32	36	49	--	80	73	84	72
12	57	44	32	33	32	36	53	71	79	a 74	86	74
13	56	46	33	38	32	38	--	72	80	--	87	a 75
14	58	49	34	42	32	37	53	72	a 76	77	86	72
15	60	50	--	36	32	39	54	73	75	77	87	71
16	60	a 47	41	36	32	a 39	59	73	74	75	a 80	71
17	60	43	42	36	32	38	61	72	77	73	a 80	68
18	57	40	42	35	32	40	a 64	73	75	73	81	69
19	56	37	42	37	32	41	64	71	78	a 79	81	69
20	56	38	40	34	32	43	--	72	79	75	81	--
21	54	37	40	32	32	44	62	72	a 77	74	77	69
22	56	36	41	32	32	42	60	72	a 73	75	76	71
23	59	38	44	33	33	40	--	68	72	76	75	71
24	53	39	39	32	34	42	59	68	73	76	76	75
25	47	41	a 43	32	38	44	60	72	70	78	72	a 74
26	45	46	39	32	46	46	58	72	69	a 78	74	a 73
27	47	46	41	32	44	49	a 58	73	72	a 75	76	70
28	46	--	38	32	42	49	60	74	74	77	79	67
29	47	39	38	33	--	46	57	70	a 77	79	81	a 64
30	50	36	35	35	--	46	56	75	79	81	--	63
31	52	--	32	34	--	47	--	78	--	80	77	--
Average	58	44	38	34	34	41	55	69	76	77	81	72

a Measurement between 2 p.m. and 3 p.m.

KANSAS RIVER BASIN--Continued

6B-8910. KANSAS RIVER AT LECOMPTON, KANS.

LOCATION.--At gaging station at highway bridge at Lecompton, Douglas County, half a mile downstream from Delaware River.
DRAINAGE AREA.--58,420 square miles, approximately, of which a large area is noncontributing.
RECORDS AVAILABLE.--Chemical analyses: October 1957 to September 1958 (discontinued).
REMARKS.--Records of discharge for water year October 1957 to September 1958 given in WSP 1560.

Chemical analyses, in parts per million, water year October 1957 to September 1958

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. 7, 1957....	3,340	14	0.01	67	12	[illegible]	[illegible]	180	93	63	0.4	3.4	0.08	401		0.55		216	68	31	1.4	669	7.4	
Nov. 15.....	2,230	16	.08	86	17	70	8.7	250	107	61	.4	3.5	.06	529		.72		284	79	34	1.8	879	7.5	
Dec. 9.....	1,780	18	.08	97	20	100	8.3	282	126	126	.4	3.4	.10	652		.89		323	92	39	2.4	1,060	7.8	
Jan. 13, 1958 ..	1,760	15	.00	98	21	110	7.0	288	131	140	.4	2.5	.08	690		.94		329	93	41	2.6	1,120	7.5	
Feb. 11.....	923	14	.00	109	22	84	7.1	322	130	101	.3	4.6	.01	646		.88		363	99	33	1.9	1,040	7.8	
Mar. 13.....	10,900	12	.05	52	16	23	6.2	182	56	26	.3	8.2	.06	309		.42		194	45	20	.7	489	7.5	
Apr. 7.....	12,900	11	.02	70	9.6	22	7.8	192	68	26	.3	4.5	.06	320		.44		214	57	18	.7	526	7.4	
June 9	7,660	12	.01	84	15	64	9.2	214	114	77	.5	4.2	.09	494		.67		272	97	33	1.7	799	7.0	
July 7	9,020	10	.02	50	8.5	22	7.0	156	44	24	.4	4.1	.05	250		.34		160	32	22	.8	423	7.2	
Aug. 11.....	10,400	14	.01	64	15	35	9.8	202	76	48	.3	1.8	.07	374		.51		223	57	24	1.0	598	7.2	
Sept. 9.....	48,600	11	.01	34	5.8	8.6	7.2	125	15	9.6	.3	3.1	.04	170		.23		109	6	14	.4	268	6.9	

MISCELLANEOUS ANALYSES OF LAKES AND STREAMS IN KANSAS RIVER BASIN

Chemical analyses, in parts per million, water year October 1957 to September 1958

Date of collection	Lake content (acre-ft)	Silica (SiO_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					
6B-8260. BONNY RESERVOIR NEAR HALE, COLO.																							
Sept. 27, 1957	35,320	20	0.00	40	8.8	21	9.3	188	23	3.5	0.9	1.5	0.11	218	0.30		136	0	24	0.8	361	7.8	
Dec. 3	37,390					22		208	33	4.3				--	--		151	0	23	.8	395	7.8	
Mar. 14, 1958	43,200					23		216	--	--				264	.36		160	0	24	.8	412	7.7	
May 2	41,130					23		212	--	--				252	.34		158	0	24	.8	407	7.9	
6B-8490. HARLAN COUNTY RESERVOIR NEAR REPUBLICAN CITY, NEBR.																							
Dec. 23, 1957	349,700					16		205						258	0.35		164	0	18	0.5	413	8.1	--
Mar. 13, 1958	361,800					17		210						278	.38		180	8	17	.6	431	7.5	10
Apr. 30	350,900					18		218						288	.39		176	0	18	.6	445	7.5	10
June 16	349,300					20		a 218						275	.37		175	0	20	.7	440	8.4	--
6B-8615. CEDAR BLUFF RESERVOIR NEAR ELLIS, KANS.																							
Dec. 18, 1957	190,980					16		138						340	0.46		218	105	14	0.5	524	7.4	
Mar. 11, 1958	189,240					16		140						348	.47		224	109	14	.5	534	8.1	
May 4	190,980					18		140						369	.50		235	120	14	.5	562	7.5	
6B-8650. KANOPOLIS RESERVOIR NEAR KANOPOLIS, KANS.																							
Nov. 15, 1957	65,350	8.9	0.07	70	11	45	12	148	114	57	0.4	2.2	0.06	404	0.55		220	99	29	1.3	653	7.8	
Feb. 3, 1958	58,730					86		184						595	.81		290	139	39	2.2	973	7.5	
May 6	51,046					71		150						564	.77		266	143	37	1.9	891	7.4	
Aug. 3	79,470					34		126						347	.47		182	79	29	1.1	551	7.0	

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

KANSAS RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF LAKES AND STREAMS IN KANSAS RIVER BASIN--Continued

Periodic determinations of suspended-sediment discharge, water year October 1957 to September 1958

Date	Discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Discharge (tons per day)
6B-8695. SALINE RIVER AT TESCOTT, KANS.			
Oct. 2, 1957, 1:20 p.m.	171	386	179
Nov. 4, 11:20 a.m.	119	471	151
Dec. 2, 12:45 p.m.	109	281	83
Feb. 3, 1958, 1:30 p.m.	94	257	65
Mar. 5, 4:10 p.m.	70	200	38
Apr. 3, 1:30 p.m.	3,140	3,030	25,700
May 7, 3:15 p.m.	558	1,540	2,320
May 22, 10:20 a.m.	6,580	1,440	25,600
July 9, 12:30 p.m.	309	584	488
July 25, 2:45 p.m.	435	2,510	2,950
Sept. 20, 10:40 a.m.	185	554	277
6B-8730. SOUTH FORK SOLOMON RIVER ABOVE WEBSTER RESERVOIR, KANS.			
May 4, 1958, 8:10 a.m.	271	3,970	2,900
May 17, 9:15 p.m.	386	2,110	2,200
Aug. 16, 3:45 p.m.	3,590	9,040	87,600
6B-8769. SOLOMON RIVER AT NILES, KANS.			
Oct. 2, 1957, 2:50 p.m.	263	406	288
Nov. 4, 12:45 p.m.	161	154	67
Dec. 3, 9:10 a.m.	128	130	45
Jan. 15, 1958, 10:00 a.m.	118	93	30
Feb. 5, 2:00 p.m.	108	73	21
Mar. 6, 11:00 a.m.	563	632	961
Mar. 9, 4:30 p.m.	1,080	1,280	3,730
Mar. 27, 6:10 p.m.	1,180	2,390	7,610
Apr. 4, 2:45 p.m.	2,020	2,580	14,100
May 8, 10:45 a.m.	493	496	660
May 20, 7:20 p.m.	7,340	2,300	45,600
June 9, 4:45 p.m.	463	356	445
July 4, 11:15 a.m.	340	644	592
July 7, 1:45 p.m.	931	1,710	4,300
July 24, 2:40 p.m.	639	2,830	4,880
Aug. 19, 6:00 p.m.	649	1,250	2,190
Sept. 10, 11:20 a.m.	1,540	4,880	20,300
6B-8780. CHAPMAN CREEK NEAR CHAPMAN, KANS.			
Mar. 9, 1958, 2:10 p.m.	237	1,700	1,090
May 18, 5:10 p.m.	859	2,550	5,910
July 3, 8:20 p.m.	5,900	2,000	31,900
July 3, 10:40 p.m.	3,780	1,800	18,400
July 4, 12:15 p.m.	3,780	1,240	12,700
July 18, 2:30 p.m.	376	2,340	2,380
Sept. 10, 12:15 p.m.	14	323	12
6B-8785. LYON CREEK NEAR WOODBINE, KANS.			
Mar. 27, 1958, 3:20 p.m.	69	185	34
May 13, 4:30 p.m.	93	139	35
June 9, 11:20 a.m.	112	326	99
June 21, 2:50 p.m.	49	231	31
Sept. 11, 10:30 a.m.	66	161	29
6B-8792. CLARK CREEK NEAR JUNCTION CITY, KANS.			
Mar. 27, 1958, 2:30 p.m.	60	68	11
June 21, 3:40 p.m.	38	156	16
July 3, 9:40 p.m.	700	1,150	2,170
Sept. 11, 11:00 a.m.	91	317	78
6B-8840. LITTLE BLUE RIVER NEAR FAIRBURY, NEBR.			
Oct. 28, 1957, 9:50 a.m.	120	38	12
Nov. 21, 12:05 p.m.	a 127	56	19
Jan. 7, 1958, 11:05 a.m.	a 109	148	44
Jan. 23, 12:40 p.m.	a 140	52	20
Feb. 12, 11:50 a.m.	a 94	56	14

a Daily mean discharge.

Periodic determinations of suspended-sediment discharge, water year October 1957 to September 1958--Continued

Date	Discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Discharge (tons per day)
6B-8840. LITTLE BLUE RIVER NEAR FAIRBURY, NEBR.--Continued			
Feb. 27, 1958, 2:35 p.m.	408	3,060	3,370
Mar. 4, 11:00 a.m.	168	195	88
Mar. 25, 11:30 a.m.	1,710	4,830	22,300
Mar. 25, 3:50 p.m.	2,110	5,710	32,500
Apr. 3, 1:20 p.m.	2,070	12,100	67,600
Apr. 3, 2:10 p.m.	2,080	10,600	59,500
Apr. 3, 3:30 p.m.	2,040	9,470	52,200
Apr. 3, 3:45 p.m.	2,030	9,840	53,900
Apr. 18, 11:20 a.m.	212	182	104
Apr. 18, 12:15 p.m.	212	172	98
May 7, 10:40 a.m.	205	134	74
May 27, 11:25 a.m.	166	50	22
June 12, 11:40 a.m.	2,310	12,200	76,100
June 19, 1:15 p.m.	232	1,400	877
July 10, 1:00 p.m.	2,070	14,200	79,400
July 10, 3:00 p.m.	2,440	10,800	71,200
July 11, 11:10 a.m.	5,100	8,700	120,000
July 11, 2:05 p.m.	5,530	8,560	128,000
July 11, 3:10 p.m.	5,640	8,180	125,000
July 17, 11:00 a.m.	6,140	5,620	93,200
July 17, 1:20 p.m.	5,780	5,640	88,000
July 18, 6:40 a.m.	5,920	3,560	56,900
July 18, 8:30 a.m.	5,820	3,460	54,400
July 24, 7:50 p.m.	6,720	5,620	102,000
July 25, 12:45 a.m.	10,700	4,140	120,000
Aug. 14, 4:15 p.m.	196	160	85
Aug. 18, 11:05 a.m.	1,650	5,790	25,800
Sept. 6, 4:40 p.m.	8,020	3,280	71,000
Sept. 6, 6:20 p.m.	8,290	3,080	68,900
Sept. 8, 10:30 a.m.	2,200	3,490	20,700
Sept. 8, 11:15 a.m.	2,080	3,770	21,200
6B-8855. BLACK VERMILLION RIVER NEAR FRANKFORT, KANS.			
Mar. 8, 1958, 11:35 a.m.	1,560	2,280	9,600
June 13, 11:40 a.m.	246	5,160	3,430
July 31, 4:45 p.m.	12,600	2,040	69,400
Aug. 1, 4:10 p.m.	3,420	675	6,230
6B-8905. DELAWARE RIVER AT VALLEY FALLS, KANS.			
Dec. 5, 1957, 12:10 p.m.	93	110	28
Jan. 16, 1958, 2:00 p.m.	76	53	11
Mar. 19, 10:30 a.m.	296	138	110
May 9, 2:45 p.m.	260	241	166
May 23, 9:45 a.m.	166	2,100	941
June 13, 5:05 p.m.	2,600	9,180	64,400
July 10, 4:20 p.m.	101	112	30
Aug. 1, 9:05 a.m.	37,400	1,500	152,000
Aug. 2, 12:30 p.m.	2,500	2,280	15,400
Sept. 11, 3:45 p.m.	610	2,940	4,840
6B-8915. WAKARUSA RIVER NEAR LAWRENCE, KANS.			
Mar. 19, 1958, 12:25 p.m.	262	111	79
May 23, 12:10 p.m.	39	205	22
July 10, 8:00 p.m.	12	141	4.6
Aug. 1, 4:30 a.m.	1,550	1,360	5,690
Sept. 11, 5:55 p.m.	16	135	5.8
6B-8920. STRANGER CREEK NEAR TONGANOXIE, KANS.			
Nov. 5, 1957, 3:00 p.m.	17	77	4
Dec. 5, 2:30 p.m.	21	72	4
Mar. 19, 1958, 11:40 a.m.	114	136	42
May 9, 4:15 p.m.	230	486	302
May 23, 11:10 a.m.	58	195	30
July 10, 5:45 p.m.	74	246	49
Aug. 1, 2:20 a.m.	12,000	1,220	39,500
Aug. 2, 10:15 a.m.	7,500	582	11,800
Sept. 11, 5:05 p.m.	14	201	8

MISCELLANEOUS ANALYSES OF LAKES AND STREAMS IN KANSAS RIVER BASIN--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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	
6B-8635. BIG CREEK NEAR HAYS, KANS.																
Mar. 30, 1958....	12:55 p.m.	128	40	573	1,280	59			77		99	99	99	100			SPWCM
May 17	4:25 p.m.	1,680	46	2,710	5,140	56	71		89		99	100					VPWCM
6B-8680. SALINE RIVER NEAR WILSON, KANS.																
May 16, 1958.....	4:30 p.m.	1,110		5,680	5,200	53	65		84		97	99	100				VPWCM
Aug. 13.....	1:45 p.m.	132	89	524	1,240	57	66		85		98	99	100				VPWCM
6B-8695. SALINE RIVER AT TESCOTT, KANS.																
Apr. 3, 1958.....	1:30 p.m.	3,140	50	3,030	5,920	56	65		84		99	100					VPWCM
May 7	3:15 p.m.	558	59	1,540	2,980	62	70		89		99	100					VPWCM
May 22	10:20 a.m.	6,580	72	1,440	3,540	66	79		94		99	100					VPWCM
July 9	12:30 p.m.	309	77	584	2,100	72	80		90		100	--					VPWCM
July 25	2:45 p.m.	435	80	2,510	6,400	62	77		94		100	--					VPWCM
6B-8710. NORTH FORK SOLOMON RIVER AT GLADE, KANS.																
May 4, 1958.....	12:55 p.m.	296		6,080	5,430	40	53	61	71	82	98	99	100				SPWCM
May 4.....	12:55 p.m.	296		6,080	5,350	2	5	23	70	82	98	99	100				SPN
6B-8740. SOUTH FORK SOLOMON RIVER AT OSBORNE, KANS.																
Mar. 30, 1958....	12:35 p.m.	482		1,370	2,400		48		66		97	98	100				VPWCM
July 5	3:10 p.m.	540		6,910	6,400	54	69		89		100						VPWCM
6B-8769. SOLOMON RIVER AT NILES, KANS.																
Mar. 6, 1958.....	11:00 a.m.	368	37	832	1,220	61	66		84		100	--					VPWCM
Mar. 9	4:30 p.m.	1,080	34	1,280	3,550	66	73		86		99	99	99	100			VPWCM
Mar. 27	6:10 p.m.	1,180	--	2,390	4,610	67	72		88		100	--					VPWCM
Apr. 2	2:45 p.m.	2,020	--	2,580	2,680	67	75		89		99	100					VPWCM
May 20	7:20 p.m.	7,340	76	2,300	3,400	74	79		91		99	100					VPWCM
July 4	11:15 a.m.	340	--	644	1,440	67	73		82		100	--					VPWCM
July 7	1:45 p.m.	931	76	1,710	6,490	63	72		87		100	--					VPWCM

July 24	2:40 p.m.	639	--	2,830	4,940	66	80	94	100	--						VPWCM
Aug. 19	6:00 p.m.	649	76	1,250	1,810	48	53	69	--	--						PWCM
Sept. 10	11:20 a.m.	1,540	75	4,880	3,820	68	78	92	100	--						VPWCM
6B-8780. CHAPMAN CREEK NEAR CHAPMAN, KANS.																
Mar. 9, 1958	2:10 p.m.	237	38	1,700	2,500	81	86	97	100							VPWCM
May 18	5:10 p.m.	859	68	2,550	4,980	76	84	95	100							VPWCM
July 3	8:20 p.m.	5,900	73	2,000	4,730	78	87	97	100							VPWCM
July 3	10:40 p.m.	3,780	--	1,800	4,180	80	87	97	100							VPWCM
July 4	12:15 p.m.	3,780	73	1,240	3,760	81	88	96	100							VPWCM
July 18	2:30 p.m.	376	70	2,340	3,200	77	82	93	100							VPWCM
6B-8785. LYON CREEK NEAR WOODBINE, KANS.																
June 9, 1958	11:20 a.m.	112	73	326	1,240	68	73		99	100						VPWCM
June 21	2:50 p.m.	49	70	231					96	100						V
6B-8792. CLARK CREEK NEAR JUNCTION CITY, KANS.																
June 21, 1958	3:40 p.m.	38		156					96	100						V
July 3	9:40 p.m.	700	73	1,150	4,260	61	67	86	100							VPWCM
6B-8840. LITTLE BLUE RIVER NEAR FAIRBURY, NEBR.																
Jan. 7, 1958	11:05 a.m.	a 109	32	148	--	--	--	--	80	81	8	100	--			V
Feb. 27	2:35 p.m.	408	39	3,060	5,290	68	77	93	99	99	100	--	--			VPWCM
Mar. 4	11:00 a.m.	168	37	195	--	--	--	--	98	98	100	--	--			V
Mar. 25	11:30 a.m.	1,710	41	4,830	10,200	43	48	65	97	99	99	100	--			VPWCM
Mar. 25	3:50 p.m.	2,110	44	5,710	9,680	40	45	63	98	99	100	--	--			VPWCM
Apr. 3	3:30 p.m.	2,040	50	9,470	12,000	55	60	75	98	99	100	--	--			VPWCM
May 7	10:40 a.m.	205	65	134	--	--	--	--	98	99	100	--	--			V
May 27	11:25 a.m.	166	77	50	--	--	--	--	95	100	--	--	--			V
June 12	11:40 a.m.	2,310	65	12,200	11,500	47	52	70	96	97	97	98	99	100		VPWCM
June 19	1:15 p.m.	232	78	1,400	4,780	83	90	97	100	--	--	--	--			VPWCM
July 10	1:00 p.m.	2,070	75	14,200	5,860	38	43	55	74	75	75	78	100			VPWCM
July 10	3:00 p.m.	2,440	75	10,800	8,560	51	58	76	99	100	--	--	--			VPWCM
July 11	11:10 a.m.	5,100	73	8,700	7,530	48	60	79	98	99	100	--	--			VPWCM
July 11	11:10 a.m.	5,100	73	8,700	9,190	20	31	59	98	99	100	--	--			VPN
July 17	11:00 a.m.	6,140	72	5,620	8,310	48	53	69	94	97	99	100	--			VPWCM
July 18	6:40 a.m.	5,920	71	3,560	5,500	57	66	79	94	96	98	100	--			VPWCM
July 24	7:50 p.m.	6,720	--	5,620	5,790	51	58	68	86	89	92	97	100			VPWCM
July 25	12:45 a.m.	10,700	68	4,140	7,080	59	65	77	91	93	97	100	--			VPWCM
Aug. 14	4:15 p.m.	196	84	160	1,140	67	76	86	98	100	--	--	--			VPWCM
Aug. 18	11:05 a.m.	1,650	75	5,790	4,540	61	67	82	98	99	100	--	--			VPWCM

a Daily mean discharge.

MISCELLANEOUS ANALYSES OF LAKES AND STREAMS IN KANSAS RIVER BASIN--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958--Continued
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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	
6B-8840. LITTLE BLUE RIVER NEAR FAIRBURY, NEBR.--Continued																
Sept. 6, 1958....	4:40 p.m.	8,020	73	3,280	8,800	58	64		74		90	93	97	100	--		VPWCM
Sept. 6	6:20 p.m.	8,290	73	3,080	8,370	59	66		76		91	94	98	100	--		VPWCM
Sept. 8	10:30 a.m.	2,200	75	3,490	7,680	49	53		67		96	98	99	100	--		VPWCM
Sept. 8	11:15 a.m.	2,080	75	3,770	7,370	46	51		65		96	98	99	100	--		VPWCM
6B-8855. BLACK VERMILLION RIVER NEAR FRANKFORT, KANS.																
Mar. 8, 1958....	11:35 a.m.	1,560	36	2,280	4,100	60	64		84		100						VPWCM
June 13.....	11:40 a.m.	246	74	5,160	4,250	75	83		98		100						VPWCM
July 31	4:45 p.m.	12,600	--	2,040	2,840	79	87		98		100						VPWCM
Aug. 1	4:10 p.m.	3,420	77	675	2,070	89	90		96		100						VPWCM
6B-8905. DELAWARE RIVER AT VALLEY FALLS, KANS.																
Mar. 19, 1958...	10:30 a.m.	296	37	138	--	--	--		--		98	99	100				V
June 13.....	5:05 p.m.	2,600	78	9,180	9,740	57	68		90		100	--					VPWCM
Aug. 1	9:05 a.m.	37,400	73	1,500	3,290	76	88		97		100	--					SPWCM
Aug. 2	12:30 p.m.	2,500	76	2,280	7,800	39	44		65		99	100					VPWCM
Sept. 11	3:45 p.m.	610	72	2,940	--	67	72		88		100	--					SPWCM
6B-8915. WAKARUSA RIVER NEAR LAWRENCE, KANS.																
July 10, 1958....	8:00 p.m.	12		141	490	82	82				100						VPWCM
Aug. 1	4:30 a.m.	1,550	74	1,360	1,720	60	68		85		96	96	96	97	100		VPWCM
6B-8920. STRANGER CREEK NEAR TONGANOXIE, KANS.																
July 10, 1958....	5:45 p.m.	74	76	246	--	--	--		--		88	100					V
Aug. 1.....	2:20 a.m.	12,000	73	1,220	1,980	86	88		97		100						VPWCM
Aug. 2.....	10:15 a.m.	7,500	76	582	1,810	88	93		96		100						PWCM

MISCELLANEOUS ANALYSES OF LAKES AND STREAMS IN KANSAS RIVER BASIN--Continued

Particle-size analyses of bed material, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time	Discharge (cfs)	Number of sampling points	Bed material: Percent finer than indicated size, in millimeters												Methods of analysis
				0.062	0.125	0.250	0.500	1.000	2.000	4.000	8.000	16.000	32.000	64.000	128.00	
6B-8840. LITTLE BLUE RIVER NEAR FAIRBURY, NEBR.																
Oct. 28, 1957.....	9:50 a.m.	120	12	--	0	9	32	51	63	84	95	99	100			SV
Nov. 21.....	12:05 p.m.	a 127	12	--	0	5	24	41	55	77	92	97	100			SV
Jan. 23, 1958.....	12:40 p.m.	a 140	11	--	0	8	40	62	72	86	98	100	--			SV
Feb. 12.....	11:50 a.m.	a 94	13	--	0	7	20	34	47	72	92	99	100			SV
Feb. 27.....	2:35 p.m.	408	22	--	0	6	26	44	54	71	89	96	100			SV
Mar. 4.....	11:00 a.m.	168	17	0	1	11	37	60	71	87	98	100	--			SV
Mar. 25.....	11:30 a.m.	1,710	8	9	10	19	39	64	75	85	93	97	100			SV
Apr. 18.....	11:20 a.m.	212	10	--	0	8	41	63	74	90	98	100	--			SV
May 7	10:40 a.m.	205	17	5	6	12	42	66	76	87	96	100	--			SV
June 19	1:15 p.m.	232	17	2	3	7	23	46	54	70	89	99	100			SV
June 11	11:10 a.m.	5,100	12	13	16	25	49	70	82	91	97	99	100			SV

a Daily mean discharge.

CHARITON RIVER BASIN

6B-9035. HONEY CREEK NEAR RUSSELL, IOWA

LOCATION.--At gaging station on downstream side of highway bridge, 0.7 mile upstream from Chariton River and 5.5 miles southeast of Russell, Lucas County.
DRAINAGE AREA.--13.2 square miles.
RECORDS AVAILABLE.--Sediment records: June 1952 to September 1958.
EXTREMES,1957-58.--Sediment concentrations: Maximum daily, 750 ppm May 4; minimum daily, no flow on many days.
Sediment loads: Maximum daily, 380 tons July 2; minimum daily, 0 tons on many days.
EXTREMES, 1952-58.--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.--Maximum observed sediment concentration during water year, 1,660 ppm Sept. 9. Flow affected by ice Nov. 27-30, Dec. 9-13, Dec. 26 to Jan. 3, Jan. 7 to Feb. 24. Backwater from Chariton River Feb. 25 to Mar. 1, May 5, July 2-5, 20, 21, July 30 to Aug. 4, Sept. 24, 25. Records of discharge for water year October 1957 to September 1958 given in WSP 1560.

Suspended sediment, water year October 1957 to September 1958

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	0.19		(t)	0.37	--	
2	0	--	0	1.1		e 0.1	.42	3	
3	0	--	0	.86		(t)	.47	--	
4	0	--	0	.25			.47	17	
5	0	--	0	.16		(t)	.54	--	
6	0	--	0	.16			.70	--	
7	0	--	0	.19			.70	22	
8	0	--	0	.54			.62	--	
9	0	--	0	.62			.45	--	
10	0	--	0	.54		(t)	.35	--	(t)
11	0	--	0	.54			.15	--	
12	0	--	0	.47			.11	--	
13	0	--	0	.54	11		.11	--	
14	0	--	0	1.0		e .1	.22	--	
15	0	--	0	.54		(t)	.37	--	
16	0	--	0	.42			.54	8	
17	0	--	0	.32			.78	--	
18	0	--	0	1.7		e .3	1.9	--	e 0.2
19	0	--	0	4.3		e 1.0	2.5	--	e .3
20	0	--	0	2.3		e .5	2.7	22	
21	0	--	0	1.8			2.1	--	e .1
22	0	--	0	1.9			1.7	--	
23	1.2	75	sa .5	1.2		e .1	1.3	--	
24	5.2	80	a 1.1	1.1			.86	--	
25	1.5	--	e .2	.95			6.7	120	sa 1.9
26	.42			.86			3.5	40	b .4
27	.22			.70			2.4	20	b .1
28	.14	--	(t)	.54		(t)	1.6	13	
29	.14			.40			1.1	--	(t)
30	.14			.33			.80	--	
31	.14			--		--	.56	--	
Total	9.10	--	1.8	26.52		2.9	37.09	--	3.7

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.

CHARITON RIVER BASIN--Continued

6B-9035. HONEY CREEK NEAR RUSSELL, IOWA--Continued

Suspended sediment, water year October 1957 to September 1958--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	0.38	--		1.0	--		13	110	3.9
2	.25	--		1.0	--		8.2	70	b 1.5
3	.35	--		1.0	2		6.3	50	.9
4	.47	--		1.0	--	(t)	5.8	30	.5
5	.54	--		1.1	--		9.8	60	sa 1.9
6	.95	3		1.0	--		17	55	b 2.6
7	1.1	--	(t)	.90			7.6	38	.8
8	.70	--		.80			7.6	26	
9	.45	--		.60			6.6	--	e .5
10	.56	--		.50			5.2	--	
11	.70	--		.45			4.3	--	
12	.90	--		.40			3.8	13	
13	1.1	--		.35			3.6	--	e .1
14	1.4	8		.30			3.2	11	
15	1.6	--		.28	--	(t)	2.8	13	
16	1.5	--		.26			2.6	--	
17	1.4	--		.25			2.3	--	
18	1.3	--		.25			2.3	10	
19	1.2	--		.27			2.3	--	
20	1.3	--		.30			2.3	15	
21	1.2	--		.34			2.1	--	
22	1.1	--	(t)	.45	6	(t)	1.9	--	
23	1.3	--		1.6	32	sa 0.4	1.9	--	
24	1.3	12		100	220	sa 85	1.8	11	e .1
25	1.3	--		45	200	a 24	1.6	--	
26	1.3	--		15	140	b 5.5	1.5	--	
27	1.3	--		22	339	s 23	1.5	14	
28	1.2	--		16	200	b 8.5	1.4	--	
29	1.2	--		--	--	--	1.5	8	
30	1.1	--		--	--	--	1.5	--	
31	1.1	--		--	--	--	1.4	11	
Total	31.55	--	0.8	212.40	--	146.5	134.7	--	15.7

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	1.7	34	0.2	0.78	--	(t)	0.22	--	
2	2.6	24	.2	.78			.32	--	
3	2.7	28	.2	1.4	100	sa 0.6	.19	--	
4	4.1	26	.3	81	750	a 160	.14	--	(t)
5	4.4	60	.7	25	162	s 13	.07	30	
6	5.0	80	1.1	6.0	110	1.8	.05	--	
7	4.8	50	.6	4.0	47	.5	.23	110	b 0.1
8	2.8	51	.4	3.6	--	e .5	.95	190	b .5
9	2.3	--		2.8	--	e .4	12	480	sa 18
10	2.1	31	e .2	2.1	52	.3	2.6	181	1.3
11	1.9	--		1.7			.78	160	b .3
12	1.6	15		1.4	--	e .2	2.8	300	sa 2.8
13	1.5	--		1.0			2.6	150	a 1.1
14	1.4	--		.95	36	.1	1.7	150	.7
15	1.4	18		1.4	--	e .3	.86	140	b .3
16	1.3	--	e .1	1.2	59	.2	.70	130	sb .3
17	1.2	--		1.0	36	.1	1.6	200	sb 1.0
18	1.1	--		.95	--	e .1	1.2	70	a .2
19	1.2	15		.62	35	.1	.54	50	b .1
20	2.1	52	.3	.35	--		.37	40	(t)
21	2.2	70	.4	.32	--		.28	38	(t)
22	2.7	100	.7	.28	--		.22		
23	2.5	58	.4	.25	--		.22		
24	3.4	30	.3	.22	22		.19		
25	1.9	--		.19	--	(t)	.14	--	(t)
26	1.5	37		.16	--		.10		
27	1.4	--	e .1	.14	--		.05		
28	1.4	--		.12	--		.02		
29	1.0	--		.07	--		0	--	0
30	.86	--		.07	--		0	--	0
31	--	--	--	.16	32		--	--	--
Total	66.06	--	7.8	140.01	--	178.7	31.14	--	26.9

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.

CHARITON RIVER BASIN--Continued

6B-9035. HONEY CREEK NEAR RUSSELL, IOWA--Continued

Suspended sediment, water year October 1957 to September 1958--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	85	120	sa 44	0.12	--	
2	312	440	a 380	16	42	sa 1.9	.14	25	
3	48	240	sa 65	4.5	40	b .5	.16	--	
4	192	300	sa 220	3.2	40	sb .4	.22	--	
5	14	93	s 3.6	26	140	sa 11	.22	--	(t)
6	4.6	70	b .9	14	40	b 1.5	.22	--	
7	2.2	60	b .4	4.4	--	e .6	.16	--	
8	2.0	60	.3	2.6	--	e .4	.14	--	
9	1.6	54	.2	1.9	79	.4	58	340	sa 100
10	1.9	95	a .5	1.5	--	e .2	7.2	75	sa 1.6
11	3.8	150	sb 1.7	1.2	--	e .2	1.6	46	b .2
12	3.2	160	b 1.4	2.2	110	sb 1.8	.86	32	.1
13	1.8	150	b .7	7.3	150	sb 3.6	.47	--	(t)
14	1.3	144	.5	2.2	90	b .5	.32	--	(t)
15	1.1	130	b .4	1.4	75	b .3	.95	28	.1
16	.86	120	b .3	.95	65	.2	1.0		
17	5.4	190	sa 3.4	.78			.95		
18	5.8	77	1.2	.54	--	e .1	.70	--	e .1
19	129	260	sa 100	.37			.47		
20	34	75	a 7.0	1.6	170	sa 1.0	.37		
21	6.9	65	b 1.2	2.5	95	.6	2.3	65	a .4
22	4.0	--	e .5	1.1	75	b .2	1.4	34	b .1
23	2.6	--		.62	--		57	260	sa 75
24	2.0	--		.70	--		85	260	sa 65
25	1.7	--	e .3	.54	--	e .1	5.3	150	sb 2.4
26	1.2	52		.47	52		2.8	80	b .6
27	45	260	sa 42	.47	--		1.9	50	b .3
28	8.7	90	sb 2.2	.42	--		1.4		
29	3.0	80	b .6	.32			1.2	--	e .1
30	229	260	sa 180	.22	--	(t)	1.2		
31	200	180	sa 110	.16			--	--	--
Total	1,268.66	--	1,125.2	185.16	--	70.3	233.77	--	246.7

Total discharge for year (cfs-days) 2,376.16
Total load for year (tons) 1,827.0

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.

CHARITON RIVER BASIN--Continued

6B-9035. HONEY CREEK NEAR RUSSELL, IOWA--Continued

Particle-size analyses of suspended sediment, water year October 1957 to September 1958
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

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, 1958.....	8:45 a.m.	620	65	569	2,130		53		76		98	98	99		100		SPWCM
July 19.....	9:50 a.m.	186	64	559	2,700		56		83		99	99	100		--		SPWCM
July 30.....	6:05 a.m.	294	64	480	1,960		70		87		100	--	--		--		SPWCM
July 30.....	9:05 a.m.	535	64	604	2,620		71		94		98	98	99		100		SPWCM

MISSOURI RIVER MAIN STEM--Continued

6B-9090. MISSOURI RIVER AT BOONVILLE, MO.

LOCATION.--Temperature recorder at gaging station at Missouri-Kansas-Texas Railroad Co. bridge at Boonville, Cooper County.
DRAINAGE AREA.--505,700 square miles, approximately.
RECORDS AVAILABLE.--Water temperatures: May 1953 to September 1958.
EXTREMES, 1957-58.--Water temperatures: Maximum daily mean, 81°F on several days during August; minimum daily mean, freezing point on many days during December to February.
EXTREMES, 1953-58.--Water temperatures: Maximum daily mean, 90°F July 31 to August 3, 1955; minimum daily mean, freezing point on many days during winter months.
REMARKS.--Records indicate only a few degrees change in temperature from day to day with very little, if any, diurnal change. Records of discharge for water year October 1957 to September 1958 given in WSP 1560.

Daily mean temperature (° F) of water, water year October 1957 to September 1958
/Recorder with temperature attachment, continuous ethyl alcohol-actuated thermograph/

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

a Estimated on basis of record for adjoining days.

INDEX

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