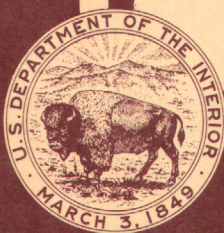
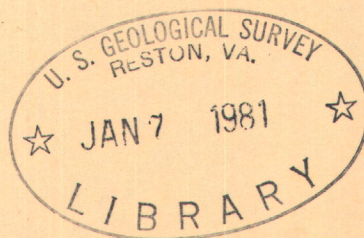


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Water Resources Data for South Dakota

Part 1. Surface Water Records



UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Prepared in cooperation with the State of South Dakota
and with other agencies

CALENDAR FOR WATER YEAR 1973

1972

OCTOBER

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
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NOVEMBER

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1973

JANUARY

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JULY

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AUGUST

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1973

**Water Resources Data
for
South Dakota**

Part 1. Surface Water Records



**UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY**

**Prepared in cooperation with the State of South Dakota
and with other agencies**

Prepared in cooperation with

South Dakota Department of Natural Resource Development
South Dakota Department of Transportation
East Dakota Conservancy Sub-district
Black Hills Conservancy Sub-district
Corps of Engineers, U.S. Army
Bureau of Reclamation, U.S. Department of the Interior
Fish and Wildlife Service, U.S. Department of the Interior
Bureau of Indian Affairs, U.S. Department of the Interior

Water resources records, 1973, for South Dakota are in the following reports of the U.S. Geological Survey:

1. Water Resources Data for South Dakota
Part 1: Surface Water Records
2. Water Resources Data for South Dakota
Part 2: Water Quality Records

Copies of this report may be obtained from
District Chief, Water Resources Division
U.S. Geological Survey
P. O. Box 1412
Room 231, Federal Building
Huron, South Dakota 57350

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WATER RESOURCES DATA FOR SOUTH DAKOTA, 1973

PART 1. SURFACE-WATER RECORDS

by O. J. Larimer and E. M. Decker

INTRODUCTION

Surface-water records for the 1973 water year for South Dakota, including records of streamflow or reservoir storage at gaging stations and partial-record stations, are given in this report and their locations shown in figures 1 and 2. Records for a few pertinent gaging stations in bordering States are also included. These data represent that portion of the National Water Data System collected by the U.S. Geological Survey and cooperating State and Federal agencies in South Dakota. The records were collected and computed by the Water Resources Division of the U.S. Geological Survey under the direction of J. E. Powell, district chief. South Dakota district personnel who contributed significantly to the collection and preparation of data included in this report were: L. B. Yarger, L. D. Becker, D. W. Heyd, H. L. Dixon, J. H. Eade, D. G. Adolphson, E. B. Hoffman, T. K. Lockner, J. Hanneman, R. C. Ugland, R. C. Beard, L. B. Huber, V. J. Wipf, and J. E. Looman.

Through September 30, 1960, the records of discharge and stage of streams and canals and contents and stage of lakes or reservoirs were published in an annual series of the U.S. Geological Survey water-supply papers entitled "Surface Water Supply of the United States."

Beginning with the 1961 water years, surface-water records have been released by the Geological Survey in annual reports on a State-boundary basis. Distribution of these reports is limited; they are designed primarily for rapid release of data shortly after the end of the water year to meet local needs. Discharge and reservoir storage records are also published in a Geological Survey water-supply paper series entitled "Surface Water Supply of the United States 1961-65"; "1966-70." A similar series is planned for the years 1971-75.

COOPERATION

The U.S. Geological Survey and organizations of the State of South Dakota have had cooperative agreements for the systematic collection of surface-water records since 1914. Organizations that supplied data are acknowledged in station descriptions. Organizations that assisted in collecting data through cooperative agreement with the Survey are:

Department of Natural Resource Development,
Vern W. Butler, Secretary.

Department of Transportation, Herb Teske, Secretary.

East Dakota Conservancy Sub-district, J. L. Siegel,
Manager-Engineer.

Black Hills Conservancy Sub-district, Ed Glassgow,
Manager-Treasurer.

Assistance in the form of funds or services was given by the Corps of Engineers, U.S. Army, in collecting records for 24 gaging stations and 10 stage stations; the Bureau of Reclamation, U.S. Department of Interior, for 3 gaging stations; and the Fish and Wildlife Service, U.S. Department of the Interior, for one gaging station. The Missouri River Basin Program provided funds and services for 17 gaging stations.

DEFINITION OF TERMS

Definition of terms related to streamflow and other hydrologic data, as used in this report, are defined as follows: (See also table for converting English units to International System (SI) units on page 17.)

Acre-foot (AC-FT, acre-ft) is the quantity of water required to cover 1 acre to a depth of 1 foot and is equivalent to 43,560 cubic feet or 325,851 gallons.

Cfs-day is the volume of water represented by a flow of 1 cubic foot per second for 24 hours. It is equivalent to 86,400 cubic feet, 1.9835 acre-feet, or 646,317 gallons, and represents a runoff of 0.0372 inch from 1 square mile.

Contents is the volume of water in a reservoir or lake. Unless otherwise indicated, volume is computed on the basis of a level pool and does not include bank storage.

Control designates a feature downstream from the gage that determines the stage-discharge relation at the gage. This feature may be a natural constriction of the channel, an artificial structure, or a uniform cross section over a long reach of the channel.

Cubic feet per second per square mile (CFSM) is the average number of cubic feet of water flowing per second from each square mile of area drained, assuming that the runoff is distributed uniformly in time and area.

Cubic foot per second (cfs) is the rate of discharge representing a volume of 1 cubic foot passing a given point during 1 second, and is equivalent to 7.48 gallons per second or 448.8 gallons per minute.

Discharge is the volume of water (or more broadly, total fluids), that passes a given point within a given period of time.

Drainage area of a stream at a specified location is that area, measured in a horizontal plane, enclosed by a topographic divide from which direct surface runoff from precipitation normally drains by gravity into the stream above the specified point. Figures of drainage area given herein include all closed basins, or noncontributing areas, within the area unless otherwise noted.

Gage height (G.H.) is the water-surface elevation referred to some arbitrary gage datum. Gage height is often used interchangeably with the more general term "stage," although gage height is more appropriate when used with a reading on a gage.

Gaging station is a particular site on a stream, canal, lake, or reservoir where systematic observations of gage height or discharge are obtained. When used in connection with a discharge record, the term is applied only to those gaging stations where a continuous record of discharge is obtained.

Partial-record station is a particular site where limited streamflow data are collected systematically over a period of years for use in hydrologic analyses.

Runoff in inches (IN.) shows the depth to which the drainage area would be covered if all the runoff for a given time period were uniformly distributed on it.

Stage-discharge relation is the relation between gage height and the amount of water flowing in a channel, expressed as volume per unit of time.

WRD is used as an abbreviation for "Water-Resources Data" in the summary REVISIONS paragraph to refer to previously published State annual basic-data reports.

WSP is used as an abbreviation for "Water-Supply Paper" in references to previously published reports.

SPECIAL NETWORKS AND PROGRAMS

Hydrologic bench-mark station is one that provides hydrologic data for a basin in which the hydrologic regimen will likely be governed solely by natural conditions. Data collected at a bench-mark station may be used to separate effects of natural from man-made changes in other basins which have been developed and in which the physiography, climate, and geology are similar to those in the undeveloped bench-mark basin.

DOWNSTREAM ORDER AND STATION NUMBERS

Records are listed in a downstream direction along the main stream, and stations on tributaries are listed between stations on the main stream in the order in which those tributaries enter the main stream. Stations on tributaries entering above all mainstream stations are listed before the first mainstream station. Stations on tributaries to tributaries are listed in a similar manner. In the list of gaging stations in the front of this report the rank of tributaries is indicated by indention, each indention representing one rank.

As an added means of identification, each gaging station and partial-record station has been assigned a station number. These are in the same downstream order used in this report. In assigning station numbers, no distinction is made between partial-record stations and continuous-record gaging stations; therefore, the station number for a partial-record station indicates downstream order position in a list made up of both types of stations. Gaps are left in the numbers to allow for new stations that may be established; hence the numbers are not consecutive. The complete 8-digit number for each station, such as 06476000, includes the part number "06" and

a 6-digit station number and appears just to the left of the station name. In this report, the records are listed in downstream order by parts. All records for a drainage basin encompassing more than one State could be arranged in downstream order by assembling pages from the various State reports by station number to include all records in the basin.

EXPLANATION OF SURFACE-WATER DATA

Collection and Computation of Data

The base data collected at gaging stations consists of records of stage and measurements of discharge of streams or canals, and stage, surface area, and contents of lakes or reservoirs. In addition, observations of factors affecting the stage-discharge relation or the stage-capacity relation, weather records, and other information are used to supplement base data in determining the daily flow or volume of water in storage. Records of stage are obtained from a water-stage recorder that gives a continuous graph of the fluctuations (for digital recorders, a tape punched at 15-, 30-, or 60-minute intervals) or from direct readings on a nonrecording gage. Measurements of discharge are made with a current meter, using the general methods adopted by the Geological Survey on the basis of experience in stream gaging since 1888. These methods are described in standard textbooks on the measurement of stream discharge. (See also SELECTED REFERENCES.) Surface areas of lakes or reservoirs are determined from instrument surveys using standard methods. The configuration of the reservoir bottom is determined by sounding at many points.

For a stream-gaging station rating tables giving the discharge for any stage are prepared from stage-discharge relation curves defined by discharge measurements. If extensions to the rating curves are necessary to define the extremes of discharge, they are made on the basis of indirect measurements of peak discharge (such as slope-area or contracted-opening measurements, computation of flow over dams or weirs), velocity-area studies, and logarithmic plotting. The application of the daily mean gage heights to the rating table gives the daily mean discharge, from which the monthly and the yearly mean discharge are computed. If the stage-discharge relation is subject to change because of frequent or continual change in the physical features that form the control, the daily mean discharge is determined by the shifting-control method, in which correction factors based

on individual discharge measurements and notes by engineers and observers are used in applying the gage heights to the rating tables. If the stage-discharge relation for a station is temporarily changed by the presence of aquatic growth or debris on the control, the daily mean discharge is computed by what is basically the shifting-control method.

At some stream-gaging stations the stage-discharge relation is affected by backwater from reservoirs, tributary streams, or other sources. This necessitates the use of the slope method in which the slope or fall in a reach of the stream is a factor in determining discharge. Information required for determining the slope or fall is obtained by means of an auxiliary gage set at some distance from the base gage. At some stations the stage-discharge relation is affected by changing stage; at these stations the rate of change in stage is used as a factor in determining discharge.

At some stream-gaging stations the stage-discharge relation is affected by ice in the winter, and it becomes impossible to compute the discharge in the usual manner. Discharge for periods of ice effect is computed on the basis of the gage-height record and occasional winter discharge measurements, consideration being given to the available information on temperature and precipitation, notes by gage observers and hydrologists, and comparable records of discharge for other stations in the same or nearby basins.

For a lake or reservoir station, capacity tables giving the contents for any stage are prepared from stage-area relation curves defined by surveys. Discharge over spillways is computed from a stage-discharge relation curve defined by discharge measurements. The application of the stage to the capacity tables gives the contents, from which the daily, monthly, or yearly change in contents is computed.

If the stage-capacity curve is subject to changes because of deposition of sediment in the reservoir, periodic resurveys of the reservoir are necessary to define new stage-capacity curves. During the period between reservoir surveys the computed contents may be increasingly in error due to the gradual accumulation of sediment.

For some gaging stations there are periods when no gage-height record is obtained or the recorded gage height is so faulty that it cannot be used to compute daily discharge or contents. This happens when the recorder stops or otherwise fails to operate properly, intakes are plugged, the float is frozen in the well, or for various other reasons. For such periods the daily discharges are estimated on the

basis of recorded range in stage, adjoining good record, discharge measurements, weather records, and comparison with other station records from the same or nearby basins. Likewise daily contents may be estimated on the basis of operator's log, adjoining good record, inflow-outflow studies, and other information.

The data in this report generally comprise a description of the station and tabulations of basic data. For gaging stations on streams or canals a table showing the daily discharge and monthly and yearly discharge is given. For gaging stations on lakes and reservoirs a monthly summary table of stage and contents or a table showing the daily contents is given. Tables of daily mean gage heights are included for some streamflow stations and for some reservoir stations. Records are published for the water year, which begins on October 1 and ends on September 30. A calendar for the 1973 water year is shown on the reverse side of the front cover to facilitate finding the day of the week for any date.

The description of the gaging station gives the location, drainage area, period of record, type and history of gages, average discharge, extremes of discharge or contents, and general remarks. The location of the gaging station and the drainage area are obtained from the most accurate maps available. River mileage, given under "LOCATION" for some stations, is that determined and used by the Corps of Engineers or other agencies. Periods for which there are published records for the present station or for stations generally equivalent to the present one are given under "PERIOD OF RECORD." The type of gage currently in use, the datum of the present gage above mean sea level, and a condensed history of the types, locations, and datums of previous gages used during the period of record are given under "GAGE." In references to datum of gage, the phrase "mean sea level" denotes "Sea Level Datum of 1929" as used by the Topographic Division of the Geological Survey, unless otherwise qualified. The average discharge for the number of years indicated is given under "AVERAGE DISCHARGE"; it is not given for stations having fewer than 5 complete years of record or for stations where changes in water development during the period of record cause the figure to have little significance. In addition, the median of yearly mean discharges is given for stream-gaging stations having 10 or more complete years of record if the median differs from the average by more than 10 percent. The maximum discharge (or contents) and the maximum gage height, the minimum discharge if there is little or no regulation (or the minimum contents), and the minimum gage height if it is significant are given if there is extensive regulation (also the minimum

discharge and gage height if they are abnormally low). In the first paragraph headed "Current year:" the data given are for the complete current water year unless otherwise specified. In the second paragraph under "EXTREMES" headed "Period of record:" the data given are for the period of record given in the PERIOD OF RECORD paragraph. Reliable information concerning major floods that occurred outside the period of record is given in the third or last paragraph under "EXTREMES." Unless otherwise qualified, the maximum discharge (or contents) corresponds to the crest stage obtained by use of a water-stage recorder (graphic or digital), a crest-stage gage, or a nonrecording gage read at the time of the crest. If the maximum gage height did not occur at the same time as the maximum discharge or contents, it is given separately. Information pertaining to the accuracy of the discharge records, to conditions that affect the natural flow at the gaging station, and availability of Water Quality records, is given under "REMARKS"; for reservoir stations information on the dam forming the reservoir, the capacity, outlet works and spillway, and purpose and use of the reservoir, is also given under "REMARKS."

Previously published records of some stations have been found to be in error on the basis of data or information later obtained. Revisions of such records are usually published along with the current records in one of the annual or compilation reports. In order to make it easier to find such revised records, a paragraph headed "REVISIONS (WATER YEARS)" has been added to the description of all stations for which revised records have been published. Listed therein are all the reports in which revisions have been published, each followed by the water years for which figures are revised in that report. In listing the water years only one number is given; for instance, 1933 stands for the water year October 1, 1932, to September 30, 1933. If no daily, monthly, or annual figures of discharge were revised, that fact is brought out by notations after the year dates as follows: "(M)" means that only the instantaneous maximum discharge was revised; "(m)" that only the instantaneous minimum discharge was revised; and "(P)" that only peak discharges were revised. If the drainage area has been revised, the report in which the revised figure was first published is given. It should be noted that for all stations for which cubic feet per second per square mile and runoff in inches are published, a revision of the drainage area necessitates corresponding revision of all figures based on the drainage area. Revised figures of cubic feet per second per square mile and runoff in inches resulting from a revision of the drainage area only are usually not published in the annual series of reports.

Skeleton rating tables are published for stream-gaging stations where they serve a useful purpose and the dates of applicability can be easily identified.

The daily tables for stream-gaging stations give the discharge corresponding to the daily mean gage height unless there are large or rapid changes in the discharge during a day. For days having large or rapid changes, discharge for the day is computed by averaging the mean discharge for several parts of a day. For digital recorders, the daily mean discharge is always the average of the discharges at each punched reading. For stations equipped with nonrecording gages, the daily discharge corresponds to once-daily readings of the gage or to the mean of twice-daily readings; but for periods of rapidly changing stage the discharge is determined from a gage-height graph based on gage readings.

The daily tables for reservoir stations give the contents corresponding to the water-surface elevation at a given time, usually at 2400 each day. For some reservoirs the elevation at a given time is given in the daily table.

The monthly summary is given below the daily table. For stream-gaging stations the line headed "TOTAL" gives the sum of the daily figures; it is the total cubic feet per second per day for the month. The line headed "MEAN" gives the average flow in cubic feet per second during the month. The lines headed "MAX" and "MIN" give the maximum and minimum daily discharges, respectively, for the month. Discharge for the month also may be expressed in cubic feet per second per square mile (line headed "CFSM"), or in inches (line headed "IN.") or in acre-feet (line headed "AC-FT"). Figures of cubic feet per second per square mile and runoff in inches are omitted if there is extensive regulation or diversion, if the drainage area includes large noncontributing areas, or if the average rainfall on the drainage basin is usually less than 20 inches.

For reservoir stations the monthly summary gives the elevation (or gage height) at the end of the month and the change in contents during the month. If elevation or gage height is given in the daily table, the monthly summary gives the contents at the end of the month, rather than the elevation or gage height. For some reservoirs a tabulation of monthly evaporation from the water surface also is included.

In the yearly summary below the monthly summary, the figures of maximum are the maximum daily discharges for the calendar and water years; likewise, the minimums in this summary are the minimum daily discharges.

For reservoir stations the yearly summary gives the change in contents for the calendar year and for the water year. For some reservoirs the yearly evaporation also is included.

Peak discharges and their times of occurrence and corresponding gage heights for many stations are listed below the yearly summary. All independent peaks above the selected base are given. The base discharge, which is given in parentheses, is selected so that an average of about three peaks a year can be presented. Peak discharges are not published for any canals, ditches, drains, or for any stream for which the peaks are subject to substantial control by man. Time of day is expressed in 24-hour local standard time; for example, 12:30 a.m. is 0030 and 1:30 p.m. is 1330.

In a general footnote, introduced by the word "NOTE" certain periods are indicated for which the discharge is computed or estimated by special methods because of no gage-height record, backwater from various sources, or other unusual conditions. Periods of no gage-height record are indicated if the period is continuous for a month or more or includes the maximum discharge for the year. Periods of backwater from an unusual source, of indefinite stage-discharge relation, or of any other unusual condition at the gage are indicated only if they are a month or more in length and the accuracy of the records is affected. Days on which the stage-discharge relation is affected by ice are not indicated. The methods used in computing discharge for various unusual conditions have been explained in preceding paragraphs. Footnotes to reservoir tables may be used to explain the use of new capacity tables or for other special conditions.

Accuracy of Data

The accuracy of discharge data depends primarily on (1) the stability of the stage-discharge relation or, if the control is unstable, the frequency of discharge measurements, and (2) the accuracy of observations of stage, measurements of discharge, and interpretation of records.

The station description under "REMARKS" states the degree of accuracy of the records. "Excellent" means that about 95 percent of the daily discharges is within 5 percent; "good" within 10 percent and "fair" within 15 percent. "Poor" means that daily discharges have less than "fair" accuracy.

Figures of daily mean discharge in this report are shown to the nearest hundredth of a cubic foot per second for discharges of less than 1 cfs; to tenths between 1.0 and 10 cfs; to whole numbers between 10 and 1,000 cfs; and to 3 significant figures above 1,000 cfs. The number of significant figures used is based solely on the magnitude of the figure. The same rounding rules apply to discharge figures listed for partial-record stations and miscellaneous sites.

Discharge at many stations, as indicated by the monthly mean, may not reflect natural runoff due to the effects of diversion, consumptive use, regulation, evaporation, or other factors. For such stations, discharge in cubic feet per second per square mile and runoff in inches are not published unless satisfactory adjustments can be made for such effects. Evaporation from a reservoir is not included in the adjustments for changes in reservoir contents, unless it is so stated. Even at those stations where adjustments are made, large errors in computed runoff may occur if adjustments or unadjusted losses (consumptive use, evaporation, seepage, etc.) are large in comparison with the observed discharge.

Publications

Each volume of the 1960 series of U.S. Geological Survey water-supply papers entitled "Surface Water Supply of the United States" contains a listing of the numbers of all water-supply papers in which records of surface-water data were published for the area covered by the individual volumes. Each volume also contains a list of water-supply papers that give detailed information on major floods for the area. The new series of water-supply papers containing surface-water records for the 5-year periods October 1, 1960, to September 30, 1965, October 1, 1966, to September 30, 1970, also include lists of annual and special reports published as water-supply papers.

Records through September 1950 for the area covered by this report have been compiled and published in Water-Supply Papers 1308(5) and 1309(6A); records for October 1950 to September 1960 have been compiled and published in Water-Supply Papers 1728(5) and 1729(6A). These reports contain summaries of monthly and annual discharge and monthend storage for all previously published records, as well as some records not contained in the annual series of water-supply papers. All records were reexamined and revised where

warranted. Estimates of discharge were made to fill short gaps whenever practical. The yearly summary table for each gaging station lists the numbers of the water-supply papers in which daily records were published for that station.

Special reports on major floods or droughts or of other hydrologic studies for the area have been issued in publications other than water-supply papers. Information relative to these reports may be obtained from the district office.

Other Data Available

Data collected at partial-record stations are given in a table at the end of the surface-water records in this report. The data presented are annual maximums of stage and discharge.

More detailed information than that published for most of the gaging stations, such as discharge measurements, gage-height records, and rating tables, is on file in the district office. Many gaging-station records in South Dakota through 1968 have been analyzed to give several statistical summaries: (1) the number of days in each year that the daily discharge was between selected limits (duration tables); (2) the lowest mean discharge for selected numbers of consecutive days in each year; and (3) the highest mean discharge for selected numbers of consecutive days in each year.

At or near some gaging stations, water-quality records also are collected. Data are obtained on the chemical quality of the stream water, on water temperature, on suspended-sediment concentration, and on the particle-size distribution of suspended sediment and bed material. These data are given in Part 2 of this report. Under the "REMARKS" paragraph of the gaging-station description, reference is made to water-quality records collected on a regular basis.

FACTORS FOR CONVERTING ENGLISH UNITS TO INTERNATIONAL SYSTEM (SI) UNITS

The following factors may be used to convert the English units published herein to the International System of Units (SI). Subsequent reports will contain both the English and SI unit equivalents in the station manuscript descriptions until such time that all data will be published in SI units.

Multiply English units	By	To obtain SI units
Length		
feet (ft)	.3048	meters (m)
miles (mi)	1.609	kilometers (km)
Area		
acres	4047	square meters (sq m)
	.4047	*hectares (ha)
	.4047	square hectometer (sq hm)
	.004047	square kilometers (sq km)
square miles (sq mi)	2.590	square kilometers (sq km)
Volume		
cubic feet (cu ft)	28.32	cubic decimeters (cu dm)
	.02832	cubic meters (cu m)
cfs-day (cfs/day)	2447	cubic meters (cu m)
	.002447	cubic hectometers (cu hm)
acre-feet (acre-ft)	1233	cubic meters (cu m)
	.001233	cubic hectometers (cu hm)
	.000001233	cubic kilometers (cu km)
Flow		
cubic feet per second (cfs)	28.32	liters per second (l/s)
	28.32	cubic decimeters per second (cu dm/s)
	.02832	cubic meters per second (cu m/s)

*The unit hectare is approved for use with the International System (SI) for a limited time. See NBS Special Bulletin 330, p. 15, 1972 edition.

HYDROLOGIC CONDITIONS

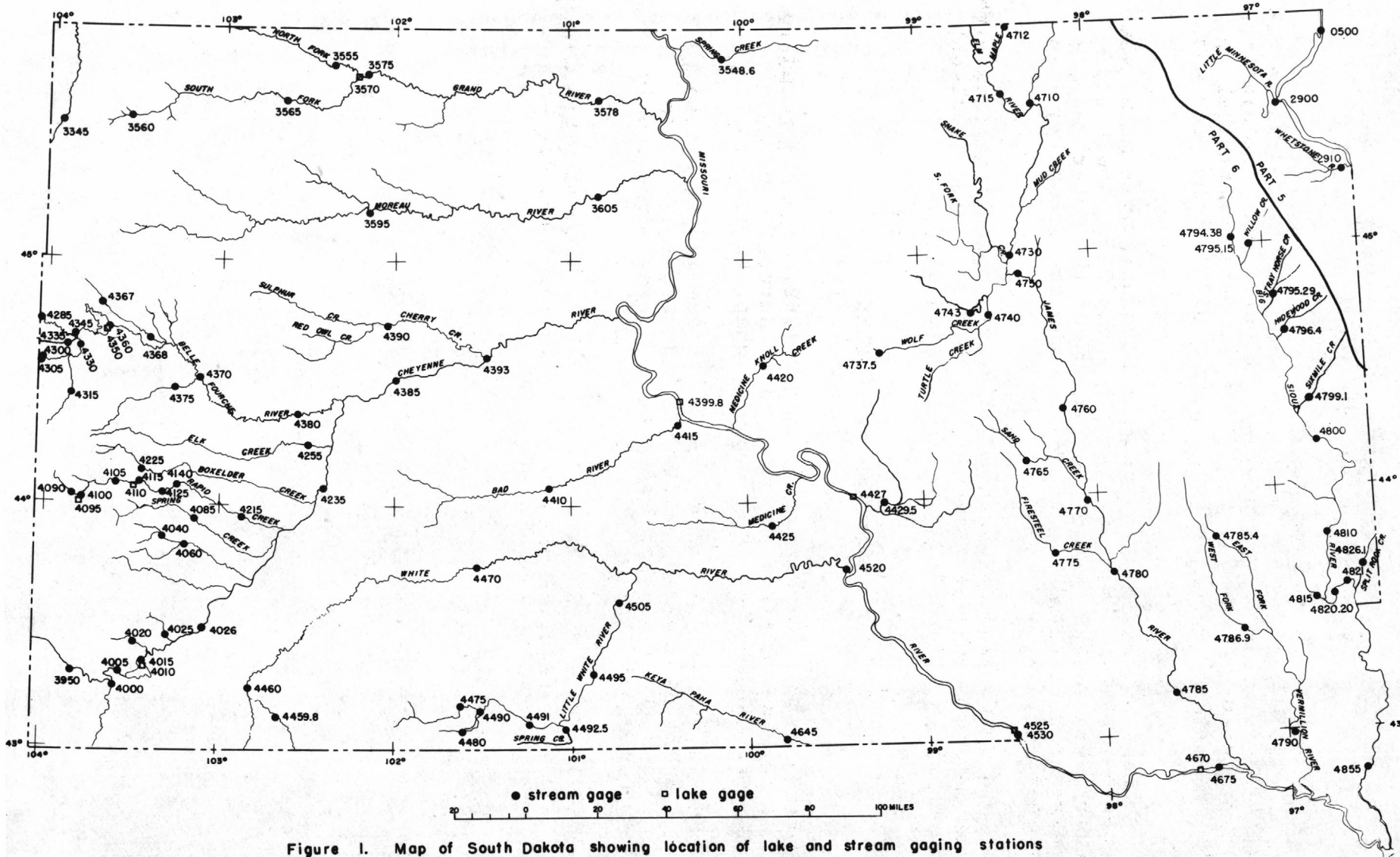
Streamflow varied from 30 percent of the median in the central portion of the State to 150 percent in the Big Sioux River basin. Generally runoff in the period September to May was above median while the later part of the year was below.

Combined storage in the four Missouri River main-stem reservoirs (Lakes Oahe, Sharpe, Francis Case, Lewis and Clark) was 23,588 acre-ft at the end of the water year, a decrease of 1,524,000 acre-ft from the corresponding date a year ago.

A comparison of monthly and yearly mean discharges with the median discharge for the 30-year base period (1931-60) is shown in figure 3 for two key gaging stations.

SELECTED REFERENCES

- Carter, R. W., and Davidian, Jacob, 1968, General procedure for gaging streams: U.S. Geol. Survey Techniques Water-Resources Inv. book 3, chap. A6, 13 p.
- Corbett, D. M., and others, 1943, Stream-gaging procedure, a manual describing methods and practices of the Geological Survey: U.S. Geol. Survey Water-Supply Paper 888, 245 p.
- Langbein, W. B., and Iseri, K. T., 1960, General introduction and hydrologic definitions: U.S. Geol. Survey Water-Supply Paper 1541-A, 29 p.



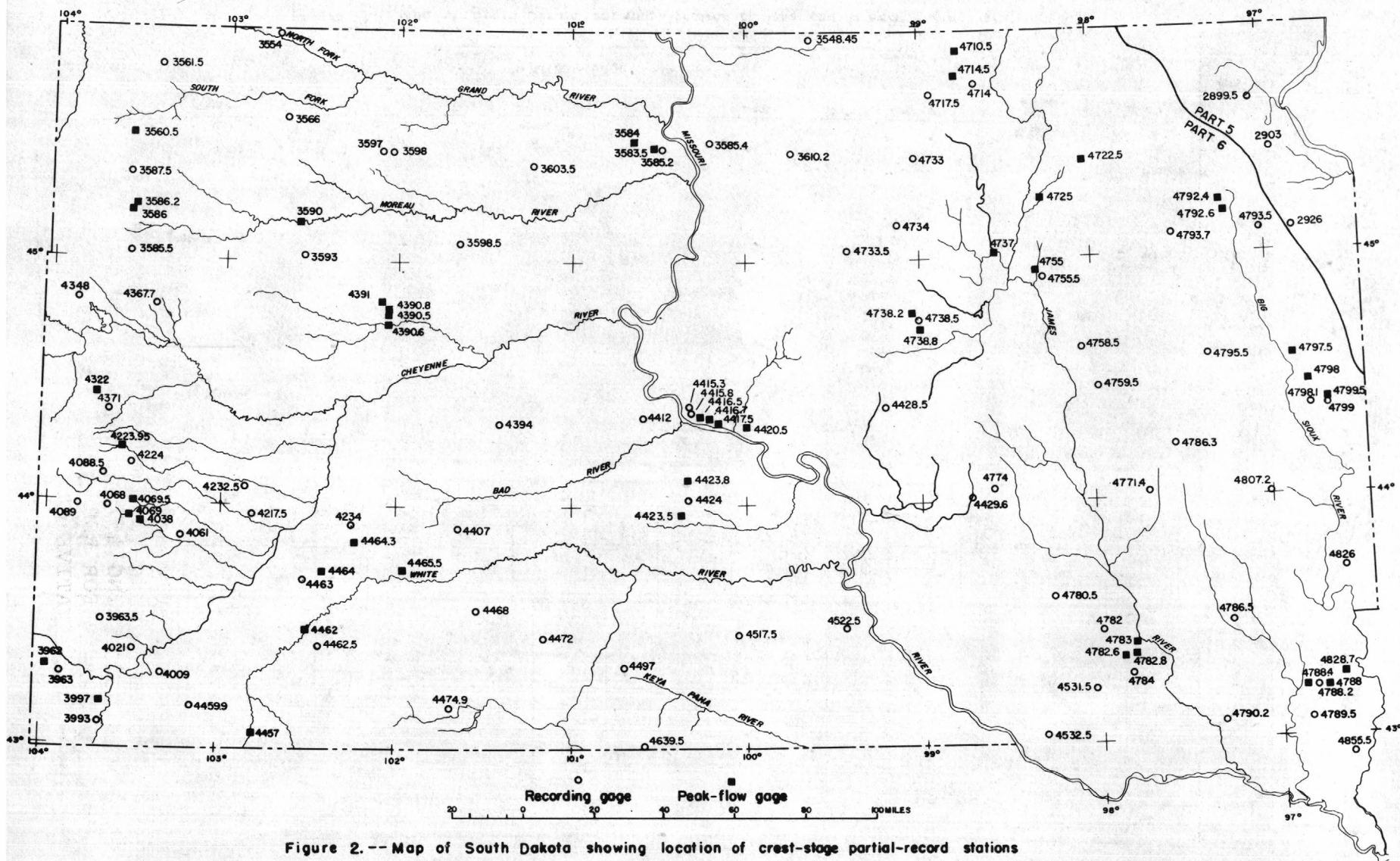
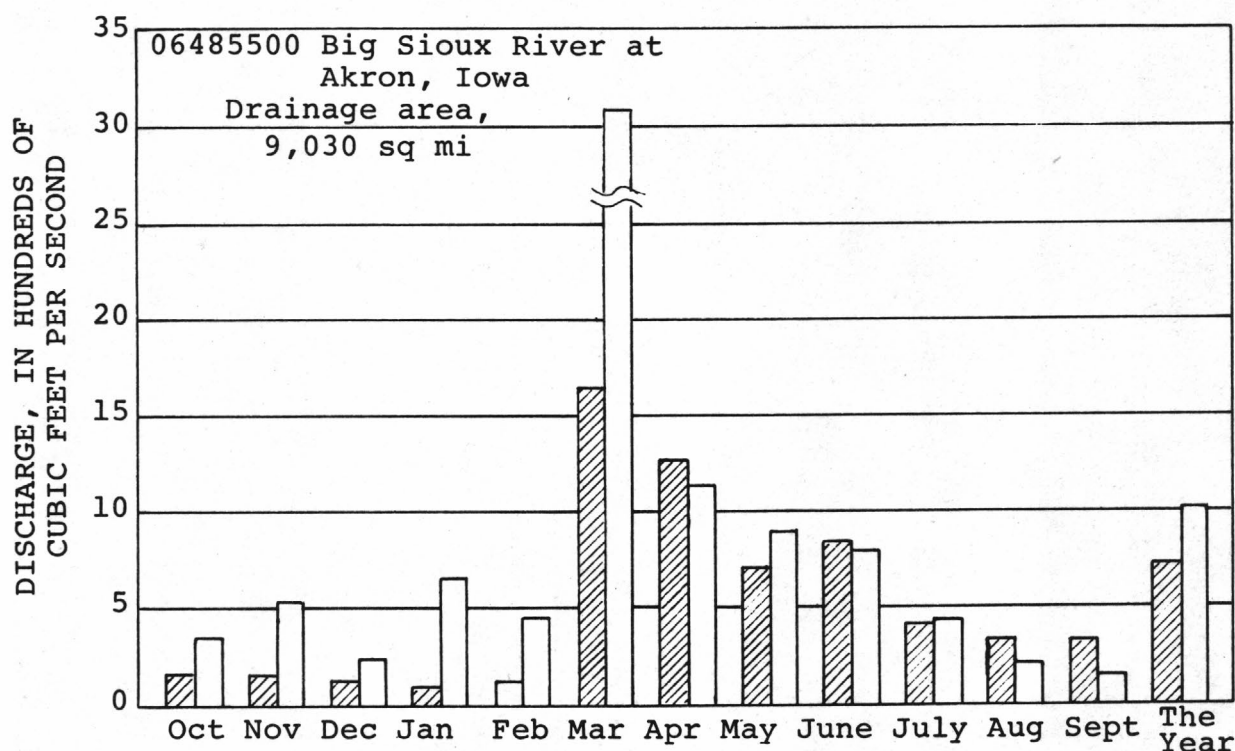
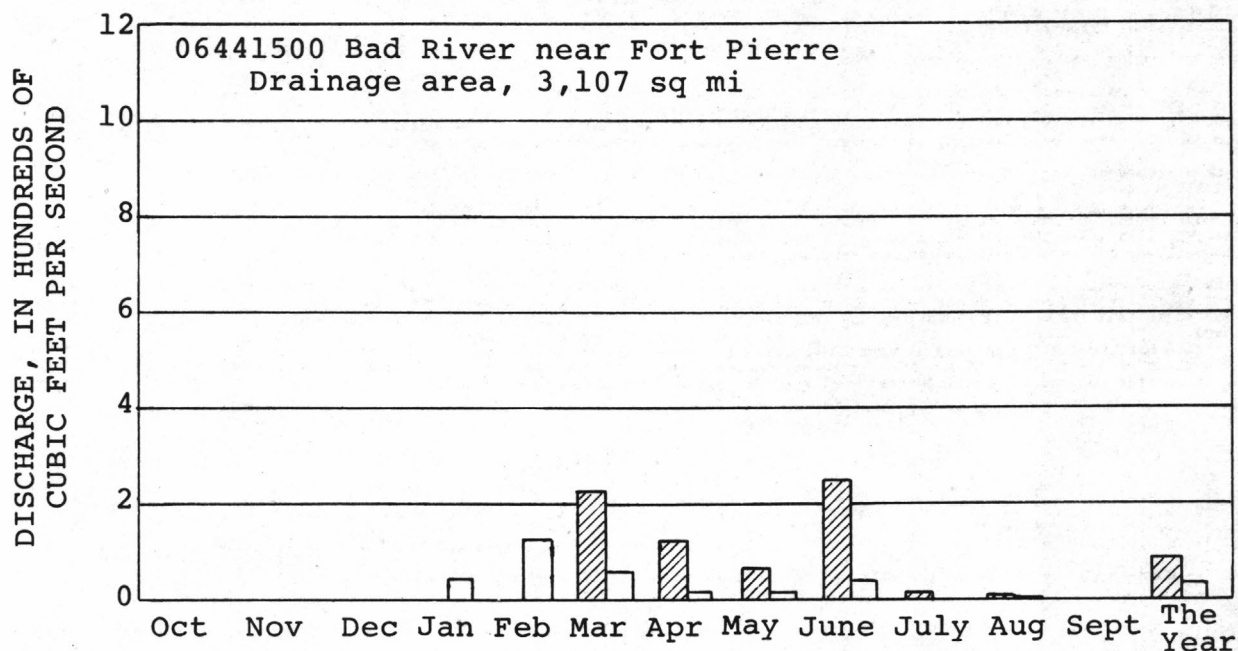


Figure 2.-- Map of South Dakota showing location of crest-stage partial-record stations





-  Median of monthly and yearly mean discharges for water years 1931-60.
 Monthly and yearly mean discharges during 1973 water year.

FIGURE 3.--RUNOFF DURING 1973 WATER YEAR COMPARED WITH MEDIAN RUNOFF FOR PERIOD 1931-60 FOR TWO REPRESENTATIVE GAGING STATIONS.

MINNESOTA RIVER BASIN

05291500 Big Stone Lake at Ortonville, Minn.

LOCATION.--Lat 45°18'18", long 96°26'57", in NW¼SW¼ sec.9, T.121 N., R.46 W., Big Stone County, at powerplant intake at west edge of Ortonville, 0.5 mi (0.8 km) north of concrete dam at outlet, 0.5 mi (0.8 km) southwest of Ortonville, Minn.

PERIOD OF RECORD.--March 1937 to current year.

GAGE.--Nonrecording gage read once a day. Datum of gage is 957.69 ft (291.904 m) above mean sea level, datum of 1929. Prior to Sept. 17, 1947, nonrecording gage at site 0.5 mi (0.8 km) south at same datum. Sept. 18, 1947, to June 30, 1963, water-stage recorder at site 0.5 mi (0.8 km) south at same datum. Sept. 21, 1959, to June 30, 1963, supplementary nonrecording gage read once daily, at present site and datum.

EXTREMES.--Current year: Maximum gage height observed, 8.08 ft (2.463 m) May 27; minimum observed, 5.96 ft (1.817 m) Sept. 24.

Period of record: Maximum gage height, 12.73 ft (3.880 m) Apr. 17, 1952; minimum observed, 3.53 ft (1.076 m) Mar. 2, 1957, strong upstream wind in channel. Minimum observations of 3.10 ft (0.945 m) Mar. 2, 1940 and 2.20 ft (0.671 m) Nov. 20, 1940, at spillway site are the result of blockage of channel to spillway by ice and snow and do not represent lake elevations.

REMARKS.--Reservoir is formed by natural lake with concrete dam at outlet. Fixed crest of dam is at elevation 963.64 ft (293.717 m), with one 5-ft (1.5 m) and two 2.5-ft (0.76 m) gates with lowest sill at elevation 958.40 ft (292.120 m), all elevations are referred to datum of 1929. Changes in gate openings are not made.

Silt barrier dam 700 ft (213 m) upstream in outlet channel of lake completed July 7, 1958; crest elevation, 963.6 ft (293.705 m). Supplementary nonrecording gage readings used for stages below crest of silt barrier to June 30, 1963. Water level subject to fluctuation caused by wind action.

GAGE HEIGHT, IN FEET, OCTOBER 1972 TO SEPTEMBER 1973

Oct. 31	7.00	Feb. 28	7.00	June 30	6.95
Nov. 30	6.95	Mar. 31	7.58	July 31	6.68
Dec. 31	6.94	Apr. 30	7.52	Aug. 31	6.31
Jan. 31	7.08	May 31	7.93	Sept. 30	6.18

NOTE.--Gage-height record other than that shown above is available from Minnesota District Office.

LITTLE MISSOURI RIVER BASIN

19

06334500 Little Missouri River at Camp Crook, S. Dak.

LOCATION.--Lat 45°32'49", long 103°58'23", in SW¼ sec.2, T.18 N., R.1 E., Harding County, on left bank 15 ft (5 m) upstream from bridge on State Highway 20 at east edge of Camp Crook.

DRAINAGE AREA.--1,970 sq mi (5,100 sq km), approximately.

PERIOD OF RECORD.--September 1903 to November 1906, May 1956 to current year. Monthly discharge only for some periods, published in WSP 1309.

GAGE.--Water-stage recorder. Datum of gage is 3,110.98 ft (948.227 m) above mean sea level. Prior to Nov. 30, 1906, nonrecording gage at site 0.5 mi (0.8 km) upstream at different datum. May 1956 to Oct. 8, 1957, nonrecording gage at site 15 ft (5 m) downstream at present datum.

AVERAGE DISCHARGE.--20 years, 139 cfs (3.936 cu m/s), 100,700 acre-ft/yr (124 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 1,790 cfs (50.7 cu m/s) June 21, gage height, 6.63 ft (2.021 m); minimum daily, 0.22 cfs (0.006 cu m/s) Aug. 19.

Period of record: Maximum discharge, 7,600 cfs (215 cu m/s) May 28, 1962, gage height, 13.07 ft (3.984 m); no flow at times.

Flood of 1952 reached a stage of about 16 ft (4.9 m), from information by local residents.

REMARKS.--Records good except those for winter periods, which are poor. Small diversions above station for irrigation. Water-quality records for the water year 1973 are published in Part 2 of this report.

REVISIONS (WATER YEARS).--WSP 1309: 1904. WSP 1729: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.7	12	9.0	10	17	124	40	254	247	105	16	2.9
2	6.3	12	8.5	12	18	170	44	185	144	88	15	4.0
3	6.7	12	8.0	11	18	228	37	140	120	68	16	5.6
4	8.5	12	7.5	11	18	311	32	136	363	80	13	19
5	9.5	12	7.0	9.0	17	294	28	105	848	86	12	9.5
6	20	12	6.0	9.0	15	366	24	90	444	78	9.0	5.1
7	14	11	5.0	9.0	10	105	22	79	379	62	7.8	4.6
8	9.5	11	4.0	9.0	9.0	76	20	68	240	51	4.3	3.8
9	8.1	12	4.0	9.0	9.0	78	15	57	133	40	4.3	3.4
10	8.1	12	4.5	9.5	9.0	72	12	45	90	32	5.3	2.3
11	7.8	12	5.0	10	10	56	16	37	71	25	4.0	2.3
12	8.1	10	5.0	12	9.0	51	17	32	57	19	4.0	2.5
13	9.0	9.0	5.0	14	8.0	43	17	28	49	17	3.7	1.9
14	9.0	8.0	5.0	16	7.0	42	16	25	40	16	3.2	1.6
15	10	8.0	5.0	18	7.0	39	17	23	37	14	1.8	4.4
16	10	8.0	5.0	18	9.0	37	17	22	40	10	1.6	5.2
17	9.0	8.0	7.0	17	10	38	19	21	42	12	1.4	5.4
18	11	8.0	9.0	16	11	38	19	19	91	12	.67	3.5
19	9.5	8.0	9.0	14	12	32	24	17	125	14	.22	3.3
20	9.5	8.0	9.0	12	13	28	44	16	614	13	.83	2.1
21	9.5	8.5	10	12	15	31	45	15	1,670	12	1.2	2.0
22	9.0	9.0	15	12	17	36	470	13	1,270	11	.67	1.9
23	9.5	10	12	12	20	35	1,160	10	1,170	18	4.6	1.8
24	9.0	10	10	14	20	42	1,080	10	1,000	18	8.1	1.6
25	9.0	9.5	10	16	25	40	701	10	631	15	5.6	.73
26	9.0	9.5	11	15	40	44	401	35	340	104	4.3	.71
27	10	9.5	12	12	100	54	425	67	219	99	3.4	.94
28	10	9.0	11	10	110	49	474	266	170	54	2.9	1.0
29	11	9.0	10	14	-----	47	454	536	140	34	2.9	1.2
30	10	9.0	9.5	18	-----	40	356	494	127	23	2.6	1.5
31	12	-----	9.5	18	-----	35	-----	369	-----	18	2.3	-----
TOTAL	298.3	298.0	247.5	398.5	583.0	2,681	6,046	3,224	10,911	1,248	162.69	101.78
MEAN	9.62	9.93	7.98	12.9	20.8	86.5	202	104	364	40.3	5.25	3.39
MAX	20	12	15	18	110	366	1,160	536	1,670	105	16	15
MIN	6.3	8.0	4.0	9.0	7.0	28	12	10	37	10	.22	.71
AC-FT	592	591	491	790	1,160	5,320	11,990	6,390	21,640	2,480	323	202

CAL YR 1972 TOTAL 82,081.65 MEAN 224 MAX 3,520 MIN .15 AC-FT 162,800
WTR YR 1973 TOTAL 26,199.77 MEAN 71.8 MAX 1,670 MIN .22 AC-FT 51,970

PEAK DISCHARGE (BASE, 1,000 CFS)

DATE	TIME	G.H.	DISCHARGE
4-24	0030	5.09	1,200
6-5	0515	4.85	1,120
6-21	1045	6.63	1,790

LITTLE MISSOURI RIVER BASIN

06335000 Little Beaver Creek near Marmarth, N. Dak.

LOCATION.--Lat 46°16'29", long 103°58'33", in NE¼ sec.7, T.132 N., R.106 W., Bowman County, North Dakota, on right bank 150 ft (46 m) downstream from concreted ford, 0.8 mi (1.3 km) downstream from Corral Creek, 3 mi (5 km) southwest of Marmarth, and 5 mi (8 km) upstream from mouth.

DRAINAGE AREA.--587 sq mi (1,520 sq km), approximately.

PERIOD OF RECORD.--April 1938 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,733.14 ft (833.061 m) above mean sea level. June 28, 1951, to May 17, 1968, water-stage recorder 300 ft (91 m) upstream at datum 10.00 ft (3.048 m) higher. See WSP 1729 or 1917 for history of changes prior to June 28, 1951.

AVERAGE DISCHARGE.--35 years, 44.4 cfs (1.257 cu m/s), 32,170 acre-ft/yr (39.7 cu hm/yr); median of yearly mean discharges, 31 cfs (0.88 cu m/s), 22,500 acre-ft/yr (28 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 3,530 cfs (100 cu m/s) June 19, gage height, 18.44 ft (5.621 m); minimum daily, 2.0 cfs (0.057 cu m/s) Feb. 13-16.

Period of record: Maximum discharge, 12,700 cfs (360 cu m/s) Apr. 6, 1952, gage height, 13.9 ft (4.24 m), from floodmark, site and datum then in use, from rating curve extended above 4,500 cfs (127 cu m/s) on basis of slope-area measurement of peak flow; no flow at times in most years.

REMARKS.--Records fair. Records of chemical analyses for the water year 1973 are published in Part 2 of the North Dakota Basic Data report.

REVISIONS (WATER YEARS).--WSP 1279: 1939(M), 1940, 1943-44(M), 1945, 1948.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.7	6.7	5.2	2.5	45	120	16	45	44	37	6.4	6.4
2	6.4	7.3	4.0	2.5	40	110	14	40	77	32	5.5	12
3	6.4	7.8	3.2	2.5	35	80	14	35	272	29	5.5	1,730
4	6.4	7.0	3.6	2.5	30	65	14	31	161	28	4.6	450
5	8.3	7.0	4.0	2.5	25	55	12	28	116	25	4.6	118
6	16	6.7	4.0	2.5	15	40	14	24	78	22	5.5	74
7	22	6.7	4.0	2.5	9.0	45	15	13	65	18	5.2	40
8	12	7.0	3.8	2.5	7.0	40	16	16	55	16	6.1	18
9	8.3	6.7	3.6	2.5	6.0	36	15	16	42	15	6.7	13
10	7.3	6.4	3.8	2.5	5.0	34	14	14	31	14	7.8	11
11	6.7	7.3	3.8	2.5	4.0	40	14	12	23	11	6.7	10
12	6.7	6.1	2.5	2.5	3.0	38	13	12	19	9.8	7.0	9.8
13	6.4	7.0	2.8	2.5	2.0	36	12	10	16	9.3	6.4	8.8
14	6.1	6.4	2.9	2.5	2.0	28	12	9.3	13	8.8	6.4	9.3
15	8.8	6.7	2.4	10	2.0	27	12	8.3	12	8.8	6.4	20
16	5.8	7.0	2.3	70	2.0	29	11	7.3	15	8.3	5.8	46
17	5.8	6.7	2.1	190	3.5	27	11	7.0	21	7.8	5.5	25
18	5.8	6.4	2.3	150	5.0	25	10	6.7	828	7.3	5.2	16
19	5.8	6.4	2.5	125	10	23	45	6.1	2,050	6.4	4.9	13
20	5.8	6.4	3.0	100	20	22	906	5.8	957	6.4	5.2	11
21	6.1	6.4	3.0	70	30	18	457	6.1	362	6.4	5.5	10
22	6.1	5.2	3.5	65	90	22	230	5.8	175	54	7.5	9.3
23	6.1	5.2	3.5	50	150	30	140	5.5	124	490	10	8.8
24	6.1	5.8	3.5	45	125	23	100	5.5	100	29	8.3	23
25	6.1	11	3.5	100	90	23	84	5.5	80	12	7.8	18
26	6.1	6.4	4.0	125	100	22	84	12	67	10	7.0	10
27	6.4	7.8	4.0	90	150	20	68	279	58	9.3	6.4	8.3
28	6.4	9.5	3.5	75	125	18	62	141	50	7.8	6.1	7.3
29	6.7	5.2	3.0	65	-----	18	57	100	43	7.0	6.1	7.8
30	6.7	4.9	3.0	65	-----	16	50	67	40	7.0	5.8	7.0
31	6.4	-----	3.0	55	-----	16	-----	51	-----	6.7	5.8	-----
TOTAL	232.7	203.1	103.3	1,485.0	1,130.5	1,146	2,522	1,024.9	5,994	959.1	193.7	2,750.8
MEAN	7.51	6.77	3.33	47.9	40.4	37.0	84.1	33.1	200	30.9	6.25	91.7
MAX	22	11	5.2	190	150	120	906	279	2,050	490	10	1,730
MIN	5.8	4.9	2.1	2.5	2.0	16	10	5.5	12	6.4	4.6	6.4
AC-FT	462	403	205	2,950	2,240	2,270	5,000	2,030	11,890	1,900	384	5,440
CAL YR 1972	TOTAL 37,503.1 MEAN 102 MAX 3,900 MIN 2.1 AC-FT 74,390											
WTR YR 1973	TOTAL 17,745.1 MEAN 48.6 MAX 2,050 MIN 2.0 AC-FT 35,200											

PEAK DISCHARGE (BASE, 2,000 CFS)

DATE	TIME	G.H.	DISCHARGE
6-19	0200	18.44	3,530
9- 3	1300	18.17	3,250

LITTLE MISSOURI RIVER BASIN

21

06335500 Little Missouri River at Marmarth, N. Dak.

LOCATION.--Lat 46°17'44", long 103°55'06", in SW¼ sec.30, T.133 N., R.105 W., Slope County, North Dakota, on left bank 90 ft (27.4 m) downstream from bridge on U.S. Highway 12 in Marmarth and 1.5 mi (2.4 km) downstream from Little Beaver Creek.

DRAINAGE AREA.--4,640 sq mi (12,020 sq km), approximately.

PERIOD OF RECORD.--March 1938 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,686.32 ft (818.790 m) above mean sea level. Prior to June 23, 1950, various nonrecording gages on former highway bridge at present site and datum. June 23, 1950, to Sept. 2, 1957, nonrecording gage at site 90 ft (27.4 m) upstream at present datum.

AVERAGE DISCHARGE.--35 years, 340 cfs (9.629 cu m/s), 246,300 acre-ft/yr (303.7 cu hm/yr); median of yearly mean discharges, 280 cfs (7.93 cu m/s), 203,000 acre-ft/yr (250 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 5,660 cfs (160 cu m/s) June 19, gage height, 7.84 ft (2.390 m); maximum gage height, 8.52 ft (2.597 m) Jan. 18, backwater from ice; minimum discharge, 7.2 cfs (0.20 cu m/s) Aug. 19, gage height, 1.51 ft (0.460 m).

Period of record: Maximum discharge, 45,000 cfs (1,270 cu m/s) Mar. 23, 1947, gage height, 21.7 ft (6.61 m); maximum gage height, 23.4 ft (7.13 m) Mar. 31, 1952, backwater from ice; no flow for part of most years.

According to local residents, the greatest known flood prior to 1953 occurred in June 1907 (stage unknown). Other major floods occurred in March 1913, May 1929, and March 1920 and reached stages of about 21.5 ft (6.55 m), 20.2 ft (6.16 m), and 19.7 ft (6.00 m), respectively. These stages are not comparable to stages during period of record, owing to construction of levees.

REMARKS.--Records fair. Small diversions for irrigation above station. Records of chemical analyses for the water year 1973 are published in Part 2 of the North Dakota report.

REVISIONS (WATER YEARS).--WSP 896: 1938-39. WSP 1086: 1943-44. WSP 1279: 1943(M), 1945-46, 1948. WSP 1439: 1950 (calendar year figures).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	35	40	24	150	180	450	95	662	834	320	79	105
2	33	40	23	130	110	430	88	566	684	283	70	89
3	31	44	21	110	100	410	80	426	1,020	245	51	2,160
4	31	62	19	70	90	400	77	388	818	211	37	1,450
5	40	68	17	30	100	390	81	330	650	181	31	436
6	73	65	15	16	70	470	87	265	754	148	28	203
7	128	58	13	12	50	450	86	236	1,180	134	38	120
8	86	48	12	10	40	502	83	190	929	124	33	81
9	76	42	11	9.0	40	507	77	163	716	111	30	59
10	48	42	10	9.0	35	539	70	141	477	91	27	42
11	42	42	9.5	10	35	533	68	118	318	76	27	33
12	38	33	9.0	12	35	658	63	96	223	68	23	27
13	37	33	9.0	12	30	632	59	86	161	55	19	21
14	35	26	8.5	12	30	503	52	74	122	48	18	47
15	33	25	8.5	15	30	401	51	61	100	42	16	66
16	33	25	8.5	170	25	346	51	50	96	38	14	107
17	31	24	8.0	710	25	161	51	44	94	33	12	192
18	31	24	9.0	890	30	126	50	37	975	30	10	98
19	27	23	10	770	45	109	117	35	4,130	27	8.2	64
20	27	23	20	650	70	93	2,230	33	1,910	23	9.6	46
21	27	22	50	470	90	89	1,630	27	1,190	24	9.6	32
22	27	22	70	450	200	82	929	25	1,650	44	10	28
23	27	23	75	430	530	90	572	26	2,770	614	24	29
24	27	23	80	420	830	97	698	23	2,540	288	17	27
25	27	24	85	470	470	135	1,370	24	2,310	124	16	28
26	27	26	100	530	360	141	1,260	103	1,680	76	15	20
27	28	27	180	420	530	118	942	782	1,020	62	15	18
28	40	26	170	340	470	101	776	858	680	53	13	17
29	58	25	200	270	-----	96	728	798	500	68	13	15
30	37	25	180	250	-----	101	734	755	382	128	12	14
31	40	-----	170	220	-----	98	-----	903	-----	98	11	-----
TOTAL	1,280	1,030	1,625.0	8,067.0	4,650	9,258	13,255	8,325	30,913	3,867	736.4	5,674
MEAN	41.3	34.3	52.4	260	166	299	442	269	1,030	125	23.8	189
MAX	128	68	200	890	830	658	2,230	903	4,130	614	79	2,160
MIN	27	22	8.0	9.0	25	82	50	23	94	23	8.2	14
AC-FT	2,540	2,040	3,220	16,000	9,220	18,360	26,290	16,510	61,320	7,670	1,460	11,250

CAL YR 1972 TOTAL 217,616.0 MEAN 595 MAX 14,000 MIN 1.6 AC-FT 431,600
WTR YR 1973 TOTAL 88,680.4 MEAN 243 MAX 4,130 MIN 8.0 AC-FT 175,900

PEAK DISCHARGE (BASE, 3,000 CFS)

DATE	TIME	G.H.	DISCHARGE
4-20	1130	6.44	3,660
6-19	0745	7.84	5,660
9-3	2000	6.61	3,890

MISSOURI RIVER MAIN STEM

06342500 Missouri River at Bismarck, N. Dak.

LOCATION.--Lat 46°48'51", long 100°49'12", in SE¼NW¼SE¼ sec.31, T.139 N., R.80 W., Burleigh County, North Dakota, on left bank 40 ft (12 m) upstream from Bismarck city waterplant, 2,100 ft (640 m) downstream from Burlington Northern Railway bridge, 1.6 mi (2.6 km) northwest of Bismarck Post Office, 3.5 mi (5.6 km) upstream from Heart River and at mile 1,314.5 (2,115.0 km).

DRAINAGE AREA.--186,400 sq mi (482,800 sq km), approximately.

PERIOD OF RECORD.--October to November 1927, April 1928 to current year. See WSP 1729 or 1917 for history of data prior to April 1928.

GAGE.--Water-stage recorder. Datum of gage is 1,618.38 ft (493.282 m).above mean sea level. See WSP 1729 or 1917 for history of changes prior to Sept. 30, 1937.

AVERAGE DISCHARGE.--45 years (1928-73), 21,720 cfs (615.1 cu m/s), 15,740,000 acre-ft/yr (19.41 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 31,800 cfs (901 cu m/s) Jan. 25, gage height, 11.54 ft (3.517 m); maximum gage height, 12.84 ft (3.914 m) Dec. 23, backwater from ice; minimum discharge, 14,300 cfs (405 cu m/s) May 15, gage height, 4.43 ft (1.350 m).

Period of record: Maximum discharge, 500,000 cfs (14,200 cu m/s) Apr. 6, 1952, gage height, 27.90 ft (8.504 m); minimum, about 1,800 cfs (51.0 cu m/s) Jan. 3, 1940; minimum gage height, 1.35 ft (0.411 m) Sept. 4, 1934, present site and datum.

Maximum stage known, 31.6 ft (9.632 m) Mar. 31, 1881 (ice jam), present site and datum.

REMARKS.--Records good. Many diversions from tributaries. Flow regulated by Lake Sakakawea 75.4 mi (121.3 km) upstream. (See station 06338000.) Records of chemical analyses, water temperatures, and suspended sediment loads for the water year 1973 are published in Part 2 of the North Dakota report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21,500	27,400	21,700	24,200	28,500	30,700	27,500	16,700	19,500	20,500	20,800	23,000
2	21,700	27,400	22,000	26,500	28,800	29,800	23,800	17,200	19,000	21,100	21,200	21,800
3	21,100	27,400	22,000	26,000	29,100	29,600	25,400	18,200	18,400	20,700	21,100	22,600
4	21,500	27,400	22,000	26,000	28,500	30,200	26,900	17,200	19,000	21,700	21,100	21,800
5	21,800	27,500	22,000	26,800	28,700	29,700	26,200	17,300	18,200	20,400	21,200	21,700
6	21,700	27,700	21,000	27,500	26,400	29,000	25,200	17,200	18,900	22,700	21,500	21,400
7	22,000	27,400	20,000	27,700	21,700	28,500	25,000	16,100	19,800	24,700	21,400	21,800
8	22,100	27,700	19,000	27,900	24,100	28,500	25,500	16,400	19,200	23,600	21,800	21,900
9	22,200	27,500	18,000	28,100	27,800	27,800	25,700	16,900	20,700	21,200	22,700	21,400
10	20,800	27,700	17,000	28,300	27,600	28,300	25,300	16,200	18,800	22,300	24,100	21,600
11	21,700	26,300	17,000	28,500	23,300	28,500	26,600	16,700	18,900	22,900	23,300	21,900
12	22,600	26,100	17,000	28,700	26,700	26,700	27,100	16,800	20,200	22,100	21,900	21,400
13	24,700	26,600	17,000	28,900	27,600	29,100	27,200	16,700	19,400	22,200	20,200	21,400
14	21,200	25,500	17,000	29,100	24,000	28,100	27,200	15,700	18,500	22,400	22,100	21,500
15	22,700	23,900	18,000	29,100	21,900	28,700	25,600	15,900	19,500	21,100	21,200	21,600
16	23,200	23,600	19,000	29,100	23,900	29,000	23,900	16,600	20,700	20,600	21,300	21,300
17	22,000	23,300	20,000	29,600	24,300	29,000	22,800	18,100	20,800	21,900	21,300	20,900
18	22,800	23,600	21,000	29,200	27,500	28,600	21,600	18,100	19,400	21,200	21,400	22,200
19	22,800	23,200	21,800	28,700	29,500	27,700	21,300	19,200	19,400	21,500	21,400	21,900
20	22,600	23,900	22,200	29,400	29,600	27,800	20,600	18,800	18,600	21,500	21,100	20,700
21	22,200	22,800	22,400	29,100	28,800	27,700	19,000	19,600	18,800	21,100	21,800	19,800
22	23,300	22,400	21,900	28,400	29,000	27,300	17,700	20,200	19,200	20,900	21,500	19,100
23	22,900	23,000	22,700	28,900	28,500	27,400	17,600	20,100	21,000	20,000	21,400	19,100
24	23,000	22,500	23,100	30,100	28,100	27,200	18,100	20,900	21,600	22,000	21,200	19,500
25	22,800	22,400	23,600	31,200	28,900	26,700	18,500	18,100	20,200	22,300	21,800	19,900
26	23,900	22,800	23,300	29,300	29,400	23,900	18,500	18,800	20,000	17,800	22,300	19,600
27	24,600	22,800	24,400	29,700	29,400	24,200	17,900	20,000	20,200	20,300	22,200	19,300
28	25,300	23,000	24,900	26,700	30,500	25,100	17,700	19,900	21,300	21,200	23,200	19,600
29	27,000	22,600	25,700	26,700	-----	24,700	17,500	18,700	20,600	21,000	25,200	19,000
30	26,900	21,900	26,100	27,000	-----	25,600	16,800	19,400	20,900	20,900	23,500	19,200
31	27,400	-----	25,000	27,600	-----	28,500	-----	20,300	-----	21,000	23,100	-----
TOTAL	712,000	747,300	657,800	874,000	762,100	863,600	679,700	558,000	590,700	664,800	679,300	627,900
MEAN	22,970	24,910	21,220	28,190	27,220	27,860	22,660	18,000	19,690	21,450	21,910	20,930
MAX	27,400	27,700	26,100	31,200	30,500	30,700	27,500	20,900	21,600	24,700	25,200	23,000
MIN	20,800	21,900	17,000	24,200	21,700	23,900	16,800	15,700	18,200	17,800	20,200	19,000
AC-FT	1,412M	1,482M	1,305M	1,734M	1,512M	1,713M	1,348M	1,107M	1,172M	1,319M	1,347M	1,245M
CAL YR 1972	TOTAL	11,199,300	MEAN	30,600	MAX	44,100	MIN	17,000	AC-FT	22,210,000		
WTR YR 1973	TOTAL	8,417,200	MEAN	23,060	MAX	31,200	MIN	15,700	AC-FT	16,700,000		

SPRING CREEK BASIN

23

06354860 Spring Creek near Herreid, S. Dak.

LOCATION.--Lat 45°58'52", long 100°06'28", in SW¼ sec.13, T.127 N., R.77 W., Campbell County, on left bank 0.5 mi (0.8 km) upstream from county highway bridge, 2.4 mi (3.9 km) southwest of Herreid and 13.2 mi (21.2 km) upstream from high-water line of Lake Oahe.

DRAINAGE AREA.--440 sq mi (1,140 sq km), approximately, of which about 220 sq mi (570 sq km) is probably noncontributing.

PERIOD OF RECORD.--October 1962 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,653.80 ft (504.078 m) above mean sea level.

AVERAGE DISCHARGE.--11 years, 10.6 cfs (0.300 cu m/s), 7,680 acre-ft/yr (9.47 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 21 cfs (0.59 cu m/s) June 17, gage height, 4.53 ft (1.381 m); no flow for many days.

Period of record: Maximum discharge, 1,160 cfs (32.9 cu m/s) Mar. 17, 1966, gage height, 11.60 ft (3.536 m); no flow for several months each year.

REMARKS.--Records fair.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

3.0	0	3.5	1.6
3.1	.03	3.7	3.8
3.2	.10	3.9	6.8
3.3	.40	4.1	10
3.4	.90		

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1		0	.34	.44	.72	2.5	.52	.56	.25			
2		0	.34	.48	.78	2.6	.72	.60	.25			
3		0	.28	.56	.78	2.7	.96	.60	.19			
4		0	.25	.72	.78	2.5	.72	.48	.09			
5		0	.22	.72	.72	1.9	.52	.25	.06			
6		0	.22	.66	.72	1.7	.48	.25	.05			
7		0	.13	.60	.66	1.7	1.0	.13	.05			
8		0	.10	.66	.56	1.5	1.2	.09	.03			
9		0	.16	.60	.56	1.5	.96	.06	.01			
10		0	.22	.56	.56	1.6	.90	.04	0			
11		0	.22	.56	.52	1.5	.60	.06	0			
12		0	.16	.56	.52	1.4	.84	.09	0			
13		0	.16	.60	.56	1.4	.66	.09	0			
14		0	.13	.60	.56	5.9	.37	.08	0			
15		0	.10	.66	.48	4.4	.48	.06	0			
16		0	.13	.66	.44	2.6	.84	.05	0			
17		0	.16	.66	.37	1.9	.60	.04	9.1			
18		0	.22	.66	.44	1.8	.52	.04	2.6			
19		0	.31	.72	.52	1.9	.66	.04	1.0			
20		0	.31	.72	.56	1.6	1.1	.04	.66			
21		0	.37	.66	.72	1.4	.96	.03	.40			
22		0	.44	.72	1.1	1.2	.90	.01	.22			
23		0	.48	.56	1.2	1.1	.84	0	.09			
24		0	.48	.72	1.2	1.3	.84	.03	.05			
25		0	.48	.78	1.5	1.6	1.1	.03	.03			
26		0	.48	.84	1.9	1.1	1.0	.05	0			
27		0	.48	.84	2.1	.90	.96	.09	0			
28		0	.48	.78	2.2	.90	.72	.22	0			
29		.01	.52	.78	-----	.72	.48	.48	0			
30		.37	.60	.72	-----	.60	.52	.37	0			
31		-----	.56	.72	-----	.52	-----	.34	-----			
TOTAL	0	.38	9.53	20.52	23.73	55.94	22.97	5.30	15.13	0	0	0
MEAN	0	.013	.31	.66	.85	1.80	.77	.17	.50	0	0	0
MAX	0	.37	.60	.84	2.2	5.9	1.2	.60	9.1	0	0	0
MIN	0	0	.10	.44	.37	.52	.37	0	0	0	0	0
AC-FT	0	.8	19	41	47	111	46	11	30	0	0	0

CAL YR 1972 TOTAL 8,138.74 MEAN 22.2 MAX 1,060 MIN 0 AC-FT 16,140
WTR YR 1973 TOTAL 153.50 MEAN .42 MAX 9 MIN 0 AC-FT 304

PEAK DISCHARGE (BASE, 40 CFS).--No peaks above base.

25

LOCATION.--Lat 45°48'10", long 102°21'45", in NE¼NE¼ sec.10, T.21 N., R.14 E., Perkins County, on left bank 100 ft (30 m) upstream from highway bridge, 0.2 mi (0.3 km) upstream from nearest tributary and 9.8 mi (15.8 km) south of White Butte.

PERIOD OF RECORD.--October 1945 to current year. Monthly discharge only for some periods, published in WSP 1309.

GAGE.--Water-stage recorder. Altitude of gage is 2,275 ft (693 m), by barometer. Prior to Aug. 29, 1947, and Apr. 17, 1950, to June 11, 1951, nonrecording gage, and Aug. 29, 1947, to Apr. 16, 1950, water-stage recorder all at site 100 ft (30 m) downstream at same datum.

EXTREMES.--Current year: Maximum discharge, 289 cfs (8.18 cu m/s) Apr. 24; maximum gage height, 5.10 ft (1.554 m) Feb. 26, backwater from ice; minimum daily discharge, 2.5 cfs (0.071 m³/s) Aug. 29.
Period of record: Maximum discharge, 30,900 cfs (875 cu m/s) Apr. 16, 1950, gage height, 20.0 ft (6.10 m), from floodmarks, from rating curve extended above 19,000 cfs (538 cu m/s) on basis of slope-area measurement of peak flow; no flow at times.

REMARKS.--Records good except those for winter periods, which are poor. Flow regulated by Bowman-Haley reservoir, capacity, 93,000 acre-ft (115 cu km), 71 mi (114 km) upstream, beginning August 1966.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.1	15	10	8.5	70	100	51	165	75	69	11	3.1
2	5.9	15	9.0	9.0	80	120	49	148	75	59	9.3	3.3
3	5.7	15	8.0	8.5	70	140	47	131	96	51	7.1	4.3
4	5.7	17	7.0	8.0	50	140	44	114	163	44	6.5	5.7
5	6.9	15	6.5	7.5	45	140	41	102	177	39	7.3	6.7
6	11	15	6.5	7.0	45	150	41	94	169	35	6.5	6.1
7	12	15	6.5	6.5	45	150	41	83	142	24	4.4	5.5
8	13	14	6.5	6.0	50	170	38	77	125	17	3.8	5.5
9	12	14	6.5	6.5	50	190	36	71	109	14	5.1	5.5
10	12	14	6.5	6.5	50	202	33	59	94	13	5.1	5.9
11	12	14	6.5	7.0	55	194	30	54	88	11	5.7	5.3
12	11	13	6.5	8.0	50	167	29	46	78	9.1	6.3	4.6
13	11	12	6.5	8.0	45	136	28	44	68	8.9	5.1	4.6
14	12	12	6.5	7.0	35	185	26	36	60	8.7	5.1	4.4
15	12	11	6.5	20	30	169	25	33	67	7.7	5.1	4.9
16	11	11	7.0	50	30	96	25	27	59	8.0	4.9	4.9
17	11	11	8.0	100	35	86	23	22	50	6.5	4.6	4.6
18	10	11	8.0	200	40	83	20	19	53	4.9	4.3	4.4
19	11	11	8.0	150	40	75	35	16	65	5.1	3.6	4.9
20	11	11	8.0	100	40	72	62	15	85	4.8	3.3	5.5
21	11	11	9.0	90	45	66	104	14	116	3.8	3.5	6.5
22	11	11	9.0	90	50	62	196	13	157	3.3	3.1	7.1
23	11	10	10	100	60	57	213	13	138	5.1	3.0	6.9
24	11	10	12	150	55	57	279	12	121	8.0	3.1	7.7
25	11	10	15	200	55	54	286	12	121	8.0	3.6	7.3
26	12	10	15	150	60	53	272	18	116	109	3.6	8.2
27	12	10	15	100	70	51	251	25	106	88	3.4	8.0
28	12	10	12	60	80	51	229	26	98	44	2.8	7.3
29	13	10	9.0	70	-----	51	207	58	90	20	2.5	6.7
30	13	10	8.0	80	-----	51	183	68	80	14	3.1	7.1
31	12	-----	8.5	80	-----	54	-----	90	-----	11	3.1	-----
TOTAL	333.3	368	267.0	1,894.0	1,430	3,372	2,944	1,685	3,041	753.9	148.9	172.5
MEAN	10.8	12.3	8.61	61.1	51.1	109	98.1	54.4	101	24.3	4.80	5.75
MAX	13	17	15	200	80	202	286	165	177	109	11	8.2
MIN	5.7	10	6.5	6.0	30	51	20	12	50	3.3	2.5	3.1
AC-FT	661	730	530	3,760	2,840	6,690	5,840	3,340	6,030	1,500	295	342
CAL YR 1972	TOTAL 45,390.8		MEAN 124	MAX 3,000	MIN 1.0	AC-FT 90,030						
WTR YR 1973	TOTAL 16,409.6		MEAN 45.0	MAX 286	MIN 2.5	AC-FT 32,550						

GRAND RIVER BASIN

06356000 South Fork Grand River at Buffalo, S. Dak.

LOCATION.--Lat 45°34'34", long 103°32'38", in SW¼ sec.29, T.19 N., R.5 E., Harding County, on right bank at downstream side of bridge on U.S. Highway 85, 0.3 mi (0.5 km) south of Buffalo.

DRAINAGE AREA.--148 sq mi (383 sq km).

PERIOD OF RECORD.--August 1955 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,839.60 ft (865.510 m) above mean sea level. Prior to May 5, 1970, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--18 years, 8.10 cfs (0.229 cu m/s), 5,870 acre-ft/yr (7.24 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 432 cfs (12.2 cu m/s) May 27, gage height, 5.93 ft (1.807 m); minimum daily, 0.50 cfs (0.014 cu m/s) Jan. 8, 9.

Period of record: Maximum discharge, 2,780 cfs (78.7 cu m/s) June 14, 1963, gage height, 9.01 ft (2.746 m), from rating curve extended above 550 cfs (15.6 cu m/s) on basis of slope-area measurement of peak flow; no flow at times.

Flood in 1908, reached a stage of 15.4 ft (4.69 m), from information by South Dakota Department of Highways.

REMARKS.--Records good except those for winter periods, which are poor.

REVISIONS (WATER YEARS).--WSP 1917: 1956-57.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Stage-discharge relation affected by ice Oct. 29 to Nov. 1, Nov. 12-15,
21-29, Dec. 2 to Mar. 1)

2.1	0.8	4.0	73
2.5	9.0	4.5	124
3.0	21	5.0	200
3.5	39	6.0	450

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.1	3.5	2.2	1.8	3.5	20	3.6	3.8	6.1	4.0	1.7	1.9
2	2.2	4.0	2.2	2.0	3.5	20	3.6	3.8	10	3.2	1.3	2.2
3	2.2	4.6	2.2	1.8	3.5	19	3.6	3.6	14	3.0	.98	3.6
4	2.2	6.4	2.5	1.7	3.5	16	3.4	3.6	9.9	3.6	1.80	11
5	17	5.3	2.2	1.0	3.4	8.8	3.4	3.4	5.3	7.2	1.3	12
6	30	4.0	1.8	.80	3.0	4.8	3.2	3.4	4.0	7.9	1.5	3.2
7	13	3.8	1.5	.60	2.5	7.2	3.2	3.4	3.6	3.0	1.7	2.8
8	4.2	3.4	1.0	.50	2.5	8.1	3.2	3.0	3.2	2.6	1.3	2.6
9	2.1	3.2	1.2	.50	2.5	8.3	3.0	3.0	3.0	2.4	.98	2.6
10	1.9	3.2	1.5	.60	2.5	6.4	3.0	2.8	3.0	2.4	1.2	2.2
11	1.5	3.2	1.6	.60	2.6	7.2	2.8	2.6	3.0	2.2	1.9	2.2
12	1.7	2.8	2.0	.60	2.6	5.9	2.4	2.6	3.0	2.1	2.1	2.1
13	1.7	2.5	2.0	.60	2.4	5.5	2.2	2.6	2.8	2.1	1.5	2.2
14	1.9	2.0	2.0	1.0	2.0	6.6	2.2	2.6	3.0	2.1	1.9	2.4
15	1.7	2.2	2.0	1.5	2.0	6.6	2.1	2.6	3.0	2.1	1.9	7.0
16	1.9	2.4	2.0	2.0	2.2	6.4	2.1	2.6	6.3	2.1	1.7	6.1
17	2.1	2.4	2.5	2.5	2.5	5.7	2.1	2.6	9.4	1.9	1.5	5.0
18	2.1	2.4	2.5	2.4	2.5	5.3	1.9	2.6	134	1.3	1.7	2.8
19	1.9	2.4	2.7	2.3	2.5	4.6	41	2.6	127	1.3	1.5	2.6
20	2.1	2.4	2.7	2.0	2.5	4.6	181	2.4	24	1.5	1.9	2.2
21	2.1	2.4	2.7	2.0	3.0	4.6	79	2.4	33	1.5	1.9	2.6
22	2.2	2.6	3.0	2.0	3.5	4.0	17	2.4	14	2.2	1.9	3.2
23	2.2	3.0	2.5	2.5	4.0	4.6	9.0	2.4	7.9	2.8	1.9	4.0
24	2.4	3.0	2.5	3.0	4.0	7.0	15	2.2	4.2	2.6	3.3	2.8
25	2.4	2.6	2.5	2.8	6.0	7.7	13	2.4	3.2	2.6	4.8	2.8
26	2.6	2.6	2.6	2.5	10	6.4	6.1	81	3.2	2.4	2.4	2.6
27	2.8	2.4	2.6	2.3	12	4.6	5.0	306	3.0	2.4	1.9	2.6
28	3.0	2.0	2.2	2.0	15	4.0	4.4	87	2.8	2.4	1.5	2.4
29	3.0	2.0	2.0	3.0	-----	4.0	4.2	123	2.8	2.4	1.3	2.4
30	3.0	2.2	1.8	3.5	-----	3.8	4.0	19	4.2	2.2	1.3	2.2
31	3.5	-----	1.8	3.5	-----	3.6	-----	9.4	-----	1.9	.98	-----
TOTAL	124.7	91.3	66.5	56.20	111.7	231.3	429.7	696.8	455.9	83.4	93.96	100.3
MEAN	4.02	3.04	2.15	1.81	3.99	7.46	14.3	22.5	15.2	2.69	1.73	3.61
MAX	30	6.4	3.0	3.5	15	20	181	306	134	7.9	4.8	12
MIN	1.5	2.0	1.0	.50	2.0	3.6	1.9	2.2	2.8	1.3	.80	1.9
AC-FT	247	181	132	111	222	459	852	1,380	904	165	106	215

CAL YR 1972 TOTAL 3,649.78 MEAN 9.97 MAX 225 MIN 0 AC-FT 7,240
WTR YR 1973 TOTAL 2,509.34 MEAN 6.87 MAX 306 MIN .50 AC-FT 4,980

PEAK DISCHARGE (BASE, 200 CFS)

DATE	TIME	G.H.	DISCHARGE	DATE	TIME	G.H.	DISCHARGE
4-20	0700	5.88	423	5-29	0100	5.57	338
5-27	0930	5.93	432	6-18	0800	5.45	312

GRAND RIVER BASIN

27

06356500 South Fork Grand River near Cash, S. Dak.

LOCATION.--Lat 45°38'56", long 102°38'27", in SW¼SW¼ sec.34, T.20 N., R.12 E., Perkins County, on left bank at downstream side of highway bridge, 1.0 mi (1.6 km) upstream from Little Nasty Creek, 4.0 mi (6.4 km) north of Cash, 10 mi (16 km) south of Lodgepole, 12 mi (19 km) northwest of Bison, and 16 mi (26 km) downstream from Big Nasty Creek.

DRAINAGE AREA.--1,350 sq mi (3,500 sq km), approximately.

PERIOD OF RECORD.--October 1945 to current year. Monthly discharge only for some periods, published in WSP 1309.

GAGE.--Water-stage recorder. Altitude of gage is 2,416 ft (736 m), by barometer. Prior to Oct. 25, 1946, nonrecording gage, and Oct. 25, 1946, to May 16, 1966, water-stage recorder, at site 500 ft (152 m) upstream. May 17, 1966, to May 2, 1968, nonrecording gage, at present site, all at same datum.

AVERAGE DISCHARGE.--28 years, 56.2 cfs (1.592 cu m/s), 40,720 acre-ft/yr (50.2 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 647 cfs (18.3 cu m/s) Apr. 21; maximum gage height, 5.87 ft (1.789 m) Feb. 24, backwater from ice; minimum daily discharge, 7.0 cfs (0.20 cu m/s).
Period of record: Maximum discharge, 27,000 cfs (765 cu m/s) Apr. 15, 1950, gage height, 15.40 ft (4.694 m), from rating curve extended above 14,000 cfs (396 cu m/s) on basis of slope-area measurement of peak flow; no flow at times.

REMARKS.--Records good except those for winter periods, which are poor.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-11, Mar. 10-13, May 9 to Aug. 22; stage-discharge relation affected by ice Oct. 30 to Nov. 2, Nov. 12 to Mar. 9)

1.4	5.5	2.2	132
1.5	10	2.5	219
1.7	28	3.0	390
1.9	56	4.0	850

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17	34	16	20	35	100	28	40	63	22	12	8.0
2	17	35	16	20	35	100	28	38	70	22	12	9.0
3	17	32	15	16	45	90	28	36	154	20	11	22
4	17	31	15	10	45	80	28	32	239	20	10	26
5	20	32	12	10	40	70	26	31	115	18	9.5	26
6	24	34	10	10	20	50	28	30	75	20	10	20
7	37	35	10	10	11	60	26	30	53	28	10	20
8	43	35	10	10	11	60	28	28	40	24	12	24
9	36	34	10	10	12	80	26	26	32	24	11	18
10	31	34	15	12	12	122	26	24	28	18	9.5	17
11	26	34	15	15	16	111	26	22	28	15	10	16
12	24	30	15	20	20	98	24	20	26	12	9.5	16
13	22	28	15	25	20	88	24	20	24	11	9.5	16
14	20	28	15	30	15	100	24	18	24	11	10	16
15	20	27	15	150	12	80	24	18	24	10	13	17
16	20	27	15	200	12	60	24	18	70	10	10	18
17	20	27	20	250	14	56	22	13	109	10	10	20
18	20	24	20	250	15	41	24	12	66	10	9.5	22
19	20	24	20	200	15	36	31	11	192	9.0	10	20
20	20	24	20	150	17	35	98	11	417	11	9.0	20
21	18	24	25	100	18	31	481	11	282	10	9.0	22
22	18	20	30	50	19	32	448	10	154	11	10	22
23	18	20	25	50	21	32	282	9.5	101	180	10	22
24	20	20	25	75	25	32	176	9.5	75	80	10	24
25	20	18	25	75	25	32	146	9.5	53	49	10	30
26	20	18	30	50	30	32	106	17	43	33	9.5	26
27	18	18	35	30	50	33	83	63	35	26	8.5	20
28	18	17	40	25	80	34	63	309	31	22	10	18
29	18	17	45	35	-----	33	49	278	22	18	9.0	17
30	19	17	30	40	-----	30	46	159	22	16	8.0	15
31	20	-----	25	40	-----	30	-----	114	-----	14	7.0	-----
TOTAL	678	798	634	1,988	690	1,868	2,473	1,467.5	2,667	784.0	308.5	587.0
MEAN	21.9	26.6	20.5	64.1	24.6	60.3	82.4	47.3	88.9	25.3	9.95	19.6
MAX	43	35	45	250	80	122	481	309	417	180	13	30
MIN	17	17	10	10	11	30	22	9.5	22	9.0	7.0	8.0
AC-FT	1,340	1,580	1,260	3,940	1,370	3,710	4,910	2,910	5,290	1,560	612	1,160

CAL YR 1972 TOTAL 46,684.00 MEAN 128 MAX 3,000 MIN 0 AC-FT 92,600
WTR YR 1973 TOTAL 14,943.00 MEAN 40.9 MAX 481 MIN 7.0 AC-FT 29,640

PEAK DISCHARGE (BASE, 500 CFS)

DATE	TIME	G.H.	DISCHARGE
4-21	2300	3.66	647
6-20	0500	3.45	528

GRAND RIVER BASIN

06357000 Shadehill Reservoir at Shadehill, S. Dak.

LOCATION.--Lat 45°45'12", long 102°12'12", in NW¼ sec.30, T.21 N., R.16 E., Perkins County, at dam on Grand River, 0.8 mi (1.3 km) west of Shadehill.

DRAINAGE AREA.--3,120 sq mi (8,080 sq km), approximately.

PERIOD OF RECORD.--June 1950 to current year.

GAGE.--Water-stage recorder. Datum of gage is at mean sea level. Prior to Apr. 3, 1952, occasional elevations obtained by level circuits and Apr. 3, 1952, to Apr. 28, 1970, nonrecording gage at same site and datum.

EXTREMES.--Current year: Maximum contents, 85,177 acre-ft (105 cu hm) Apr. 28, elevation, 2,272.76 ft (692.737 m); minimum, 53,648 acre-ft (66.1 cu hm) Jan. 15, elevation, 2,265.93 ft (690.655 m).
Period of record: Maximum usable contents observed, 259,900 acre-ft (320 cu hm) Apr. 10, 1952, elevation, 2,297.86 ft (700.388 m); minimum usable observed since first filling to spillway level, 25,950 acre-ft (32.0 cu hm) Mar. 17, 1962, elevation, 2,258.90 ft (688.51 m).

REMARKS.--Reservoir formed by earthfill dam. Storage began July 1, 1950; dam completed August 1951. Conservation storage, 81,443 acre-ft (100 cu hm) between elevations 2,250.8 ft (686.04 m), invert of canal and river outlet, and elevation 2,272.0 ft (692.51 m), crest of morning glory spillway. Dead storage, 58,231 acre-ft (71.8 cu hm) below elevation 2,250.8 ft (686.04 m). Flood control, 217,708 acre-ft (268 cu hm) between elevations 2,272.0 ft (692.51 m) and 2,302.0 ft (701.65 m), crest of emergency spillway. Surcharge, 111,203 acre-ft (137 cu hm) at elevation 2,312.0 ft (704.70 m), maximum pool elevation. Total reservoir capacity is 468,585 acre-ft (578 cu hm) at elevation 2,312.0 ft (704.70 m). The reservoir provides flood control and water for irrigation purposes. Figures given herein represent usable contents above elevation 2,250.8 ft (686.04 m). Prior to Oct. 1, 1968, reservoir contents published as total contents and included dead storage. Water-quality records for the water year 1973 are published in Part 2 of this report.

COOPERATION.--Records of elevations and contents furnished by Bureau of Reclamation.

MONTHEND ELEVATION AND CONTENTS AT 2400 HOURS, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	2,269.59	69,981	-
Oct. 31.....	2,268.46	64,798	-5,183
Nov. 30.....	2,267.38	59,961	-4,837
Dec. 31.....	2,266.42	55,757	-4,204
CAL YR 1972.....	-	-	-1,609
Jan. 31.....	2,268.82	66,435	+10,678
Feb. 28.....	2,269.84	71,142	+4,706
Mar. 31.....	2,272.04	81,638	+10,496
Apr. 30.....	2,272.70	84,880	+3,242
May 31.....	2,272.09	81,882	-2,998
June 30.....	2,272.19	82,371	+489
July 31.....	2,270.87	75,996	-6,375
Aug. 31.....	2,269.48	69,470	-6,526
Sept. 30.....	2,268.68	65,797	-3,673
WTR YR 1973.....	-	-	-2,184

GRAND RIVER BASIN

29

06357500 Grand River at Shadehill, S. Dak.

LOCATION.--Lat 45°45'25", long 102°11'41", in NW¼NW¼ sec.30, T.21 N., R.16 E., Perkins County, on left bank 0.2 mi (0.3 km) downstream from Shadehill Dam, 1.0 mi (1.6 km) southwest of Shadehill, and 12.0 mi (19.3 km) southwest of Lemmon.

DRAINAGE AREA.--3,120 sq mi (8,080 sq km), approximately.

PERIOD OF RECORD.--February 1943 to current year. Records for July 1904 to October 1906 collected at site 4 mi (6 km) upstream and published as "at Seim" in WSP 130, 172, and 208 have been found to be unreliable and should not be used.

GAGE.--Water-stage recorder. Datum of gage is 2,192.48 ft (668.268 m) above mean sea level. Prior to Aug. 31, 1947, nonrecording gage, and Aug. 31, 1947, to Oct. 24, 1958, water-stage recorder, at site 0.8 mi (1.3 km) downstream at datum 6.02 ft (1.835 m) lower.

AVERAGE DISCHARGE.--30 years, 122 cfs (3.455 cu m/s), 88,390 acre-ft/yr (109 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 303 cfs (8.58 cu m/s) Apr. 28, 29, gage height, 4.33 ft (1.320 m); minimum daily, 74 cfs (2.10 cu m/s) Aug. 11, 18.

Period of record: Maximum discharge, 58,000 cfs (1,640 cu m/s) Apr. 16, 1950, gage height, 21.0 ft (6.40 m), from floodmarks upstream from bridge; 19.06 ft (5.809 m), from floodmark in gage well, unreliable, site and datum then in use; no flow for many days in some years.

REMARKS.--Records good. Flow completely regulated by Shadehill Reservoir since July 1, 1950. (See station 06357000.)

REVISIONS (WATER YEARS).--WSP 1279: 1943(M). See also Period of Record.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 22 to Nov. 5, Aug. 12 to Sept. 30)

3.3	61
3.8	161
4.3	307

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	110	120	98	94	98	97	110	269	133	142	88	77
2	112	120	98	94	98	98	106	255	139	135	87	78
3	112	118	98	96	96	98	102	226	161	129	87	78
4	113	118	96	94	96	100	100	255	152	127	87	78
5	114	118	96	94	96	100	98	238	159	124	88	77
6	112	116	97	94	96	101	99	221	166	125	89	78
7	112	116	96	94	96	102	98	208	168	126	81	79
8	114	116	96	92	96	102	96	195	170	124	75	78
9	114	114	99	92	97	102	96	196	168	123	75	77
10	114	114	100	90	96	102	94	176	161	122	75	78
11	114	114	100	90	96	102	96	164	154	123	74	78
12	113	112	98	90	96	102	94	149	150	122	76	77
13	114	112	97	90	96	104	93	140	146	122	75	77
14	114	112	96	90	96	110	96	135	145	124	76	77
15	115	109	95	90	96	103	94	131	142	123	75	77
16	115	109	94	90	96	103	94	124	139	122	75	77
17	116	109	94	90	96	108	96	123	134	122	75	77
18	114	106	93	92	96	111	96	121	168	122	74	77
19	114	106	92	96	96	114	99	122	151	122	77	79
20	116	106	90	96	97	116	99	122	141	121	77	79
21	118	106	90	96	96	120	116	124	150	120	76	78
22	120	104	90	98	96	118	124	123	163	123	76	79
23	119	104	90	96	94	120	175	123	170	122	76	79
24	118	104	92	97	92	122	218	122	172	122	76	78
25	118	103	92	98	92	122	253	122	175	122	75	78
26	119	103	90	99	93	122	279	124	174	101	77	76
27	119	102	92	101	94	124	294	122	162	87	77	75
28	119	100	92	100	94	117	296	124	155	87	76	76
29	122	99	92	100	-----	116	295	124	148	88	77	75
30	122	99	94	99	-----	112	285	126	144	88	77	75
31	120	-----	94	98	-----	110	-----	128	-----	89	76	-----
TOTAL	3,586	3,289	2,931	2,930	2,677	3,378	4,291	4,932	4,660	3,649	2,425	2,322
MEAN	116	110	94.5	94.5	95.6	109	143	159	155	118	78.2	77.4
MAX	122	120	100	101	98	124	296	269	175	142	89	79
MIN	110	99	90	90	92	97	93	121	133	87	74	75
AC-FT	7,110	6,520	5,810	5,810	5,310	6,700	8,510	9,780	9,240	7,240	4,810	4,610
CAL YR 1972	TOTAL 86,482		MEAN 236	MAX 3,020	MIN 84	AC-FT 171,500						
WTR YR 1973	TOTAL 41,070		MEAN 113	MAX 296	MIN 74	AC-FT 81,460						

MOREAU RIVER BASIN

31

06359500 Moreau River near Faith, S. Dak.

LOCATION.--Lat 45°11'52", long 102°09'22", in NW¼ sec.10, T.14 N., R.16 E., Perkins County, on left bank 10 ft (3 m) downstream from bridge on State Highway 73, 3.1 mi (5.0 km) downstream from Rabbit Creek and 13.5 mi (21.7 km) northwest of Faith.

DRAINAGE AREA.--2,660 sq mi (6,890 sq km), approximately.

PERIOD OF RECORD.--March 1943 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,238.68 ft (682.350 m) above mean sea level. Prior to Oct. 5, 1949, nonrecording gage 0.3 mi (0.5 km) upstream and Oct. 5, 1949, to July 16, 1959, nonrecording gage and crest-stage gage at present site; both at datum 1.0 ft (0.30 m) higher. July 17, 1959, to Sept. 1, 1971, recording gage at site 500 ft (152 m) downstream at present datum.

AVERAGE DISCHARGE.--30 years, 138 cfs (3.908 cu m/s), 99,980 acre-ft/yr (123 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 1,170 cfs (33.1 cu m/s) June 4; maximum gage height, 7.30 ft (2.225 m) Jan. 19, backwater from ice; minimum daily discharge, 2.0 cfs (0.057 cu m/s) July 18.
Period of record: Maximum discharge, 26,000 cfs (736 cu m/s) Apr. 9, 1944, gage height, 20.9 ft (6.37 m), from floodmarks, site and datum then in use, from rating curve extended above 12,000 cfs (340 cu m/s) on basis of slope-area measurement of peak flow; no flow at times in 1944, 1946, 1948-51, 1955-66, 1968-71.

REMARKS.--Records good except those for winter periods, which are poor.

REVISIONS (WATER YEARS).--WSP 1176: 1944. WSP 1279: 1946(M).

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 18 to June 19; stage-discharge relation affected by ice Nov. 12 to Mar. 7)

1.7	0.98	2.2	15	4.0	298
1.8	2.1	2.4	30	5.0	611
1.9	4.2	3.0	102	6.0	979
2.0	7.2	3.5	183		

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.1	6.5	6.0	6.8	100	300	63	56	550	13	20	2.1
2	2.1	11	5.7	7.0	100	250	56	50	296	10	16	6.0
3	2.1	7.2	5.7	7.0	100	200	47	46	348	9.4	14	24
4	2.1	7.2	5.7	6.5	70	160	41	41	811	8.2	11	13
5	34	7.2	5.7	6.0	50	150	38	41	595	7.8	11	7.8
6	41	7.2	5.5	6.0	45	150	35	44	401	7.2	8.8	6.6
7	21	6.9	5.3	6.0	45	150	34	40	239	6.0	8.2	6.0
8	16	6.0	5.0	6.0	45	161	33	33	152	5.4	7.8	5.7
9	10	6.0	5.2	6.0	45	133	30	31	117	5.4	6.9	6.0
10	8.8	6.0	5.5	6.0	45	143	30	24	92	4.8	6.0	6.0
11	9.4	6.0	5.7	6.0	48	108	28	24	79	4.2	5.7	6.3
12	9.4	5.8	5.7	7.0	45	94	27	22	67	3.8	5.7	6.6
13	8.5	5.6	5.7	8.0	42	82	25	19	56	3.6	5.4	6.6
14	7.8	5.5	5.7	10	40	151	24	19	48	3.0	5.4	6.0
15	6.9	5.5	5.7	15	40	295	22	19	40	2.7	5.4	7.8
16	6.3	5.5	5.7	50	45	135	21	17	36	2.3	4.5	8.2
17	5.4	5.5	6.0	100	47	104	20	17	31	2.3	4.0	7.8
18	5.4	5.5	6.5	200	50	128	19	17	31	2.0	3.4	7.2
19	5.7	5.5	6.5	300	50	154	84	17	48	2.3	3.2	7.2
20	6.0	5.5	7.0	250	50	266	496	17	34	4.0	2.7	6.9
21	6.0	5.5	7.5	200	60	309	659	17	29	4.5	2.7	6.9
22	5.7	6.0	8.0	200	70	298	532	17	22	5.7	120	6.9
23	5.7	6.5	7.5	200	100	271	496	19	26	9.4	13	7.2
24	5.4	6.5	7.0	250	100	239	349	24	25	510	8.5	24
25	5.4	6.5	7.0	300	200	189	230	22	20	410	5.4	14
26	5.4	6.4	7.5	250	250	156	163	88	19	158	4.5	11
27	5.4	6.0	7.5	200	400	131	114	301	18	94	4.2	8.5
28	5.7	5.8	7.2	100	300	113	88	529	17	62	3.8	8.8
29	5.7	5.8	7.0	120	-----	92	76	502	13	43	3.4	7.8
30	5.7	6.0	6.8	120	-----	80	65	635	13	33	3.0	7.2
31	6.6	-----	6.8	120	-----	70	-----	679	-----	26	2.3	-----
TOTAL	272.7	190.1	195.3	3,069.3	2,582	5,262	3,945	3,427	4,275	1,463.0	325.9	256.1
MEAN	8.80	6.34	6.30	99.0	92.2	170	132	111	143	47.2	10.5	8.54
MAX	41	11	8.0	300	400	309	659	679	811	510	120	24
MIN	2.1	5.5	5.0	6.0	40	70	19	17	13	2.0	2.3	2.1
AC=FT	541	377	387	6,090	5,120	10,440	7,820	6,800	8,480	2,900	646	508

CAL YR 1972 TOTAL 70,760.8 MEAN 193 MAX 4,400 MIN 2.0 AC=FT 140,400
WTR YR 1973 TOTAL 25,263.4 MEAN 69.2 MAX 811 MIN 2.0 AC=FT 50,110

PEAK DISCHARGE (BASE, 1,500 CFS).--No peaks above base.

MOREAU RIVER BASIN

06360500 Moreau River near Whitehorse, S. Dak.

LOCATION.--Lat 45°15'21", long 100°50'33", in SW¼SE¼ sec.17, T.15 N., R.27 E., Dewey County, on left bank 30 ft (9 m) downstream from bridge, 2.4 mi (3.9 km) southeast of Whitehorse, 8.8 mi (14.2 km) downstream from Little Moreau River, and 16.3 mi (26.2 km) southeast of town of Timber Lake.

DRAINAGE AREA.--4,880 sq mi (12,640 sq km), approximately.

PERIOD OF RECORD.--June 1954 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,661.48 ft (506.419 m) above mean sea level. Prior to Nov. 24, 1954, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--19 years, 192 cfs (5.437 cu m/s), 139,100 acre-ft/yr (172 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 4,000 cfs (113 cu m/s) Mar. 3; maximum gage height, 12.29 ft (3.746 m) Mar. 3, backwater from ice; no flow for many days.

Period of record: Maximum discharge, 21,000 cfs (595 cu m/s) Mar. 14, 1972; maximum gage height, 26.20 ft (7.986 m) Mar. 14, 1972, backwater from ice; no flow at times each year.

Flood in June 1953 reached a stage of about 26.2 ft (7.99 m). Flood in March 1947 was probably higher.

REMARKS.--Records good except those for winter periods, which are poor. Water-quality records for the water year 1973 are published in Part 2 of this report.

REVISIONS (WATER YEARS).--WSP 1917: 1957, 1960.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0	11	6.0	.50	500	1,300	274	205	704	19	65	15
2	0	8.5	4.0	.40	460	1,400	235	169	722	16	52	13
3	0	7.6	2.0	.30	440	1,600	203	147	960	14	41	13
4	0	7.6	1.0	.10	440	926	174	123	640	12	33	15
5	.54	7.6	0	0	420	713	150	106	534	10	33	21
6	1.8	7.6	0	0	380	627	126	93	788	8.5	26	17
7	.33	7.6	0	0	300	631	113	83	674	7.2	20	18
8	.14	7.6	0	0	250	501	102	74	564	5.7	18	21
9	.07	7.2	0	0	200	416	92	68	431	4.2	16	16
10	.14	7.0	0	0	150	388	81	62	322	3.5	15	16
11	.14	7.0	0	0	100	392	75	58	230	1.2	14	17
12	.14	6.0	0	1.0	90	332	67	52	169	.84	12	14
13	1.8	6.0	.10	30	90	246	62	46	138	.84	9.7	13
14	16	5.0	.30	50	85	949	59	40	113	.84	8.5	11
15	15	6.0	.50	100	80	883	57	37	102	.84	7.2	9.7
16	13	6.0	1.0	260	80	730	57	32	87	.60	5.7	9.7
17	11	7.0	1.0	300	85	665	54	29	74	.38	5.4	8.9
18	9.3	7.0	1.0	300	95	610	50	28	65	.24	4.6	7.2
19	8.5	6.0	2.0	250	100	695	46	27	61	.17	3.5	6.1
20	7.2	9.0	2.0	220	120	837	386	25	131	.14	1.8	5.7
21	7.0	9.0	3.0	200	140	810	1,440	24	215	.14	.84	5.0
22	8.0	10	3.0	250	150	748	2,040	21	133	.09	2.0	5.0
23	9.0	11	4.0	300	200	819	1,610	19	95	.67	2.5	4.6
24	9.3	11	5.0	350	250	851	1,020	17	70	1.2	2.0	5.7
25	8.9	10	5.0	450	300	936	824	16	49	.84	.99	6.1
26	8.0	8.0	5.0	500	400	735	644	28	37	.99	35	6.5
27	7.2	8.0	5.0	600	750	644	509	291	29	.99	58	6.5
28	7.6	8.0	4.0	600	1,500	530	439	354	25	232	40	20
29	7.2	7.0	2.0	600	-----	443	335	1,260	21	159	29	36
30	6.8	7.0	1.0	600	-----	371	263	912	19	109	22	29
31	8.0	-----	1.0	550	-----	316	-----	774	-----	81	18	-----
TOTAL	172.10	235.3	58.90	6,512.30	8,155	22,244	11,587	5,220	8,222	692.11	601.73	391.7
MEAN	5.55	7.84	1.90	210	291	718	386	168	274	22.3	19.4	13.1
MAX	16	11	6.0	600	1,500	1,800	2,040	1,260	960	232	65	36
MIN	0	5.0	0	0	80	246	46	16	19	.09	.84	4.6
AC-FT	341	467	117	12,920	16,180	44,120	22,980	10,350	16,310	1,370	1,190	777

CAL YR 1972 TOTAL 186,628.57 MEAN 510 MAX 20,000 MIN 0 AC-FT 370,200
WTR YR 1973 TOTAL 64,092.14 MEAN 176 MAX 2,040 MIN 0 AC-FT 127,100

PEAK DISCHARGE (BASE, 1,800 CFS)

DATE	TIME	G.H.	DISCHARGE
3-3	-	-	4,000
4-22	1100	6.89	2,120

CHEYENNE RIVER BASIN

33

06386500 Cheyenne River near Spencer, Wyo.

LOCATION.--Lat 43°25', long 104°08', in N½ sec.25, T.40 N., R.61 W., Niobrara County, Wyoming, at right abutment on downstream side of old highway bridge, 1.8 mi (2.9 km) downstream from Robbers Roost Creek, 7.5 mi (12.1 km) northeast of Spencer, and 30 mi (48 km) south of Newcastle, Wyoming.

DRAINAGE AREA.--5,270 sq mi (13,650 sq km), approximately.

PERIOD OF RECORD.--October 1948 to current year. Published as South Fork Cheyenne River near Spencer October 1949 to September 1951.

GAGE.--Water-stage recorder. Altitude of gage is 3,600 ft (1,100 m), from topographic map. Prior to Oct. 18, 1955, water-stage recorder at site 400 ft (122 m) upstream, Oct. 18, 1955, to Aug. 1, 1961, at site 2,500 ft (762 m) upstream, and Aug. 1, 1961, to Aug. 22, 1962, at site 2,200 ft (671 m) upstream, all at different datums.

AVERAGE DISCHARGE.--25 years, 59.8 cfs (1.69 cu m/s), 43,330 acre-ft/yr (53.4 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 6,250 cfs (177 cu m/s) Sept. 10, gage height, 7.30 ft (2.225 m); no flow for many days.

Period of record: Maximum discharge, 16,000 cfs (453 cu m/s) May 27, 1962, gage height, 8.74 ft (2.664 m), site and datum then in use; no flow for many days in each year.

REMARKS.--Records poor. There are many small reservoirs above station used for storage of stock and irrigation water, total capacity, about 33,900 acre-ft (41.8 cu hm). Diversions above station for irrigation of about 6,860 acres (27.8 sq km), of which about 140 acres (57 sq hm) lies below station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						0	1.0	462	21	2.0	92	.20
2						0	1.0	1,000	22	1.6	75	1.1
3						0	1.0	783	22	1.4	66	1.4
4						0	1.0	478	18	1.1	57	106
5						0	1.0	489	19	.75	40	66
6						5.8	1.0	530	22	.75	25	40
7						3.0	1.0	1,440	22	.50	18	25
8						2.0	1.0	1,390	17	.30	10	15
9						1.0	1.2	760	14	.25	5.1	1,920
10						.90	1.0	495	11	.20	3.9	3,130
11						.80	1.0	414	9.9	.20	3.3	639
12						.69	1.0	373	8.8	.15	2.5	751
13						.60	1.0	313	8.8	.05	2.5	605
14						.50	1.0	240	8.2	.05	2.0	317
15						.80	1.0	180	9.3	.01	1.4	203
16						1.0	1.0	130	8.2	.01	1.2	149
17						1.0	1.0	88	11	0	1.2	120
18						1.0	1.0	80	10	0	.90	98
19						1.0	6.4	70	8.2	.53	.70	85
20						1.0	17	57	7.1	3.9	.50	75
21						1.0	12	56	6.0	87	.30	68
22						1.0	10	46	5.1	2,540	.20	56
23						1.0	6.6	45	4.3	768	.09	40
24						1.0	6.0	40	3.6	300	.07	42
25						1.0	8.8	35	2.8	150	.05	31
26						1.0	16	37	2.5	100	.04	28
27						1.0	26	33	2.3	70	.03	22
28						1.0	82	31	1.8	51	.02	43
29						1.0	290	30	1.6	43	.02	57
30						1.0	598	27	1.8	182	.02	39
31						1.0	-----	23	-----	152	.02	-----
TOTAL	0	0	0	0	0	32.09	1,097.0	10,175	309.3	4,456.75	409.06	8,772.70
MEAN	0	0	0	0	0	1.04	36.6	328	10.3	144	13.2	292
MAX	0	0	0	0	0	5.8	598	1,440	22	2,540	92	3,130
MIN	0	0	0	0	0	0	1.0	23	1.6	0	.02	.20
AC-FT	0	0	0	0	0	64	2,180	20,180	613	8,840	811	17,400

CAL YR 1972 TOTAL 8,611.51 MEAN 23.5 MAX 839 MIN 0 AC-FT 17,080
WTR YR 1973 TOTAL 25,251.90 MEAN 69.2 MAX 3,130 MIN 0 AC-FT 50,090

PEAK DISCHARGE (BASE, 2,000 CFS)

NOTE.--No gage-height record Mar. 6 to Apr. 18.

DATE	TIME	G.H.	DISCHARGE
5-7	2130	5.51	2,180
7-22	0630	6.28	4,000
9-10	0100	7.30	6,250

CHEYENNE RIVER BASIN

06394000 Beaver Creek near Newcastle, Wyo.

LOCATION.--Lat 43°32'07", long 104°07'02", in NW¼ sec.18, T.41 N., R.60 W., Weston County, Wyoming, at highway bridge, 2.2 mi (3.5 km) downstream from Sheep Creek, and 23 mi (37 km) south of Newcastle.

DRAINAGE AREA.--1,320 sq mi (3,420 sq km), approximately.

PERIOD OF RECORD.--February to September 1943, October 1944 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 3,660 ft (1,120 m), from topographic map. Prior to Nov. 1, 1945, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--29 years (1944-73), 32.7 cfs (0.926 cu m/s), 23,690 acre-ft/yr (29.2 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 964 cfs (27.3 cu m/s) June 16, gage height, 9.19 ft (2.801 m); minimum daily, 0.22 cfs (0.006 cu m/s) July 13, 18.

Period of record: Maximum discharge, 11,900 cfs (337 cu m/s) June 16, 1962, gage height, 19.98 ft (6.090 m); no flow at times in 1943, 1945, 1950, 1952-61, 1966.

REMARKS.--Records fair except those for winter periods, which are poor. There are many small reservoirs above station used for storage of stock and irrigation water, total capacity, about 11,000 acre-ft (13.6 cu hm). Diversions for irrigation of about 4,900 acres (19.8 sq km) above station. Water-quality records for the water year 1973 are published in Part 2 of the Wyoming Basic Data report.

REVISIONS (WATER YEARS).--WSP 1209: 1943, 1946, 1948-49.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	UCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	13	10	9.0	15	17	18	28	9.3	1.1	10	2.5
2	11	15	10	9.0	15	17	18	37	64	.84	9.3	5.9
3	11	16	8.0	9.0	15	17	16	48	167	.65	8.6	10
4	11	17	6.0	8.0	15	17	14	26	163	.65	8.2	9.5
5	12	17	5.0	8.0	15	17	12	17	205	.60	8.3	8.3
6	13	17	5.0	8.0	15	17	12	71	51	5.1	8.4	7.1
7	14	17	5.0	8.0	15	17	8.8	20	24	5.9	8.5	5.8
8	15	17	5.0	8.0	15	17	9.1	9.9	15	2.8	8.4	5.4
9	14	17	5.0	8.0	15	17	8.5	8.0	11	3.5	8.3	5.3
10	14	17	5.0	9.0	15	17	8.2	6.2	7.5	3.3	7.2	5.3
11	14	17	5.0	10	16	17	8.9	5.4	5.4	.95	7.1	6.1
12	15	17	6.0	11	16	17	8.5	4.2	4.0	.28	7.5	14
13	15	17	6.0	12	16	17	2.3	3.6	2.9	.22	8.0	97
14	16	15	6.0	13	16	17	1.5	3.3	2.7	.48	7.2	25
15	16	14	6.0	13	16	30	1.4	2.8	47	.79	7.0	16
16	16	14	7.0	13	16	30	1.2	2.4	755	1.0	4.9	10
17	16	14	8.0	13	16	30	1.2	1.9	411	.46	3.0	9.2
18	16	14	9.0	13	17	30	1.4	1.8	59	.22	2.4	8.1
19	16	14	10	13	17	28	11	1.6	31	2.3	2.4	6.6
20	16	13	10	13	17	28	16	1.4	21	22	2.5	5.0
21	16	13	10	13	17	39	14	1.4	41	21	2.1	4.0
22	16	13	10	13	17	53	32	1.2	28	17	2.0	3.0
23	16	12	10	13	17	68	29	1.0	16	87	6.5	3.0
24	16	12	10	13	17	59	33	1.2	12	36	3.0	3.0
25	16	12	10	13	17	54	77	1.2	8.6	22	3.4	3.0
26	17	12	10	13	17	41	75	1.3	6.6	65	2.8	3.0
27	17	12	10	13	17	33	57	1.7	5.3	18	2.3	3.0
28	16	10	10	13	17	29	126	1.4	3.0	16	2.3	10
29	16	10	10	13	-----	24	54	1.1	2.3	15	2.1	10
30	14	10	10	15	-----	24	31	20	1.7	13	1.7	10
31	13	-----	9.0	15	-----	20	-----	18	-----	12	2.2	-----
TOTAL	455	428	246.0	355.0	449	858	706.0	349.0	2,180.3	375.14	167.6	314.1
MEAN	14.7	14.3	7.94	11.5	16.0	27.7	23.5	11.3	72.7	12.1	5.41	10.3
MAX	17	17	10	15	17	68	126	71	755	87	10	97
MIN	11	10	5.0	8.0	15	17	1.2	1.0	1.7	.22	1.7	2.5
AC-FT	902	849	488	704	891	1,700	1,400	692	4,320	744	332	623

CAL YR 1972 TOTAL 16,431.90 MEAN 44.9 MAX 1,000 MIN 3.6 AC-FT 32,990
 MTR YR 1973 TOTAL 6,883.14 MEAN 18.9 MAX 755 MIN .22 AC-FT 13,650

PEAK DISCHARGE (BASE, 500 CFS).--June 16 (1130) 964 cfs (9.19 ft).

CHEYENNE RIVER BASIN

35

06395000 Cheyenne River at Edgemont, S. Dak.

LOCATION.--Lat 43°18'20", long 103°49'14", in SW¼SE¼SE¼ sec.36, T.8 S., R.2 E., Fall River County, on right bank at downstream side of bridge on U.S. Highway 18 at Edgemont, 300 ft (91 m) downstream from Burlington Northern Railroad bridge and 600 ft (183 m) upstream from Cottonwood Creek.

DRAINAGE AREA.--7,143 sq mi (18,500 sq km).

PERIOD OF RECORD.--June 1903 to November 1906 (no winter records), April 1928 to February 1933, October 1946 to current year.

GAGE (revised).--Water-stage recorder. Datum of gage is 3,414.56 ft (1,040.758 m) above mean sea level. Prior to Dec. 1, 1906, nonrecording gage 20 ft (6 m) upstream at datum 0.7 ft (0.21 m) lower. Apr. 11, 1928, to Feb. 28, 1933, Oct. 4, 1946, to Oct. 23, 1947, and Jan. 11, 1961, to Apr. 24, 1963, nonrecording gage at present site at datum 2.00 ft (0.610 m) higher.

AVERAGE DISCHARGE.--31 years (1928-32, 1946-73), 106 cfs (3.002 cu m/s), 76,800 acre-ft/yr (94.7 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 4,920 cfs (139 cu m/s) Sept. 10, gage height, 7.31 ft (2.228 m); minimum daily, 0.50 cfs (0.014 cu m/s) Jan. 9.

Period of record: Maximum discharge, 13,800 cfs (391 cu m/s) May 25, 1971, gage height, 8.57 ft (2.612 m); no flow at times most years.

Flood of May 1, 1920, reached a stage of 12.0 ft (3.66 m), present datum, from floodmarks at railroad bridge. Flood of May 12, 1920, reached a stage of 11.0 ft (3.35 m), present datum, from floodmarks at railroad bridge.

REMARKS.--Records good except those for winter periods, which are poor. Many small reservoirs above station used for stock and irrigation water, total capacity, about 45,000 acre-ft (55.5 cu hm). Water-quality records for the water year 1973 are published in Part 2 of this report.

REVISIONS (WATER YEARS).--WSP 1086: Drainage area. WSP 1116: 1947.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used July 21 to Sept. 5; stage-discharge relation affected by ice Nov. 12 to Feb. 28)

2.0	2.2	3.0	156
2.1	5.8	3.5	383
2.3	18	4.5	1,000
2.5	38	6.0	2,780
2.7	72	7.0	4,430

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.1	29	16	3.0	10	116	27	475	35	8.7	82	11
2	8.7	29	13	4.0	9.0	102	24	658	101	7.0	52	22
3	8.7	30	8.0	3.0	10	82	21	823	237	7.0	43	19
4	9.3	22	5.0	2.0	10	73	17	608	185	5.4	37	35
5	9.9	19	2.0	2.0	10	43	18	486	189	5.4	32	82
6	8.7	19	1.0	2.0	8.0	43	18	472	156	4.7	26	60
7	9.3	18	1.0	2.0	6.0	43	19	916	60	4.0	20	41
8	9.9	18	1.0	1.0	6.0	44	19	1,440	39	4.4	16	31
9	9.9	17	1.0	.50	7.0	47	23	870	27	5.8	16	172
10	9.9	18	1.0	1.0	8.0	77	17	585	19	5.1	14	3,270
11	9.3	19	1.5	3.0	9.0	75	14	464	15	4.0	14	1,060
12	10	18	1.5	5.0	9.0	48	11	388	10	3.3	12	612
13	10	16	1.5	7.0	8.0	43	10	296	7.0	3.3	12	753
14	11	14	1.5	12	7.0	29	9.9	240	16	3.6	8.7	519
15	12	12	1.5	14	7.0	27	9.3	182	22	2.9	10	326
16	11	13	1.5	15	8.0	27	9.3	146	86	2.9	12	222
17	11	13	2.0	14	9.0	27	11	121	645	2.2	10	171
18	11	13	2.5	13	10	41	16	102	276	1.5	7.0	150
19	12	12	3.0	10	10	43	25	87	82	7.1	5.1	119
20	13	12	3.0	7.0	11	37	44	70	45	16	4.0	95
21	15	12	3.0	7.0	15	37	58	52	35	19	4.0	77
22	17	13	4.0	8.0	18	44	39	47	37	1,310	4.7	62
23	16	14	4.0	9.0	20	60	32	40	33	940	7.5	51
24	16	15	4.0	10	25	64	32	35	22	484	5.8	45
25	14	14	4.0	10	24	64	45	35	16	201	5.8	43
26	14	14	5.0	9.0	26	47	92	37	14	121	7.0	41
27	13	14	6.0	8.0	30	40	75	35	12	108	7.5	37
28	13	13	5.0	7.0	50	32	77	30	11	56	7.5	34
29	14	13	4.0	9.0	-----	27	231	27	10	52	8.1	50
30	9.3	14	3.0	10	-----	29	456	25	10	43	9.3	47
31	19	-----	3.0	10	-----	27	-----	23	-----	151	9.3	-----
TOTAL	363.0	497	113.5	217.50	380.0	1,538	1,499.5	9,815	2,452.0	3,589.3	509.3	8,257
MEAN	11.7	16.6	3.66	7.02	13.6	49.6	50.0	317	81.7	116	16.4	275
MAX	19	30	16	15	50	116	456	1,440	645	1,310	82	3,270
MIN	8.1	12	1.0	.50	6.0	27	9.3	23	7.0	1.5	4.0	11

CAL YR 1972 TOTAL 14,444.20 MEAN 39.5 MAX 614 MIN .10
WTR YR 1973 TOTAL 29,231.10 MEAN 80.1 MAX 3,270 MIN .50

PEAK DISCHARGE (BASE, 1,500 CFS)

DATE	TIME	G.H.	DISCHARGE
5-8	0500	5.31	1,870
7-22	1300	5.94	2,550
9-10	0700	7.31	4,920

CHEYENNE RIVER BASIN

06400000 Hat Creek near Edgemont, S. Dak.

LOCATION.--Lat 43°14'46", long 103°35'16", in SW¼SE¼SE¼ sec.24, T.9 S., R.4 E., Fall River County, on left bank at downstream side of bridge on State Highway 71, 2.0 mi (3.2 km) upstream from mouth, 2.0 mi (3.2 km) west of Heppner, and 12.5 mi (20.1 km) southeast of Edgemont.

DRAINAGE AREA.--1,044 sq mi (2,704 sq km).

PERIOD OF RECORD.--April 1905 to September 1906, October 1950 to current year. Monthly discharge only for some periods, published in WSP 1309.

GAGE.--Water-stage recorder. Datum of gage is 3,295.71 ft (1,004.532 m) above mean sea level. Nonrecording gage Apr. 8, 1905, to May 2, 1906, at site 1,000 ft (305 m) downstream and May 3 to July 7, 1906, at site 0.8 mi (1.3 km) upstream at different datum. Nov. 6, 1950, to May 1, 1951, nonrecording gage at present site and datum.

AVERAGE DISCHARGE.--24 years, 23.2 cfs (0.657 cu m/s), 16,810 acre-ft/yr (20.7 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 685 cfs (19.4 cu m/s) Apr. 22, gage height, 9.38 ft (2.859 m); no flow for many days.

Period of record: Maximum discharge, 13,300 cfs (377 cu m/s) June 16, 1967, gage height, 13.35 ft (4.069 m), from rating curve extended above 2,600 cfs (73.6 cu m/s) on basis of slope-area measurement at 11.98 ft (3.652 m). No flow for many days each year.

REMARKS.--Records fair except those for winter periods, which are poor. A few small diversions above station for irrigation. Lander ditch diverts water from Hat Creek 0.8 mi (1.3 km) upstream from gaging station for irrigating hay meadows downstream from station. Results of discharge measurements, in cubic feet per second, of Lander ditch during water year 1972-73 are given herewith:

Feb. 20	3.34	July 11	0
Mar. 20	3.34	Aug. 7	0
Apr. 26	0	Aug. 29	0
May 23	3.52	Sept. 25	.10
June 12	2.58		

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1				0	0	1.5	5.0	53	.45	0	.10	0
2				0	0	1.4	3.2	485	.37	0	.10	0
3				0	0	1.0	8.1	483	.45	0	.10	0
4				0	0	2.1	3.9	358	.12	0	.12	25
5				0	0	2.0	4.2	99	0	0	.12	1.3
6				0	.15	1.3	2.1	37	0	0	.12	15
7				0	.10	2.9	4.6	70	0	0	.01	.98
8				0	.10	1.9	5.5	109	.10	0	.02	0
9				0	.15	4.3	4.8	104	1.1	0	0	0
10				0	.20	4.4	6.1	57	.52	0	0	0
11				0	.25	2.3	7.2	25	.97	0	0	0
12				0	.25	2.0	11	11	.18	0	0	0
13				0	.20	3.8	12	9.6	0	0	0	9.5
14				0	.15	5.1	17	17	.20	0	0	11
15				0	.15	1.3	15	15	2.3	0	0	33
16				0	.15	4.4	14	14	1.3	0	0	25
17				0	.20	1.8	12	12	.67	0	0	15
18				0	.25	1.2	10	11	.67	0	0	39
19				0	.25	2.6	16	10	.30	0	0	23
20				0	.25	7.0	131	5.9	.02	0	0	18
21				4.0	.30	12	418	1.7	0	61	0	8.9
22				3.0	.30	68	579	1.3	0	78	0	4.2
23				3.0	.50	83	175	.52	0	60	0	1.6
24				3.0	1.7	157	56	.24	0	41	0	1.3
25				.50	2.2	81	30	.24	0	6.3	0	.82
26				0	1.4	70	26	.30	0	1.7	0	.67
27				0	1.5	115	28	.52	0	.52	0	.74
28				0	1.8	60	36	.60	0	.59	0	.37
29				.06	-----	32	46	1.6	0	3.1	0	.37
30				0	-----	18	30	1.2	0	.24	0	.30
31		-----		0	-----	11	-----	1.6	-----	.06	0	-----
TOTAL	0	0	0	13.56	12.50	762.1	1,716.7	1,995.52	9.72	252.51	.93	235.05
MEAN	0	0	0	.44	.45	24.6	57.2	64.4	.32	8.15	.030	7.84
MAX	0	0	0	4.0	2.2	157	579	485	2.3	78	.10	39
MIN	0	0	0	0	0	1.2	2.1	.24	0	0	0	0
AC=FT	0	0	0	27	25	1,510	3,410	3,960	19	501	1.0	466
CAL YR 1972	TOTAL	1,014.82	MEAN	2.77	MAX	118	MIN	0	AC=FT	2,010		
WTR YR 1973	TOTAL	4,998.59	MEAN	13.7	MAX	579	MIN	0	AC=FT	9,910		

PEAK DISCHARGE (BASE, 1,000 CFS).---No peaks above base.

CHEYENNE RIVER BASIN

37

06401000 Angostura Reservoir near Hot Springs, S. Dak.

LOCATION.--Lat 43°20'35", long 103°26'16", in SW¼NW¼ sec.20, T.8 S., R.6 E., Fall River County, at dam on Cheyenne River, 6.5 mi (10.5 km) southeast of Hot Springs.

DRAINAGE AREA.--9,100 sq mi (2,360 sq km), approximately.

PERIOD OF RECORD.--October 1949 to current year.

GAGE.--Water-stage recorder. Datum of gage is at mean sea level. Prior to Aug. 26, 1965, nonrecording gage at same site and datum.

EXTREMES.--Current year: Maximum contents, 128,036 acre-ft (158 cu hm) May 9, elevation, 3,187.30 ft (971.489 m); minimum, 92,361 acre-ft (114 cu hm) Oct. 5-7, elevation, 3,178.99 ft (968.956 m).
Period of record: Maximum contents observed, 145,200 acre-ft (179 cu hm) June 18, 1962, elevation, 3,189.00 ft (972.007 m); minimum observed since normal operating level reached, 45,350 acre-ft (55.9 cu hm) Sept. 28, 1960, elevation, 3,162.90 ft (964.052 m).

REMARKS.--Reservoir formed by concrete gravity dam with earth embankment with gated concrete gravity spillway section. Storage began October 3, 1949; dam completed December 1949. Conservation capacity, 127,558 acre-ft (157 cu hm) between elevations 3,139.75 ft (956.996 m), invert of lowest outlet, and 3,187.2 ft (971.46 m), top of spillway gates. Dead storage below elevation 3,139.75 (956.996 m), 11,203 acre-ft (13.8 cu hm). Surcharge capacity, 196,221 acre-ft (242 cu hm), maximum pool elevation. Figures given herein represent contents above elevation 3,139.75 ft (956.996 m). Water is stored for irrigation.

COOPERATION.--Records of elevations, contents, and diversion to Angostura project furnished by Bureau of Reclamation.

MONTHEND ELEVATION AND CONTENTS AT 2400 HOURS, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)	+Diversions (acre-feet)
Sept. 30.....	3,179.14	92,953	-	-
Oct. 31.....	3,179.25	93,387	+434	900
Nov. 30.....	3,179.69	95,125	+1,738	-
Dec. 31.....	3,180.07	96,629	+1,504	-
CAL YR 1972.....	-	-	-441	42,650
Jan. 31.....	3,180.52	98,431	+1,802	-
Feb. 28.....	3,181.13	100,886	+2,455	-
Mar. 31.....	3,182.70	107,389	+6,503	-
Apr. 30.....	3,184.23	113,963	+6,574	-
May 31.....	3,186.74	125,384	+11,421	3,830
June 30.....	3,185.58	120,007	-5,377	7,450
July 31.....	3,183.38	110,282	-9,725	16,440
Aug. 31.....	3,179.93	96,072	-14,210	14,300
Sept. 30.....	3,182.96	108,480	+12,408	2,970
WTR YR 1973.....	-	-	+15,557	45,890

(+) Diversions from Angostura irrigation project.

CHEYENNE RIVER BASIN

06401500 Cheyenne River below Angostura Dam, S. Dak.

LOCATION.--Lat 43°20'42", long 103°26'12", in NE¼NW¼NW¼ sec.20, T.8 S., R.6 E., Fall River County, on right bank 800 ft (244 m) downstream from Angostura Dam, 4.8 mi (7.7 km) upstream from Fall River and 6.5 mi (10.5 km) southeast of Hot Springs.

DRAINAGE AREA.--9,100 sq mi (23,600 sq km), approximately.

PERIOD OF RECORD.--October 1945 to current year. Monthly discharge only for some periods, published in WSP 1309.

GAGE.--Water-stage recorder. Datum of gage is 3,058.02 ft (932.084 m) above mean sea level (Bureau of Reclamation bench mark). Prior to Oct. 17, 1946, nonrecording gage and Oct. 17, 1946, to July 7, 1946, water-stage recorder at site 4.8 mi (7.7 km) downstream at different datum.

AVERAGE DISCHARGE.--28 years, 83.1 cfs (2,353 cu m/s), 60,210 acre-ft/yr (74.2 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 1,250 cfs (35.4 cu m/s) May 9, gage height, 5.87 ft (1.789 m); minimum daily, 0.88 cfs (0.025 cu m/s) Sept. 20.
Period of record: Maximum discharge, 24,300 cfs (688 cu m/s) June 18, 1962, gage height, 13.81 ft (4.209 m), from rating curve extended above 6,000 cfs (170 cu m/s); no flow Oct. 9, 1949, to Feb. 5, 1950, Apr. 28, Aug. 26, 30, 1951.

REMARKS (revised).--Records good except those below 5 cfs (0.14 cu m/s), which are fair. Flow completely regulated by Angostura Reservoir 800 ft (244 m) upstream since October 1949. (See station 06401000.) Water-quality records for the water year 1973 are published in Part 2 of this report.

REVISIONS (WATER YEARS.--WSP 1309: 1946(M).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.95	1.3	1.1	1.1	1.4	1.5	1.3	1.4	1.8	1.4	1.4	1.4
2	.94	1.4	1.2	1.1	1.4	1.6	1.2	1.2	1.9	1.4	1.4	1.8
3	.96	1.3	1.2	1.2	1.4	1.6	1.3	1.2	1.9	1.5	1.4	1.3
4	.97	1.3	1.4	1.3	1.4	1.5	1.4	1.2	1.8	1.5	1.5	1.2
5	1.1	1.3	1.3	1.4	1.4	1.6	1.3	1.6	1.9	1.4	1.5	1.2
6	1.4	1.3	1.3	1.3	1.7	1.6	1.4	1.3	1.8	1.4	1.5	1.1
7	1.3	1.4	1.3	1.3	1.6	1.6	1.5	1.2	1.9	1.4	1.4	1.1
8	1.2	1.3	1.3	1.4	1.8	1.6	1.4	1.4	1.9	1.4	1.4	1.1
9	1.2	1.4	1.2	1.6	1.6	1.5	1.4	561	1.8	1.4	1.5	1.0
10	1.2	1.4	1.2	1.5	1.6	1.5	1.4	696	1.9	1.3	1.5	1.1
11	1.2	1.5	1.2	1.4	1.6	1.5	1.3	468	2.0	1.2	1.5	1.2
12	1.2	1.5	1.1	1.2	1.6	1.4	1.3	392	1.9	1.2	1.5	1.4
13	1.2	1.5	1.1	1.2	1.6	1.5	1.3	284	2.5	1.2	1.6	1.2
14	1.2	1.5	1.1	1.2	1.8	1.5	1.4	250	5.5	1.3	1.4	1.5
15	1.2	1.5	1.1	1.2	1.8	1.4	1.5	161	1.8	1.2	1.4	1.5
16	1.2	1.5	1.1	1.1	1.6	1.4	1.4	120	1.6	1.2	1.5	1.5
17	1.2	1.4	1.1	1.2	1.6	1.4	1.4	130	2.9	1.2	1.3	2.7
18	1.2	1.4	1.1	1.2	1.6	1.4	1.5	55	1.9	1.2	1.3	4.0
19	1.3	1.4	1.1	1.2	1.6	1.2	1.6	2.5	1.9	1.6	1.3	.91
20	1.2	1.2	1.1	1.2	1.6	1.2	1.6	3.3	1.8	1.5	1.3	.88
21	1.3	1.2	1.1	1.3	1.6	1.3	1.5	2.7	1.6	1.4	1.3	1.4
22	1.2	1.2	1.1	1.3	1.6	1.2	1.4	4.5	1.6	1.3	1.4	1.5
23	1.2	1.2	1.1	1.3	1.5	1.2	1.3	2.6	1.6	1.4	1.3	1.5
24	1.3	1.1	1.1	1.3	1.5	1.2	1.4	2.7	1.6	1.4	1.3	1.4
25	1.2	1.1	1.1	1.3	1.6	1.2	1.4	2.7	1.6	1.4	1.3	1.2
26	1.2	1.1	1.1	1.6	1.6	1.4	1.4	2.7	1.5	1.6	1.2	1.4
27	1.3	1.1	1.1	1.5	1.5	1.4	1.3	3.0	1.6	1.4	1.2	1.4
28	1.3	1.1	1.1	1.5	1.6	1.4	1.2	2.7	1.5	1.4	1.2	1.5
29	1.3	1.1	1.1	1.4	-----	1.2	1.4	2.6	1.5	1.7	1.2	1.4
30	1.4	1.1	1.1	1.3	-----	1.2	1.5	2.2	1.5	1.6	1.3	1.4
31	1.3	-----	1.1	1.4	-----	1.2	-----	1.9	-----	1.5	1.3	-----
TOTAL	37.32	39.1	35.7	40.5	44.2	43.4	41.9	3,163.6	58.0	43.0	42.6	43.19
MEAN	1.20	1.30	1.15	1.31	1.58	1.40	1.40	102	1.93	1.39	1.37	1.44
MAX	1.4	1.5	1.4	1.6	1.8	1.6	1.8	696	5.5	1.7	1.6	4.0
MIN	.94	1.1	1.1	1.1	1.4	1.2	1.2	1.2	1.5	1.2	1.2	.88
AC-FT	74	78	71	80	88	86	83	6,280	115	85	84	86
CAL YR 1972	TOTAL	1,269.64	MEAN	3.47	MAX	173	MIN	.91	AC-FT	2,520		
WTR YR 1973	TOTAL	3,632.51	MEAN	9.95	MAX	696	MIN	.88	AC-FT	7,210		

CHEYENNE RIVER BASIN

39

06402000 Fall River at Hot Springs, S. Dak.

LOCATION.--Lat 43°25'50", long 103°28'33", in NW¼NW¼ sec.24, T.7 S., R.5 E., Fall River County, on left bank at intersection of River Street and University Avenue in Hot Springs and 6.0 mi (9.7 km) upstream from mouth.

DRAINAGE AREA.--137 sq mi (355 sq km).

PERIOD OF RECORD.--October 1937 to current year. Monthly discharge only for October 1937, published in WSP 1309.

GAGE.--Water-stage recorder. Datum of gage is 3,413.20 ft (1,040.343 m) above mean sea level. Prior to June 2, 1939, nonrecording gage at site 300 ft (91 m) upstream at datum 3.00 ft (0.914 m) higher.

AVERAGE DISCHARGE.--36 years, 25.9 cfs (0.733 cu m/s), 18,760 acre-ft/yr (23.1 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 197 cfs (5.58 cu m/s) Aug. 21, gage height, 2.73 ft (0.832 m); minimum daily, 16 cfs (0.45 cu m/s) Oct. 10.

Period of record: Maximum discharge, 13,100 cfs (371 cu m/s) Sept. 4, 1938, gage height, 18.4 ft (5.61 m), site and datum then in use, from rating curve extended above 51 cfs (1.44 cu m/s) on basis of weir formula and slope-area measurement of peak flow; minimum, 4 cfs (0.11 cu m/s) Sept. 23, 1940.

REMARKS.--Records good. Flow regulated by Coldbrook Reservoir, capacity, 7,200 acre-ft (8.88 cu hm), beginning September 1952, and Cottonwood Springs Lake, capacity, 8,385 acre-ft (10.3 cu hm), since June 1969. Some diversion above station for municipal supply of Hot Springs.

REVISIONS (WATER YEARS).--WSP 1279: 1938, 1941(M), 1947(M). WSP 1729: 1959(M).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17	18	23	26	21	26	22	23	21	22	21	20
2	17	19	23	26	21	27	22	22	22	20	21	29
3	17	19	23	26	21	27	22	22	22	20	22	22
4	17	20	24	26	21	27	21	22	22	20	22	22
5	18	19	24	25	21	29	21	22	22	19	22	22
6	18	19	25	25	21	29	21	23	21	19	22	22
7	17	21	25	25	22	26	22	22	20	20	21	22
8	17	21	26	25	22	26	22	23	20	20	21	22
9	17	20	26	25	22	26	22	23	19	20	19	24
10	16	19	26	24	23	26	22	22	19	19	19	27
11	17	20	26	24	23	25	22	22	20	19	19	24
12	21	21	25	23	24	24	20	22	19	17	21	23
13	22	21	26	22	24	25	20	22	18	17	19	23
14	20	21	26	22	25	24	20	22	19	17	18	23
15	21	21	25	22	25	22	22	22	19	18	18	23
16	21	21	26	22	25	22	21	21	18	18	18	23
17	21	22	26	22	25	22	22	21	19	18	17	23
18	20	22	27	21	26	22	23	21	20	17	19	23
19	20	22	27	22	26	22	27	21	20	19	19	23
20	20	22	29	22	26	22	25	21	20	19	19	23
21	19	22	29	21	26	24	23	21	21	19	23	24
22	20	22	29	21	26	24	23	21	21	19	21	24
23	19	22	30	20	26	23	23	19	21	19	20	24
24	19	22	30	20	26	23	23	19	21	18	19	24
25	19	22	30	20	26	22	23	20	21	19	20	24
26	19	21	30	20	26	22	23	21	20	20	20	24
27	18	20	29	21	26	22	23	22	21	19	20	24
28	18	20	27	21	26	22	23	22	21	20	19	24
29	19	21	27	21	-----	22	23	21	21	21	19	23
30	19	22	26	20	-----	22	24	21	22	21	19	23
31	19	-----	26	21	-----	22	-----	21	-----	21	20	-----
TOTAL	582	622	821	701	672	747	670	667	610	594	617	701
MEAN	18.8	20.7	26.5	22.6	24.0	24.1	22.3	21.5	20.3	19.2	19.9	23.4
MAX	22	22	30	26	26	29	27	23	22	22	23	29
MIN	16	18	23	20	21	22	20	19	18	17	17	20
AC-FT	1,150	1,230	1,630	1,390	1,330	1,480	1,330	1,320	1,210	1,180	1,220	1,390

CAL. YR. 1972 TOTAL 7,774 MEAN 21.2 MAX 30 MIN 16 AC-FT 15,420
 WTR YR. 1973 TOTAL 8,004 MEAN 21.9 MAX 30 MIN 16 AC-FT 15,880

PEAK DISCHARGE (BASE, 135 CFS)

DATE	TIME	G.H.	DISCHARGE
8-21	1930	2.73	197
9-2	0800	2.64	148

CHEYENNE RIVER BASIN

06402500 Beaver Creek near Buffalo Gap, S. Dak.

LOCATION.--Lat 43°27'56", long 103°18'22", in SE¼SE¼ sec.5, T.7 S., R.7 E., Fall River County, on left bank 1.5 mi (2.4 km) south of Buffalo Gap and 4.5 mi (7.2 km) upstream from mouth.

DRAINAGE AREA.--130 sq mi (340 sq km), approximately.

PERIOD OF RECORD.--October 1937 to current year. Monthly discharge only for October 1937, published in WSP 1309.

GAGE.--Water-stage recorder. Altitude of gage is 3,150 ft (960 m), from topographic map. Prior to June 20, 1939, nonrecording gage at site 0.8 mi (1.3 km) downstream at different datum.

AVERAGE DISCHARGE.--36 years, 7.10 cfs (0.201 cu m/s), 5,140 acre-ft/yr (6.34 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 13 cfs (0.37 cu m/s) Mar. 4, gage height, 3.87 ft (1.180 m); maximum gage height, 4.35 ft (1.326 m) Jan. 10, backwater from ice; minimum daily discharge, 0.40 cfs (0.011 cu m/s) July 12.

Period of record: Maximum discharge, 11,700 cfs (331 cu m/s) Sept. 4, 1938, gage height, 16.46 ft (5.017 m), site and datum then in use, from rating curve extended above 11 cfs (0.31 cu m/s) on basis of slope-area measurement of peak flow; no flow at times in some years. Flood in 1927 reached a stage of 18.0 ft (5.49 m).

REMARKS.--Records good except those above 50 cfs (1.42 cu m/s) and those for winter periods, which are poor. Nearly all flow is diverted above station during irrigation season.

REVISIONS (WATER YEARS).--WSP 956: 1941. WSP 1309: 1939-40(M), 1947(M).

Rating tables (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Dec. 25-28, Mar. 7-10, June 29 to Aug. 16;
stage-discharge relation affected by ice Dec. 3-18, Dec. 29
to Jan. 13, Feb. 6-10)

Oct. 1 to Mar. 10

Mar. 11 to Sept. 30

3.4 6.1
3.6 9.8
3.8 14

2.7 0.40
2.9 .80
3.2 2.7
3.5 6.1
4.0 17

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.8	10	9.6	8.0	10	10	8.9	8.3	1.2	.56	.86	2.3
2	9.0	10	9.6	8.5	10	10	8.9	7.8	1.3	.52	.78	6.0
3	9.0	9.8	9.0	8.0	10	10	8.7	7.8	1.2	.50	1.8	5.3
4	9.0	9.6	5.5	7.0	10	9.6	8.7	7.8	1.1	.50	1.8	4.9
5	9.6	9.6	5.0	7.0	10	9.8	8.7	7.8	1.0	.48	1.6	4.9
6	9.4	9.6	5.0	6.5	10	9.6	8.9	8.7	.98	.46	.78	4.8
7	9.6	9.6	5.0	6.5	9.5	9.2	8.9	8.3	.92	.42	.70	4.8
8	9.4	9.6	5.0	6.2	9.5	9.2	8.9	8.3	.86	.44	.70	5.2
9	9.2	9.4	5.0	6.0	10	9.2	8.9	8.3	.92	.46	.68	5.7
10	9.2	9.4	5.0	6.5	11	9.2	8.9	8.2	.86	.42	.68	5.7
11	8.5	9.2	5.2	7.0	12	9.2	8.7	8.2	.86	.42	.68	5.7
12	7.9	9.6	5.5	8.0	12	9.2	8.7	8.3	.86	.40	.72	6.0
13	7.9	9.6	5.5	10	12	9.2	8.9	7.6	.86	.48	.70	5.8
14	7.9	9.2	5.7	12	12	12	8.7	7.6	.92	.48	.62	5.8
15	8.3	9.4	6.0	12	12	9.6	7.5	8.0	.92	.46	.58	6.6
16	9.6	9.4	6.0	12	12	9.2	8.2	4.8	.76	.46	.58	6.4
17	9.4	9.2	6.5	12	12	9.2	6.8	3.4	.78	.48	.70	6.3
18	9.4	9.0	7.0	11	12	9.1	7.5	3.4	.76	.48	3.9	6.1
19	9.6	9.0	7.5	11	12	9.1	9.4	2.8	.78	.76	3.9	5.8
20	9.8	9.0	7.4	11	12	9.1	9.4	1.4	.74	1.1	4.7	5.8
21	9.8	8.8	7.2	11	12	9.2	8.0	1.2	.72	1.8	4.7	6.8
22	9.8	8.8	7.7	11	11	10	7.8	1.2	.68	3.2	5.1	8.0
23	9.8	8.5	7.7	10	11	9.4	7.8	1.0	.66	3.7	5.3	8.2
24	9.8	8.5	7.9	10	12	9.2	8.0	1.0	.62	4.1	4.0	8.5
25	9.8	8.5	8.3	10	11	9.2	8.0	1.1	.60	3.6	3.9	8.5
26	9.6	8.5	8.5	10	11	9.2	8.2	1.3	.58	3.4	3.9	8.3
27	9.6	8.5	9.0	10	11	9.1	8.0	1.4	.60	3.4	3.8	8.3
28	9.6	8.5	9.0	12	11	8.9	7.5	1.3	.60	3.7	3.7	8.5
29	9.8	9.0	9.0	10	-----	8.9	7.3	1.2	.58	4.7	3.7	8.3
30	10	9.4	8.0	10	-----	8.9	8.3	1.3	.62	3.0	3.3	8.3
31	10	-----	8.0	10	-----	8.9	-----	1.2	-----	.98	2.4	-----
TOTAL	288.1	276.2	216.3	290.2	310.0	291.6	251.1	150.0	24.84	45.86	71.26	191.6
MEAN	9.29	9.21	6.98	9.36	11.1	9.41	8.37	4.84	.83	1.48	2.30	6.39
MAX	10	10	9.6	12	12	12	9.4	8.7	1.3	4.7	5.3	8.5
MIN	7.9	8.5	5.0	6.0	9.5	8.9	6.8	1.0	.58	.40	.58	2.3
AC-FT	571	548	429	576	615	578	498	298	49	91	141	380

CAL YR 1972 TOTAL 2,685.05 MEAN 7.34 MAX 131 MIN .75 AC-FT 5,330

WTR YR 1973 TOTAL 2,407.06 MEAN 6.59 MAX 12 MIN .40 AC-FT 4,770

PEAK DISCHARGE (BASE, 24 CFS).--No peaks above base.

41

LOCATION.--Lat 43°30'05", long 103°04'23", in SW¼NE¼ sec.29, T.6 S., R.9 E., Custer County, on right bank at right end of highway bridge, 5.8 mi (9.3 km) upstream from Cottonwood Creek and 12 mi (19 km) east of Buffalo Gap.

PERIOD OF RECORD.--October 1968 to current year.

AVERAGE DISCHARGE.--5 years, 122 cfs (3.455 cu m/s), 88,390 acre-ft/yr (109 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 1,160 cfs (32.9 cu m/s) May 10, gage height, 5.45 ft (1.661 m); minimum daily, 28 cfs (0.79 cu m/s) July 7.
Period of record: Maximum discharge, 17,600 cfs (498 cu m/s) May 25, 1971, gage height, 11.44 ft (3.487 m); minimum daily, 20 cfs (0.57 cu m/s) Dec. 30, 1968.

REMARKS.--Records good except those for winter periods, which are poor. Flow regulated by Angostura Reservoir 34 mi (55 km) upstream, see station 06401000. Water-quality records for the water year 1973 are published in Part 2 of this report.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 21 to July 30; stage-discharge relation
affected by ice Nov. 29 to Feb. 20)

2.2	27	3.1	109	4.5	576
2.5	39	3.5	209	5.0	831
2.8	64	4.0	368	6.0	1,500

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	68	70	70	70	65	61	70	85	60	35	49	71
2	64	70	70	70	60	62	74	71	61	33	50	110
3	63	70	65	65	60	64	74	69	66	30	48	177
4	64	70	60	60	60	63	71	63	63	31	48	111
5	70	71	60	55	60	62	74	57	65	30	49	96
6	71	71	60	50	55	62	70	60	64	29	55	95
7	68	71	60	50	55	62	63	59	61	28	58	96
8	63	72	60	50	55	61	60	80	60	29	54	96
9	63	72	60	50	55	61	60	68	58	29	52	96
10	62	74	60	55	60	59	59	904	58	30	57	96
11	63	74	65	60	65	59	59	594	61	31	60	96
12	62	74	65	70	70	59	59	566	63	33	65	96
13	64	75	65	70	65	63	56	369	53	36	64	96
14	63	74	65	70	60	122	56	393	50	42	62	96
15	64	74	65	70	60	87	56	277	53	45	53	96
16	64	74	65	70	70	71	56	234	53	48	52	90
17	64	74	70	70	80	66	53	180	52	58	52	90
18	65	74	70	70	90	65	55	194	52	65	53	90
19	65	71	70	70	95	62	91	107	56	65	57	90
20	63	71	70	70	100	62	111	70	56	65	52	80
21	66	71	70	70	105	62	81	66	54	60	47	80
22	66	64	70	70	91	79	68	66	49	60	56	80
23	66	64	75	70	61	72	61	63	48	60	55	80
24	68	64	75	70	61	68	58	61	45	60	59	80
25	68	71	75	70	60	65	61	65	45	60	64	80
26	68	70	75	70	59	62	63	66	40	55	70	80
27	69	70	75	70	59	62	61	79	35	55	72	76
28	69	72	75	60	60	64	57	75	35	55	75	72
29	69	70	70	70	-----	62	56	75	36	55	72	70
30	70	70	70	70	-----	63	68	78	38	55	71	71
31	70	-----	70	70	-----	68	-----	69	-----	53	69	-----
TOTAL	2,044	2,132	2,095	2,025	1,896	2,060	1,961	5,263	1,590	1,458	1,800	2,733
MEAN	65.9	71.1	67.6	65.3	67.7	66.5	65.4	170	53.0	45.8	58.1	91.1
MAX	71	75	75	70	105	122	111	904	66	65	75	177
MIN	62	64	60	50	55	59	53	57	35	28	47	70
AC=FT	4,050	4,230	4,160	4,020	3,760	4,090	3,890	10,440	3,150	2,820	3,570	5,420
CAL. YR 1972	TOTAL 25,563			MEAN 69.8	MAX 898	MIN 43	AC=FT 50,700					
WTR YR 1973	TOTAL 27,019			MEAN 74.0	MAX 904	MIN 28	AC=FT 53,590					

CHEYENNE RIVER BASIN

06404000 Battle Creek near Keystone, S. Dak.

LOCATION (revised).--Lat 43°52'21", long 103°20'10", in SW¼SW¼ sec.18, T.2 S., R.7 E., Pennington County, on right bank 250 ft (76 m) upstream from highway culverts, 0.6 mi (1.0 km) downstream from Iron Creek and 4.5 mi (7.2 km) southeast of Keystone.

DRAINAGE AREA.--66 sq mi (171 sq km).

PERIOD OF RECORD.--July 1945 to July 1947, October 1961 to current year.

GAGE (revised).--Water-stage recorder. Altitude of gage is 3,800 ft (1,158 m), from topographic map. Prior to Nov. 13, 1961, nonrecording gage at site 110 ft (34 m) downstream at different datum and Nov. 13 to Dec. 4, 1961, at same site at present datum. Dec. 5, 1961, to June 9, 1972, water-stage recorder at site 70 ft (21 m) downstream (destroyed by flood); June 10 to Nov. 20, 1972, nonrecording gage at site 50 ft (15 m) downstream, all at present datum.

AVERAGE DISCHARGE.--13 years (1945-46, 1961-73), 11.7 cfs (0.331 cu m/s), 8,480 acre-ft/yr (10.5 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 737 cfs (20.9 cu m/s) Apr. 19, gage height, 6.36 ft (1.939 m); minimum daily, 0.80 cfs (0.023 cu m/s) Feb. 7-9.

Period of record: Maximum discharge, 26,200 cfs (742 cu m/s) June 9, 1972, gage height, 14.5 ft (4.42 m), from floodmarks, site then in use, from rating curve extended above 550 cfs (15.6 cu m/s) on basis of slope-area measurement of peak flow; no flow for many days in 1961, 1962, 1970.

REMARKS.--Records good except those for winter periods, which are poor.

Rating tables (gage height, in feet, and discharge, in cubic feet per second)
(Stage-discharge relation affected by ice Nov. 22 to Mar. 24)

Oct. 1 to Nov. 20

Nov. 21 to Sept. 30

2.9	1.0	2.9	0.6	3.7	25
3.1	4.0	3.0	1.0	4.0	46
3.2	6.2	3.1	1.9	4.5	111
		3.2	4.0	5.0	222
		3.3	7.0	5.5	362

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.5	3.4	2.4	2.2	1.2	2.0	7.0	47	13	4.3	10	2.5
2	2.5	3.0	2.0	2.4	1.2	2.0	7.0	46	22	3.4	8.2	5.6
3	3.0	3.0	1.8	2.2	1.2	1.9	8.0	43	48	2.7	6.7	6.4
4	3.5	3.0	1.6	2.0	1.2	1.8	9.0	40	29	2.7	6.1	3.8
5	3.7	3.0	1.4	1.8	1.0	1.6	8.0	39	24	3.4	5.8	2.6
6	3.5	3.0	1.2	1.6	.90	1.6	7.0	39	22	2.7	5.2	2.0
7	3.0	3.2	1.0	1.4	.80	1.6	8.0	36	19	1.9	4.6	1.7
8	2.6	3.2	1.0	1.2	.80	1.6	8.0	33	16	1.8	4.6	1.5
9	2.6	3.2	1.0	1.0	.80	1.8	8.0	32	15	1.8	3.8	1.5
10	2.6	3.2	1.0	1.0	.80	2.0	9.0	29	13	1.6	3.6	1.5
11	2.4	3.2	1.2	1.2	1.0	2.5	10	27	13	1.6	4.9	1.5
12	2.4	3.2	1.2	1.2	1.0	3.0	10	25	12	1.4	7.8	1.4
13	2.4	3.2	1.2	1.2	1.2	3.5	10	23	14	1.4	9.4	1.4
14	2.4	3.2	1.2	1.4	1.3	5.0	11	22	13	1.4	6.1	1.4
15	2.4	3.2	1.2	1.6	1.2	6.0	12	20	16	1.4	4.6	1.8
16	2.3	3.2	1.2	1.8	1.3	5.6	11	20	11	.96	3.4	2.1
17	2.3	3.2	1.4	2.4	1.4	5.6	11	18	9.8	1.4	3.0	2.3
18	2.4	3.2	1.7	2.2	1.4	5.6	9.2	17	9.8	1.4	3.2	2.3
19	2.3	3.1	1.6	2.2	1.3	5.6	198	15	9.0	3.0	3.0	1.9
20	2.6	3.0	1.6	2.0	1.2	5.6	284	15	9.0	18	3.0	1.6
21	2.7	2.9	1.8	1.8	1.2	5.6	118	14	9.4	18	2.1	1.5
22	2.7	2.6	2.4	1.6	1.4	5.8	61	13	8.2	12	1.6	1.5
23	2.7	2.4	2.2	1.8	1.6	6.0	45	12	7.8	9.8	5.8	1.5
24	2.7	2.4	2.0	2.2	1.2	6.0	40	12	7.4	11	5.5	1.9
25	2.7	2.4	2.0	2.0	1.2	6.6	39	12	7.8	20	3.6	2.2
26	2.9	2.6	2.0	1.6	1.4	11	36	16	6.1	11	4.3	2.1
27	2.9	2.4	2.4	1.4	1.6	9.8	36	23	4.9	9.0	4.0	1.8
28	2.9	1.9	2.4	1.0	1.8	9.0	35	20	4.9	7.8	4.3	1.6
29	2.9	2.0	2.2	1.0	-----	8.0	35	20	4.3	9.0	4.6	1.5
30	2.9	2.2	2.0	1.2	-----	7.0	39	16	4.3	8.2	3.4	1.4
31	3.2	-----	2.0	1.2	-----	7.0	-----	14	-----	8.6	2.5	-----
TOTAL	84.6	86.7	51.3	50.8	33.70	149.7	1,129.2	758	402.7	182.66	148.7	63.8
MEAN	2.73	2.89	1.65	1.64	1.20	4.83	37.6	24.5	13.4	5.89	4.80	2.13
MAX	3.7	3.4	2.4	2.4	1.8	11	284	47	48	20	10	6.4
MIN	2.3	1.9	1.0	1.0	.80	1.6	7.0	12	4.3	.96	1.6	1.4
AC=FT	168	172	102	101	67	297	2,240	1,500	799	362	295	127

CAL YR 1972 TOTAL 7,751.50 MEAN 21.2 MAX 2,400 MIN .10 AC=FT 15,380
WTR YR 1973 TOTAL 3,141.86 MEAN 8.61 MAX 284 MIN .80 AC=FT 6,230

PEAK DISCHARGE (BASE, 100 CFS).--Apr. 9 (1945) 737 cfs (6.36 ft).

CHEYENNE RIVER BASIN

43

06405000 Grace Coolidge Creek near Custer, S. Dak.

LOCATION.--Lat 43°45'40", long 103°21'42", in SE¼NE¼ sec.26, T.3 S., R.6 E., Custer County, on right bank at U.S. Highway Alternate 16, 1.7 mi (2.7 km) southwest of junction U.S. Highways 36 and Alternate 16 and 11.5 mi (18.5 km) east of Custer.

DRAINAGE AREA.--25.3 sq mi (65.5 sq km).

PERIOD OF RECORD.--July 1945 to July 1947 (published as Squaw Creek near Custer), June 1967 to current year.

GAGE (revised).--Water-stage recorder and grouted-rock control. Altitude of gage is 4,100 ft (1,250 m), from topographic map. Prior to July 31, 1947, nonrecording gage at site 0.5 mi (0.8 km) upstream at different datum. June 1967 to Sept. 30, 1972, at datum 1.00 ft (0.305 m) higher.

AVERAGE DISCHARGE.--7 years (1945-46, 1967-73), 3.72 cfs (0.105 cu m/s), 2,700 acre-ft/yr (3.33 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 46 cfs (1.30 cu m/s) Apr. 20, gage height, 1.95 ft (0.594 m); no flow for many days.

Period of record: Maximum discharge, 709 cfs (20.1 cu m/s) June 10, 1972, gage height, 4.64 ft (1.414 m), present datum, from rating curve extended above 80 cfs (2.27 cu m/s) on basis of slope-area measurement of peak flow; no flow for many days most years.

Flood of June 12, 1967, reached a stage of 2.45 ft (0.747 m), present datum, from floodmarks, discharge, 151 cfs (4.28 cu m/s).

REMARKS.--Records fair except those for winter periods, which are poor. Considerable losses in sinkholes in vicinity of gage.

REVISIONS (WATER YEAR).--WRD S.Dak. 1971: 1970(M).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.6	1.6	0	0		0	1.2	22	4.5	.63	3.4	9.8
2	1.6	1.6	0	0		0	1.4	23	8.3	.40	2.6	12
3	1.3	1.6	0	0		0	1.6	22	15	.16	2.0	11
4	1.3	1.5	0	0		0	1.8	22	12	.16	1.8	11
5	2.0	1.5	0	0		0	2.0	20	10	.28	1.6	10
6	6.0	1.6	0	0		0	5.3	19	8.8	0	1.3	10
7	3.7	1.6	0	0		0	5.0	18	7.8	0	1.1	10
8	3.0	1.5	0	0		0	4.0	16	6.9	0	.69	10
9	2.2	1.5	0	0		0	3.0	15	6.4	0	.51	10
10	2.0	1.5	0	0		0	2.0	13	5.3	0	.51	10
11	1.8	1.4	0	0		0	1.8	12	4.9	0	.63	11
12	2.0	1.3	0	0		0	3.7	11	4.1	0	1.1	16
13	1.8	1.2	0	0		0	4.5	9.8	3.7	0	2.0	17
14	1.8	1.1	0	0		0	4.9	8.8	4.5	0	1.1	17
15	1.6	1.0	0	.10		0	5.6	8.8	6.0	0	.57	17
16	1.6	.90	0	.25		0	4.5	7.8	4.5	0	.40	16
17	1.5	.80	1.0	.20		0	4.1	7.8	3.4	0	.06	15
18	1.3	.70	1.9	.10		0	4.1	6.4	3.7	0	0	13
19	1.3	.60	1.5	.10		0	17	6.0	3.7	.08	0	12
20	1.3	.50	1.0	.10		0	38	6.0	3.4	2.6	0	7.8
21	1.1	.40	.30	.10		0	28	5.6	3.4	4.1	0	2.4
22	1.1	.40	0	.10		0	22	5.3	2.6	2.6	0	1.8
23	1.1	.40	0	.10		0	19	4.9	2.2	1.6	1.5	1.3
24	.88	.40	0	.10		.10	18	4.5	1.6	7.8	.69	2.4
25	1.1	.40	0	.10		.20	18	4.5	1.3	12	.51	1.8
26	1.1	.30	0	.05		.30	17	6.0	.69	7.4	.16	1.8
27	.88	.30	0	0		.40	17	9.3	.57	5.6	.06	1.8
28	.88	.60	0	0		.50	18	8.3	.57	4.9	.10	1.8
29	1.1	.10	0	0		.60	18	7.8	.45	4.1	9.3	2.0
30	1.5	0	0	0		.80	19	6.4	.63	4.1	9.8	2.0
31	2.2	-----	0	0		1.0	-----	5.3	-----	3.7	10	-----
TOTAL	53.64	28.30	5.70	1.40	0	3.90	309.5	342.3	140.91	62.21	53.49	263.7
MEAN	1.73	.94	.18	.045	0	.13	10.3	11.0	4.70	2.01	1.73	8.79
MAX	6.0	1.6	1.9	.25	0	1.0	38	23	15	12	10	17
MIN	.88	0	0	0	0	0	1.2	4.5	.95	0	0	1.3
AC-FT	106	56	11	2.8	0	7.7	614	679	279	123	106	523

CAL YR 1972 TOTAL 1,622.53 MEAN 4.43 MAX 230 MIN 0 AC-FT 3,220
WTR YR 1973 TOTAL 1,265.05 MEAN 3.47 MAX 38 MIN 0 AC-FT 2,510

PEAK DISCHARGE (BASE, 25 CFS).--Apr. 20 (0300) 46 cfs (1.95 ft).

CHEYENNE RIVER BASIN

06406000 Battle Creek at Hermosa, S. Dak.

LOCATION.--Lat 43°49'41", long 103°11'44", in NE¼SW¼SW¼ sec.32, T.2 S., R.8 E., Custer County, on right bank 50 ft (15 m) downstream from Chicago and North Western Transportation Co. bridge, 0.8 mi (1.3 km) south of Hermosa and 2.9 mi (4.7 km) downstream from Grace Coolidge Creek.

DRAINAGE AREA.--178 sq mi (461 sq km).

PERIOD OF RECORD.--August to December 1903 (gage heights only), July 1949 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 3,290 ft (1,000 m), from topographic map. Nonrecording gage, August to December 1903, at site 50 ft (15 m) upstream, July 7, 1949, to Nov. 2, 1950, at site 0.5 mi (0.8 km) upstream, Nov. 3, 1950, to Dec. 6, 1961, at site 170 ft (52 m) downstream, all at different datum. Dec. 7, 1961, to June 10, 1972, water-stage recorder (destroyed by flood), and June 11, 1972, to Aug. 28, 1972, nonrecording gage at site 80 ft (24 m) downstream at present datum.

AVERAGE DISCHARGE.--24 years, 9.60 cfs (0.272 cu m/s), 6,960 acre-ft/yr (8.58 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 261 cfs (7.39 cu m/s) Apr. 20, gage height, 5.12 ft (1.561 m); minimum daily, 3.6 cfs (0.11 cu m/s) July 11.

Period of record: Maximum discharge, 21,400 cfs (606 cu m/s) June 10, 1972, gage height, 17.72 ft (5.401 m), from floodmarks, from rating curve extended above 2,800 cfs (79.3 cu m/s) on basis of contracted-opening and flow-over-railroad embankment measurement of peak flow; no flow at times in 1954-57, 1959.

REMARKS.--Records good except those for winter periods, which are poor.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 12-14; stage-discharge relation affected
by ice Dec. 2-23, Dec. 29 to Jan. 18, Jan. 27-31, Feb. 7-19)

2.1	2.8	3.5	65
2.3	6.7	4.0	115
2.7	18	5.0	250
3.0	32		

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.0	10	7.7	5.4	5.6	4.1	6.5	65	21	7.7	8.4	7.1
2	8.0	10	7.4	5.4	5.6	4.1	6.3	62	20	7.4	8.2	11
3	7.4	10	5.8	5.2	5.6	4.0	6.3	58	62	8.4	7.7	11
4	7.4	11	5.4	5.0	5.6	4.0	6.3	53	47	8.4	6.7	9.8
5	8.2	11	5.0	4.8	5.6	4.0	6.3	50	38	8.2	6.5	8.7
6	7.7	11	4.6	4.6	5.6	4.3	6.3	49	33	6.3	6.3	8.1
7	8.4	10	4.2	4.4	5.0	4.3	7.0	48	28	5.4	6.3	8.1
8	8.4	9.0	4.6	4.4	4.8	4.1	7.0	43	24	5.4	6.1	7.8
9	8.0	9.0	5.0	4.4	4.8	4.3	7.0	41	21	6.3	5.6	7.9
10	7.2	9.0	5.4	4.4	5.0	4.4	6.7	39	18	4.4	5.9	7.5
11	6.5	8.7	5.6	4.4	6.0	4.4	6.7	34	17	3.6	8.0	7.2
12	7.0	8.4	5.7	4.6	5.8	4.6	6.5	30	14	4.3	11	7.7
13	7.0	8.4	5.8	4.8	5.6	5.0	6.5	28	14	3.8	9.2	8.4
14	7.0	8.2	5.9	5.4	5.0	6.5	6.5	26	15	5.2	7.2	7.8
15	7.4	8.2	6.0	5.4	4.6	7.0	6.3	24	17	5.0	6.5	9.6
16	7.2	8.2	6.0	5.1	4.8	7.2	6.1	23	18	3.8	7.0	9.9
17	7.2	7.7	6.0	5.2	5.0	7.2	6.1	22	15	4.0	6.3	10
18	7.0	8.0	6.1	5.4	5.0	7.4	6.1	21	14	5.4	5.2	10
19	7.0	8.0	6.2	5.4	5.0	7.4	20	19	14	7.7	5.2	9.9
20	7.0	8.7	6.2	5.4	5.0	7.0	181	17	17	13	5.4	9.5
21	7.2	10	6.4	5.4	4.8	7.0	108	16	15	14	4.6	9.5
22	7.4	9.2	6.6	5.4	4.8	8.4	73	17	14	14	4.8	9.0
23	7.4	9.0	6.0	5.4	4.8	8.4	55	16	13	11	6.3	8.6
24	8.4	9.0	5.9	5.6	4.6	8.2	47	15	11	11	6.3	9.7
25	8.4	8.4	5.9	5.6	4.4	7.2	46	15	9.5	17	6.5	9.5
26	8.7	8.2	5.9	5.6	4.3	7.2	43	18	8.4	14	6.3	9.2
27	9.0	7.7	6.1	4.8	4.1	7.0	43	26	8.2	11	5.6	8.2
28	9.2	7.4	6.1	4.4	4.1	7.0	41	31	8.4	10	5.2	8.0
29	10	7.2	6.0	4.8	-----	6.5	41	30	8.2	8.7	4.4	8.0
30	10	7.7	5.6	5.6	-----	6.5	45	28	8.2	8.2	4.8	6.7
31	10	-----	5.4	5.6	-----	6.3	-----	23	-----	9.0	5.4	-----
TOTAL	244.7	266.3	180.5	157.3	140.9	185.0	859.5	987	570.9	251.6	198.9	263.4
MEAN	7.89	8.88	5.82	5.07	5.03	5.97	28.7	31.8	19.0	8.12	6.42	8.78
MAX	10	11	7.7	5.6	6.0	8.4	181	65	62	17	11	11
MIN	6.5	7.2	4.2	4.4	4.1	4.0	6.1	15	8.2	3.6	4.4	6.7
AC-FT	485	528	358	312	279	367	1,700	1,960	1,130	499	395	522
CAL YR 1972	TOTAL 7,468.6 MEAN 20.4 MAX 1,750 MIN 1.5 AC-FT 14,810											
WTR YR 1973	TOTAL 4,306.0 MEAN 11.8 MAX 181 MIN 3.6 AC-FT 8,540											

PEAK DISCHARGE (BASE, 150 CFS).--Apr. 20 (0245) 261 cfs (5.12 ft).

45

LOCATION (revised).--Lat 43°56'31", long 103°09'32", in SE₄SE₄SE₄ sec.21, T.1 S., R.8 E., Pennington County, at left upstream end of county highway bridge, 0.3 mi (0.5 km) upstream from Chicago and North Western Railway Company bridge and 7.5 mi (12.1 km) north of Hermosa.

PERIOD OF RECORD.--July 1949 to current year.

GAGE (revised).--Water-stage recorder. Datum of gage is 3,267.30 ft (995.873 m) above mean sea level. Prior to Mar. 30, 1973, nonrecording gage and crest-stage gage 210 ft (64.0 m) upstream at datum 2.00 ft (0.610 m) higher.

EXTREMES.--Current year: Maximum discharge, 96 cfs (2.72 cu m/s) May 10, gage height, 1.21 ft (0.369 m); minimum daily, 0.31 cfs (0.009 cu m/s) Oct. 17, 19-23.

Period of record: Maximum discharge, 13,400 cfs (379 cu m/s) June 10, 1972, gage height, 13.12 ft (3.99 m), from floodmarks, from rating curve extended above 350 cfs (9.91 cu m/s) on basis of contracted-opening measurement of peak flow; no flow for many days most years.

REMARKS.--Records good except those prior to Mar. 30, which are poor. Considerable loss in sinkholes in reach 10 to 15 mi (16 to 24 km) above station. Flow slightly regulated by Lake Sheridan, capacity, 12,657 acre-ft (15.6 cu km). 24 mi (39 km) above station.

Rating tables (gage height, in feet, and discharge, in cubic feet per second)
(Stage-discharge relation affected by ice Nov. 11 to Mar. 24)

Mar. 30 to Sept. 30

0.3	0	0.1	0	0.5	16
.4	3.6	.2	2.0	.7	32
.5	7.6	.3	4.9	1.0	66

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.5	.99	2.5	1.8	2.0	3.0	2.9	5.2	13	3.8	2.6	1.7
2	2.1	.99	2.1	2.0	2.0	3.0	3.2	3.4	11	3.5	2.6	2.6
3	2.1	1.4	1.5	1.8	2.0	2.7	3.0	3.0	17	3.5	2.6	2.4
4	2.1	1.7	1.0	1.6	2.0	2.5	3.2	2.9	32	8.4	2.6	2.1
5	1.7	1.4	.80	1.4	1.8	2.5	3.2	2.9	33	18	2.7	1.9
6	1.7	.99	.50	1.0	1.7	2.6	3.2	2.9	29	4.8	2.8	1.8
7	1.7	1.7	.50	1.0	1.5	2.6	3.1	2.6	25	4.0	2.4	1.8
8	1.4	1.4	.50	1.0	1.5	2.5	2.9	2.3	22	5.1	2.4	1.8
9	1.4	2.1	.50	1.0	1.5	2.6	2.9	8.3	19	6.1	2.5	1.8
10	1.4	1.4	.50	1.2	1.6	2.6	2.6	56	17	4.0	2.6	1.8
11	.99	1.5	.60	1.4	2.5	2.6	2.6	43	14	3.9	2.6	1.8
12	.99	1.5	.60	1.4	2.3	2.5	2.6	25	11	3.5	3.1	1.9
13	.99	1.5	.60	2.0	2.2	2.0	2.6	17	9.3	3.5	2.9	2.0
14	.64	1.5	.60	2.2	2.2	1.5	2.6	11	8.0	3.2	2.8	1.8
15	.99	1.6	.60	2.2	2.0	1.5	2.6	7.5	8.0	2.9	2.6	2.0
16	.99	1.6	.60	2.1	2.2	1.6	2.7	5.7	12	2.9	2.0	2.0
17	.31	1.5	1.0	2.1	2.2	1.7	2.6	4.7	13	2.9	1.7	2.0
18	1.4	1.5	2.5	2.0	2.2	1.7	2.6	4.4	12	2.9	1.9	2.0
19	.31	1.5	2.2	2.0	2.2	1.7	4.8	4.0	12	3.3	1.8	2.0
20	.31	1.5	2.2	2.0	2.2	1.8	9.4	3.4	8.3	4.0	1.7	1.8
21	.31	1.5	2.5	2.0	2.4	2.0	3.9	3.7	6.9	3.8	1.8	1.9
22	.31	1.5	3.0	2.0	2.6	2.1	3.5	3.6	6.8	3.4	1.8	1.8
23	.31	1.5	2.5	2.1	3.0	2.2	3.2	4.0	5.8	3.2	1.9	1.8
24	.64	1.6	2.0	2.2	2.6	2.3	3.2	3.7	5.0	3.6	2.0	2.0
25	.64	1.6	2.0	2.2	2.6	2.5	2.9	3.5	4.4	3.6	1.9	1.9
26	.64	1.8	2.5	2.0	3.0	3.0	2.9	4.4	4.0	2.6	1.9	1.8
27	.64	2.0	2.5	1.8	3.0	2.6	2.6	8.1	3.9	2.8	1.8	1.8
28	.64	2.1	2.3	1.8	3.0	2.5	2.7	12	4.1	2.9	1.7	1.8
29	.64	2.1	2.0	2.0	-----	2.6	2.8	15	4.0	2.8	1.7	1.8
30	.64	2.1	1.8	2.1	-----	2.6	3.6	15	4.1	2.6	1.7	1.8
31	.64	-----	1.8	2.1	-----	2.6	-----	14	-----	2.6	1.7	-----
TOTAL	32.07	47.07	46.80	55.7	62.0	72.2	96.6	302.4	374.6	128.1	68.8	57.4
MEAN	1.03	1.57	1.51	1.80	2.21	2.33	3.22	9.75	12.5	4.13	2.22	1.91
MAX	2.5	2.1	3.0	2.2	3.0	3.0	9.4	56	33	18	3.1	2.6
MIN	.31	.99	.50	1.0	1.5	1.5	2.6	2.3	3.9	2.6	1.7	1.7
CAL YR 1972	TOTAL	9,821.24	MEAN	26.8	MAX	3,300	MIN	.31				
NTR YR 1973	TOTAL	1,343.74	MEAN	3.68	MAX	.56	MIN	.31				

CHEYENNE RIVER BASIN

06409000 Castle Creek above Deerfield Reservoir, near Hill City, S. Dak.
(Hydrologic bench-mark station)

LOCATION.--Lat 44°00'49", long 103°49'48", in SW $\frac{1}{4}$ sec.25, T.1 N., R.2 E., Pennington County, on right bank 50 ft (15 m) downstream from highway bridge, 250 ft (76 m) downstream from South Fork Castle Creek, 600 ft (183 m) upstream from high-water line of Deerfield Reservoir, 2.5 mi (4.0 km) southwest of Deerfield Dam, and 14 mi (23 km) northwest of Hill City.

DRAINAGE AREA.--83 sq mi (215 sq km), approximately.

PERIOD OF RECORD.--June 1948 to current year. Prior to October 1953, published as "above Deerfield Reservoir, near Deerfield".

GAGE.--Water-stage recorder and grouted-rock control. Altitude of gage is 5,910 ft (1,800 m), from reservoir elevation. Prior to Aug. 31, 1948, nonrecording gage at site 50 ft (15 m) upstream at datum 2.05 ft (0.625 m) higher.

AVERAGE DISCHARGE.--25 years, 10.0 cfs (0.283 cu m/s), 7,240 acre-ft/yr (8.93 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 40 cfs (1.13 cu m/s) May 5, gage height, 2.56 ft (0.780 m); maximum gage height, 2.60 ft (0.79 m) Dec. 1, backwater from ice; minimum daily discharge, 3.5 cfs (0.099 cu m/s) Mar. 14.
Period of record: Maximum discharge, 1,120 cfs (31.7 cu m/s) May 22, 1952, gage height, 5.81 ft (1.771 m), from rating curve extended above slope-area measurement at gage height, 5.67 ft (1.728 m); minimum, 1.2 cfs (0.034 cu m/s) Apr. 25, 1969; minimum gage height, 1.35 ft (0.411 m) Nov. 12, 1949, Feb. 19, 1954, Mar. 7, 1957, Mar. 29, 1961.

REMARKS.--Records good except those for winter periods, which are poor. Recording rain gage located at Deerfield Dam 2.5 mi (4.0 km) northeast of station. Water-quality records for the water year 1973 are published in Part 2 of this report.

REVISIONS (WATER YEARS).--WSP 1917: 1952(M).

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 27 to Apr. 3; stage-discharge relation affected by ice Oct. 30 to Nov. 2, Nov. 10 to Dec. 18, Dec. 31 to Jan. 13, Jan. 27-30, Feb. 7-16, Mar. 14-17, Apr. 6-12)

1.6 6.6
1.8 11
2.3 29

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	11	8.5	8.5	11	9.1	12	19	14	14	12	11
2	11	11	8.0	9.0	11	8.8	12	19	25	13	11	15
3	11	11	7.5	8.5	11	8.8	11	20	19	13	11	13
4	11	12	7.2	8.0	11	8.4	11	21	17	13	11	12
5	13	11	7.0	7.5	10	8.6	13	24	16	13	11	11
6	12	11	6.5	7.5	10	8.6	11	26	16	12	11	11
7	12	11	6.0	7.5	8.0	7.7	9.0	23	15	12	11	11
8	12	11	6.0	7.5	8.0	8.6	9.0	23	15	12	11	12
9	12	11	6.0	7.5	8.0	8.6	9.5	23	15	12	11	12
10	12	11	6.0	7.5	9.0	8.8	10	20	14	12	11	14
11	12	10	6.5	7.6	10	8.6	10	20	14	12	11	13
12	12	9.0	6.5	8.0	9.5	9.1	14	19	14	12	12	12
13	12	8.0	6.5	9.0	9.0	9.1	20	19	14	12	12	12
14	12	8.0	6.5	11	8.0	3.5	25	18	16	11	11	12
15	12	8.0	6.5	11	8.0	7.0	18	18	16	12	11	13
16	12	8.0	7.0	11	8.5	7.5	17	17	14	11	11	13
17	12	8.0	8.0	11	9.1	11	18	17	14	11	11	12
18	12	8.0	9.0	11	9.1	11	19	16	17	11	11	12
19	12	8.0	10	11	8.8	11	20	16	23	12	11	12
20	12	8.0	10	11	8.4	11	21	15	18	19	11	12
21	12	8.0	9.8	11	8.8	13	15	16	17	14	11	13
22	12	8.4	9.8	11	9.1	12	17	15	16	13	11	10
23	12	8.6	9.8	11	9.3	12	22	15	16	13	13	9.1
24	12	9.0	9.8	11	9.1	12	22	16	15	12	11	11
25	12	8.6	9.8	12	8.8	12	21	16	15	12	11	11
26	11	8.5	10	11	9.1	12	20	18	15	11	11	11
27	11	8.4	10	9.5	9.1	12	21	18	15	11	11	11
28	11	8.3	10	9.0	9.3	12	21	18	15	12	11	11
29	11	8.3	9.6	9.0	-----	11	20	16	15	12	11	11
30	9.5	8.5	8.4	9.5	-----	12	19	15	15	12	11	11
31	10	-----	8.5	11	-----	12	-----	15	-----	12	11	-----
TOTAL	360.5	278.6	250.7	295.6	258.0	306.8	487.5	571	480	383	346	354.1
MEAN	11.6	9.29	8.09	9.54	9.21	9.90	16.3	18.4	16.0	12.4	11.2	11.8
MAX	13	12	10	12	11	13	25	26	25	19	13	15
MIN	9.5	8.0	6.0	7.5	8.0	3.5	9.0	15	14	11	11	9.1
AC-FT	715	553	497	586	512	609	967	1,130	952	760	686	702

CAL YR 1972 TOTAL 4,381.4 MEAN 12.0 MAX 24 MIN 6.0 AC-FT 8,690
WTR YR 1973 TOTAL 4,371.8 MEAN 12.0 MAX 26 MIN 3.5 AC-FT 8,670

PEAK DISCHARGE (BASE, 100 CFS).--No peaks above base.

CHEYENNE RIVER BASIN

47

06409500 Deerfield Reservoir near Hill City, S. Dak.

LOCATION.--Lat 44°01'46", long 103°47'09", in NE¼SW¼ sec.20, T.1 N., R.3 E., at dam on Castle Creek, 0.4 mi (0.6 km) upstream from Dutchman Creek and 12.5 mi (20.1 km) northwest of Hill City.

DRAINAGE AREA.--95 sq mi (246 sq km), approximately.

PERIOD OF RECORD.--May 1947 to current year. Some elevations obtained during period of initial filling, December 1945 to May 1947, are available in Bureau of Reclamation files. Prior to October 1953, published as "near Deerfield."

GAGE.--Water-stage recorder. Datum of gage is at mean sea level (levels by Bureau of Reclamation). Prior to July 20, 1964, nonrecording gage at same site and datum.

EXTREMES.--Current year: Maximum contents, 15,215 acre-ft (18.8 cu hm) Apr. 19, elevation, 5,908.15 ft (1,800.804 m); minimum, 12,074 acre-ft (14.9 cu hm) Oct. 20, elevation, 5,900.10 ft (1,798.350 m).
Period of record: Maximum contents observed, 15,340 acre-ft (18.9 cu hm) May 22, 1952, elevation, 5,908.50 ft (1,800.911 m), from capacity table extended above elevation 5,908.00 ft (1,800.758 m), crest of spillway; minimum observed, 5 acre-ft (6,160 cu m) Oct. 2, 1959, elevation, 5,839.10 ft (1,779.758 m).

REMARKS.--Reservoir is formed by earthfill dam. Storage began Dec. 4, 1945; dam completed in 1947. Usable capacity, 15,153 acre-ft (18.7 cu hm) between elevations 5,839 ft (1,779.7 m), lowest outlet, and 5,908 ft (1,800.8 m), crest of spillway. Dead storage below elevation 5,839 ft (1,779.7 m), 565 acre-ft (0.697 cu hm). Figures given herein represent usable contents. Water is used to supplement Rapid City water supply and for irrigation in Rapid Creek basin downstream from Rapid City.

COOPERATION.--Records of elevation and contents furnished by Bureau of Reclamation.

MONTHEND ELEVATION AND CONTENTS AT 2400 HOURS, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	5,902.91	13,126	-
Oct. 31.....	5,900.55	12,240	-886
Nov. 30.....	5,901.66	12,652	+412
Dec. 31.....	5,903.01	13,164	+512
CAL YR 1972.....	-	-	+227
Jan. 31.....	5,904.22	13,632	+468
Feb. 28.....	5,905.30	14,057	+425
Mar. 31.....	5,906.79	14,656	+599
Apr. 30.....	5,908.13	15,207	+551
May 31.....	5,907.50	14,946	-261
June 30.....	5,907.61	14,991	+45
July 31.....	5,907.02	14,749	-242
Aug. 31.....	5,905.07	13,966	-783
Sept. 30.....	5,902.52	12,977	-989
WTR YR 1973.....	-	-	-149

CHEYENNE RIVER BASIN

49

06410500 Rapid Creek above Pactola Reservoir, at Silver City, S. Dak.

LOCATION.--Lat 44°05'05", long 103°34'48", in SW¼SE¼ sec.36, T.2 N., R.4 E., Pennington County, on right bank 0.8 mi (1.3 km) west of Silver City and 3.0 mi (4.8 km) downstream from Slate Creek.

DRAINAGE AREA.--292 sq mi (756 sq km).

PERIOD OF RECORD.--October 1953 to current year.

GAGE.--Water-stage recorder. Datum of gage is 4,620.00 ft (1,408.176 m) above mean sea level (Bureau of Reclamation bench mark).

AVERAGE DISCHARGE.--20 years, 41.3 cfs (1.170 cu m/s), 29,920 acre-ft/yr (36.9 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 169 cfs (4.79 cu m/s) May 9, gage height, 5.52 ft (1.682 m); maximum gage height, 6.06 ft (1.847 m) Nov. 24, 28, backwater from ice; minimum daily discharge, 10 cfs (0.283 cu m/s) Mar. 20.

Period of record: Maximum discharge, 2,060 cfs (583 cu m/s) May 15, 1965, gage height, 10.44 ft (3.182 m), from rating curve extended above 1,000 cfs (28.3 cu m/s) on basis of slope-area measurement of peak flow; minimum daily, 4.0 cfs (0.11 cu m/s) Jan. 20, 1962.

REMARKS.--Records good except those for winter periods, which are poor. Flow regulated by Deerfield Reservoir on Castle Creek (see station 06409500).

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 28 to July 7; stage-discharge relation affected by ice Oct. 31 to Nov. 1, Nov. 10 to Mar. 11, Mar. 14-21, 26-28, Apr. 8-10)

4.4	20
4.6	37
5.0	88
5.5	182

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	55	23	26	18	19	20	29	127	66	49	39	42
2	55	22	25	19	20	21	29	121	101	46	36	51
3	56	23	23	17	20	20	29	121	107	43	35	55
4	56	20	20	15	19	20	30	134	87	42	34	49
5	61	23	18	15	18	20	35	154	82	42	34	46
6	61	22	15	15	16	21	40	160	77	40	34	45
7	59	21	14	14	16	22	37	158	73	37	34	43
8	58	23	13	14	16	21	30	154	69	38	33	44
9	57	22	14	14	17	22	30	158	66	37	32	44
10	56	18	15	15	18	23	33	143	64	37	31	44
11	56	19	16	16	20	24	36	133	63	36	41	45
12	56	19	15	19	18	26	41	130	64	36	49	44
13	58	19	15	21	17	26	49	122	61	36	57	42
14	58	20	15	22	16	24	68	117	65	36	48	42
15	58	20	15	21	16	22	73	110	83	36	46	46
16	57	20	16	21	17	20	55	105	66	36	44	46
17	57	18	17	22	18	20	60	104	62	35	44	46
18	57	18	18	22	18	20	71	99	65	35	44	44
19	56	18	18	21	18	20	101	95	82	39	43	41
20	58	18	18	20	18	10	150	93	75	72	42	41
21	34	20	19	20	19	32	142	91	65	64	42	41
22	28	20	20	21	20	35	118	78	58	52	46	42
23	24	20	20	22	20	32	125	72	55	46	58	40
24	24	20	20	22	19	30	132	74	53	45	50	42
25	23	20	20	22	19	29	127	74	50	41	46	40
26	23	22	21	21	20	30	112	86	48	40	44	40
27	23	24	21	19	20	32	109	87	48	40	43	40
28	21	23	21	19	20	31	125	92	48	39	44	40
29	23	24	20	20	-----	29	132	83	48	43	43	40
30	20	25	18	20	-----	29	127	75	58	38	43	39
31	22	-----	18	20	-----	29	-----	69	-----	38	42	-----
TOTAL	1,410	624	564	587	512	760	2,275	3,419	2,009	1,294	1,301	1,304
MEAN	45.5	20.8	18.2	18.9	18.3	24.5	75.8	110	67.0	41.7	42.0	43.5
MAX	61	25	26	22	20	35	150	160	107	72	58	55
MIN	20	18	13	14	16	10	29	69	48	35	31	39
AC-FT	2,800	1,240	1,120	1,160	1,020	1,510	4,510	6,780	3,980	2,570	2,580	2,590

CAL YR 1972 TOTAL 16,229 MEAN 44.3 MAX 183 MIN 10 AC-FT 32,190
WTR YR 1973 TOTAL 16,059 MEAN 44.0 MAX 160 MIN 10 AC-FT 31,850

CHEYENNE RIVER BASIN

06411000 Pactola Reservoir near Silver City, S. Dak.

LOCATION.--Lat 44°04'20", long 103°29'17", in NE¼SW¼ sec.2, T.1 N., R.5 E., Pennington County, in outlet works of dam on Rapid Creek, 3.8 mi (6.1 km) east of Silver City.

DRAINAGE AREA.--319 sq mi (82.6 sq km).

PERIOD OF RECORD.--August 1956 to current year.

GAGE.--Water-stage recorder. Datum of gage is at mean sea level (Bureau of Reclamation datum). Prior to Feb. 18, 1970, nonrecording gage at same site and datum.

EXTREMES.--Current year: Maximum contents, 54,447 acre-ft (67.1 cu hm) June 5, elevation, 4,579.60 ft (1,395.862 m); minimum, 49,434 acre-ft (61.0 cu hm) Sept. 16, elevation, 4,573.51 ft (1,394.006 m).
Period of record: Maximum contents observed, 60,970 acre-ft (75.2 cu hm) May 19, 1964, elevation, 4,585.87 ft (1,397.773 m); minimum observed since initial filling, 50,070 acre-ft (61.7 cu hm) Sept. 29, 1968, elevation, 4,574.31 ft (1,394.250 m).

REMARKS.--Reservoir formed by an earthfill dam completed August 1956. Storage began August 22, 1956. Conservation capacity, 54,960 acre-ft (67.8 cu hm) between elevations 4,456.1 ft (1,358.22 m) and 4,580.2 ft (1,396.04 m). Combined dead and inactive storage below elevation 4,456.1 ft (1,358.22 m) is 1,003 acre-ft (1.24 cu hm). Flood storage capacity, 43,050 acre-ft (53.1 cu hm) between elevations 4,580.2 ft (1,396.04 m) and 4,621.5 ft (1,408.63 m), crest of spillway. Surcharge capacity, 15,780 acre-ft (19.5 cu hm) between elevations 4,621.5 ft (1,408.63 m) and 4,633.7 ft (1,412.35 m), maximum pool elevation. Figures given herein represent contents above elevation 4,456.1 ft (1,358.22 m). Reservoir provides flood control and water for municipal and irrigation uses.

COOPERATION.--Records of elevations and contents furnished by Bureau of Reclamation.

MONTHEND ELEVATION AND CONTENTS AT 2400 HOURS, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	4,576.86	52,143	-
Oct. 31.....	4,576.67	51,986	-157
Nov. 30.....	4,576.23	51,624	-362
Dec. 31.....	4,575.90	51,354	-270
CAL YR 1972.....	-	-	-1,687
Jan. 31.....	4,575.42	50,964	-390
Feb. 28.....	4,575.24	50,818	-146
Mar. 31.....	4,576.28	51,666	+848
Apr. 30.....	4,579.07	53,994	+2,328
May 31.....	4,579.19	54,097	+104
June 30.....	4,578.31	53,352	-745
July 31.....	4,575.26	50,834	-2,518
Aug. 31.....	4,573.53	49,450	-1,384
Sept. 30.....	4,573.54	49,458	+8
WTR YR 1973.....	-	-	-2,685

CHEYENNE RIVER BASIN

51

06411500 Rapid Creek below Pactola Dam, S. Dak.

LOCATION.--Lat 44°04'36", long 103°28'54", in SW¼NE¼ sec.2, T.1 N., R.5 E., Pennington County, on right bank 2,000 ft (610 m) downstream from Pactola Dam, 3.9 mi (6.3 km) upstream from Deer Creek and 13 mi (21 km) west of Rapid City.

DRAINAGE AREA.--320 sq mi (829 sq km), approximately.

PERIOD OF RECORD.--October 1928 to September 1932 (combined records of Creek and Dakota Power and Light Co. flume), July 1946 to current year. Prior to October 1953, published as "near Pactola." Monthly discharge only for some periods, published in WSP 1309.

GAGE.--Water-stage recorder; concrete control since Oct. 16, 1962. Datum of gage is 4,406.00 ft (1,342.949 m) above mean sea level, Bureau of Reclamation bench mark. Apr. 19, 1929, to June 30, 1932, nonrecording gage at site 3,500 ft (1,070 m) upstream at different datum. July 24, 1946, to Aug. 24, 1947, nonrecording gage and Aug. 25, 1947, to Nov. 18, 1953, water-stage recorder, at site 2 mi (3 km) upstream at different datum.

AVERAGE DISCHARGE.--31 years, 45.3 cfs (1.283 cu m/s), 32,820 acre-ft/yr (40.5 cu hm/yr).

EXTREMES.--Current year: Maximum daily discharge, 168 cfs (4.76 cu m/s) May 8-11; maximum gage height, 8.14 ft (2.481 m) May 7-16; minimum daily discharge, 14 cfs (0.40 cu m/s) many days during February and March. Period of record: Maximum discharge, 2,170 cfs (61.5 cu m/s) May 22, 1952, gage height, 6.74 ft (2.054 m), site and datum then in use; no flow Oct. 11-17, 1962.

REMARKS.--Records good. Flow completely regulated by Pactola Reservoir 2,000 ft (610 m) upstream since Aug. 22, 1956. (See station 06411000.) Water-quality records for the water year 1973 are published in Part 2 of this report.

REVISIONS (WATER YEARS).--WSP 1309: 1931(M).

Rating table (gage height, in feet, and discharge, in cubic feet per second)

7.1	12	7.9	99
7.3	22	8.1	161
7.5	38	8.5	338
7.7	62		

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	54	25	24	24	24	14	15	120	71	57	62	44
2	54	25	24	24	24	14	15	147	71	57	62	45
3	54	25	24	23	24	14	15	137	71	83	62	45
4	54	24	24	25	24	14	15	144	71	98	62	45
5	54	24	24	25	24	14	15	144	71	98	61	45
6	54	24	24	23	24	14	15	144	87	98	61	45
7	54	24	24	23	24	14	15	153	96	101	61	45
8	56	24	24	23	24	14	15	168	96	101	61	45
9	56	24	23	23	24	14	15	168	96	101	61	45
10	56	24	23	23	24	14	15	168	96	101	61	45
11	56	24	23	24	24	14	15	168	96	103	61	45
12	56	24	23	24	24	14	15	165	96	106	61	45
13	56	24	23	24	24	14	15	165	96	113	61	44
14	56	24	23	24	24	14	16	165	96	115	61	44
15	54	24	23	24	24	14	16	165	96	115	61	44
16	54	23	23	24	24	14	16	165	96	115	61	44
17	54	23	23	25	24	14	16	139	94	115	61	44
18	54	24	23	25	24	14	16	123	94	115	61	44
19	54	24	23	25	24	14	16	120	94	98	61	44
20	54	24	23	25	24	14	47	120	94	90	61	44
21	54	24	23	25	20	14	96	120	94	85	61	44
22	54	24	23	25	14	14	92	101	94	87	61	44
23	54	24	23	25	14	15	92	96	94	87	62	44
24	54	24	24	25	14	15	94	96	94	87	61	44
25	37	24	23	25	14	15	94	79	94	85	61	44
26	25	24	23	25	14	15	94	74	94	85	61	42
27	25	24	23	25	14	15	94	74	94	71	61	42
28	25	24	23	25	14	15	94	74	67	62	53	42
29	25	24	23	25	-----	15	94	73	53	62	44	42
30	25	24	23	24	-----	15	94	73	57	62	44	42
31	25	-----	23	24	-----	15	-----	71	-----	62	44	-----
TOTAL	1,497	721	722	753	598	443	1,276	3,919	2,613	2,815	1,837	1,321
MEAN	48.3	24.0	23.3	24.3	21.4	14.3	42.5	126	87.1	90.8	59.3	44.0
MAX	56	25	24	25	24	15	96	168	96	115	62	45
MIN	25	23	23	23	14	14	15	71	53	57	44	42
AC-FT	2,970	1,430	1,430	1,490	1,190	879	2,530	7,770	5,180	5,580	3,640	2,620
CAL YR 1972	TOTAL 19,489.6	MEAN 53.3	MAX 177	MIN 5.0	AC-FT 38,660							
WTR YR 1973	TOTAL 18,515.0	MEAN 50.7	MAX 168	MIN 14	AC-FT 36,720							

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LOCATION (revised).--Lat 44°05'09", long 103°14'31", in SW¼SE¼ sec.35, T.2 N., R.7 E., Pennington County, on left bank 300 ft (91 m) upstream from Oskosh Street in Rapid City and 3.6 mi (5.8 m) downstream from Canyon Lake Dam (destroyed).

PERIOD OF RECORD.--June 1903 to November 1906, July 1942 to current year. Monthly discharge only for some periods, published in WSP 1309.

GAGE (revised).--Water-stage recorder. Datum of gage is 3,237.71 ft (986.854 m). Prior to Nov. 30, 1906, at site 1 mi (1.6 km) downstream at different datum and June 10 to Nov. 1, 1972, at site 800 ft (244 m) downstream at datum 6.91 ft (2.107 m) lower. July 1942 to June 9, 1972, water-stage recorder at site 300 ft (91 m) downstream at datum 6.91 ft (2.107 m) lower, destroyed by flood.

EXTREMES.--Current year: Maximum discharge, 282 cfs (7.99 cu m/s) July 8, gage height, 7.33 ft (2.234 m); minimum daily, 22 cfs (0.623 cu m/s) Mar. 12.

Period of record: Maximum discharge, 50,000 cfs (1,420 cu m/s) June 9, 1972, gage height, 15.45 ft (4.709 m), from floodmarks, from rating curve extended above 1,400 cfs (39.6 cu m/s) on basis of slope-area measurements at gage heights 8.37 ft (2.551 m) and 15.45 ft (4.709 m); minimum, 1.6 cfs (0.045 cu m/s) Apr. 20, 1962.

REMARKS (revised).--Records good except those for winter periods, which are poor. Several small diversions above station to municipal park pools and for irrigation of about 320 acres (130 sq hm). Flow regulated by Pactola Reservoir 25.4 mi (40.9 km) upstream, see station 06411000.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	70	41	45	39	38	25	33	152	94	43	70	48
2	70	41	46	42	38	28	32	182	100	45	66	68
3	70	41	37	40	39	28	32	183	100	34	66	66
4	70	41	30	38	38	26	32	192	98	87	66	64
5	71	42	28	35	39	27	32	195	97	106	70	60
6	72	41	25	30	38	28	35	195	92	76	68	60
7	72	41	25	30	30	26	34	186	108	72	69	60
8	72	42	25	28	41	27	34	186	108	103	65	60
9	72	42	25	28	38	27	30	190	106	88	66	60
10	71	42	25	30	38	24	31	186	108	79	56	60
11	72	42	28	34	41	24	29	190	110	71	60	56
12	72	42	28	34	44	22	28	186	108	67	72	58
13	71	40	30	37	41	26	28	187	105	87	72	59
14	70	40	39	43	33	46	28	185	109	112	65	61
15	70	40	38	45	34	29	28	183	113	107	61	69
16	70	40	38	44	36	34	28	180	112	111	53	68
17	70	44	40	44	44	35	27	176	115	122	56	70
18	69	45	44	43	42	38	30	150	108	124	60	66
19	70	46	43	42	42	41	60	145	109	142	57	65
20	71	46	44	42	41	40	85	142	105	151	57	64
21	72	43	44	42	41	36	118	144	104	133	53	64
22	72	42	46	40	36	46	136	139	96	130	63	63
23	72	44	44	36	31	35	129	118	96	126	74	64
24	74	44	42	41	30	40	126	117	94	140	75	63
25	72	38	46	39	29	37	125	119	95	136	73	61
26	56	40	48	38	26	35	124	116	92	124	65	63
27	41	43	42	37	26	33	125	114	95	116	58	60
28	41	40	42	35	25	31	135	121	87	88	60	60
29	41	35	43	39	-----	30	137	115	46	77	48	59
30	41	50	39	43	-----	30	154	108	50	73	43	58
31	41	-----	40	41	-----	30	-----	102	-----	70	41	-----
TOTAL	2,038	1,258	1,159	1,181	1,019	984	2,005	4,884	2,960	3,040	1,928	1,857
MEAN	65.7	41.9	37.4	38.1	36.4	31.7	66.8	159	98.7	98.1	62.2	61.9
MAX	74	50	48	45	44	46	154	195	115	151	75	70
MIN	41	35	25	28	25	22	27	102	46	34	41	48
AC-FT	4,040	2,500	2,300	2,340	2,020	1,950	3,980	9,690	5,870	6,030	3,820	3,680
CAL YR 1972	TOTAL 36,165			MEAN 98.8	MAX 5,600	MIN 18	AC-FT 71,750					
WTR YR 1973	TOTAL 24,313			MEAN 66.6	MAX 195	MIN 22	AC-FT 48,220					

CHEYENNE RIVER BASIN

06421500 Rapid Creek near Farmingdale, S. Dak.

LOCATION.--Lat 43°56'31", long 102°51'12", in SW¼SW¼SW¼ sec.19, T.1 S., R.11 E., Pennington County, on right bank at downstream side of bridge, 2 mi (3.2 km) southeast of Farmingdale and 4.8 mi (7.7 km) downstream from Antelope Creek.

DRAINAGE AREA.--602 sq mi (1,559 sq km).

PERIOD OF RECORD.--July 1946 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 2,700 ft (823 m), from topographic map. Prior to Sept. 19, 1947, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--27 years, 56.0 cfs (1.586 cu m/s), 40,570 acre-ft/yr (50.0 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 272 cfs (7.703 cu m/s) Apr. 20, gage height, 7.89 ft (2.405 m); maximum gage height, 8.49 ft (2.588 m) Mar. 4, backwater from ice; minimum daily discharge, 2.2 cfs (0.062 cu m/s) July 5.

Period of record: Maximum discharge, 7,320 cfs (207 cu m/s) June 10, 1972, gage height, 11.85 ft (3.612 m), from floodmarks, from rating curve extended above 400 cfs (11.3 cu m/s) on basis of contracted-opening and flow-over-road embankment of peak flow; no flow at times in 1949, 1952-56, 1958-63, 1969-71.

REMARKS.--Records good except those for winter periods, which are poor. Flow regulated by Pactola Reservoir 67 mi (108 km) upstream (see station 06441000) since August 1956, and by Deerfield Reservoir on Castle Creek since November 1945 (see station 06409500). Diversions for irrigation of about 10,000 acres (4,050 sq hm) above station. Water-quality records for the 1973 water year are published in Part 2 of this report.

Rating tables (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Nov. 10, Mar. 5-29, May 27 to June 30,
Sept. 23-30; stage-discharge relation affected by ice Nov. 11 to Mar. 4)

Oct. 1 to Apr. 20

Apr. 20 to Sept. 30

5.8	0	6.5	62	4.9	2.0	6.0	43
5.9	4.5	7.0	124	5.1	4.4	6.5	84
6.0	10	8.0	272	5.3	8.7	7.0	141
				5.6	20	8.0	295

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	49	72	65	50	48	53	74	219	80	10	35	23
2	39	74	60	55	50	52	76	188	77	5.1	34	27
3	41	74	45	50	50	50	74	206	101	4.3	29	45
4	46	73	42	47	50	48	70	202	86	2.8	29	49
5	53	73	40	45	48	46	70	199	81	2.2	29	42
6	86	70	36	42	46	48	66	200	72	24	27	39
7	74	65	36	42	43	39	62	199	60	13	30	36
8	72	64	36	40	42	36	60	196	70	6.4	23	34
9	74	68	36	40	40	31	57	209	70	23	16	34
10	77	67	36	42	45	32	51	204	67	26	9.6	33
11	72	66	40	45	60	30	50	200	73	7.0	12	33
12	82	65	49	50	58	23	49	195	77	8.7	14	33
13	83	64	47	55	55	24	47	189	77	6.2	12	35
14	77	63	48	60	50	23	49	189	77	8.4	17	35
15	65	62	49	60	45	3.2	44	186	81	8.7	13	39
16	74	61	50	60	45	52	42	179	85	21	9.0	59
17	79	60	55	65	50	101	43	175	81	21	9.3	54
18	79	60	57	60	50	98	43	169	85	17	11	59
19	68	60	57	57	50	106	102	146	84	21	9.3	53
20	76	60	57	55	50	95	226	138	84	62	10	50
21	79	60	60	55	52	102	185	127	74	115	9.9	49
22	71	61	62	55	54	110	174	114	66	73	18	48
23	76	62	60	57	55	127	179	106	58	63	12	49
24	80	63	58	60	50	115	171	88	58	65	18	54
25	85	63	60	60	48	153	168	83	52	74	31	62
26	89	63	62	55	50	147	168	100	55	71	34	51
27	78	62	62	45	52	142	167	118	34	71	35	52
28	62	60	60	35	52	102	165	114	32	64	31	46
29	60	62	60	37	-----	79	165	116	33	50	28	40
30	60	63	55	50	-----	70	172	98	24	46	31	42
31	60	-----	25	50	-----	68	-----	88	-----	41	28	-----
TOTAL	2,166	1,940	1,565	1,579	1,388	2,205.2	3,069	4,940	2,054	1,030.8	654.1	1,305
MEAN	69.9	64.7	50.5	50.9	49.6	71.1	102	159	68.5	33.3	21.1	43.5
MAX	89	74	65	65	60	153	226	219	101	115	35	62
MIN	39	60	25	35	40	3.2	42	83	24	2.2	9.0	23
AC-FT	4,300	3,850	3,100	3,130	2,750	4,370	6,090	9,800	4,070	2,040	1,300	2,590

CAL YR 1972 TOTAL 36,719.0 MEAN 100 MAX 2,860 MIN 25 AC-FT 72,830
WTR YR 1973 TOTAL 23,896.1 MEAN 65.5 MAX 226 MIN 2.2 AC-FT 47,400

CHEYENNE RIVER BASIN

55

06422500 Boxelder Creek near Nemo, S. Dak.

LOCATION.--Lat 44°08'38", long 103°27'16", in SE¼SE¼ sec.12, T.2 N., R.5 E., Lawrence County, on right bank at ranch 0.2 mi (0.3 km) upstream from county line, 0.9 mi (1.4 km) downstream from Jim Creek and 4.5 mi (7.2 km) southeast of Nemo.

DRAINAGE AREA.--96 sq mi (249 km), approximately.

PERIOD OF RECORD.--July 1945 to July 1947, May 1966 to current year.

GAGE.--Water-stage recorder. Datum of gage is 4,320.27 ft (1,316.818 m) above mean sea level. July 1945 to July 1947 nonrecording gage at site 100 ft (30 m) upstream at different datum. May 17, 1966, to June 9, 1972, water-stage recorder (destroyed by flood) and June 10, 1972, to Aug. 8, 1972, nonrecording gage, both at site 100 ft (30 m) upstream at datum 2.00 ft (0.610 m) higher.

AVERAGE DISCHARGE.--8 years (1946, 1967-73), 25.3 cfs (0.716 cu m/s), 18,330 acre-ft/yr (22.6 cu hm/yr).

EXTREMES.--Maximum discharge, 117 cfs (3.31 cu m/s) Apr. 20, gage height, 2.67 ft (0.814 m); maximum gage height, 2.72 ft (0.829 m) May 28; minimum daily discharge, 5.0 cfs (0.14 cu m/s) Dec. 8, 9.
Period of record: Maximum discharge, 30,100 cfs (852 cu m/s) June 9, 1972, gage height, 20.4 ft (6.22 m), from floodmarks, from rating curve extended above 600 cfs (17.0 cu m/s) on basis of slope-area measurement of peak flow; minimum daily, 0.70 cfs (0.020 cu m/s) Dec. 30, 1968.
Flood of 1914 reached a stage of about 14 ft (4.3 m).

REMARKS.--Records good except those for winter periods, which are poor.

Rating tables (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 28 to June 8, Aug. 18 to Sept. 30;
stage-discharge relation affected by ice Nov. 12 to Feb. 28, Mar. 14, 15)

Oct. 1 to Feb. 28

Mar. 1 to Sept. 30

1.5	6.0	1.5	6.0	2.4	77
1.6	10	1.7	15	3.0	180
1.8	24	2.0	35		

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	13	9.0	7.5	8.0	8.0	9.6	72	38	18	12	6.8
2	12	11	9.0	8.0	8.0	8.4	10	52	17	11	12	
3	12	11	8.0	7.0	8.0	7.6	9.6	67	54	16	9.6	18
4	12	11	7.0	6.5	8.0	6.8	8.8	69	37	16	9.8	13
5	14	11	6.5	6.0	8.0	6.8	11	75	34	17	10	10
6	16	11	6.0	6.0	7.5	6.8	15	90	32	15	10	8.6
7	16	11	5.5	6.0	7.0	6.8	14	80	30	13	10	7.6
8	15	10	5.0	6.0	7.0	6.4	11	75	28	13	9.8	7.2
9	14	10	5.0	6.0	7.0	6.8	10	82	27	14	8.5	7.2
10	13	8.9	5.5	6.5	7.5	7.2	12	70	26	13	8.3	6.8
11	13	8.5	6.0	7.0	8.0	6.8	12	63	25	12	7.8	6.8
12	13	8.4	6.0	8.0	8.0	8.0	16	57	25	12	9.2	6.8
13	13	8.3	6.0	9.5	7.5	8.0	20	54	24	12	21	6.9
14	13	8.2	6.0	10	7.0	10	32	50	25	12	14	6.9
15	13	8.2	6.0	9.5	7.0	10	31	47	47	12	9.5	8.7
16	13	8.2	6.5	9.2	7.5	8.8	27	43	28	11	8.2	9.4
17	13	8.2	7.0	9.2	8.0	8.0	36	41	27	11	7.5	9.6
18	13	8.1	7.5	9.0	8.0	8.8	47	38	27	10	7.2	8.8
19	13	8.0	7.6	8.5	7.8	9.2	75	36	36	11	7.2	7.9
20	13	8.0	7.6	8.5	8.0	13	98	34	32	23	7.0	7.2
21	13	8.0	8.0	8.5	8.0	11	77	37	30	25	6.3	7.2
22	13	8.5	8.5	8.5	8.0	12	65	36	26	25	7.3	7.1
23	12	9.0	8.2	9.0	8.0	12	71	32	23	28	25	7.2
24	12	9.5	8.0	9.0	7.5	10	75	33	21	25	18	8.2
25	12	11	8.0	9.0	7.5	10	72	35	21	20	12	8.0
26	12	10	8.2	8.5	8.0	10	62	50	19	15	10	7.9
27	12	10	8.2	8.0	8.0	12	62	70	20	14	8.7	7.3
28	12	10	8.0	7.5	8.0	11	71	97	20	15	8.1	7.2
29	11	9.0	7.5	8.0	-----	9.6	72	67	19	14	8.4	7.2
30	8.5	9.0	7.5	8.5	-----	10	71	52	20	12	7.4	6.5
31	11	-----	7.5	8.0	-----	9.2	-----	44	-----	12	6.4	-----
TOTAL	394.5	284.0	220.3	246.4	215.8	279.0	1,203.0	1,767	873	483	315.2	250.0
MEAN	12.7	9.47	7.11	7.95	7.71	9.00	40.1	57.0	29.1	15.6	10.2	8.33
MAX	16	13	9.0	10	8.0	13	98	97	54	28	25	18
MIN	8.5	8.0	5.0	6.0	7.0	6.4	8.8	32	19	10	6.3	6.5
AC-FT	782	563	437	489	428	553	2,390	3,500	1,730	958	625	496

CAL YR 1972 TOTAL 20,276.7 MEAN 55.4 MAX 6,700 MIN 1.5 AC-FT 40,220
WTR YR 1973 TOTAL 6,531.2 MEAN 17.9 MAX 98 MIN 5.0 AC-FT 12,950

PEAK DISCHARGE (BASE, 100 CFS)

DATE	TIME	G.H.	DISCHARGE
4-20	0200	2.67	117
5-28	0245	2.72	108

CHEYENNE RIVER BASIN

06423500 Cheyenne River near Wasta, S. Dak.

LOCATION.--Lat 44°04'52", long 102°24'03", in NE¼NE¼NW¼ sec.2, T.1 N., R.14 E., Pennington County, on left bank at downstream side of highway bridge, 200 ft (61 m) downstream from Chicago and North Western Transportation Co. bridge, 3.0 mi (4.8 m) east of Wasta, and 8.6 mi (13.8 m) downstream from Boxelder Creek.

DRAINAGE AREA.--12,800 sq mi (33,200 sq km), approximately.

PERIOD OF RECORD.--July 1914 to June 1915, August 1928 to June 1932, March 1934 to current year. Monthly discharge only for some periods, published in WSP 1309. Records for Feb. 19-28, 1930, published in WSP 701, have been found to be unreliable and should not be used.

GAGE (corrected).--Water-stage recorder. Prior to Aug. 1, 1940, nonrecording gage at site 50 ft (15 m) upstream; Aug. 1, 1940, to Dec. 3, 1940, nonrecording gage and Dec. 4, 1940, to Sept. 30, 1968, water-stage recorder at present site all at same datum 2.0 ft (0.610 m) higher. Oct. 1, 1968, to Sept. 30, 1972, at datum 1.0 ft (0.305 m) higher.

AVERAGE DISCHARGE.--42 years (1928-31, 1934-73), 370 cfs (10.48 cu m/s), 268,100 acre-ft/yr (331 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 6,650 cfs (188 cu m/s) Apr. 20, gage height, 6.98 ft (2.128 m); minimum daily, 36 cfs (1.02 cu m/s) July 16.

Period of record: Maximum discharge observed, 46,300 cfs (1,310 cu m/s) May 6, 1932, gage height, 13.28 ft (4.048 m), present datum, from rating curve extended above 11,000 cfs (312 cu m/s) on basis of an incomplete discharge measurement at gage height 10.65 ft (3.246 m), present datum; maximum gage height observed, 14.5 ft (4.42 m), present datum, June 13, 1915; minimum discharge, 0.6 cfs (0.017 cu m/s) July 27, 1961.

Flood in May 1920 reached a stage of 18 ft (5.5 m), present datum, from information by local residents.

REMARKS.--Records good except those for winter periods, which are poor. Flow regulated by Angostura Reservoir 108 mi (174 km) upstream (see station 06401000) since October 1949 and by upstream reservoirs on Rapid Creek since 1957.

REVISIONS (WATER YEARS).--WSP 786: Drainage area. WSP 1279: 1930(M), 1931, 1937. See also Period of Record.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 2-13, 15-26, June 18 to Sept. 4; stage-discharge relation affected by ice Nov. 15 to Mar. 1, Mar. 14)

0.9	34	3.0	1,010
1.2	70	4.0	2,060
1.5	128	5.0	3,310
2.0	298	6.0	4,820
2.5	589		

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	123	128	120	110	120	400	195	1,930	312	88	126	84
2	126	216	115	120	140	326	193	1,020	269	78	114	116
3	119	215	110	110	160	215	189	515	424	57	101	788
4	116	188	105	95	150	185	182	457	358	52	94	234
5	131	185	100	90	130	179	173	405	261	383	92	167
6	136	174	100	85	100	169	173	374	253	227	92	136
7	155	160	100	80	100	150	169	372	246	96	83	116
8	156	152	100	75	100	149	164	361	218	75	83	103
9	143	156	105	75	120	139	154	359	213	868	86	107
10	139	157	110	80	140	136	148	379	203	273	84	107
11	139	158	112	80	170	135	143	884	188	95	72	105
12	139	150	112	85	160	131	138	954	179	55	75	105
13	144	159	110	90	160	130	135	864	182	46	92	105
14	144	130	110	95	155	300	132	771	183	42	92	105
15	144	135	110	100	140	308	128	666	186	37	94	105
16	142	140	110	100	140	347	128	628	207	36	97	100
17	146	140	115	95	160	742	127	538	186	38	97	100
18	147	140	130	90	165	1,360	126	484	182	44	100	100
19	149	140	130	90	170	1,240	535	417	181	46	100	100
20	149	140	140	90	190	855	3,990	394	173	167	100	100
21	144	135	160	90	200	753	2,420	312	173	1,320	100	100
22	146	140	180	90	220	1,160	854	269	152	286	100	100
23	152	140	170	95	240	967	552	238	139	273	385	100
24	156	135	160	100	240	586	417	219	120	212	184	120
25	156	130	160	100	240	1,670	345	202	114	261	92	176
26	155	125	170	95	260	976	315	205	101	212	101	176
27	155	120	170	90	300	679	303	2,720	93	152	114	212
28	156	120	150	90	350	491	292	1,610	88	139	114	164
29	147	120	130	95	-----	306	286	531	78	131	105	144
30	106	120	120	100	-----	236	290	440	74	114	90	133
31	78	-----	110	110	-----	203	-----	353	-----	105	86	-----
TOTAL	4,338	4,448	3,924	2,890	4,910	15,623	13,396	19,871	5,736	6,008	3,345	4,408
MEAN	140	148	127	93.2	175	504	447	641	191	194	108	147
MAX	156	216	180	120	350	1,670	3,990	2,720	424	1,320	385	788
MIN	78	120	100	75	100	130	126	202	74	36	72	84
AC-FT	8,600	8,820	7,780	5,730	9,740	30,990	26,570	39,410	11,380	11,920	6,630	8,740

CAL YR 1972 TOTAL 112,281 MEAN 307 MAX 9,240 MIN 30 AC-FT 222,700
WTR YR 1973 TOTAL 88,897 MEAN 244 MAX 3,990 MIN 36 AC-FT 176,300

CHEYENNE RIVER BASIN

57

06425500 Elk Creek near Elm Springs, S. Dak.

LOCATION.--Lat 44°14'54", long 102°30'10", in SW 1/4 sec. 1, T.3 N., R.13 E., Meade County, near center of span on downstream side of county highway bridge, 1.4 mi (2.3 km) downstream from Hay Draw, 5.0 mi (8.0 km) southeast of Elm Springs, and 7.0 mi (11.3 km) upstream from mouth.

DRAINAGE AREA.--540 sq mi (11,400 sq km), approximately.

PERIOD OF RECORD.--July 1949 to current year.

GAGE.--Nonrecording gage and crest-stage gage; crest-stage gage since Sept. 29, 1954. Datum of gage is 2,304.49 ft (702.409 m) above mean sea level. Prior to Sept. 16, 1954, on upstream side of bridge, Sept. 16, 1954, to Jan. 31, 1967, on downstream side of bridge, at site 350 ft (107 m) downstream at same datum.

AVERAGE DISCHARGE.--24 years, 25.2 cfs (0.714 cu m/s), 18,260 acre-ft/yr (22.5 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 1,440 cfs (40.8 cu m/s) Apr. 22, gage height, 8.56 ft (2.609 m); no flow for many days.

Period of record: Maximum discharge, 8,540 cfs (242 cu m/s) Mar. 29, 1952, gage height, 10.61 ft (3.234 m), from floodmarks, site and datum then in use, from rating curve extended above 5,100 cfs (144 cu m/s); maximum gage height, 11.0 ft (3.35 m) May 29, 1962, from floodmarks, site and datum then in use; no flow for long periods in each year.

Maximum stage known, about 17 ft (5.2 m), at former site, in May 1920, from information by local residents.

REMARKS.--Records poor.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Stage-discharge relation affected by ice Nov. 12 to Mar. 3)

4.32	0	4.7	4.4	5.8	116
4.4	.45	4.9	11	6.3	264
4.5	1.3	5.2	29	7.0	569
4.6	2.6	5.5	62	8.0	1,100

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.6	7.4	7.6	6.4	4.4	14	38	32	74	8.2	7.1	.66
2	2.6	9.0	6.0	6.0	4.4	14	36	31	196	8.2	3.8	.59
3	2.9	9.0	5.2	5.4	4.4	14	32	28	328	7.4	3.4	.52
4	2.9	9.4	4.4	4.4	4.2	14	30	28	148	6.1	2.9	2.0
5	2.6	9.4	4.4	3.2	3.8	10	28	28	79	5.8	2.4	.66
6	2.6	9.4	4.0	2.4	3.6	9.4	28	32	60	5.2	2.2	.38
7	6.1	9.0	3.6	2.2	4.0	8.6	28	31	47	4.4	1.7	.32
8	6.8	9.0	2.0	1.6	4.4	8.2	27	36	45	4.4	1.6	.20
9	5.8	9.4	1.0	2.0	4.8	12	26	47	42	4.0	1.4	0
10	5.8	9.4	1.2	2.2	5.4	11	24	43	37	3.6	1.2	0
11	5.8	9.8	1.4	2.2	6.0	11	23	38	34	3.0	.97	0
12	6.1	9.0	2.0	2.8	6.8	7.4	20	33	32	2.6	.81	0
13	6.1	8.6	2.4	3.4	7.6	7.8	20	29	30	2.1	.73	0
14	6.1	8.0	3.2	3.6	8.0	11	17	26	28	2.0	0	0
15	5.5	7.6	4.2	3.9	8.0	15	15	27	26	1.7	0	0
16	5.2	7.4	5.4	3.8	8.4	16	14	28	26	1.4	0	0
17	5.5	7.2	6.0	3.8	9.0	14	16	29	25	1.3	0	0
18	5.8	7.2	6.8	3.6	9.6	26	17	29	24	1.1	0	0
19	6.1	7.0	6.8	3.4	9.4	22	27	30	24	1.2	0	0
20	6.8	6.6	7.4	3.0	9.2	26	173	32	24	2.7	0	0
21	6.4	5.8	7.4	3.0	9.6	26	278	32	22	3.0	0	0
22	6.4	5.0	8.8	3.6	9.8	29	896	26	22	3.6	0	0
23	6.1	4.2	7.8	4.2	9.8	28	121	26	21	7.8	14	0
24	6.1	2.8	8.8	4.4	10	26	28	23	22	6.1	34	.20
25	5.8	3.2	9.6	4.2	10	27	26	24	20	215	16	.05
26	5.5	3.4	15	3.8	10	24	43	33	18	94	8.6	0
27	5.5	3.4	15	3.0	14	25	38	233	15	20	3.4	.15
28	5.8	6.0	9.6	2.0	14	26	36	228	13	16	3.4	.26
29	5.8	7.7	9.0	2.4	-----	26	35	110	11	9.8	1.4	.32
30	6.1	7.6	8.2	3.0	-----	27	34	99	11	11	.81	.45
31	6.1	-----	7.2	3.6	-----	38	-----	82	-----	8.2	.73	-----
TOTAL	165.3	217.9	191.4	106.5	212.6	573.4	2,174	1,553	1,504	470.9	112.55	6.76
MEAN	5.33	7.26	6.17	3.44	7.59	18.5	72.5	50.1	50.1	15.2	3.63	.23
MAX	6.8	9.8	15	6.4	14	38	896	233	328	215	34	2.0
MIN	2.6	2.8	1.0	1.6	3.6	7.4	14	23	11	1.1	0	0
AC-FT	328	432	380	211	422	1,140	4,310	3,080	2,980	934	223	13
CAL YR 1972	TOTAL	11,352.29	MEAN	31.0	MAX	1,370	MIN	0	AC-FT	22,520		
WTR YR 1973	TOTAL	7,288.31	MEAN	20.0	MAX	896	MIN	0	AC-FT	14,460		

PEAK DISCHARGE (BASE, 400 CFS)

DATE	TIME	G.H.	DISCHARGE
4-22	1000	8.56	1,440
6-2	2230	7.28	694
7-25	2200	7.39	767

CHEYENNE RIVER BASIN

59

06430000 Murray ditch at Wyoming-South Dakota State line

LOCATION.--Lat 44°34'35", long 104°02'58", in SW¼SW¼ sec.7, T.7 N., R.1 E., Butte County, on right bank 15 ft (5 m) downstream from State line and 12 mi (19 km) southwest of Belle Fourche.

PERIOD OF RECORD.--June 1954 to current year (irrigation seasons only prior to October 1959).

GAGE.--Water-stage recorder. Altitude of gage is 3,440 ft (1,050 m), from topographic map.

EXTREMES.--Period of record: Maximum daily discharge, 37 cfs (1.05 cu m/s) July 17, 1973; no flow for long periods in each year.

REMARKS.--Records fair. Ditch diverts water from left bank of Redwater Creek, 2.0 mi (3.2 km) upstream, for irrigation of about 700 acres (283 sq hm). Flow maintained during irrigation season only.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.45	1.7						0	0	5.1	16	0
2	.35	1.7						0	.03	5.1	15	0
3	.30	1.7						0	0	5.1	14	0
4	.24	1.7						0	0	5.7	16	0
5	.40	1.7						0	0	5.8	18	0
6	.27	1.7						0	0	5.3	20	0
7	.24	1.7						0	0	6.4	21	0
8	.21	1.7						0	0	8.1	21	0
9	.21	1.7						0	0	7.6	22	1.0
10	.18	1.7						0	0	7.6	22	3.0
11	.27	1.7						0	0	13	22	3.0
12	.27	1.7						0	0	19	22	3.0
13	.24	1.7						0	0	20	23	3.0
14	.24	1.7						0	0	25	22	3.0
15	.21	1.7						0	0	22	22	3.1
16	.18	1.7						0	0	21	23	1.4
17	.15	1.7						0	0	37	22	.91
18	.15	1.7						0	0	35	22	.75
19	.12	1.7						0	0	36	24	.65
20	.03	1.7						0	0	32	23	.60
21	0	1.7						0	0	28	22	.50
22	.11	1.7						0	0	27	1.6	.40
23	2.3	1.7						0	0	33	.46	.35
24	2.2	1.7						0	0	30	0	.35
25	1.9	1.7						0	3.2	21	0	.24
26	1.8	1.6						0	5.6	17	0	.21
27	1.8	1.6						.10	5.6	15	0	.09
28	1.7	1.5						0	5.5	14	0	.53
29	1.7	1.5						0	5.3	15	0	2.2
30	1.7	.10						0	5.3	16	0	2.0
31	1.7							0		15	0	
TOTAL	21.62	48.80	0	0	0	0	0	.10	30.53	552.8	434.06	30.28
MEAN	.70	1.63	0	0	0	0	0	.003	1.02	17.8	14.0	1.01
MAX	2.3	1.7	0	0	0	0	0	.10	5.6	37	24	3.1
MIN	0	.10	0	0	0	0	0	0	0	5.1	0	0
AC-FT	43	97	0	0	0	0	0	.2	61	1,100	861	60

CAL YR 1972 TOTAL 536.32 MEAN 1.47 MAX 30 MIN 0 AC-FT 1,060
 MTR YR 1973 TOTAL 1,118.19 MEAN 3.06 MAX 37 MIN 0 AC-FT 2,220

CHEYENNE RIVER BASIN

06430500 Redwater Creek at Wyoming-South Dakota State line

LOCATION.--Lat 44°34'26", long 104°02'54", in NW¼NW¼ sec.18, T.7 N., R.1 E., Butte County, on left bank 800 ft (244 m) downstream from State line, 5.7 mi (9.2 km) upstream from Crow Creek, and 12 mi (19 km) southwest of Belle Fourche, S. Dak.

DRAINAGE AREA.--471 sq mi (1,219 sq km).

PERIOD OF RECORD.--April 1929 to September 1931 and February 1936 to July 1937 (published as "near Beulah, Wyo."), June 1954 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 3,410 ft (1,040 m), from topographic map. Apr. 25, 1929, to Sept. 30, 1931, and Feb. 28, 1936, to July 31, 1937, nonrecording gage at site 2 mi (3 km) upstream at different datum.

AVERAGE DISCHARGE.--21 years (1929-31, 1954-73), 35.8 cfs (1.014 cu m/s), 25,940 acre-ft/yr (32.0 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 2,440 cfs (69.1 cu m/s) Aug. 22, gage height, 12.19 ft (3.716 m); minimum, 12 cfs (0.34 cu m/s) July 11, gage height, 1.86 ft (0.567 m).
Period of record: Maximum discharge, 2,440 cfs (69.1 cu m/s) Aug. 22, 1973, gage height, 12.19 ft (3.716 m); no flow Aug. 13-15, 1929.

REMARKS.--Records good except those for winter periods, which are fair. Large diversions for irrigation above station. Total flow passing State line may be obtained by adding flow of Murray ditch. (See station 06430000.)

REVISIONS.--WSP 1309: 1931(M), 1936-37(M).

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Aug. 21 to Sept. 30; stage-discharge relation affected by ice Dec. 4-14, Jan. 4-12)

2.0	18
2.5	52
3.0	97
3.7	190
6.0	603

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	44	45	47	42	47	42	43	81	226	60	32	45
2	44	46	46	42	46	42	43	74	198	59	35	42
3	43	46	45	43	47	42	42	70	235	58	36	50
4	44	45	40	42	47	42	42	76	161	57	36	49
5	49	45	40	40	46	42	42	109	126	56	33	49
6	48	45	40	38	44	42	44	138	106	56	32	51
7	47	44	40	36	44	42	45	141	94	54	31	54
8	47	45	35	34	45	41	44	144	85	51	30	53
9	46	45	35	34	44	42	43	155	80	51	31	50
10	44	45	40	36	45	41	44	128	75	49	35	49
11	44	45	40	38	46	41	43	117	73	40	36	49
12	45	45	42	41	46	41	44	106	72	35	37	49
13	45	45	44	42	45	43	47	102	71	32	38	48
14	45	45	44	45	44	49	50	103	69	29	40	47
15	45	45	43	45	44	40	50	104	70	27	37	49
16	45	45	42	47	45	40	47	120	68	23	38	50
17	45	45	42	47	45	42	48	125	68	21	37	51
18	45	45	44	46	45	42	50	130	71	18	37	52
19	46	44	44	45	44	42	58	120	89	19	38	53
20	46	44	45	45	44	42	74	104	98	26	39	53
21	46	43	45	45	44	44	66	92	77	28	142	53
22	45	43	47	45	45	48	57	83	71	29	490	52
23	43	44	45	45	45	46	60	74	68	28	85	53
24	43	44	45	46	44	45	73	70	67	28	65	53
25	44	44	44	46	44	44	82	69	62	33	55	52
26	45	45	44	46	43	44	72	82	59	32	49	53
27	44	44	44	45	42	46	68	116	59	32	50	53
28	44	43	44	44	43	46	78	151	59	34	48	51
29	45	43	44	44	47	43	93	145	59	34	45	50
30	45	45	42	49	-----	43	87	150	60	33	45	49
31	44	-----	42	48	-----	43	-----	211	-----	33	45	-----
TOTAL	1,395	1,337	1,324	1,334	1,253	1,332	1,679	3,490	2,776	1,165	1,827	1,512
MEAN	45.0	44.6	42.7	43.0	44.8	43.0	56.0	113	92.5	37.6	58.9	50.4
MAX	49	46	47	49	47	49	93	211	235	60	490	54
MIN	43	43	35	34	42	40	42	69	59	18	30	42
AC-FT	2,770	2,650	2,630	2,650	2,490	2,640	3,330	6,920	5,510	2,310	3,620	3,000

CAL YR 1972 TOTAL 18,405 MEAN 50.3 MAX 178 MIN 32 AC-FT 36,510
WTR YR 1973 TOTAL 20,424 MEAN 56.0 MAX 490 MIN 18 AC-FT 40,510

PEAK DISCHARGE (BASE, 150 CFS)

DATE	TIME	G.H.	DISCHARGE
5- 9	0515	3.55	168
6- 3	0715	4.19	269
8-22	0030	12.19	2,440

CHEYENNE RIVER BASIN

61

06431500 Spearfish Creek at Spearfish, S. Dak.

LOCATION.--Lat 44°28'57", long 103°51'40", in SE¼NW¼ sec.15, T.6 N., R.2 E., Lawrence County, on right bank in city park in Spearfish, 500 ft (152 m) downstream from fish hatchery and nearest tributary, and 9.8 mi (15.8 km) upstream from mouth.

DRAINAGE AREA.--168 sq mi (435 sq km).

PERIOD OF RECORD.--October 1946 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 3,640 ft (1,109 m), from topographic map. Prior to Dec. 5, 1946, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--27 years, 50.2 cfs (1.422 cu m/s), 36,320 acre-ft/yr (44.8 cu hm/yr), unadjusted.

EXTREMES.--Current year: Maximum discharge, 287 cfs (8.13 cu m/s) May 31, gage height, 7.09 ft (2.161 m); minimum daily, 16 cfs (0.45 cu m/s) Mar. 14.

Period of record: Maximum discharge, 4,240 cfs (120 cu m/s) May 15, 1965, gage height, 10.53 ft (3.210 m), from rating curve extended above 520 cfs (14.7 cu m/s) on basis of slope-area measurement of peak flow; no flow for part of Oct. 18, 1970.

Flood of June 5, 1904, reached a stage of 7.00 ft (2.134 m), site and datum of former gage near Spearfish, 1 mi (2 km) upstream, drainage area, 157 sq mi (407 sq km); discharge about 5,000 cfs (142 cu m/s).

REMARKS.--Records good except those for the winter periods, which are fair. Regulation by fish hatchery and by hydroelectric plant 0.5 mi (0.8 km) upstream causes diurnal fluctuation, but since storage capacity is small, daily flows are not appreciably affected. Prior to water year 1962 average monthly diversion by Homestake Mining Co., about 7 cfs (0.20 cu m/s). Figures of daily discharge do not include diversion by Homestake Mining Co.

REVISIONS.--WSP 1116: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	59	60	55	54	63	66	49	106	248	83	55	63
2	58	61	55	54	46	64	49	105	241	83	52	70
3	54	59	54	49	71	63	47	104	227	81	55	69
4	57	61	49	45	66	63	45	107	204	79	54	66
5	63	62	45	45	65	62	52	108	177	81	57	64
6	60	64	50	47	64	63	56	149	158	77	56	62
7	61	61	55	52	50	60	52	166	144	75	57	63
8	61	60	55	55	55	60	50	180	133	75	54	64
9	60	60	56	55	55	58	49	213	124	71	55	62
10	60	62	56	57	66	60	43	185	122	68	55	63
11	60	62	56	56	72	58	50	171	122	66	53	62
12	59	63	54	62	67	58	55	153	124	66	57	61
13	60	61	57	65	65	57	61	144	118	67	56	60
14	60	60	59	60	50	16	70	144	112	66	52	61
15	63	62	58	60	60	40	68	149	112	65	53	63
16	62	61	57	61	64	61	65	166	110	63	52	64
17	62	61	58	61	63	67	69	180	108	62	52	62
18	59	59	54	62	63	64	75	194	110	58	56	57
19	57	60	52	62	63	59	81	180	110	62	57	55
20	58	58	53	62	60	58	92	163	108	70	52	54
21	58	58	55	65	62	61	85	153	104	68	54	59
22	60	56	56	65	61	62	80	137	100	70	55	59
23	58	59	57	64	63	57	83	126	96	70	57	61
24	57	59	57	64	61	58	96	122	92	67	55	60
25	59	56	58	64	63	53	101	122	92	62	58	57
26	61	61	54	64	64	54	95	124	90	62	57	57
27	62	62	54	64	64	52	93	153	88	58	57	56
28	61	58	54	59	65	52	104	210	87	59	58	55
29	62	46	54	69	-----	50	105	248	83	58	58	54
30	61	54	49	68	-----	50	106	245	87	58	60	55
31	60	-----	56	68	-----	47	-----	273	-----	57	58	-----
TOTAL	1,852	1,786	1,692	1,838	1,731	1,753	2,126	4,980	3,831	2,107	1,717	1,818
MEAN	59.7	59.5	54.6	59.3	61.8	56.5	70.9	161	128	68.0	55.4	60.6
MAX	63	64	59	69	72	67	106	273	248	83	60	70
MIN	54	46	45	45	46	16	43	104	83	57	52	54
AC-FT	3,670	3,540	3,360	3,650	3,430	3,480	4,220	9,880	7,600	4,180	3,410	3,610
MEAN†	67.0	66.9	62.8	67.6	70.0	65.3	79.9	167	135	77.2	65.4	68.8
(+)	446	439	507	513	458	540	535	365	437	567	615	488
AC-FT‡	4,120	3,980	3,870	4,160	3,890	4,020	4,760	10,240	8,040	4,750	4,020	4,100
CAL YR 1972	TOTAL 26,045		MEAN 71.2		MAX 160		MIN 45		AC-FT 51,660			
WTR YR 1973	TOTAL 27,231		MEAN 74.6		MAX 273		MIN 16		AC-FT 54,010			

+ Diversion, in acre-ft, by Homestake Mining Company

‡ Adjusted for diversion

CHEYENNE RIVER BASIN

06433000 Redwater River above Belle Fourche, S. Dak.

LOCATION.--Lat 44°40'02", long 103°50'20", in NW¼SE¼ sec.11, T.8 N., R.2 E., Butte County, on right bank at upstream side of bridge on U.S. Highway 212 in Belle Fourche, 0.5 mi (0.8 km) upstream from Hay Creek and 0.9 mi (1.4 km) upstream from mouth.

DRAINAGE AREA.--920 sq mi (2,383 sq km).

PERIOD OF RECORD.--November 1945 to current year. Records for water year 1946 incomplete, yearly discharge published in WSP 1309. Prior to October 1960, published as Redwater Creek above Belle Fourche.

GAGE.--Water-stage recorder. Altitude of gage is 3,000 ft (910 m), from topographic map. Prior to Dec. 13, 1946, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--28 years (1945-73), 132 cfs (3.738 cu m/s), 95,630 acre-ft/yr (118 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 1,070 cfs (30.3 cu m/s) Apr. 20, gage height, 4.77 ft (1.454 m); minimum daily, 68 cfs (1.93 cu m/s) Aug. 11, 12.
Period of record: Maximum discharge, 16,400 cfs (464 cu m/s) June 16, 1962, gage height, 11.69 ft (3.563 m), from rating curve extended above 6,000 cfs (170 cu m/s) on basis of slope-area measurement of peak flow; no flow for part of Aug. 5, 1960, Aug. 8-10, 1968, and Aug. 13, 1969.

REMARKS.--Records good except those for winter periods, which are poor. Diversions for irrigation of about 13,000 acres (5,260 sq km) above station.

REVISIONS (WATER YEARS).--WSP 1389: 1954 (maximum gage height only).

Rating tables (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Sept. 29, 30; stage-discharge relation affected
by ice Dec. 4-16, Jan. 2-11)

Oct. 1 to Nov. 23

Nov. 24 to Sept. 30

3.7	131	2.7	54	4.0	494
3.8	155	3.0	109	4.5	850
4.0	210	3.5	255		

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	170	140	190	200	180	180	195	389	775	127	99	144
2	170	170	190	160	180	180	195	342	722	130	94	161
3	168	200	190	130	180	180	195	311	752	122	86	182
4	167	200	160	115	180	180	197	307	594	119	79	175
5	181	200	140	110	180	180	197	370	507	119	77	174
6	187	200	120	120	170	180	203	520	426	112	74	185
7	183	200	110	130	160	180	209	607	360	111	74	178
8	179	200	95	130	160	180	203	628	324	103	74	184
9	180	200	100	140	170	180	197	686	290	106	73	179
10	178	200	110	150	170	180	193	642	274	92	73	178
11	178	200	130	150	180	180	197	552	255	76	68	176
12	175	190	130	160	175	180	193	507	233	69	68	178
13	169	190	150	160	170	190	200	448	219	70	76	172
14	166	190	140	170	160	220	206	426	216	70	72	173
15	167	190	140	170	160	170	216	426	216	72	72	183
16	167	190	140	175	170	160	213	453	213	72	72	180
17	162	190	150	180	180	180	206	488	216	72	72	175
18	169	190	180	175	180	180	213	500	233	70	72	174
19	170	190	200	170	180	180	379	488	251	70	70	168
20	165	190	220	180	180	180	820	436	286	69	73	170
21	165	190	250	180	180	190	520	379	274	72	76	170
22	165	190	250	175	180	220	342	307	251	79	340	170
23	165	190	250	175	180	210	282	244	233	97	360	166
24	160	190	250	180	170	200	286	193	226	110	193	174
25	160	180	250	180	170	190	356	170	223	81	171	165
26	160	180	250	185	180	190	337	211	197	82	160	171
27	160	160	250	185	180	200	294	565	167	82	159	163
28	160	160	250	180	180	200	290	671	148	88	153	163
29	165	170	230	185	-----	200	365	760	140	94	148	168
30	165	190	230	180	-----	190	400	708	135	94	146	165
31	150	-----	230	180	-----	190	-----	738	-----	97	142	-----
TOTAL	5,226	5,620	5,675	5,060	4,885	5,800	8,299	14,472	9,356	2,827	3,566	5,164
MEAN	169	187	183	163	174	187	277	467	312	91.2	115	172
MAX	187	200	250	200	180	220	820	760	775	130	360	185
MIN	150	140	95	110	160	160	193	170	135	69	68	144
AC-FT	10,370	11,150	11,260	10,040	9,690	11,500	16,460	28,710	18,560	5,610	7,070	10,240

CAL YR 1972 TOTAL 70,946 MEAN 194 MAX 761 MIN 73 AC-FT 140,700
WTR YR 1973 TOTAL 75,950 MEAN 208 MAX 820 MIN 68 AC-FT 150,600

PEAK DISCHARGE (BASE, 500 CFS)

DATE	TIME	G.H.	DISCHARGE	DATE	TIME	G.H.	DISCHARGE
4-20	1800	4.77	1,070	6-1	1845	4.59	922
5-9	1815	4.43	798	8-23	0130	4.43	820
5-29	0415	4.54	882				

CHEYENNE RIVER BASIN

63

06433500 Hay Creek at Belle Fourche, S. Dak.

LOCATION.--Lat 44°40'01", long 103°50'46", in NW¼SW¼ sec.11, T.8 N., R.2 E., Butte County, on right bank at intersection of Tenth Avenue and Jackson Street in Belle Fourche, 0.5 mi (0.8 km) upstream from mouth.

DRAINAGE AREA.--121 sq mi (313 sq km).

PERIOD OF RECORD.--October 1953 to current year.

GAGE.--Water-stage recorder. Datum of gage is 3,005.18 ft (915.979 m) above mean sea level (City of Belle Fourche bench mark). Prior to Dec. 8, 1953, nonrecording gage at site 300 ft (91 m) downstream at same datum.

AVERAGE DISCHARGE.--20 years, 1.30 cfs (0.0368 cu m/s), 942 acre-ft/yr (1.16 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 99 cfs (2.80 cu m/s) Apr. 21, gage height, 5.63 ft (1.716 m); no flow for many days.
Period of record: Maximum discharge, 930 cfs (26.3 cu m/s) June 19, 1972, gage height, 9.15 ft (2.789 m); no flow for many days each year.

REMARKS.--Records fair except those for winter periods, which are poor. Minor diversion to the stream at times from city reservoir overflow, which enters stream above gage.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used July 27 to Aug. 8; stage-discharge relation affected by ice Oct. 31 to Nov. 2, Nov. 12 to Jan. 29, Feb. 4-28)

3.2	0	3.5	1.5	4.5	25
3.3	.35	3.7	3.6	5.0	48
3.4	.85	4.0	9.6	5.5	82

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0	.14	.35	.70	1.3	3.0	3.9	17	7.5	1.6	0	0
2	0	.30	.35	.70	1.3	3.0	3.9	16	7.5	1.4	0	.42
3	0	.55	.30	.70	1.3	3.0	3.5	18	7.5	1.1	0	.35
4	0	.55	.40	.60	1.3	3.0	3.5	14	18	.85	0	.21
5	.79	.60	.50	.50	1.2	3.2	3.5	12	20	.70	0	.07
6	1.1	.55	.40	.40	.80	2.4	3.4	9.9	11	.50	0	0
7	.07	.55	.30	.35	.60	2.0	3.4	9.1	7.0	.28	0	.03
8	0	.55	.10	.30	.60	1.8	3.4	8.1	5.8	.17	0	0
9	0	.60	.10	.30	.70	2.0	3.4	7.0	5.0	.07	0	0
10	0	.60	.15	.35	.70	1.8	3.1	6.5	4.5	0	.15	0
11	0	.50	.15	.40	.80	1.7	2.9	6.0	3.9	0	.19	0
12	0	.40	.15	.50	.80	1.5	2.9	5.5	3.8	0	0	0
13	0	.35	.15	1.0	.70	1.5	3.0	5.1	3.8	0	0	0
14	0	.30	.20	2.0	.60	1.5	3.1	5.0	3.6	0	0	.04
15	0	.35	.20	3.0	.50	.85	3.5	5.0	3.1	0	0	.28
16	0	.30	.20	4.0	.70	2.1	3.4	4.8	2.6	0	0	.21
17	0	.30	1.0	3.0	.80	1.9	3.2	4.5	2.4	0	0	.14
18	0	.30	1.5	1.0	.80	2.0	3.4	4.1	3.1	0	0	.14
19	0	.30	2.0	.80	1.0	4.1	35	3.4	3.1	0	0	.17
20	0	.30	3.0	.60	1.0	5.7	76	3.1	3.9	0	0	.10
21	0	.35	3.5	.60	1.0	11	82	3.0	8.1	0	3.3	.31
22	0	.40	4.0	.70	1.2	12	40	2.5	6.3	0	15	.17
23	0	.40	2.0	.80	1.2	9.9	23	2.4	4.8	2.1	21	.14
24	0	.35	1.5	1.0	1.2	13	18	2.4	4.1	2.8	3.0	.50
25	0	.35	1.5	1.0	1.0	13	19	2.5	3.1	5.9	1.1	.21
26	0	.35	1.5	1.0	2.0	9.6	20	6.1	2.5	3.9	.31	.28
27	.03	.35	1.0	.70	2.0	13	19	27	2.1	1.4	.07	.10
28	.07	.30	.80	.50	2.5	9.3	16	28	2.1	.75	0	.03
29	.21	.30	.60	.80	-----	6.9	15	22	1.9	.50	0	0
30	.17	.35	.50	1.5	-----	5.1	16	16	1.8	.24	0	0
31	.15	-----	.60	1.3	-----	4.3	-----	10	-----	.10	0	-----
TOTAL	2.59	11.89	29.00	31.10	29.60	155.15	439.4	286.0	163.9	24.36	44.12	3.90
MEAN	.084	.40	.94	1.00	1.06	5.00	14.6	9.23	5.46	.79	1.42	.13
MAX	1.1	.60	4.0	4.0	2.5	13	82	28	20	5.9	21	.50
MIN	0	.14	.10	.30	.50	.85	2.9	2.4	1.8	0	0	0
AC-FT	5.1	24	58	62	59	308	872	567	325	48	88	7.7

CAL YR 1972 TOTAL 1,944.62 MEAN 5.31 MAX 610 MIN 0 AC-FT 3,860
WTR YR 1973 TOTAL 1,221.01 MEAN 3.35 MAX 82 MIN 0 AC-FT 2,420

PEAK DISCHARGE (BASE, 50 CFS)

DATE	TIME	G.H.	DISCHARGE
4-19	2200	5.62	98
4-21	0400	5.63	99

CHEYENNE RIVER BASIN

06434500 Inlet Canal near Belle Fourche, S. Dak.

LOCATION.--Lat 44°42'14", long 103°49'23", in NE¼NW¼ sec.36, T.9 N., R.2 E., Butte County, on right bank 0.5 mi (0.8 km) downstream from Crow Creek, 0.9 mi (1.4 km) downstream from diversion dam on Belle Fourche River, and 2.5 mi (4.0 km) northeast of Belle Fourche.

PERIOD OF RECORD.--October 1945 to current year. Monthly diversions from Inlet Canal between station and reservoir for some periods, published in WSP 1309.

GAGE.--Water-stage recorder. Datum of gage is 2,985.22 ft (909.895 m) above mean sea level. Prior to Dec. 10, 1946, nonrecording gage, and Dec. 10, 1946, to Nov. 26, 1949, water-stage recorder at site 0.8 mi (1.3 km) upstream at same datum.

AVERAGE DISCHARGE.--28 years, 156 cfs (4.418 cu m/s), 113,000 acre-ft/yr (139 cu hm/yr).

EXTREMES.--Period of record: Maximum daily discharge, 1,340 cfs (37.9 cu m/s) May 30, 1962; no flow for many days in 1946-49, 1963, 1966, 1971-73.

REMARKS.--Records good except those for winter periods, which are poor. Records show actual diversions to Belle Fourche Reservoir (see station 06435000), from Belle Fourche River and Crow Creek, except for 4,370 acre-ft (5.39 cu hm) which was diverted for irrigation from the canal between the station and reservoir. Water-quality records for the water year 1973 are published in Part 2 of this report.

COOPERATION.--Records of diversion from the canal furnished by Bureau of Reclamation.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	363	220	200	260	204			0	488	302	165	165
2	383	243	180	250	83			0	483	247	161	194
3	385	270	150	200	0			0	462	227	149	208
4	389	271	130	160	0			0	316	209	145	201
5	430	258	140	150	0			0	169	201	134	208
6	465	256	150	160	0			0	164	174	133	227
7	348	250	130	160	0			0	161	160	123	216
8	296	249	110	170	0			0	157	148	105	220
9	275	248	110	170	0			0	151	143	99	213
10	264	249	120	180	0			0	151	133	105	206
11	254	248	140	180	0			0	157	107	127	208
12	250	238	140	190	0			0	178	84	128	211
13	248	231	160	190	0			0	195	81	157	215
14	248	213	160	200	0			0	234	101	142	213
15	246	213	160	210	0			0	360	108	140	231
16	247	238	170	250	0			0	416	104	141	229
17	242	246	180	300	0			15	425	94	128	224
18	243	238	225	250	0			94	411	109	124	217
19	238	231	250	230	0			291	152	104	134	215
20	242	250	300	240	0			471	37	120	144	212
21	244	226	300	250	97			532	74	151	144	213
22	244	219	300	249	79			467	82	151	356	215
23	245	215	300	231	0			392	79	195	485	217
24	238	233	300	226	0			330	77	223	267	222
25	239	221	300	224	0			318	84	183	233	208
26	239	223	300	223	0			355	222	172	220	236
27	241	220	300	216	0			533	350	170	220	205
28	241	218	300	210	0			499	324	173	196	199
29	246	210	290	237	-----			494	291	170	188	211
30	243	220	280	240	-----			751	285	162	176	204
31	227	-----	280	206	-----		-----	745	-----	170	169	-----
TOTAL	8,703	7,065	6,555	6,612	463	0	0	6,287	7,135	4,876	5,338	6,363
MEAN	281	236	211	213	16.5	0	0	203	238	157	172	212
MAX	465	271	300	300	204	0	0	751	488	302	485	236
MIN	227	210	110	150	0	0	0	0	37	81	99	165
AC-FT	17,260	14,010	13,000	13,110	918	0	0	12,470	14,150	9,670	10,590	12,620

CAL YR 1972 TOTAL 65,061.90 MEAN 178 MAX 932 MIN 0 AC-FT 129,100

WTR YR 1973 TOTAL 59,397.00 MEAN 163 MAX 751 MIN 0 AC-FT 117,800

06435000 Belle Fourche Reservoir near Belle Fourche, S. Dak.

LOCATION.--Lat 44°44'12", long 103°40'27", in SW¼SE¼ sec.18, T.9 N., R.4 E., Butte County, at dam on Owl Creek, 9.8 mi (15.8 km) northeast of Belle Fourche.

PERIOD OF RECORD.--January 1912 to current year.

GAGE.--Water-stage recorder. Datum of gage is at mean sea level, adjustment of 1912. Prior to June 6, 1967, nonrecording gage at present site and datum.

EXTREMES.--Current year: Maximum contents, 167,120 acre-ft (206 cu hm) June 4-9, elevation, 2,972.7 ft (906.08 m); minimum, 75,080 acre-ft (92.6 cu hm) Sept. 2-8, elevation, 2,958.4 ft (901.72 m).

Period of record: Maximum contents observed, 197,400 acre-ft (243 cu hm) Apr. 30, 1919, May 20, 1920, elevation, 2,974.9 ft (906.75 m); minimum observed, -3,000 acre-ft (-3.70 cu hm) Sept. 30, 1936, water was lowered below dead storage level of 2,927.0 ft (892.15 m) by opening holes in crib walls.

REMARKS.--Offstream reservoir formed by earthfill dam. Storage began in May 1910; dam completed in April 1911. Conservation capacity, 185,170 acre-ft (228 cu hm), 1949 survey, between elevations 2,927.0 ft (892.15 m), lowest outlet, and 2,975.0 ft (906.78 m), crest of spillway weir. Dead storage below elevation 2,927.0 ft (892.15 m), 6,800 acre-ft (8.38 cu hm). Figures given herein represent contents above elevation 2,927.0 ft (892.15 m). Water diverted from Belle Fourche River through Inlet Canal (see station 06434500) is stored in Belle Fourche Reservoir for irrigation.

COOPERATION.--Elevations and contents furnished by Bureau of Reclamation.

MONTHEND ELEVATION AND CONTENTS AT 2400 HOURS, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	2,963.1	102,260	-
Oct. 31.....	2,965.8	118,423	+16,163
Nov. 30.....	2,968.1	133,680	+15,257
Dec. 31.....	2,969.8	145,552	+11,872
CAL YR 1972.....	-	-	+25,852
Jan. 31.....	2,971.9	161,050	+25,498
Feb. 28.....	2,972.1	162,560	+1,510
Mar. 31.....	2,972.3	164,080	+1,520
Apr. 30.....	2,972.3	164,080	0
May 31.....	2,972.4	164,840	+760
June 30.....	2,971.5	158,050	-6,790
July 31.....	2,964.1	107,901	-50,149
Aug. 31.....	2,958.5	75,600	-32,301
Sept. 30.....	2,958.6	76,120	+520
WTR YR 1973.....	-	-	-26,140

CHEYENNE RIVER BASIN

67

06436700 Indian Creek near Arpan, S. Dak.

LOCATION.--Lat 44°48'51", long 103°41'22", in SE¼NE¼ sec.24, T.10 N., R.3 E., Butte County, on left bank 3,200 ft (975 m) upstream from North Canal flume, 3.5 mi (5.6 km) northwest of Arpan and 6.9 mi (11.1 km) downstream from Bitter Creek.

DRAINAGE AREA.--315 sq mi (815 sq km), approximately.

PERIOD OF RECORD.--August 1961 to current year.

GAGE.--Water-stage recorder.

AVERAGE DISCHARGE.--12 years, 19.8 cfs (0.561 cu m/s), 4,350 acre-ft/yr (17.7 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 63 cfs (1.78 cu m/s) May 26; maximum gage height, 6.86 ft (2.091 m) Jan. 17, backwater from ice; no flow for many days.
Period of record: Maximum discharge, 2,690 cfs (76.2 cu m/s) May 8, 1967, gage height, 14.58 ft (4.444 m), from floodmarks; maximum gage height, 15.11 ft (4.606 m) May 26, 1962, from floodmarks; no flow for many days in most year.

REMARKS.--Records fair except those for winter periods, which are poor.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0	0	.50	0	2.0	20	2.0	1.2	20	0	0	
2	0	0	.10	0	2.2	20	2.0	.58	12	0	0	
3	0	0	.10	0	2.5	9.0	1.2	1.2	8.7	0	0	
4	0	0	.10	0	2.5	8.0	.28	2.9	6.5	0	0	
5	1.0	0	.06	0	2.0	8.0	.87	2.3	5.0	0	0	
6	0	0	.04	0	1.5	8.0	.14	1.2	5.0	0	0	
7	0	0	.02	0	.30	8.0	0	0	4.1	0	0	
8	0	0	0	0	.30	7.5	0	0	4.4	0	0	
9	0	0	0	0	.50	7.5	0	0	3.5	0	0	
10	0	0	0	0	.50	6.5	0	0	1.7	0	0	
11	0	0	0	0	.70	6.0	0	0	1.2	0	0	
12	0	0	0	0	1.0	5.5	0	0	1.2	0	0	
13	0	0	0	0	.70	5.3	0	0	.29	0	0	
14	0	0	0	0	.40	5.6	0	0	0	0	0	
15	0	0	0	0	.20	8.1	0	0	0	0	0	
16	0	0	0	.20	.10	7.8	0	0	0	0	0	
17	0	0	0	2.0	.40	7.8	0	0	0	0	0	
18	0	0	0	30	.70	12	0	0	0	0	0	
19	0	0	0	10	.80	18	.07	0	0	0	0	
20	0	0	0	2.0	1.0	19	2.6	0	0	0	0	
21	0	0	0	1.0	2.0	18	17	0	0	0	0	
22	0	0	0	1.5	3.0	18	41	0	0	0	.63	
23	0	0	0	2.0	5.0	17	26	0	0	0	17	
24	0	0	0	3.0	8.0	15	17	0	0	0	11	
25	0	0	0	2.5	9.0	12	12	0	0	3.2	5.0	
26	0	0	0	2.0	10	9.6	9.9	0	0	5.9	3.8	
27	0	0	0	1.0	25	7.4	8.4	.47	0	4.4	2.9	
28	0	.10	0	.50	25	5.6	7.1	3.2	0	1.7	2.3	
29	0	.20	0	1.0	-----	3.8	5.0	.49	0	.60	1.4	
30	0	.50	0	1.5	-----	2.9	2.6	.41	0	.30	.87	
31	0	-----	0	2.0	-----	2.0	-----	28	-----	0	0	-----
TOTAL	1.0	.80	.92	62.20	107.30	308.9	155.16	131.05	73.59	16.10	44.90	0
MEAN	.032	.027	.030	2.01	3.83	9.96	5.17	4.23	2.45	.52	1.45	0
MAX	1.0	.50	.50	30	25	20	41	49	20	5.9	17	0
MIN	0	0	0	0	.10	2.0	0	0	0	0	0	0
AC=FT	2.0	1.6	1.8	123	213	613	308	260	146	32	89	0

CAL YR 1972 TOTAL 15,008.06 MEAN 41.0 MAX 1,250 MIN 0 AC=FT 29,770
WTR YR 1973 TOTAL 901.92 MEAN 2.47 MAX 49 MIN 0 AC=FT 1,790

PEAK DISCHARGE (BASE, 350 CFS).--No peaks above base.

CHEYENNE RIVER BASIN

06436800 Horse Creek near Vale, S. Dak.

LOCATION.--Lat 44°39'30", long 103°20'17", in SE¼NW¼ sec.13, T.8 N., R.6 E., Butte County, on right bank 600 ft (183 m) downstream from Dry Creek, 2.9 mi (4.7 km) upstream from mouth and 4.0 mi (6.4 km) northeast of Vale.

DRAINAGE AREA.--530 sq mi (1,370 sq km), approximately.

PERIOD OF RECORD.--April 1962 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,688.96 ft (819.595 m) above mean sea level.

AVERAGE DISCHARGE.--11 years, 56.8 cfs (1.609 cu m/s), 41,150 acre-ft/yr (50.7 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 270 cfs (7.65 cu m/s) July 24, gage height, 5.38 ft (1.640 m); minimum daily, 2.5 cfs (0.071 cu m/s) Dec. 8-10.

Period of record: Maximum discharge, 2,380 cfs (67.4 cu m/s) May 26, 1965, gage height, 10.84 ft (3.304 m); minimum daily, 0.20 cfs (0.006 cu m/s) May 7-9, 1962, Jan. 17, 18, 1970.

REMARKS.--Records good except those for winter periods, which are poor. Natural flow of stream affected by diversions for irrigation above station and by return flow from Belle Fourche Irrigation Project. Water-quality records for the water year 1973 are published in Part 2 of this report.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 20-29, Oct. 31 to Nov. 24, Nov. 26, July 29 to Aug. 7; stage-discharge relation affected by ice Nov. 25, Nov. 27 to Mar. 8, Mar. 14, 15)

3.1	2.6	3.7	30
3.2	4.9	4.0	57
3.3	7.7	5.0	185
3.5	16	6.0	381

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	54	7.7	6.8	3.5	6.5	20	13	12	79	60	89	56
2	54	7.7	6.0	3.6	6.5	30	12	9.9	74	65	87	55
3	56	8.1	4.0	3.2	6.5	35	11	8.1	96	66	90	59
4	44	8.8	3.5	3.0	6.3	40	10	6.3	108	72	86	57
5	34	8.8	3.0	3.0	6.0	50	8.4	5.5	64	75	101	48
6	30	8.8	2.9	3.0	6.0	40	8.1	5.7	47	79	103	42
7	26	8.8	2.7	2.8	6.0	45	7.1	4.9	42	94	105	42
8	17	8.4	2.5	2.8	6.0	42	6.6	4.7	41	83	99	39
9	13	7.7	2.5	2.7	6.0	34	6.0	4.7	42	98	85	36
10	11	7.7	2.5	2.8	6.0	26	5.5	4.4	36	100	87	35
11	9.6	7.7	2.6	3.0	6.5	21	4.9	4.2	35	105	96	39
12	8.1	7.7	2.6	4.0	6.5	19	4.9	3.8	30	107	96	50
13	7.7	7.7	2.6	5.0	6.0	15	4.9	3.8	32	114	110	48
14	7.1	7.7	2.6	6.0	5.5	20	4.4	3.6	42	107	105	45
15	6.6	7.7	2.7	7.0	5.5	30	4.2	3.3	50	116	104	47
16	6.9	7.7	2.7	7.0	6.0	18	4.0	3.1	54	122	110	44
17	6.6	7.7	2.8	6.0	6.5	24	3.8	2.9	52	122	110	43
18	6.3	7.7	3.0	6.0	6.5	29	4.0	5.7	51	120	121	43
19	5.7	8.1	3.2	5.5	6.5	40	21	60	57	135	110	43
20	6.0	8.1	3.2	5.5	6.5	52	80	20	55	150	107	41
21	6.6	8.1	3.6	5.5	7.0	76	68	12	58	160	100	32
22	6.9	7.4	4.0	5.5	7.0	107	52	17	45	175	95	30
23	6.6	7.1	3.8	6.0	7.0	120	59	22	36	193	80	26
24	6.9	7.1	3.8	7.0	6.5	83	50	27	38	250	70	24
25	6.3	7.2	3.8	7.0	6.5	62	33	41	44	193	60	26
26	7.4	7.4	4.0	6.5	7.0	51	26	72	30	178	60	30
27	7.4	7.4	4.0	6.0	10	39	20	176	25	170	50	29
28	6.3	7.1	3.8	5.5	15	31	17	155	30	162	49	31
29	6.3	6.8	3.6	6.0	-----	24	15	103	37	121	95	40
30	7.0	6.8	3.5	6.5	-----	20	14	130	47	98	107	44
31	7.7	-----	3.5	6.5	-----	17	-----	113	-----	92	71	-----
TOTAL	485.0	232.7	105.8	153.4	189.8	1,260	577.8	1,044.6	1,477	3,782	2,838	1,224
MEAN	15.6	7.76	3.41	4.95	6.78	40.6	19.3	33.7	49.2	122	91.5	40.8
MAX	56	8.8	6.8	7.0	15	120	80	176	108	250	121	59
MIN	5.7	6.8	2.5	2.7	5.5	15	3.8	2.9	25	60	49	24
AC-FT	962	462	210	304	376	2,500	1,150	2,070	2,930	7,500	5,630	2,430

CAL YR 1972 TOTAL 26,798.6 MEAN 73.2 MAX 700 MIN 2.2 AC-FT 53,160
WTR YR 1973 TOTAL 13,370.1 MEAN 36.6 MAX 250 MIN 2.5 AC-FT 26,520

PEAK DISCHARGE (BASE, 400 CFS).--No peaks above base.

CHEYENNE RIVER BASIN

69

06437000 Belle Fourche River near Sturgis, S. Dak.

LOCATION.--Lat 44°30'47", long 103°08'11", in SE¼NW¼ sec.3, T.6 N., R.8 E., Meade County, near right bank on downstream side of bridge on State Highway 34, 0.5 mi (0.8 km) upstream from Bear Butte Creek and 20 mi (32 km) northeast of Sturgis.

DRAINAGE AREA.--5,870 sq mi (15,200 sq km), approximately.

PERIOD OF RECORD.--October 1945 to current year. Monthly discharge only for some periods, published in WSP 1309.

GAGE.--Water-stage recorder. Datum of gage is 2,526.13 ft (769.964 m) above mean sea level. Prior to Oct. 31, 1946, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--28 years, 269 cfs (7.618 cu m/s), 194,900 acre-ft/yr (240 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 4,140 cfs (117 cu m/s) Apr. 21, gage height, 8.80 ft (2.682 m); minimum daily, 17 cfs (0.48 cu m/s) Jan. 4, 5, 8, 9.

Period of record: Maximum discharge, 17,900 cfs (507 cu m/s) May 24, 1946, gage height, 13.86 ft (4.225 m), from rating curve extended above 11,000 cfs (312 cu m/s); maximum gage height, 14.32 ft (4.365 m) June 16, 1962; no flow for many days in 1945, 1950, and Aug. 9, 1961.

REMARKS.--Records good except those for winter periods, which are poor. Flow regulated by Keyhole Reservoir, usable capacity, 191,600 acre-ft (236 cu hm), 246 mi (396 km) upstream, since February 1952. At a point 75 mi (121 km) above station, water is diverted to Belle Fourche Reservoir (see station 06435000), through Inlet Canal (see station 06434500), with other small diversions from the main stem and tributaries for irrigation. Total diversion for irrigation of about 60,000 acres (243 sq km) above station. Water-quality records for the water year 1973 are published in Part 2 of this report.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 2-7, June 1-14; stage-discharge relation
affected by ice Oct. 30 to Nov. 2, Nov. 12 to Mar. 3)

3.2	58	6.0	1,390
3.5	125	8.0	3,110
4.0	285	9.0	4,380
4.8	635		

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	191	65	50	19	42	450	370	1,020	1,090	278	317	247
2	187	75	45	20	44	500	370	976	1,250	271	307	243
3	204	77	40	18	45	550	366	885	1,250	268	296	285
4	191	73	33	17	45	502	354	829	1,730	250	299	303
5	147	73	32	17	44	398	347	823	1,530	268	325	292
6	150	71	32	18	50	411	343	937	1,370	271	351	254
7	128	69	32	18	75	423	347	1,070	1,180	275	336	224
8	110	69	30	17	100	411	336	1,150	1,010	270	343	220
9	93	69	28	17	100	402	328	1,170	924	271	325	204
10	86	67	26	18	150	362	325	1,180	829	303	303	197
11	82	67	27	20	200	343	321	1,090	763	275	325	178
12	77	65	27	23	300	343	321	995	696	268	374	191
13	75	60	26	25	250	336	325	904	602	285	423	204
14	73	50	28	30	200	386	340	829	545	290	419	214
15	73	40	30	35	150	351	343	799	516	310	378	207
16	73	39	30	35	200	317	351	793	436	320	374	214
17	71	38	32	33	250	366	351	841	390	347	378	217
18	71	38	34	33	300	432	366	823	370	351	362	214
19	69	39	34	31	300	493	453	859	436	370	366	214
20	69	39	34	30	300	498	2,520	718	840	458	382	207
21	71	39	34	30	300	757	3,580	484	982	550	402	194
22	71	40	35	30	300	989	2,290	398	872	530	635	194
23	71	45	34	35	300	872	1,330	303	799	657	2,650	191
24	71	50	34	40	300	690	1,010	275	723	781	1,860	187
25	71	50	34	45	300	707	995	275	668	685	670	181
26	69	50	35	40	350	685	1,040	354	570	535	343	197
27	69	48	35	35	400	613	1,200	1,080	512	525	247	201
28	67	47	32	32	450	540	1,010	2,160	278	484	214	194
29	69	45	30	35	-----	466	1,000	2,520	254	423	289	194
30	65	48	25	40	-----	411	1,010	1,970	268	366	332	207
31	65	-----	18	42	-----	390	-----	1,310	-----	328	282	-----
TOTAL	2,979	1,645	996	878	5,845	15,394	23,642	29,820	23,683	11,863	14,907	6,469
MEAN	96.1	54.8	32.1	28.3	209	497	788	962	789	383	481	216
MAX	204	77	50	45	450	989	3,580	2,520	1,730	781	2,650	303
MIN	65	38	18	17	42	317	321	275	254	250	214	178
AC=FT	5,910	3,260	1,980	1,740	11,590	30,530	46,890	59,150	46,980	23,530	29,570	12,830

CAL YR 1972 TOTAL 194,996 MEAN 533 MAX 5,510 MIN 18 AC=FT 386,800
WTR YR 1973 TOTAL 138,121 MEAN 378 MAX 3,580 MIN 17 AC=FT 274,000

CHEYENNE RIVER BASIN

06438000 Belle Fourche River near Elm Springs, S. Dak.

LOCATION.--Lat 44°22'11", long 102°33'56", in NE¼NE¼ sec.29, T.5 N., R.13 E., Meade County, on right bank 10 ft (3 m) downstream from highway bridge, 4.3 mi (6.9 km) northwest of Elm Springs and 4.7 mi (7.6 km) downstream from Hay Creek.

DRAINAGE AREA.--7,210 sq mi (18,670 sq km), approximately.

PERIOD OF RECORD.--August 1928 to June 1932, March 1934 to current year. Monthly discharge only for some periods, published in WSP 1309.

GAGE.--Water-stage recorder. Datum of gage is 2,171.60 ft (661.904 m) above mean sea level. Prior to July 27, 1939, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--42 years (1928-31, 1934-73), 366 cfs (10.37 cu m/s), 265,200 acre-ft/yr (327 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 5,350 cfs (152 cu m/s) Apr. 21, gage height, 6.30 ft (1.920 m); minimum daily, 10 cfs (0.28 cu m/s) Dec. 8, Jan. 9-11.

Period of record: Maximum discharge, 45,100 cfs (1,280 cu m/s) June 8, 1964, gage height, 15.90 ft (4.846 m), from rating curve extended above 23,000 cfs (651 cu m/s); no flow for many days in 1936-37, 1939-40, 1961-62.

Flood in May 1927 reached a stage of 21.8 ft (6.64 m). Flood in spring of 1933 reached a stage of about 20 ft (6.1 m), from floodmarks.

REMARKS.--Records good except those for periods of no gage-height record and those for winter periods, which are poor. Flow regulated by Keyhole Reservoir, usable capacity, 191,600 acre-ft (236 cu hm), 304 mi (489 km) upstream, since February 1952. At a point 133 mi (214 km) above station, water is diverted to Belle Fourche Reservoir (see station 06435000), through Inlet Canal near Belle Fourche (see station 06434500), with other smaller diversions from the main stem and tributaries for irrigation. Total diversion for irrigation of about 60,000 acres (243 sq km) above station. Water-quality records for the water year 1973 are published in Part 2 of this report.

REVISIONS (WATER YEARS).--WSP 786: Drainage area. WSP 926: 1929, 1931(M), 1935, 1937.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Stage-discharge relation affected by ice Oct. 30 to Nov. 1, Nov. 12 to Mar. 3)

1.0	49	3.0	1,190
1.3	111	4.0	2,240
1.7	252	6.0	4,800
2.4	670		

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	240	40	75	25	70	500	446	1,270	1,210	300	340	341
2	216	87	50	26	70	500	428	1,260	1,200	300	330	314
3	204	109	35	25	70	550	416	1,150	1,420	290	320	293
4	204	101	30	20	65	602	410	1,040	1,450	270	320	314
5	228	81	25	15	60	446	393	973	1,430	270	330	320
6	189	74	20	15	90	369	381	1,010	1,380	270	360	314
7	167	70	15	12	100	347	369	1,150	1,200	280	370	280
8	154	68	10	11	150	358	369	1,300	1,010	290	360	252
9	134	66	11	10	200	347	364	1,320	878	290	350	244
10	114	66	12	10	200	336	352	1,330	814	310	360	224
11	104	66	12	10	250	320	352	1,290	734	300	360	208
12	92	60	12	11	300	314	341	1,150	694	290	400	197
13	89	50	12	11	250	325	352	1,060	635	300	430	204
14	85	40	13	12	200	398	358	955	544	310	450	204
15	81	35	14	12	150	381	381	878	524	320	400	224
16	81	35	15	13	200	352	381	846	518	330	400	216
17	79	35	20	13	250	336	398	830	450	360	380	216
18	77	35	30	14	300	410	398	854	400	370	380	212
19	74	35	29	15	300	702	507	838	330	400	370	212
20	72	35	29	15	350	854	1,580	838	404	450	360	212
21	72	35	29	15	350	838	4,720	702	837	500	360	216
22	72	36	30	20	350	1,090	3,450	524	878	540	381	208
23	72	38	28	40	350	1,190	2,200	440	798	518	2,060	189
24	70	40	28	55	350	946	1,530	336	742	700	1,260	201
25	70	45	28	60	350	862	1,250	298	686	750	1,410	189
26	70	45	29	60	400	846	1,260	325	600	600	686	182
27	70	45	30	55	450	798	1,350	677	550	550	440	182
28	68	43	29	50	500	694	1,350	2,090	350	500	330	193
29	68	70	28	65	-----	607	1,190	2,650	300	450	284	185
30	50	75	27	70	-----	530	1,270	2,460	300	400	352	182
31	29	-----	25	70	-----	482	-----	1,700	-----	350	393	-----
TOTAL	3,395	1,662	780	855	6,725	17,630	28,544	33,544	23,266	12,158	17,326	6,928
MEAN	110	55.4	25.2	27.6	240	569	952	1,082	776	392	559	231
MAX	240	109	75	70	500	1,190	4,720	2,650	1,450	750	3,260	341
MIN	29	35	10	10	60	314	341	298	300	270	284	182
AC=FT	6,730	3,300	1,550	1,700	13,340	34,970	56,620	66,530	46,150	24,120	34,370	13,740

CAL YR 1972 TOTAL 219,188.0 MEAN 599 MAX 6,970 MIN 8.0 AC=FT 434,800
WTR YR 1973 TOTAL 152,815.0 MEAN 419 MAX 4,720 MIN 10 AC=FT 303,100

NOTE.--No gage-height record June 26 to July 23, July 25 to Aug. 21.

CHEYENNE RIVER BASIN

71

06438500 Cheyenne River near Plainview, S. Dak.

LOCATION.--Lat 44°31'16", long 101°59'34", in NE¼SW¼ sec.31, T.7 N., R.18 E., Ziebach County, near left bank on downstream side of highway bridge, 1.0 mi (1.6 km) downstream from Ash Creek and 10 mi (16 km) southeast of Plainview.

DRAINAGE AREA.--21,600 sq mi (55,900 sq km), approximately.

PERIOD OF RECORD.--October 1950 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,877.65 ft (572.308 m) above mean sea level. Prior to Mar. 22, 1951, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--23 years, 635 cfs (17.98 cu m/s), 460,100 acre-ft/yr (567 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 5,730 cfs (162 cu m/s) Apr. 21, gage height, 7.51 ft (2.289 m); minimum daily, 75 cfs (2.12 cu m/s) Dec. 8.

Period of record: Maximum discharge, 41,700 cfs (1,180 cu m/s) May 26, 1957, from rating curve extended above 18,000 cfs (510 cu m/s); maximum gage height, 11.68 ft (3.560 m) May 26, 1965; no flow Dec. 14, 19-21, 1961.

Flood late in May 1920, reached a stage of about 17.5 ft (5.33 m), from information by local residents. Flood in May 1927 reached a stage of about 14 ft (4.3 m), from information by local residents.

REMARKS.--Records good except those for winter periods, which are poor. Flow regulated by Angostura Reservoir 164 mi (264 km) upstream (see station 06401000) since October 1949 and upstream reservoirs on Rapid Creek since 1956 and Belle Fourche River since 1952. Flow also affected by diversions for irrigation of about 70,000 acres (86.3 cu hm) and return flow from irrigated areas.

REVISIONS.--Revised figures of discharge, in cubic feet per second, for September 1971, superceeding figures published in WRD S.Dak., 1971, are given below:

DISCHARGE, IN CUBIC FEET PER SECOND, 1971

SEPT. 1.....	888	SEPT. 16.....	440
2.....	725	17.....	408
3.....	639	18.....	384
4.....	658	19.....	373
5.....	612	20.....	368
6.....	1,760	21.....	368
7.....	1,500	22.....	362
8.....	1,150	23.....	331
9.....	1,100	24.....	331
10.....	878	25.....	326
11.....	696	26.....	331
12.....	552	27.....	331
13.....	505	28.....	340
14.....	454	29.....	336
15.....	447	30.....	340
TOTAL.....			17,933
MEAN.....			598
MAX.....			1,760
MIN.....			326
AC-FT.....			35,570

WTR YR 1971 TOTAL 483,050 MEAN 1,323 MAX - MIN - AC-FT 958,100
 CAL YR 1971 TOTAL 504,927 MEAN 1,383 MAX - MIN - AC-FT 1,002,000

CHEYENNE RIVER BASIN

06438500 Cheyenne River near Plainview, S. Dak.--Continued

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	358	220	160	160	250	1,100	760	1,730	2,150	463	455	441
2	334	172	140	160	270	1,000	700	2,460	1,800	408	428	441
3	322	260	120	150	300	1,000	681	1,680	2,020	375	408	455
4	322	295	100	140	280	955	663	1,610	2,130	350	401	920
5	358	260	90	120	270	836	645	1,570	2,200	326	381	537
6	377	236	85	110	270	760	618	1,520	1,970	452	369	492
7	334	220	80	100	250	690	600	1,550	1,850	470	388	441
8	322	211	75	95	270	654	592	1,600	1,680	363	414	408
9	316	202	80	90	350	654	584	1,650	1,500	344	375	363
10	300	199	85	95	400	636	568	1,700	1,400	837	369	357
11	270	199	90	100	450	618	560	1,720	1,320	521	357	332
12	265	190	95	110	500	592	545	1,950	1,200	394	344	320
13	265	180	100	120	450	592	537	1,850	1,130	350	357	304
14	256	170	110	140	400	700	529	1,800	1,070	332	388	304
15	252	170	130	150	350	1,470	529	1,660	968	326	428	326
16	256	170	150	150	400	740	545	1,630	894	332	414	344
17	248	170	170	150	450	740	545	1,570	870	332	388	421
18	248	170	190	150	450	1,000	545	1,520	836	350	394	388
19	252	170	200	140	500	730	592	1,490	750	357	388	381
20	256	170	210	130	550	1,610	2,080	1,490	720	381	375	375
21	252	170	230	140	600	1,440	4,380	1,410	968	708	375	363
22	252	170	250	150	600	1,550	4,590	1,220	1,290	1,240	484	350
23	256	170	230	160	600	2,010	3,190	1,020	1,180	1,200	907	338
24	256	170	210	170	650	1,730	2,240	894	1,090	942	2,580	357
25	256	170	200	180	700	1,460	1,850	740	980	918	2,240	363
26	260	160	200	180	800	2,170	1,770	790	918	1,000	1,230	401
27	260	160	200	170	900	1,550	1,700	1,100	824	802	654	381
28	256	160	190	170	1,000	1,360	1,770	3,750	681	654	484	388
29	265	160	180	180	-----	1,170	1,680	3,410	576	618	388	388
30	252	160	170	200	-----	955	1,600	3,230	492	553	357	369
31	260	-----	160	220	-----	836	-----	2,740	-----	514	401	-----
TOTAL	8,736	5,684	4,680	4,480	13,260	33,308	38,188	54,054	37,457	17,212	17,921	12,048
MEAN	282	189	151	145	474	1,074	1,273	1,744	1,249	555	578	402
MAX	377	295	250	220	1,000	2,170	4,590	3,750	2,200	1,240	2,580	920
MIN	248	160	75	90	250	592	529	740	492	326	344	304
AC=FT	17,330	11,270	9,280	8,890	26,300	66,070	75,750	107,200	74,300	34,140	35,550	23,900
CAL YR 1972	TOTAL	314,679	MEAN	860	MAX	8,170	MIN	45	AC=FT	624,200		
NTR YR 1973	TOTAL	247,028	MEAN	677	MAX	4,590	MIN	75	AC=FT	490,000		

CHEYENNE RIVER BASIN

73

06439000 Cherry Creek near Plainview, S. Dak.

LOCATION.--Lat 44°44'38", long 102°03'11", in SW¼NE¼ sec.16, T.9 N., R.17 E., Meade County, on left bank 5 ft (2 m) downstream from bridge on State Highway 73, 0.2 mi (0.3 km) downstream from small right-bank tributary, 6.2 mi (10.0 km) downstream from Red Owl Creek, and 11 mi (18 km) northeast of Plainview.

DRAINAGE AREA.--1,190 sq mi (3,080 sq km), approximately.

PERIOD OF RECORD.--October 1945 to current year. Monthly discharge only for October and November 1945, published in WSP 1309.

GAGE.--Water-stage recorder. Datum of gage is 2,158.06 ft (657.777 m) above mean sea level. Prior to June 8, 1948, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--28 years, 47.3 cfs (1.340 cu m/s), 34,270 acre-ft/yr (42.3 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 212 cfs (6.00 cu m/s) May 30, gage height, 5.75 ft (1.753 m); no flow for long periods.
Period of record: Maximum discharge, 17,500 cfs (496 cu m/s) Apr. 1, 1952, gage height, 22.63 ft (6.898 m); no flow for long periods in each year.

REMARKS.--Records good except those for winter periods, which are poor.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1					0	58	58	22	94	.40		
2					0	50	42	17	78	.16		
3					0	48	32	14	68	0		
4					0	34	28	12	80	0		
5					0	36	22	11	59	0		
6					1.0	33	19	11	75	0		
7					2.0	27	16	9.8	66	0		
8					2.2	20	13	8.5	40	0		
9					2.2	18	12	8.2	28	0		
10					2.0	17	11	7.8	21	0		
11					2.5	16	9.5	7.0	17	0		
12					2.5	15	9.5	6.6	13	0		
13					2.0	13	9.2	6.1	11	0		
14					1.5	19	8.8	5.9	9.2	0		
15					1.5	17	7.8	5.7	8.5	0		
16					1.6	16	6.8	5.2	8.0	0		
17					2.0	14	6.4	5.0	7.8	0		
18					2.5	15	6.1	4.8	6.8	0		
19					3.0	13	6.1	4.2	6.4	0		
20					3.0	19	12	4.4	5.9	0		
21					4.0	32	105	4.0	5.2	0		
22					6.0	93	44	3.8	5.0	0		
23					10	168	75	3.6	4.6	0		
24					8.0	170	98	3.4	3.8	0		
25					8.0	148	73	3.2	3.2	0		
26					30	124	60	3.4	2.6	0		
27					60	108	51	15	1.6	0		
28					80	84	37	31	1.4	0		
29					-----	67	32	50	.96	0		
30					-----	56	28	142	.72	0		
31					-----	47	-----	168	-----	0		
TOTAL	0	0	0	0	237.5	1,595	938.2	603.6	731.68	.56	0	0
MEAN	0	0	0	0	8.48	51.5	31.3	19.5	24.4	.018	0	0
MAX	0	0	0	0	80	170	105	168	94	.40	0	0
MIN	0	0	0	0	0	13	6.1	3.2	.72	0	0	0
AC-FT	0	0	0	0	471	3,160	1,860	1,200	1,450	1.1	0	0

CAL YR 1972 TOTAL 20,776.61 MEAN 56.8 MAX 1,230 MIN 0 AC-FT 41,210
WTR YR 1973 TOTAL 4,106.54 MEAN 11.3 MAX 170 MIN 0 AC-FT 8,150

PEAK DISCHARGE (BASE, 1,000 CFS).--No peaks above base.

MISSOURI RIVER MAIN STEM

75

06439980 Lake Oahe near Pierre, S. Dak.

LOCATION.--Lat 44°27'30", long 100°23'29", in NE¼ sec.1, T.111 N., R.80 W., 5th principal meridian, Hughes County, in Pier A of Control Tower No. 1 of powerhouse intake structure of dam on Missouri River, 6.0 mi (9.7 km) northwest of Pierre, 7.1 mi (11.4 km) upstream from Bad River, and at mile 1,072.3 (1,725.3 km).

DRAINAGE AREA.--243,500 sq mi (630,700 sq km), approximately.

PERIOD OF RECORD.--August 1958 to current year. Prior to October 1967, published as Oahe Reservoir near Pierre.

GAGE.--Water-stage recorder. Datum of gage is at mean sea level. Prior to Jan. 14, 1959, nonrecording gages at various locations upstream from outlet works, Jan. 14, 1959, to Sept. 30, 1962, recorder in Tower No. 1 of outlet works, all at same datum.

EXTREMES.--Current year: Maximum contents, 19,625,000 acre-ft (24,200 cu hm) Apr. 29; maximum elevation, 1,608.8 ft (490.36 m) Apr. 30, affected by wind; minimum contents, 16,500,000 acre-ft (20,300 cu hm) Dec. 21, elevation, 1,598.2 ft (487.13 m).

Period of record: Maximum contents, 22,397,000 acre-ft (27,600 cu hm) May 31, 1970, elevation, 1,616.7 ft (492.77 m), affected by wind; minimum since initial filling, 16,500,000 acre-ft (20,300 cu hm) Dec. 21, 1972, elevation, 1,599.2 ft (487.31 m).

REMARKS.--Reservoir is formed by an earthfill dam; storage began in August 1958. Maximum capacity, 23,630,000 acre-ft (29,100 cu hm) below elevation 1,620.0 ft (493.78 m), top of spillway gates. Normal maximum, 22,530,000 acre-ft (27,800 cu hm) below 1,617.0 ft (492.86 m), of which about 2,390,000 acre-ft (2,950 cu hm) is designated for flood control. Inactive storage, 5,538,000 acre-ft (6,830 cu hm) below elevation 1,540.0 ft (469.39 m). Dead storage, 2,000 acre-ft (2.47 cu hm) below elevation 1,425.0 ft (434.34 m), invert of lowest outlet tunnel. Figures given herein represent elevations at powerhouse intake structure and total contents adjusted for wind effect.

The spillway consists of a gated chute with flat crest at elevation 1,596.5 ft (486.61 m), 8 gates, 50 by 23.5 ft (15.2 X 7.2 m) each; design capacity, 300,000 cfs (8,500 cu m/s). The outlet works consist of 7 turbines with a generating capacity of 85,000 kilowatts each. Water is used for flood control, navigation, power, and incidental uses.

COOPERATION.--Elevation and contents furnished by Corps of Engineers.

MONTHEND ELEVATION AND CONTENTS AT 2400 HOURS, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	1,606.4	18,848,000	-
Oct. 31.....	1,602.6	17,749,000	-1,099,000
Nov. 30.....	1,601.0	17,325,000	-424,000
Dec. 31.....	1,599.9	16,944,000	-381,000
CAL YR 1972.....	-	-	-505,000
Jan. 31.....	1,602.3	17,683,000	+739,000
Feb. 28.....	1,603.1	17,920,000	+237,000
Mar. 31.....	1,607.3	19,167,000	+1,247,000
Apr. 30.....	1,608.8	19,615,000	+448,000
May 31.....	1,608.5	19,544,000	-71,000
June 30.....	1,607.8	19,328,000	-216,000
July 31.....	1,606.1	18,801,000	-527,000
Aug. 31.....	1,603.4	17,908,000	-893,000
Sept. 30.....	1,602.4	17,742,000	-166,000
WTR YR 1973.....	-	-	-1,106,000

BAD RIVER BASIN

06441000 Bad River near Midland, S. Dak.

LOCATION.--Lat 44°04'01", long 101°09'36", in NE¼NW¼ sec.7, T.1 N., R.25 E., Haakon County, on right bank at downstream side of bridge on State Highway 63, 0.4 mi (0.6 km) southwest of Midland, 2.0 mi (3.2 km) upstream from Mitchell Creek, and 3.7 mi (6.0 km) upstream from Ash Creek.

DRAINAGE AREA.--1,460 sq mi (3,780 sq km), approximately.

PERIOD OF RECORD.--October 1945 to current year. Prior to February 1946 monthly discharge only, published in WSP 1309.

GAGE.--Water-stage recorder. Datum of gage is 1,849.14 ft (563.618 m) above mean sea level. Prior to Feb. 21, 1961, nonrecording gage, and Feb. 21, 1961, to June 14, 1967, water-stage recorder at site 4.2 mi (6.8 km) downstream at datum 15.72 ft (4.791 m) lower. June 15 to July 26, 1967, nonrecording gage at site 30 ft (9 m) upstream and July 27, 1967, to June 14, 1971, water-stage recorder at site 60 ft (18 m) upstream, both at present datum.

AVERAGE DISCHARGE.--28 years, 68.2 cfs (1.931 cu m/s), 49,410 acre-ft/yr (60.9 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 1,560 cfs (44.2 cu m/s) May 29, gage height, 9.84 ft (2.999 m); no flow for many days.

Period of record: Maximum discharge, 29,400 cfs (833 cu m/s) June 15, 1967, gage height, 24.44 ft (7.449 m), from floodmarks, 20.10 ft (6.126 m), from floodmarks, at former site and datum, from rating curve extended above 16,000 cfs (453 cu m/s); no flow for many days in each year.

REMARKS.--Records good except those for winter periods, which are poor.

REVISIONS.--WSP 2117: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1					0	0	10	16	227			
2					0	0	6.7	12	129			
3					0	0	3.8	117	79			
4					0	7.0	1.8	79	51			
5					0	5.9	1.5	48	37			
6					3.0	.90	1.5	31	28			
7					5.0	0	.90	20	24			
8					4.5	0	.72	14	18			
9					4.0	.40	1.1	11	14			
10					3.0	1.5	1.1	8.4	9.8			
11					1.0	2.5	1.8	6.7	6.3			
12					.50	3.8	.72	3.5	4.6			
13					.10	7.1	.72	2.0	2.8			
14					.10	13	.72	2.5	2.0			
15					0	8.4	2.2	2.8	1.5			
16					0	24	.90	5.0	.72			
17					0	82	.90	1.3	.40			
18					0	46	1.1	.72	.07			
19					0	101	4.2	.27	.16			
20					0	59	4.6	.16	0			
21					0	27	130	.27	0			
22					0	33	674	.16	0			
23					0	20	263	.07	0			
24					0	90	129	0	0			
25					0	194	74	0	0			
26					0	68	42	1.5	0			
27					0	260	29	11	0			
28					0	81	23	446	0			
29					-----	33	21	1,490	0			
30					-----	19	20	1,050	0			
31		-----			-----	12	-----	388	-----			
TOTAL	0	0	0	0	21.20	1,199.50	1,451.98	3,768.35	635.35	0	0	0
MEAN	0	0	0	0	.76	38.7	48.4	122	21.2	0	0	0
MAX	0	0	0	0	5.0	260	674	1,490	227	0	0	0
MIN	0	0	0	0	0	0	.72	0	0	0	0	0
AC=FT	0	0	0	0	42	2,380	2,880	7,470	1,260	0	0	0

CAL YR 1972 TOTAL 10,099.76 MEAN 27.6 MAX 979 MIN 0 AC=FT 20,030
WTR YR 1973 TOTAL 7,076.38 MEAN 19.4 MAX 1,490 MIN 0 AC=FT 14,040

PEAK DISCHARGE (BASE, 500 CFS)

DATE	TIME	G.H.	DISCHARGE
4-22	0400	7.88	911
5-29	2200	9.84	1,560

BAD RIVER BASIN

77

06441500 Bad River near Fort Pierre, S. Dak.

LOCATION.--Lat 44°19'36", long 100°23'02", in NW¼NW¼ sec.10, T.4 N., R.31 E., Stanley County, on right bank at downstream side of highway bridge, 2.1 mi (3.4 km) south of Fort Pierre, 4.3 mi (6.9 km) downstream from Willow Creek, and 6.0 mi (9.7 km) upstream from mouth.

DRAINAGE AREA.--3,107 sq mi (8,047 sq km).

PERIOD OF RECORD.--August 1928 to current year. Monthly discharge only for July 1932 to February 1934, published in WSP 1309.

GAGE.--Water-stage recorder. Datum of gage is 1,427.83 ft (435.203 m) above mean sea level. Prior to July 10, 1951, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--45 years, 155 cfs (4.390 cu m/s), 112,300 acre-ft/yr (138 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 1,850 cfs (52.4 cu m/s) May 31, gage height, 8.52 ft (2.597 m); no flow for many days.

Period of record: Maximum discharge, 43,800 cfs (1,240 cu m/s) June 18, 1967, gage height, 29.55 ft (9.007 m); no flow for long periods in each year.

Flood in April 1927 reached a stage of 30.89 ft (9.415 m), from floodmarks, discharge, about 55,000 cfs (1,560 cu m/s). Flood in July 1905 reached a stage about 2 ft (0.610 m) higher than that in April 1927.

REMARKS.--Records good except those for winter periods, which are poor. Water-quality records for the water year 1973 are published in Part 2 of this report.

REVISIONS (WATER YEARS).--WSP 786: Drainage area. WSP 856: 1929(M), 1937.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1				0	45	160	65	30	571		0	
2				0	45	120	50	24	277		0	
3				0	50	100	39	19	205		0	
4				0	45	80	31	16	131		0	
5				0	25	58	24	40	91		0	
6				0	15	69	20	88	65		0	
7				0	15	59	17	62	50		0	
8				0	20	43	13	45	40		0	
9				0	20	35	9.8	33	31		0	
10				0	25	30	7.5	24	25		0	
11				0	25	25	6.2	18	20		0	
12				0	20	21	4.6	13	15		0	
13				0	15	18	4.1	10	12		0	
14				0	10	170	3.6	8.3	9.2		0	
15				0	10	242	3.3	7.1	7.1		0	
16				1.0	10	133	3.0	4.9	5.3		46	
17				290	15	78	2.5	4.1	4.1		17	
18				400	25	58	1.9	3.3	4.1		4.9	
19				200	300	45	2.2	3.3	3.0		.60	
20				80	500	67	6.6	2.2	2.7		.06	
21				50	450	64	18	1.7	1.9		0	
22				25	350	73	9.2	1.2	1.2		1.5	
23				17	300	68	141	.76	1.1		7.1	
24				30	200	64	389	.60	.42		2.5	
25				50	150	252	205	.54	.18		.30	
26				45	130	216	130	.85	0		.30	
27				35	150	187	87	322	0		0	
28				35	180	132	59	735	0		0	
29				35	-----	220	40	167	0		0	
30				40	-----	133	31	811	0		0	
31		-----		40	-----	86	-----	1,580	-----		0	-----
TOTAL	0	0	0	1,373.0	3,145	3,106	1,423.5	4,075.85	1,573.30	0	80.26	0
MEAN	0	0	0	44.3	112	100	47.5	131	52.4	0	2.59	0
MAX	0	0	0	400	500	252	389	1,580	571	0	46	0
MIN	0	0	0	0	10	18	1.9	.54	0	0	0	0
AC=FT	0	0	0	2,720	6,240	6,160	2,820	8,080	3,120	0	159	0
CAL YR 1972	TOTAL 59,452.58			MEAN 162	MAX 7,290	MIN 0	AC=FT 117,900					
WTR YR 1973	TOTAL 14,776.91			MEAN 40.5	MAX 1,580	MIN 0	AC=FT 29,310					

PEAK DISCHARGE (BASE, 2,000 CFS).--No peaks above base.

MEDICINE KNOLL CREEK BASIN

06442000 Medicine Knoll Creek near Blunt, S. Dak.

LOCATION.--Lat 44°33'46", long 99°54'50", in NW¼ sec.31, T.113 N., R.75 W., Sully County, on left bank at downstream side of highway bridge, 4.8 mi (7.7 km) northeast of Blunt and 5.5 mi (8.8 km) upstream from South Fork Medicine Knoll Creek.

DRAINAGE AREA.--455 sq mi (1,180 sq km), approximately.

PERIOD OF RECORD.--March 1950 to current year. Prior to October 1959, published as Medicine Creek near Blunt.

GAGE.--Water-stage recorder. Datum of gage is 1,611.08 ft (491.057 m) above mean sea level. Prior to Oct. 31, 1950, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--23 years, 5.31 cfs (0.150 cu m/s), 3,850 acre-ft/yr (4.75 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 62 cfs (1.76 cu m/s) Mar. 6; maximum gage height, 9.08 ft (2.768 m) Mar. 6, backwater from ice; no flow for many days.

Period of record: Maximum discharge, 1,830 cfs (51.8 cu m/s) Apr. 5, 1952, gage height, 12.34 ft (3.761 m), from floodmarks; maximum gage height, 13.2 ft (4.02 m) between Mar. 26-29, 1950, from floodmarks, backwater from ice; no flow for long periods in each year.

REMARKS.--Records fair.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1					0	25	2.2	.02	1.2			
2					0	28	1.7	.02	3.0			
3					0	26	1.2	.02	13			
4					0	25	1.2	.02	21			
5					0	25	1.0	.01	20			
6					0	30	.58	0	16			
7					0	35	.52	0	12			
8					0	42	.45	0	7.4			
9					0	41	.28	0	4.9			
10					0	35	.39	0	3.2			
11					0	29	.28	0	1.9			
12					0	24	.25	0	1.1			
13					0	17	.28	0	.58			
14					0	21	.22	0	.18			
15					0	23	.08	0	.02			
16					0	19	.15	0	0			
17					0	18	.10	0	0			
18					0	17	.15	0	0			
19					0	15	.06	0	0			
20					0	13	.72	0	0			
21					.10	9.8	.65	0	0			
22					.20	7.2	.39	0	0			
23					.60	6.3	.22	0	0			
24					1.0	5.1	.22	0	0			
25					3.0	5.1	.25	0	0			
26					5.0	5.1	.22	0	0			
27					8.0	4.5	.22	0	0			
28					15	3.4	.15	0	0			
29					-----	3.1	.10	0	0			
30					-----	2.8	.04	0	0			
31		-----			-----	2.4	-----	.08	-----			-----
TOTAL	0	0	0	0	32.90	562.8	14.27	.17	105.48	0	0	0
MEAN	0	0	0	0	1.18	18.2	.48	.006	3.52	0	0	0
MAX	0	0	0	0	15	42	2.2	.08	21	0	0	0
MIN	0	0	0	0	0	2.4	.04	0	0	0	0	0
AC=FT	0	0	0	0	65	1,120	28	.3	209	0	0	0

CAL YR 1972 TOTAL 1,601.84 MEAN 4.38 MAX 200 MIN 0 AC=FT 3,180
 WTR YR 1973 TOTAL 715.62 MEAN 1.96 MAX 42 MIN 0 AC=FT 1,420

PEAK DISCHARGE (BASE, 50 CFS).--Mar. 6 (time and stage unknown) 62 cfs.

MEDICINE CREEK BASIN

79

06442500 Medicine Creek at Kennebec, S. Dak.

LOCATION.--Lat 43°54'17", long 99°52'35", in NW¼NE¼ sec.18, T.105 N., R.75 W., Lyman County, on right bank 4 ft (1 m) downstream from highway bridge, 0.5 mi (0.8 km) west of Kennebec and 0.5 mi (0.8 km) downstream from small right-bank tributary.

DRAINAGE AREA.--465 sq mi (1,204 sq km), approximately.

PERIOD OF RECORD.--July 1954 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,659.64 ft (505.858 m) above mean sea level. Prior to Dec. 28, 1954, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--19 years, 15.5 cfs (0.439 cu m/s), 11,230 acre-ft/yr (13.8 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 277 cfs (7.84 cu m/s) Feb. 24, gage height, 4.29 ft (1.308 m); maximum gage height, 4.42 ft (1.347 m), backwater from ice; no flow for many days.
Period of record: Maximum discharge, 8,970 cfs (254 cu m/s) Mar. 28, 1960, gage height, 16.71 ft (5.093 m); no flow for many days each year.
Flood in April 1952 reached a stage of 17.0 ft (5.18 m), from floodmarks.

REMARKS.--Records fair.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1				0	0	43	4.7	0	23			
2				0	.50	38	3.6	0	15			
3				0	2.0	41	2.8	0	11			
4				0	5.0	42	2.3	0	8.3			
5				0	10	32	2.0	0	7.8			
6				0	15	32	1.8	0	5.3			
7				0	12	28	1.6	0	3.0			
8				0	9.0	20	1.4	0	1.8			
9				0	7.0	24	1.2	0	.64			
10				0	6.0	16	1.0	0	.14			
11				0	4.5	11	.80	0	.02			
12				0	3.0	9.6	.60	0	0			
13				0	2.0	7.2	.40	0	0			
14				0	1.0	43	.30	0	0			
15				.50	.80	96	.20	0	0			
16				1.0	.80	118	.15	0	0			
17				1.5	1.0	69	.10	0	0			
18				3.0	3.0	37	.04	0	0			
19				5.0	10	24	.02	0	0			
20				9.0	30	17	.01	0	0			
21				8.0	50	13	0	0	0			
22				3.5	90	11	0	0	0			
23				.50	213	8.9	0	0	0			
24				.30	219	8.9	0	0	0			
25				.20	180	11	0	0	0			
26				.40	143	10	0	0	0			
27				.30	99	26	0	.77	0			
28				.20	58	20	0	24	0			
29				0	-----	14	0	49	0			
30				0	-----	9.4	0	62	0			
31		-----		0	-----	6.2	-----	32	-----			-----
TOTAL	0	0	0	33.40	1,174.60	886.2	25.02	167.77	76.00	0	0	0
MEAN	0	0	0	1.08	42.0	28.6	.83	5.41	2.53	0	0	0
MAX	0	0	0	9.0	219	118	4.7	62	23	0	0	0
MIN	0	0	0	0	0	6.2	0	0	0	0	0	0
AC=FT	0	0	0	66	2,330	1,760	50	333	151	0	0	0

CAL YR 1972 TOTAL 2,882.69 MEAN 7.88 MAX 416 MIN 0 AC=FT 5,720
WTR YR 1973 TOTAL 2,362.99 MEAN 6.47 MAX 219 MIN 0 AC=FT 4,690

PEAK DISCHARGE (BASE, 100 CFS)

DATE	TIME	G.H.	DISCHARGE
2-24	0200	4.29	277
3-16	1000	2.97	140

MISSOURI RIVER MAIN STEM

06442700 Lake Sharpe near Fort Thompson, S. Dak.

LOCATION.--Lat 44°02'18", long 99°26'45", in SE¼ sec.27, T.107 N., R.72 W., Lyman County, at left approach wall of powerhouse at Big Bend Dam on Missouri River, 2.5 mi (4.0 km) south of Fort Thompson, and at mile 987.4 (1,588.7 km).

DRAINAGE AREA.--249,300 sq mi (645,700 sq km), approximately.

PERIOD OF RECORD.--July 1963 to current year.

GAGE.--Water-stage recorder. Datum of gage is at mean sea level.

EXTREMES.--Current year: Maximum contents, 1,810,000 acre-ft (2,230 cu hm) Oct. 21, elevation, 1,421.2 ft (433.18 m); minimum, 1,683,000 acre-ft (2,080 cu hm) June 8, elevation, 1,419.1 ft (432.54 m).

Period of record: Maximum contents, 1,829,000 acre-ft (2,260 cu hm) Apr. 22, 1971, elevation, 1,421.9 ft (433.40 m), affected by wind; minimum since initial filling, 1,448,000 acre-ft (1,790 cu hm) Sept. 17, 1967, elevation, 1,414.7 ft (431.20 m), affected by wind.

REMARKS.--Reservoir is formed by earth-fill dam; closure made July 1963; intentional storage began November 1963. Maximum capacity, 1,900,000 acre-ft (2,340 cu hm) below elevation, 1,423.0 ft (433.73 m), top of spillway gates. Normal maximum, 1,725,000 acre-ft (2,130 cu hm) below elevation 1,420.0 ft (432.82 m) Inactive storage, 1,465,000 acre-ft (1,810 cu hm) below elevation 1,415.0 ft (431.29 m). Figures given herein represent elevations at powerhouse and total contents adjusted for wind effect.

The spillway consists of a concrete chute with flat crest at elevation 1,385.0 ft (422.15 m) surmounted by 8 Taintor gates, each 40 by 38 ft (12.2 X 11.6 m); design capacity, 390,000 cfs (11,000 cu m/s). Normal releases are through 8 power units (completed in July 1966), with a generating capacity of 58,500 kilowatts each. Maximum release through powerplant about 100,000 cfs (2,830 cu m/s). Water is used for flood control, navigation, power, and incidental uses.

COOPERATION.--Elevation and contents furnished by Corps of Engineers.

MONTHEND ELEVATION AND CONTENTS AT 2400 HOURS, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	1,420.1	1,747,000	-
Oct. 31.....	1,420.9	1,791,000	+44,000
Nov. 30.....	1,420.4	1,758,000	-33,000
Dec. 31.....	1,420.4	1,758,000	0
CAL YR 1972.....	-	-	+8,000
Jan. 31.....	1,420.5	1,762,000	+4,000
Feb. 28.....	1,420.1	1,738,000	-24,000
Mar. 31.....	1,420.5	1,764,000	+26,000
Apr. 30.....	1,420.3	1,755,000	-9,000
May 31.....	1,420.5	1,768,000	+13,000
June 30.....	1,420.4	1,762,000	-6,000
July 31.....	1,420.6	1,767,000	+5,000
Aug. 31.....	1,420.4	1,759,000	-8,000
Sept. 30.....	1,420.2	1,754,000	-5,000
WTR YR 1973.....	-	-	+7,000

CROW CREEK BASIN

81

06442950 Crow Creek near Gann Valley, S. Dak.

LOCATION.--Lat 43°59'29", long 99°13'07", in NE¼NW¼ sec.15, T.106 N., R.70 W., Buffalo County, near center of span at downstream side of highway bridge, 6.4 mi (10.3 km) upstream from Smith Creek, 6.9 mi (11.1 km) downstream from Elm Creek, and 12.0 mi (19.3 km) southwest of Gann Valley.

DRAINAGE AREA.--670 sq mi (1,740 sq km), approximately.

PERIOD OF RECORD.--October 1971 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,434.73 ft (437.306 m), above mean sea level.

EXTREMES.--Current year: Maximum discharge, 1,840 cfs (52.1 cu m/s) Mar. 3, gage height, 12.60 ft (3.840 m); no flow for many days.

Period of record: Maximum discharge, 2,080 cfs (58.9 cu m/s) Mar. 13, 1972, gage height, 13.17 ft (4.014 m); no flow for many days each year.

REMARKS.--Records good except those for winter periods, which are poor.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Stage-discharge relation affected by ice Jan. 16 to Mar. 3;
shifting-control method used Mar. 4-16)

2.25	0	2.7	5.4	5.0	197
2.3	.19	2.9	11	6.0	344
2.4	.82	3.2	23	8.0	710
2.5	1.9	3.5	39	11.0	1,400
2.6	3.4	4.0	75		

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1				0	4.0	500	23	6.1	11			0
2				0	4.0	800	19	5.8	8.7			0
3				0	4.5	1,300	17	4.9	13			0
4				0	4.0	1,170	16	4.5	9.7			0
5				0	3.5	906	14	4.3	5.9			0
6				0	3.0	608	13	4.3	2.9			0
7				0	3.0	382	11	4.5	2.2			0
8				0	3.0	319	9.9	10	1.5			0
9				0	3.5	279	8.7	5.1	2.3			0
10				0	3.5	212	7.9	3.1	2.0			0
11				0	3.0	161	7.6	4.1	1.6			0
12				0	3.0	120	6.6	3.6	1.4			0
13				0	2.5	89	5.6	3.2	.90			0
14				0	2.0	167	5.4	2.8	.74			0
15				0	1.5	151	5.6	2.5	.67			0
16				5.0	1.5	137	5.8	2.0	.53			0
17				30	2.0	102	4.9	1.8	.29			0
18				50	2.0	78	5.4	1.5	.19			0
19				60	4.0	60	7.9	1.2	0			0
20				50	6.0	49	9.6	.99	0			0
21				35	10	41	9.0	.90	0			0
22				25	50	39	5.9	.60	0			0
23				15	300	33	11	.53	0			0
24				10	500	29	9.3	.53	0			0
25				9.0	470	34	8.5	.41	0			0
26				8.0	400	33	7.1	.53	0			0
27				5.0	350	33	6.8	1.2	0			0
28				4.0	400	30	6.3	4.2	0			0
29				3.5	-----	28	6.1	5.8	0			2.3
30				3.5	-----	26	5.6	5.6	0			.04
31				4.0	-----	24	-----	4.4	-----			-----
TOTAL	0	0	0	317.0	2,543.5	7,940	279.5	180.19	65.52	0	0	2.34
MEAN	0	0	0	10.2	90.8	256	9.32	5.81	2.18	0	0	.078
MAX	0	0	0	60	500	1,300	23	45	13	0	0	2.3
MIN	0	0	0	0	1.5	24	4.9	.41	0	0	0	0
AC=FT	0	0	0	629	5,050	15,750	554	357	130	0	0	4.6
CAL YR 1972	TOTAL	22,356.08	MEAN	61.1	MAX	1,830	MIN	0	AC=FT	44,340		
WTR YR 1973	TOTAL	11,328.05	MEAN	31.0	MAX	1,300	MIN	0	AC=FT	22,470		

PEAK DISCHARGE (BASE, 150 CFS)

DATE	TIME	G.H.	DISCHARGE	DATE	TIME	G.H.	DISCHARGE
2-24	-	-	650	3-14	1200	5.54	258
3-3	0700	12.60	1,840	5-6	1600	4.76	164

WHITE RIVER BASIN

06445980 White Clay Creek near Oglala, S. Dak.

LOCATION.--Lat 43°08'46", long 102°40'58", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.30, T.37 N., R.45 W., Shannon County, on left bank at downstream side of bridge on U.S. Highway 18, 4.3 mi (6.9 km) southeast of Oglala, 5.5 mi (8.8 km) upstream from Oglala Dam, and 11 mi (18 km) northwest of Pine Ridge.

DRAINAGE AREA.--340 sq mi (880 sq km), approximately.

PERIOD OF RECORD.--August 1965 to current year.

GAGE.--Water-stage recorder.

AVERAGE DISCHARGE.--8 years, 12.7 cfs (0.360 cu m/s), 9,200 acre-ft/yr (11.3 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 75 cfs (2.12 cu m/s) Mar. 16, maximum gage height, 8.36 ft (2.548 m) Feb. 23, backwater from ice; no flow Aug. 30, 31, Sept. 8-10.

Period of record: Maximum discharge, 659 cfs (18.7 cu m/s) June 16, 1967, gage height, 14.74 ft (4.493 m); maximum gage height, 15.02 ft (4.578 m) Mar. 11, 1966, backwater from ice; no flow Sept. 4, 1965, Aug. 20-28, Sept. 4-7, 9-12, 1970, Aug. 30, 31, Sept. 8-10, 1973.

REMARKS.--Records good except those for winter periods, which are poor. Some storage and possible regulation above station.

DISCHARGE, IN CURIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.89	3.2	4.0	3.5	5.0	30	15	18	13	3.1	3.0	.21
2	.80	3.1	3.8	3.5	4.8	25	15	20	13	2.9	1.9	.64
3	.98	2.7	3.5	3.0	4.8	23	15	19	12	4.5	2.6	1.1
4	.64	2.5	2.5	2.5	4.8	20	14	18	12	7.3	.89	1.2
5	.55	2.5	1.5	2.0	4.8	15	14	17	11	6.0	1.4	.50
6	.80	2.4	1.0	1.5	4.5	20	14	16	10	4.2	1.4	.16
7	.80	2.2	1.0	1.5	4.0	25	14	16	9.4	2.9	1.2	.15
8	.44	2.0	.50	1.3	3.0	30	14	16	8.8	2.1	1.4	0
9	.64	2.2	.50	1.0	3.0	35	14	16	8.2	1.4	1.8	0
10	.89	2.2	.80	1.0	3.2	32	14	15	7.8	1.1	2.4	0
11	1.3	1.8	1.0	1.3	3.5	32	14	14	7.5	.64	2.6	.11
12	1.6	1.7	1.2	1.5	4.0	26	14	13	7.5	.44	2.5	.50
13	2.1	1.7	1.2	2.0	4.0	26	14	13	7.2	.33	2.2	.55
14	2.9	1.5	1.3	3.0	3.0	30	13	12	7.3	1.4	1.8	.55
15	2.6	1.5	1.3	4.5	2.5	35	13	12	7.8	2.0	1.2	.98
16	3.1	1.5	1.5	10	3.0	45	14	12	8.5	1.9	.72	.55
17	3.1	1.5	2.0	8.0	5.0	37	14	11	8.6	1.6	1.1	.72
18	3.5	1.5	2.2	6.0	10	19	14	11	7.6	1.1	1.5	.28
19	3.9	1.2	2.5	4.5	8.0	17	15	11	7.3	.89	1.3	.08
20	3.8	1.2	2.7	4.0	9.0	17	27	11	7.0	2.5	1.1	.11
21	3.8	1.2	3.5	4.0	9.0	16	31	10	6.8	3.2	1.1	.55
22	4.0	.80	4.0	4.5	10	16	22	9.8	7.2	2.2	.49	1.1
23	4.0	.80	3.5	9.5	10	18	20	9.5	7.3	1.8	3.2	1.3
24	4.5	.90	3.5	13	8.0	18	18	9.4	6.9	1.8	2.9	3.0
25	3.9	1.2	3.5	15	5.0	18	16	9.9	6.9	1.9	1.3	2.0
26	3.6	2.0	3.2	10	10	18	15	11	6.5	1.8	1.1	1.9
27	3.5	4.0	4.0	7.0	15	18	15	14	5.7	1.8	.72	1.3
28	3.5	3.5	4.5	4.5	35	18	15	16	4.9	1.5	.03	1.8
29	3.4	3.7	4.0	5.0	-----	16	15	16	4.0	1.6	.04	2.4
30	3.0	3.8	3.5	5.0	-----	15	15	15	3.6	1.5	0	3.6
31	3.2	-----	3.5	5.0	-----	15	-----	15	-----	2.9	0	-----
TOTAL	75.93	62.00	76.70	148.1	195.9	725	477	426.6	241.3	70.30	44.89	27.34
MEAN	2.45	2.07	2.47	4.78	7.00	23.4	15.9	13.8	8.04	2.27	1.45	.91
MAX	4.5	4.0	4.5	15	35	45	31	20	13	7.3	3.2	3.6
MIN	.44	.80	.50	1.0	2.5	15	13	9.4	3.6	.33	0	0
AC=FT	151	123	152	294	389	1,440	946	846	479	139	89	54

CAL YR 1972 TOTAL 1,971.26 MEAN 5.39 MAX 29 MIN .44 AC=FT 3,910

WTR YR 1973 TOTAL 2,571.06 MEAN 7.04 MAX 45 MIN 0 AC=FT 5,100

PEAK DISCHARGE (BASE, 150 CFS).--No peaks above base.

WHITE RIVER BASIN

83

06446000 White River near Oglala, S. Dak.

LOCATION.--Lat 43°15'17", long 102°49'29", in SW¼NE¼ sec.24, T.38 N., R.47 W., Shannon County, on right bank at downstream side of bridge, 3.0 mi (4.8 km) downstream from Blacktail Creek and 7.0 mi (11.3 km) northwest of Oglala.

DRAINAGE AREA.--2,200 sq mi (5,700 sq km), approximately.

PERIOD OF RECORD.--May 1943 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,853.54 ft (869.759 m) above mean sea level. Prior to May 6, 1947, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--30 years, 57.5 cfs (1.628 cu m/s), 41,660 acre-ft/yr (51.4 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 367 cfs (10.4 cu m/s) Apr. 23, gage height, 9.78 ft (2.981 m); no flow Oct. 20 to Nov. 2, Aug. 12-19, 23, 24.

Period of record: Maximum discharge, 5,200 cfs (147 cu m/s) June 21, 1947, gage height, 23.50 ft (7.163 m), from rating curve extended above 2,800 cfs (79.3 cu m/s) on basis of velocity-area studies; maximum gage height, 23.61 ft (7.196 m) June 16, 1967; no flow at times in 1952, 1954, 1957, 1961, 1964, 1965, 1970-73.

REMARKS.--Records good except those for winter periods, which are poor. Some diversions for irrigation above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.6	0	7.0	5.0	12	140	54	72	60	8.3	7.3	9.7
2	6.0	0	6.0	5.5	11	131	48	107	50	7.4	6.2	17
3	3.8	3.5	5.0	5.0	12	127	45	150	44	6.9	5.8	11
4	3.0	1.4	4.0	4.0	12	132	42	333	40	7.9	4.6	9.8
5	1.0	4.6	3.5	4.0	12	122	40	160	37	8.9	3.0	9.8
6	4.8	6.5	3.0	4.0	10	109	40	113	34	9.9	3.8	25
7	9.0	7.7	3.0	4.0	8.0	97	40	96	32	8.7	3.2	29
8	8.5	7.8	3.0	4.0	8.0	92	39	80	31	7.5	3.8	18
9	7.9	10	3.0	3.5	9.0	88	38	210	29	7.0	3.2	14
10	6.5	8.3	3.0	4.0	10	79	36	252	26	6.2	1.8	9.6
11	7.9	7.0	3.5	4.5	11	74	36	120	24	5.8	4.0	6.0
12	8.1	5.6	3.5	5.0	11	66	37	94	23	6.9	0	4.8
13	7.6	4.8	3.5	6.0	10	70	36	84	22	7.8	0	5.4
14	7.8	5.0	3.5	7.0	8.0	91	35	77	20	19	0	7.2
15	7.0	5.5	3.5	7.5	8.0	91	35	73	21	20	0	19
16	7.0	5.0	4.0	8.0	9.0	119	34	71	22	19	0	40
17	7.3	5.0	4.5	7.5	12	113	35	67	19	18	0	27
18	6.2	5.0	4.5	7.0	15	103	35	64	17	11	0	22
19	2.8	5.0	5.0	7.0	15	93	50	55	18	9.2	0	25
20	0	5.0	5.0	8.0	17	93	111	50	19	8.9	3.5	30
21	0	5.0	5.5	10	17	120	177	47	17	11	1.8	25
22	0	5.0	7.0	12	20	156	234	45	16	12	1.4	22
23	0	5.5	6.5	16	25	103	353	43	16	52	0	17
24	0	6.0	6.5	16	30	78	227	40	14	114	0	15
25	0	7.0	6.5	16	40	187	88	39	12	45	2.0	21
26	0	7.0	7.0	14	60	231	66	39	11	27	5.0	16
27	0	7.0	7.5	12	100	117	58	42	11	22	5.8	10
28	0	6.5	6.0	10	120	114	55	48	11	18	6.3	12
29	0	6.0	5.5	11	-----	175	53	56	9.7	16	6.6	16
30	0	6.5	5.0	12	-----	114	59	59	8.9	14	7.7	15
31	0	-----	5.0	12	-----	72	-----	60	-----	9.6	8.4	-----
TOTAL	117.8	161.05	149.0	251.5	632.0	3,497	2,236	2,846	714.6	544.9	88.45	508.3
MEAN	3.80	5.37	4.81	8.11	22.6	113	74.5	91.8	23.8	17.6	2.85	16.9
MAX	9.0	10	7.5	16	120	231	353	333	60	114	8.4	40
MIN	0	0	3.0	3.5	8.0	66	34	39	8.9	5.8	0	4.8
AC-FT	234	319	296	499	1,250	6,940	4,440	5,650	1,420	1,080	175	1,010

CAL YR 1972 TOTAL 8,415.44 MEAN 23.0 MAX 232 MIN 0 AC-FT 16,690
WTR YR 1973 TOTAL 11,746.60 MEAN 32.2 MAX 353 MIN 0 AC-FT 23,300

PEAK DISCHARGE (BASE, 800 CFS).--No peaks above base.

WHITE RIVER BASIN

06447000 White River near Kadoka, S. Dak.

LOCATION.--Lat 43°45'09", long 101°31'28", in SE4SE4 sec.30, T.3 S., R.22 E., Black Hills meridian, Jackson County, near center of span on downstream side of bridge on State Highway 73, 5.0 mi (8.0 km) upstream from Pass Creek, 5.5 mi (8.8 km) downstream from Cottonwood Creek, and 5.8 mi (9.3 km) south of Kadoka.

DRAINAGE AREA.--5,000 sq mi (12,500 sq km), approximately.

PERIOD OF RECORD.--July 1942 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,122.18 ft (646.840 m) above mean sea level. Prior to June 14, 1949, nonrecording gage, and June 14, 1949, to Mar. 8, 1955, water-stage recorder at site 0.3 mi (0.5 km) downstream at same datum. Mar. 9, 1955, to May 17, 1957, nonrecording gage at present site and datum.

AVERAGE DISCHARGE.--31 years, 289 cfs (8.184 cu m/s), 209,400 acre-ft/yr (258 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 10,600 cfs (300 cu m/s) May 27, gage height, 11.84 ft (3.609 m); no flow Oct. 1-16, Jan. 7-11, Aug. 10-23.

Period of record: Maximum discharge, 21,700 cfs (615 cu m/s) June 7, 1951, gage height, 13.83 ft (4.215 m), site then in use, from rating curve extended above 16,000 cfs (453 cu m/s); no flow at times in many years.

Flood of June 4, 1942, reached a stage of 16.24 ft (4.950 m) from floodmarks, discharge, about 32,000 cfs (906 cu m/s), from rating curve extended above 16,000 cfs (453 cu m/s). Floods of Mar. 8, 1905, and in spring of 1927 were 1 or 2 ft (0.3 or 0.4 m) higher than flood of June 4, 1942, from information by local residents.

REMARKS.--Records good except those for winter periods, which are poor. Some diversions above station for irrigation.

REVISIONS (WATER YEARS).--WSP 1279: 1944(M), 1948.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973												
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0	16	20	7.0	16	940	260	981	313	10	18	20
2	0	7.9	20	8.0	16	664	262	1,450	243	12	14	10
3	0	33	15	7.0	16	481	185	776	215	20	8.9	368
4	0	48	10	6.0	16	360	152	511	197	31	8.4	857
5	0	45	7.0	3.5	15	274	128	304	268	525	8.0	254
6	0	40	4.5	2.0	13	222	100	250	191	258	7.0	100
7	0	34	3.5	0	12	229	83	451	143	128	5.0	81
8	0	29	3.0	0	12	203	80	385	118	83	3.2	62
9	0	22	3.0	0	13	194	76	313	98	286	1.80	50
10	0	19	3.5	0	14	179	74	229	78	1,410	0	29
11	0	19	3.5	0	15	175	72	190	60	426	0	21
12	0	16	3.5	1.0	15	173	78	164	53	167	0	17
13	0	12	3.5	4.0	14	312	76	200	51	95	0	46
14	0	9.0	3.5	10	13	2,350	74	219	46	60	0	75
15	0	9.0	4.0	12	11	2,040	75	179	80	45	0	274
16	0	10	5.0	12	11	1,100	76	161	39	36	0	286
17	3.7	11	5.0	11	12	783	86	140	36	30	0	341
18	4.0	13	6.0	10	13	1,110	100	131	34	26	0	182
19	2.0	13	6.0	10	16	1,400	226	115	44	25	0	110
20	3.7	14	7.0	12	50	1,180	2,850	100	36	98	0	88
21	3.2	17	8.0	15	200	776	3,300	98	33	507	0	66
22	3.6	19	9.0	20	700	742	1,870	88	25	692	0	51
23	4.0	20	8.5	20	850	742	769	81	23	243	0	41
24	4.6	20	8.0	20	750	769	429	70	16	167	66	629
25	4.1	19	8.5	20	750	800	379	72	12	158	54	617
26	3.2	18	9.0	17	800	1,480	541	93	10	203	20	167
27	3.2	18	10	15	900	804	434	5,710	10	200	17	103
28	3.7	17	9.0	15	986	511	350	6,430	12	146	17	98
29	6.0	17	7.0	14	-----	407	250	1,830	12	100	8.9	108
30	7.9	18	6.5	15	-----	299	229	804	11	46	100	72
31	16	-----	6.5	15	-----	250	-----	463	-----	26	31	-----
TOTAL	69.30	602.9	226.5	301.5	6,249	21,949	13,664	22,988	2,507	6,259	387.20	5,243
MEAN	2.24	20.1	7.31	9.73	223	708	455	742	83.6	202	12.5	175
MAX	16	48	20	20	986	2,350	3,300	6,430	313	1,410	100	857
MIN	0	7.9	3.0	0	11	173	72	70	10	10	0	10
AC-FT	137	1,200	449	598	12,390	43,540	27,100	45,600	4,970	12,410	768	10,400

CAL YR 1972 TOTAL 70,425.20 MEAN 192 MAX 3,000 MIN 0 AC-FT 139,700

WTR YR 1973 TOTAL 80,446.40 MEAN 220 MAX 6,430 MIN 0 AC-FT 159,600

PEAK DISCHARGE (BASE, 3,600 CFS)

DATE	TIME	G.H.	DISCHARGE
3-14	2230	8.24	3,910
4-20	1500	8.31	4,080
5-27	2330	11.84	10,600

WHITE RIVER BASIN

85

06447500 Little White River near Martin, S. Dak.

LOCATION.--Lat 43°10'00", long 101°37'47", in NW¼ sec.19, T.37 N., R.36 W., Bennett County, on right bank 70 ft (21 m) downstream from highway culvert and 5.4 mi (8.7 km) east of Martin.

DRAINAGE AREA.--310 sq mi (803 sq km), approximately, of which about 230 sq mi (596 sq km) probably contributes directly to surface runoff.

PERIOD OF RECORD.--February 1938 to September 1940, July 1962 to current year. Prior to October 1965, published as South Fork White River near Martin.

GAGE.--Water-stage recorder. Altitude of gage is 3,045 ft (928 m), by barometer. Prior to Aug. 14, 1938, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--13 years, 20.1 cfs (0.569 cu m/s), 14,560 acre-ft/yr (18.0 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 87 cfs (2.46 cu m/s) Mar. 18, gage height, 3.07 ft (0.936 m); maximum gage height, 3.38 ft (1.030 m) Feb. 20, backwater from ice; minimum daily discharge, 3.4 cfs (0.096 cu m/s) Aug. 22, 23.

Period of record: Maximum discharge, 1,190 cfs (33.7 cu m/s) July 19, 1965, gage height, 12.90 ft (3.932 m), from rating curve extended above 340 cfs (9.63 cu m/s) on basis of computation of peak flow through culvert and flow-over-road measurement of peak flow; maximum gage height, 13.21 ft (4.026 m) Mar. 11, 1966, backwater from ice; minimum daily discharge, 0.6 cfs (0.017 cu m/s) Aug. 14, 16, 18, 1940; no flow for part of each day Oct. 19, 20, 22, 1962, regulation caused by construction work above station. Flood of May 5, 1932, reached a stage of 13.3 ft (4.05 m), from floodmarks.

REMARKS.--Records good except those for winter periods, which are poor.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Stage-discharge relation affected by ice Oct. 31 to Nov. 4, Nov. 13 to Mar. 9, Mar. 11)

0.6	2.4	1.5	23
0.7	4.3	2.0	41
0.8	6.3	2.5	62
1.1	13	3.1	88

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.0	16	15	8.5	13	60	40	30	37	8.8	5.7	4.7
2	8.6	20	9.0	8.5	13	55	39	43	29	8.4	5.5	5.1
3	8.8	19	7.0	8.0	13	55	37	48	22	8.0	5.1	5.5
4	9.0	25	6.0	7.5	13	50	35	51	19	8.4	4.9	6.5
5	9.0	23	6.0	7.5	12	50	32	40	17	8.8	4.7	6.1
6	9.5	21	5.5	7.0	12	55	31	31	17	8.2	4.5	5.9
7	10	20	5.0	7.0	11	55	29	27	15	7.4	4.5	5.5
8	11	17	5.0	6.5	11	50	27	25	14	6.9	5.3	5.5
9	11	16	5.0	6.8	12	45	27	23	14	6.5	4.9	5.7
10	12	15	5.5	7.0	12	43	26	21	13	6.3	4.5	5.5
11	11	15	5.5	7.5	12	43	26	20	12	6.1	4.7	5.5
12	10	12	6.0	8.5	11	43	26	19	12	5.7	4.7	6.1
13	9.9	12	6.0	10	11	42	25	18	11	5.5	5.1	6.7
14	11	15	6.5	13	11	44	25	18	11	5.9	5.1	7.1
15	11	16	6.5	15	11	59	24	17	11	5.9	5.1	7.8
16	11	17	6.5	15	15	54	23	17	11	6.3	4.5	8.8
17	11	17	7.0	14	20	64	22	16	10	5.9	4.1	9.7
18	12	16	8.0	13	25	86	22	16	10	5.5	3.7	11
19	12	16	8.5	13	30	70	22	15	10	5.5	3.5	11
20	12	16	8.5	12	40	69	28	15	11	6.5	3.7	11
21	12	15	8.5	12	45	62	38	14	11	7.1	3.5	10
22	13	15	9.0	11	50	50	50	13	12	8.0	3.4	9.5
23	13	15	9.0	11	50	55	54	13	12	7.8	3.4	9.2
24	14	15	8.5	12	55	61	41	13	11	7.8	3.9	9.9
25	13	15	8.5	13	55	67	31	13	10	7.6	4.5	12
26	14	14	9.0	13	50	70	27	14	9.9	7.1	4.5	13
27	14	14	9.5	12	55	62	26	19	9.5	6.7	4.7	14
28	14	14	9.5	11	60	58	26	37	9.0	6.7	5.3	14
29	14	14	8.5	11	-----	53	25	48	9.0	6.3	4.9	15
30	14	15	8.0	12	-----	45	25	52	9.0	6.1	4.9	19
31	12	-----	8.0	13	-----	41	-----	44	-----	5.7	4.9	-----
TOTAL	355.8	490	234.0	326.3	728	1,716	909	790	408.4	213.8	141.7	266.3
MEAN	11.5	16.3	7.55	10.5	26.0	55.4	30.3	25.5	13.6	6.90	4.57	8.88
MAX	14	25	15	15	60	86	54	52	37	8.8	5.7	19
MIN	8.6	12	5.0	6.5	11	41	22	13	9.0	5.5	3.4	4.7
AC-FT	706	972	464	647	1,440	3,400	1,800	1,570	810	424	281	528

CAL YR 1972 TOTAL 6,442.4 MEAN 17.6 MAX 84 MIN 5.0 AC-FT 12,780
WTR YR 1973 TOTAL 6,579.3 MEAN 18.0 MAX 86 MIN 3.4 AC-FT 13,050

PEAK DISCHARGE (BASE, 100 CFS).--No peaks above base.

WHITE RIVER BASIN

06448000 Lake Creek above refuge, near Tuthill, S. Dak.

LOCATION.--Lat 43°05'07", long 101°36'04", in NE¼ sec.19, T.36 N., R.36 W., Bennett County, on left wingwall at upstream side of culvert, 80 ft (24 m) downstream from west boundary of LaCreek game refuge and 7.5 mi (12.1 km) southwest of Tuthill.

DRAINAGE AREA.--58 sq mi (150 sq km), approximately, of which about 23 sq mi (60 sq km) probably contributes directly to surface runoff.

PERIOD OF RECORD.--February 1938 to September 1940, July 1962 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 3,090 ft (942 m), by barometer. Prior to Aug. 10, 1938, nonrecording gage and Aug. 10, 1938, to Sept. 30, 1940, water-stage recorder at site 110 ft (34 m) upstream at same datum.

AVERAGE DISCHARGE.--13 years, 19.7 cfs (0.558 cu m/s), 14,270 acre-ft/yr (17.6 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 99 cfs (2.80 cu m/s) May 27, gage height, 3.21 ft (0.978 m); maximum gage height, 3.46 ft (1.055 m) Jan. 16, backwater from ice; minimum daily discharge, 9.7 cfs (0.27 cu m/s) Aug. 28.

Period of record: Maximum discharge, 154 cfs (4.36 cu m/s) Mar. 9, 1966, gage height, 2.83 ft (0.863 m); maximum gage height, 3.75 ft (1.143 m) Feb. 12, 1971, backwater from ice; no flow for part of June 5, 1939.

REMARKS.--Records good except those for winter periods, which are poor. A few small diversions for irrigation of hay meadows above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Nov. 1, Nov. 3-12, 16-27, Feb. 20 to Mar. 11, Sept. 26-30; stage-discharge relation affected by ice Nov. 2, 13-15, Nov. 28 to Feb. 19)

1.9	7.3	2.7	44
2.1	14	3.0	68
2.4	27	3.3	106

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15	21	18	21	19	32	29	40	20	12	12	15
2	15	23	18	21	19	30	28	30	19	12	12	13
3	15	23	17	21	20	33	24	25	20	14	12	12
4	16	24	16	20	19	30	23	23	20	15	11	12
5	16	22	15	20	19	30	22	22	19	15	11	11
6	17	22	14	20	18	32	22	22	18	14	11	12
7	18	21	14	18	18	30	23	22	18	13	10	14
8	18	20	15	18	19	29	23	21	18	13	11	13
9	17	19	15	17	19	29	23	19	17	13	11	15
10	17	19	15	18	20	29	23	18	17	13	12	14
11	18	19	15	20	20	29	23	17	18	13	13	13
12	17	20	15	20	20	27	22	17	18	11	13	17
13	18	19	17	21	19	29	21	17	16	14	12	18
14	17	19	18	21	17	64	21	17	16	17	11	16
15	17	20	19	22	18	41	22	17	18	15	11	19
16	17	22	19	22	24	39	22	16	15	14	11	20
17	17	21	19	21	28	35	21	17	15	13	10	20
18	17	21	18	21	30	31	21	16	15	12	11	18
19	17	21	18	20	30	28	27	16	15	14	11	17
20	18	20	18	20	32	26	35	16	16	21	11	19
21	18	20	18	20	33	24	27	16	15	22	10	20
22	19	20	19	20	33	31	24	16	15	18	11	19
23	19	20	19	20	35	32	22	16	14	16	11	19
24	19	20	19	20	33	30	22	18	13	15	11	29
25	19	20	19	21	30	36	22	19	13	14	11	23
26	19	18	19	20	32	32	22	23	13	14	10	23
27	19	20	19	19	34	28	22	69	12	14	10	22
28	19	20	20	20	33	28	22	61	12	13	9.7	23
29	19	18	20	19	-----	26	22	34	12	12	11	32
30	20	20	20	19	-----	26	29	28	12	12	12	27
31	20	-----	21	19	-----	27	-----	23	-----	13	16	-----
TOTAL	547	612	546	619	691	973	709	731	479	441	349.7	545
MEAN	17.6	20.4	17.6	20.0	24.7	31.4	23.6	23.6	16.0	14.2	11.3	18.2
MAX	20	24	21	22	35	64	35	69	20	22	16	32
MIN	15	18	14	17	17	24	21	16	12	11	9.7	11
AC-FT	1,080	1,210	1,080	1,230	1,370	1,930	1,410	1,450	950	875	694	1,080

CAL YR 1972 TOTAL 7,732.0 MEAN 21.1 MAX 51 MIN 13 AC-FT 15,340
WTR YR 1973 TOTAL 7,242.7 MEAN 19.8 MAX 69 MIN 9.7 AC-FT 14,370

PEAK DISCHARGE (BASE, 50 CFS)

DATE	TIME	G.H.	DISCHARGE
3-14	0900	3.15	76
5-27	2130	3.21	99

WHITE RIVER BASIN

87

06449000 Lake Creek below refuge, near Tuthill, S. Dak.

LOCATION.--Lat 43°08'46", long 101°30'38", in SW¼ sec.30, T.37 N., R.35 W., Bennett County, on left bank 400 ft (122 m) downstream from east boundary of LaCreek game refuge, 1.2 mi (1.9 km) southwest of Tuthill and 5.5 mi (8.8 km) upstream from mouth.

DRAINAGE AREA.--120 sq mi (311 sq km), approximately, of which about 60 sq mi (155 sq km) probably contributes directly to surface runoff.

PERIOD OF RECORD.--February 1938 to September 1940, July 1962 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 3,055 ft (931 m), by barometer. Prior to Aug. 4, 1938, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--13 years, 15.5 cfs (0.439 cu m/s), 11,230 acre-ft/yr (13.8 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 80 cfs (2.27 cu m/s) Apr. 1; maximum gage height, 4.05 ft (1.234 m) Apr. 1, 5; minimum daily discharge, 0.11 cfs (0.003 cu m/s) Sept. 5.

Period of record: Maximum discharge, 178 cfs (5.04 cu m/s) June 18, 1967, gage height, 5.17 ft (1.576 m) no flow for many days in most years.

REMARKS.--Records fair. Flow regulated by series of lakes above gage.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Nov. 19, Feb. 1-17, May 23 to June 19, July 31 to Sept. 30)

0.80	0	1.3	2.6	3.0	37
.90	.12	1.5	5.2	3.5	54
1.0	.40	1.7	8.3	4.0	75
1.1	.88	2.0	14	4.5	99
1.2	1.6	2.5	24		

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.54	3.5	14	20	18	27	79	20	37	3.7	2.4	.28
2	.88	4.2	14	20	18	28	79	20	54	3.5	2.1	.28
3	.83	4.5	15	20	18	28	78	20	53	3.4	2.0	.25
4	.67	5.0	16	20	18	29	78	20	51	3.2	2.0	.12
5	.85	5.4	16	20	18	29	78	19	50	2.8	2.1	.11
6	1.2	5.7	16	21	17	41	76	18	50	2.5	2.1	.30
7	1.8	6.0	17	21	17	50	75	18	50	2.2	2.1	.18
8	1.6	6.5	17	21	18	49	75	18	49	1.9	2.0	.16
9	1.8	6.7	17	21	18	49	75	18	48	2.0	1.7	.15
10	1.8	7.5	17	21	19	49	73	17	48	2.1	1.4	.12
11	1.4	7.9	17	20	19	48	74	18	47	2.1	.80	6.7
12	1.6	8.3	17	20	19	48	71	17	46	2.0	.41	24
13	3.1	9.2	17	20	19	48	70	18	46	2.2	.16	17
14	2.3	9.4	17	20	20	50	67	18	45	2.1	.51	1.3
15	2.2	9.6	18	20	20	49	64	18	44	1.9	1.3	.75
16	2.8	9.7	18	20	21	49	43	18	42	1.9	1.1	.56
17	2.4	9.8	18	20	22	49	23	19	40	2.3	.71	.88
18	2.2	9.5	17	20	22	48	23	20	32	2.4	.41	.90
19	2.7	10	17	20	22	48	22	20	21	2.6	.29	2.3
20	2.4	11	17	20	23	48	23	21	19	3.2	.46	4.8
21	2.3	12	17	20	23	49	22	22	18	3.3	1.4	4.3
22	2.5	12	17	19	24	50	22	22	17	2.6	1.1	3.9
23	2.5	12	18	19	25	51	21	23	16	2.2	.68	2.9
24	2.5	12	18	19	25	51	21	24	16	2.0	.61	3.6
25	2.2	12	18	19	25	52	21	24	11	2.1	.44	3.7
26	2.8	13	18	19	26	53	21	26	5.3	2.0	.37	2.9
27	2.8	13	18	18	26	54	21	30	4.7	2.1	.34	3.0
28	3.1	13	18	19	26	62	21	31	4.5	2.0	.28	2.8
29	3.1	14	18	18	-----	78	20	32	4.4	1.8	.29	2.5
30	3.0	14	19	18	-----	78	20	32	4.1	1.4	.25	2.3
31	3.0	-----	20	18	-----	78	-----	33	-----	2.0	.30	-----
TOTAL	64.87	276.4	531	611	586	1,520	1,456	674	973.0	73.5	32.11	93.24
MEAN	2.09	9.21	17.1	19.7	20.9	49.0	48.5	21.7	32.4	2.37	1.04	3.11
MAX	3.1	14	20	21	26	78	79	33	54	3.7	2.4	24
MIN	.54	3.5	14	18	17	27	20	17	4.1	1.4	.16	.11
AC=FT	129	548	1,050	1,210	1,160	3,010	2,890	1,340	1,930	146	64	185

CAL YR 1972 TOTAL 7,012.38 MEAN 19.2 MAX 96 MIN .41 AC=FT 13,910
WTR YR 1973 TOTAL 6,891.12 MEAN 18.9 MAX 79 MIN .11 AC=FT 13,670

WHITE RIVER BASIN

06449100 Little White River near Vetel, S. Dak.

LOCATION.--Lat 43°06'03", long 101°13'49", in NE¼NW¼ sec.17, T.36 N., R.33 W., Bennett County, on left bank 120 ft (37 m) downstream from highway bridge, 0.3 mi (0.5 km) downstream from small right-bank tributary, 10.8 mi (17.4 km) southeast of Vetel, and 15.3 mi (24.6 km) upstream from Spring Creek.

DRAINAGE AREA.--590 sq mi (1,530 sq km), approximately, of which about 415 sq mi (1,075 sq km) probably contributes directly to surface runoff.

PERIOD OF RECORD.--August 1959 to current year. Prior to October 1965, published as South Fork White River near Vetel.

GAGE.--Water-stage recorder. Datum of gage is 2,780.69 ft (847.554 m) above mean sea level. Prior to Nov. 14, 1959, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--14 years, 55.0 cfs (1.558 cu m/s), 39,850 acre-ft/yr (49.1 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 176 cfs (4.98 cu m/s) Mar. 9, gage height, 4.02 ft (1.225 m); maximum gage height, 4.04 ft (1.231 m) Apr. 1; minimum daily discharge, 13 cfs (0.37 cu m/s) Aug. 27, 28. Period of record: Maximum discharge, 1,330 cfs (37.7 cu m/s) Mar. 13, 1966, gage height, 7.75 ft (2.362 m); minimum daily, 10 cfs (0.28 cu m/s) Sept. 1-3, 10, 1961, Dec. 18, 1964.

REMARKS.--Records good except those for winter periods, which are poor. Some small diversions for irrigation and some storage in several small lakes above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Stage-discharge relation affected by ice Nov. 12-16, Nov. 22 to Feb. 20)

2.6	13	3.4	88
2.8	30	3.7	124
3.1	57	4.0	169

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	24	56	34	32	87	164	90	101	23	17	14
2	20	19	30	34	31	94	163	85	100	22	17	21
3	20	26	23	32	30	95	147	83	106	21	17	20
4	20	36	23	32	29	94	128	84	111	23	17	17
5	20	49	22	32	27	94	128	81	101	24	17	17
6	20	44	22	30	26	104	128	78	81	23	16	16
7	20	44	22	30	24	140	130	76	78	20	16	16
8	20	45	21	29	23	169	127	75	77	20	17	17
9	20	46	21	30	23	167	125	74	76	21	17	16
10	20	47	24	31	24	166	127	72	75	20	17	17
11	20	47	27	35	24	164	128	74	72	19	19	17
12	19	45	30	40	23	163	128	69	70	18	17	20
13	19	35	33	44	22	137	121	50	60	20	17	24
14	18	30	34	45	22	144	112	47	56	21	17	38
15	19	37	36	46	22	115	109	47	62	20	16	30
16	19	45	38	45	23	137	105	42	55	18	15	27
17	19	51	40	42	25	123	99	41	52	17	15	25
18	18	51	40	40	30	114	70	40	54	17	16	22
19	19	51	44	38	40	105	73	40	48	17	15	20
20	19	51	44	38	50	99	75	40	38	21	15	19
21	19	51	46	34	67	97	67	39	33	24	15	19
22	20	49	46	35	77	107	64	38	31	21	15	20
23	19	48	44	35	87	123	63	38	30	20	16	20
24	18	50	43	36	88	140	61	39	30	19	17	30
25	18	50	44	38	85	150	61	48	28	20	16	25
26	18	50	45	36	87	141	76	50	29	18	15	24
27	18	48	45	33	87	141	78	84	24	19	13	23
28	19	48	42	30	86	138	78	90	22	18	13	25
29	19	45	36	30	-----	134	79	73	22	17	15	42
30	21	50	32	31	-----	150	84	82	25	17	16	39
31	21	-----	32	32	-----	158	-----	101	-----	17	15	-----
TOTAL	599	1,313	1,081	1,099	1,214	3,990	3,098	1,970	1,749	615	496	680
MEAN	19.3	43.6	34.9	35.5	43.4	129	103	63.5	58.3	19.8	16.0	22.7
MAX	21	51	50	46	88	169	164	101	111	24	19	47
MIN	18	19	21	29	22	87	61	38	22	17	13	11
AC-FT	1,190	2,600	2,140	2,180	2,410	7,910	6,140	3,910	3,470	1,220	984	1,350

CAL YR 1972 TOTAL 18,782 MEAN 51.3 MAX 162 MIN 18 AC-FT 37,250
WTR YR 1973 TOTAL 17,904 MEAN 49.1 MAX 169 MIN 13 AC-FT 35,510

PEAK DISCHARGE (BASE, 150 CFS)

DATE	TIME	G.H.	DISCHARGE	DATE	TIME	G.H.	DISCHARGE
3-9	0330	4.02	176	3-25	0030	3.96	155
3-14	1030	3.93	158	4-1	1400	4.04	171

WHITE RIVER BASIN

89

06449250 Spring Creek near St. Francis, S. Dak.

LOCATION.--Lat 43°04'21", long 101°01'49", in NW¼NE¼ sec.25, T.36 N., R.32 W., Todd County, on left bank 40 ft (12 m) downstream from highway culvert, 4.1 mi (6.6 km) upstream from mouth and 8.0 mi (12.9 km) southwest of St. Francis.

DRAINAGE AREA.--57 sq mi (148 sq km), approximately, of which about 10 sq mi (26 sq km) probably contributes directly to surface runoff.

PERIOD OF RECORD.--August 1959 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,815.50 ft (858.164 m) above mean sea level.

AVERAGE DISCHARGE.--14 years, 3.77 cfs (0.107 cu m/s), 2,730 acre-ft/yr (3.37 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 30 cfs (0.85 cu m/s) Mar. 25, gage height, 5.87 ft (1.789 m); no flow for many days.

Period of record: Maximum discharge, 65 cfs (1.84 cu m/s) June 21, 1962, gage height, 7.41 ft (2.259 m); maximum gage height, 7.43 ft (2.265 m) Mar. 19, 1969; no flow for many days in each year.

REMARKS.--Records good. Small diversions above station for irrigation of hay meadows.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Stage-discharge relation affected by ice Feb. 9-25; shifting-control
method used Mar. 23-28)

3.94	0	4.5	5.0
4.0	.26	5.0	13
4.1	.93	6.0	31
4.3	2.5		

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1					0	23	24	16	19	.02		
2					0	23	24	15	16	.02		
3					0	27	23	15	14	.02		
4					0	24	24	16	11	.01		
5					0	23	22	15	9.0	.01		
6					0	20	20	14	7.0	.01		
7					0	18	19	13	6.0	.01		
8					0	17	17	12	4.5	.01		
9					.20	17	17	10	3.8	.01		
10					.70	17	18	9.5	3.5	0		
11					1.0	16	17	8.8	3.2	0		
12					1.5	16	16	7.9	2.9	0		
13					1.5	16	16	7.5	2.7	0		
14					1.2	25	15	7.1	2.6	0		
15					1.0	24	13	6.4	2.7	0		
16					1.0	27	13	6.1	2.5	0		
17					1.2	28	12	5.8	1.8	0		
18					1.5	24	12	5.6	1.7	0		
19					2.0	21	13	5.0	1.3	0		
20					2.3	20	16	4.6	1.2	0		
21					3.5	19	14	4.0	1.1	0		
22					5.0	21	17	3.6	.86	0		
23					11	22	17	3.4	.59	0		
24					14	25	16	3.1	.53	0		
25					20	21	14	2.8	.33	0		
26					24	20	13	3.2	.11	0		
27					25	27	12	11	.07	0		
28					24	26	12	19	0	0		
29					-----	24	11	15	.03	0		
30					-----	23	12	17	.03	0		
31		-----			-----	23	-----	20	-----	0		-----
TOTAL	0	0	0	0	141.60	677	489	302.4	120.05	.12	0	0
MEAN	0	0	0	0	5.06	21.8	16.3	9.75	4.00	.004	0	0
MAX	0	0	0	0	25	28	24	20	19	.02	0	0
MIN	0	0	0	0	0	16	11	2.8	0	0	0	0
AC=FT	0	0	0	0	281	1,340	970	600	238	.2	0	0

CAL YN 1972 TOTAL 1,008.81 MEAN 2.76 MAX 25 MIN 0 AC=FT 2,000
WTR YN 1973 TOTAL 1,730.17 MEAN 4.74 MAX 28 MIN 0 AC=FT 3,430

PEAK DISCHARGE (BASE, 25 CFS)

DATE	TIME	G.H.	DISCHARGE	DATE	TIME	G.H.	DISCHARGE
3-3	1330	5.75	28	3-25	0700	5.87	30
3-16	1800	5.79	28	4-2	0800	5.60	25

WHITE RIVER BASIN

06449500 Little White River near Rosebud, S. Dak.

LOCATION.--Lat 43°19'32", long 100°53'00", in SW¼NW¼ sec.28, T.39 N., R.30 W., Todd County, on left bank at downstream side of bridge on U.S. Highway 18, 0.3 mi (0.5 km) downstream from Scabby Creek, 0.7 mi (1.1 km) downstream from Soldier Creek, and 6.4 mi (10.3 km) north of Rosebud.

DRAINAGE AREA.--1,020 sq mi (2,640 sq km), approximately, of which about 760 sq mi (1,970 sq km) probably contributes directly to surface runoff.

PERIOD OF RECORD.--May 1943 to current year. Prior to October 1965, published as South Fork White River near Rosebud.

GAGE.--Water-stage recorder. Datum of gage is 2,294.99 ft (699.513 m) above mean sea level. Prior to May 11, 1948, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--30 years, 112 cfs (3.172 cu m/s), 81,140 acre-ft/yr (100 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 365 cfs (10.3 cu m/s) Mar. 14, gage height, 4.48 ft (1.366 m); maximum gage height, 6.48 ft (1.975 m) Feb. 18, backwater from ice; minimum daily discharge, 37 cfs (1.05 cu m/s) Aug. 21.

Period of record: Maximum discharge, 4,640 cfs (131 cu m/s) June 11, 1967, gage height, 14.09 ft (4.295 m), from rating curve extended above 1,300 cfs (36.8 cu m/s); minimum daily, 10 cfs (0.28 cu m/s) Jan. 4, 1949, Feb. 20, 1955.

REMARKS.--Records good except those for winter periods, which are poor. Some small diversions for irrigation and some storage in several small lakes above station.

REVISIONS (WATER YEARS).--WSP 1056: 1943, drainage area. WSP 1309: 1946(M).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	58	74	106	66	86	240	255	189	177	66	47	41
2	41	80	108	68	86	226	253	163	175	61	47	64
3	60	78	85	66	86	215	244	158	157	60	45	65
4	61	80	70	64	86	220	221	163	162	63	45	56
5	62	89	60	62	86	227	199	156	162	77	46	50
6	56	104	50	62	86	214	193	161	156	70	46	50
7	61	97	50	62	84	194	206	154	142	60	45	48
8	63	100	50	60	82	233	198	146	138	57	47	48
9	61	94	55	58	82	251	200	149	139	62	49	51
10	67	93	60	62	84	257	195	144	138	57	45	52
11	66	92	70	66	84	260	189	142	130	52	49	50
12	63	100	75	70	88	257	186	142	127	47	52	57
13	66	96	75	75	86	264	190	131	125	50	50	60
14	68	90	76	80	86	325	180	114	119	58	49	58
15	64	80	76	82	80	276	180	118	126	56	51	76
16	69	90	78	85	80	230	161	119	118	53	44	73
17	68	95	78	85	82	247	157	115	113	52	42	69
18	59	106	80	82	88	221	158	112	112	55	41	68
19	59	105	82	80	95	207	154	109	102	58	43	63
20	62	107	86	80	180	195	161	107	98	64	38	58
21	69	107	88	78	200	185	151	105	91	69	37	58
22	72	105	90	78	220	195	135	98	90	67	40	55
23	72	100	90	78	230	202	137	101	86	66	43	55
24	71	101	88	80	230	237	135	101	81	65	45	69
25	71	105	88	82	220	268	126	101	78	57	45	73
26	75	104	86	84	220	255	124	113	76	52	44	71
27	73	106	86	82	240	237	142	259	73	50	43	68
28	69	102	84	80	250	231	151	225	69	50	41	71
29	69	97	80	80	-----	223	151	183	65	50	52	111
30	73	99	68	82	-----	215	161	149	65	48	51	92
31	70	-----	66	86	-----	232	-----	166	-----	47	42	-----
TOTAL	2,038	2,876	2,384	2,305	3,609	7,239	5,293	4,393	3,490	1,799	1,404	1,880
MEAN	65.7	95.9	76.9	74.4	129	234	176	142	116	58.0	45.3	62.7
MAX	75	107	108	86	250	325	255	259	177	77	52	111
MIN	56	74	50	58	80	185	124	98	65	47	37	41
AC-FT	4,040	5,700	4,730	4,570	7,160	14,360	10,500	8,710	6,920	3,570	2,780	3,730

CAL YR 1972 TOTAL 36,709 MEAN 100 MAX 274 MIN 40 AC-FT 72,810
 WTR YR 1973 TOTAL 38,710 MEAN 106 MAX 325 MIN 37 AC-FT 76,780

PEAK DISCHARGE (BASE, 330 CFS).--Mar. 14 (0445) 365 cfs (4.48 ft).

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LOCATION.--Lat 43°36'04", long 100°44'52", in SW¼NW¼ sec.23, T.42 N., R.29 W., Mellette County, on left bank at downstream side of bridge on U.S. Highway 83, 1.3 mi (2.1 km) downstream from Pine Creek and 2.0 mi (3.2 km) north of town of White River.

PERIOD OF RECORD.--October 1949 to current year. Prior to October 1965, published as South Fork White River below White River.

AVERAGE DISCHARGE.--24 years, 131 cfs (3.710 cu m/s), 94,910 acre-ft/yr (117 cu hm/yr).

Period of record: Maximum discharge, 13,700 cfs (388 cu m/s) June 12, 1967, gage height, 10.02 ft (3.054 m), site and datum then in use; maximum gage height, 11.21 ft (3.417 m) June 7, 1968, site and datum then in use; maximum gage height at present site and datum, 15.46 ft (4.712 m) June 7, 1968, from floodmarks; no flow for parts of several days in 1952, 1954, 1956; minimum daily discharge, 7 cfs (0.20 cu m/s) July 31, Aug. 31, Sept. 1, 1952.

REMARKS.--Records fair except those for winter periods, which are poor. Diurnal fluctuations caused by small powerplant 2.2 mi (3.5 km) upstream. Several small diversions for irrigation and some storage in several small lakes above station.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	57	83	86	64	90	254	249	215	153	54	32	64
2	57	90	86	64	90	222	250	202	156	55	47	76
3	57	72	85	70	90	182	240	176	157	57	34	92
4	57	74	80	70	95	178	240	158	148	44	35	69
5	63	72	70	65	95	172	227	152	150	57	33	73
6	64	90	60	65	90	173	219	154	137	57	40	67
7	65	97	50	65	90	167	232	156	117	42	29	65
8	59	91	50	65	85	181	236	142	113	48	23	70
9	66	91	50	50	85	206	227	137	111	58	34	72
10	61	89	55	40	90	215	219	135	102	56	35	76
11	64	86	60	60	90	214	210	132	104	44	33	81
12	69	95	65	65	95	212	206	136	113	39	44	83
13	53	97	70	70	95	213	190	135	143	44	32	97
14	64	94	80	75	95	291	178	123	139	43	34	97
15	62	83	80	80	93	282	178	108	148	51	47	114
16	58	73	80	90	85	231	178	101	125	51	42	101
17	64	90	82	90	85	211	163	100	121	47	32	87
18	69	96	82	85	80	210	158	97	105	50	40	85
19	68	95	80	85	85	194	179	90	105	50	36	68
20	67	90	80	82	90	182	158	86	118	55	40	66
21	67	89	85	82	150	180	159	80	92	61	47	66
22	66	89	95	80	200	171	139	82	91	57	41	70
23	75	87	95	80	250	181	131	76	94	55	44	79
24	70	95	95	85	250	204	134	79	95	57	49	86
25	67	84	90	85	240	255	135	80	67	44	46	97
26	72	92	90	90	240	267	128	99	61	40	48	99
27	65	88	90	90	260	248	132	378	62	36	51	97
28	71	92	90	85	270	246	137	699	58	40	47	71
29	71	79	85	85	-----	227	137	269	55	46	45	116
30	69	73	80	85	-----	219	157	189	69	38	76	156
31	71	-----	70	90	-----	236	-----	149	-----	42	61	-----
TOTAL	2,008	2,616	2,396	2,337	3,653	6,594	5,526	4,915	3,309	1,518	1,277	2,540
MEAN	64.8	87.2	77.3	75.4	130	213	184	159	110	49.0	41.2	84.7
MAX	75	97	95	90	270	291	250	699	157	61	76	156
MIN	53	72	50	40	80	167	128	76	55	36	23	64
AC-FT	3,980	5,190	4,750	4,640	7,250	13,080	10,960	9,750	6,560	3,010	2,530	5,040
WTR YR 1972	TOTAL 36,974			MEAN 101	MAX 648	MIN 32	AC-FT 73,340					
CAL YR 1973	TOTAL 38,689			MEAN 106	MAX 699	MIN 23	AC-FT 76,740					

WHITE RIVER BASIN

06452000 White River near Oacoma, S. Dak.

LOCATION.--Lat 43°44'54", long 99°33'22", in SEkSW¹ sec.3, T.103 N., R.73 W., Lyman County, on left bank at downstream side of bridge on State Highway 47, 1.5 mi (2.4 km) downstream from Wagner Draw, 1.8 mi (2.9 km) upstream from high-water line of Lake Francis Case, and 8.8 mi (14.2 km) southwest of Oacoma.

DRAINAGE AREA.--10,200 sq mi (26,400 sq km), approximately.

PERIOD OF RECORD.--August 1928 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,377.29 (419.798 m) above mean sea level. See WSP 1709 or 1729 for history of changes prior to Feb. 27, 1960.

AVERAGE DISCHARGE.--45 years, 538 cfs (15.236 cu m/s), 389,800 acre-ft/yr (481 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 6,960 cfs (197 cu m/s) May 29, gage height, 7.93 ft (2.417 m); minimum daily, 2.8 cfs (0.079 cu m/s) Aug. 28.
Period of record: Maximum discharge, 51,900 cfs (1,470 cu m/s) Mar. 30, 1952, gage height, 15.40 ft (4.694 m), site and datum then in use; maximum gage height, 17.6 ft (5.36 m) Mar. 31, 1950, site and datum then in use, from floodmarks, ice jam; no flow Aug. 14-28, 1971.

REMARKS.--Records good except those for winter periods, which are poor. Some diversions for irrigation above station. Water-quality records for the water year 1973 are published in Part 2 of this report.

REVISIONS (WATER YEARS).--WSP 786: Drainage area. WSP 1309: 1929-30(M).

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 5-15, May 28 to June 1; stage-discharge relation affected by ice Nov. 15 to Mar. 2)

1.9	2.5	2.3	34	3.3	280	5.0	1,420
2.0	6.0	2.5	70	3.6	402	6.0	2,760
2.1	12	2.7	112	4.0	606	7.0	4,710
2.2	21	3.0	187	4.5	960	8.0	7,500

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	32	69	100	32	110	1,600	761	624	1,810	76	207	4.7
2	30	163	90	33	120	1,700	692	505	1,230	61	171	21
3	27	133	70	30	120	1,090	659	470	920	46	201	17
4	25	108	40	26	110	936	521	972	678	36	140	39
5	27	92	20	26	95	1,230	490	1,520	536	26	103	88
6	36	86	10	26	95	960	475	1,090	445	20	59	101
7	28	74	10	24	90	747	445	798	389	17	34	218
8	28	70	10	24	90	636	412	641	346	16	21	393
9	27	72	10	23	90	557	376	547	346	19	19	317
10	33	110	11	23	95	510	362	480	354	17	13	246
11	30	119	12	24	100	485	325	436	302	141	14	190
12	27	140	12	25	110	475	302	490	266	143	36	160
13	30	133	12	30	110	455	284	445	246	184	25	133
14	28	112	12	30	110	606	270	416	234	516	18	105
15	22	85	12	100	100	584	277	380	231	407	18	145
16	23	80	12	130	90	1,750	277	342	204	306	14	133
17	23	80	14	140	95	2,350	277	317	190	227	14	138
18	22	85	20	140	100	1,500	253	371	212	158	8.6	133
19	28	90	20	130	200	1,160	260	371	187	130	5.1	184
20	31	90	25	110	400	984	273	317	171	108	7.5	284
21	31	95	30	100	750	1,140	277	280	174	94	8.0	354
22	46	100	38	110	1,000	1,500	841	256	160	84	11	299
23	51	110	36	120	1,200	1,160	3,160	243	158	108	17	214
24	53	120	34	110	1,000	1,130	1,600	237	133	133	15	209
25	55	120	36	110	950	1,020	1,180	227	121	164	11	193
26	53	120	40	100	900	1,270	944	253	112	485	8.0	207
27	49	110	40	95	950	1,590	725	396	90	338	4.3	182
28	48	95	38	95	1,000	2,990	595	706	80	266	2.8	543
29	46	95	32	95	-----	1,710	521	6,490	68	221	4.3	685
30	62	100	30	100	-----	1,210	542	4,530	84	201	6.6	460
31	70	-----	30	100	-----	904	-----	3,070	-----	204	8.0	-----
TOTAL	1,125	3,056	906	2,281	10,180	35,939	18,376	28,222	10,477	4,952	1,226.2	6,415.7
MEAN	36.3	102	29.2	73.6	364	1,159	613	910	349	160	39.6	214
MAX	74	163	100	140	1,200	2,990	3,160	6,490	1,810	516	207	685
MIN	22	69	10	23	90	455	253	227	68	16	2.8	4.7
AC-FT	2,230	6,060	1,800	4,520	20,190	71,290	36,450	55,980	20,780	9,820	2,430	12,730

CAL YR 1972 TOTAL 148,455.0 MEAN 406 MAX 6,600 MIN 10 AC-FT 294,500
WTR YR 1973 TOTAL 123,155.9 MEAN 337 MAX 6,490 MIN 2.8 AC-FT 244,300

PEAK DISCHARGE (BASE, 5,500 CFS).--May 29 (1700) 6,960 cfs (7.93 ft).

MISSOURI RIVER MAIN STEM

93

06452500 Lake Francis Case at Pickstown, S. Dak.

LOCATION.--Lat 43°04'05", long 98°33'15", in SE¼ sec.5, T.95 N., R.65 W., Charles Mix County, in tower 6 of outlet works at Fort Randall Dam, on Missouri River at Pickstown, 1.0 mi (1.6 km) upstream from Randall Creek, and at mile 880.0 (1,415.9 km).

DRAINAGE AREA.--263,500 sq mi (682,500 sq km), approximately.

PERIOD OF RECORD.--December 1952 to current year. Prior to October 1964, published as Fort Randall Reservoir at Pickstown.

GAGE.--Water-stage recorder. Datum of gage is at mean sea level. Prior to Mar. 25, 1953, elevations determined from temporary nonrecording gages.

EXTREMES.--Current year: Maximum contents, 4,254,000 acre-ft (5,250 cu hm) Apr. 7; maximum elevation, 1,359.7 ft (414.44 m) Apr. 6, affected by wind; minimum contents, 2,557,000 acre-ft (3,150 cu hm) Dec. 4, elevation, 1,337.8 ft (407.76 m).
Period of record: Maximum contents, 5,087,000 acre-ft (6,270 cu hm) June 20, 1962, elevation, 1,364.2 ft (415.80 m), affected by wind; minimum since initial filling, 1,450,000 acre-ft (1,790 cu hm) Oct. 23, 1956, elevation, 1,311.5 ft (399.75 m).

REMARKS.--Reservoir is formed by earthfill dam; storage begin in December 1952; initial closure made July 1952. Maximum capacity, 5,816,000 acre-ft (7,170 cu hm) below elevation 1,375.0 ft (419.10 m), top of spillway gates. Normal maximum, 4,834,000 acre-ft (5,960 cu hm) below elevation 1,365.0 ft (416.05 m). Inactive storage, 1,336,000 acre-ft (1,650 cu hm) below elevation 1,310.0 ft (399.29 m). No dead storage; elevation of invert of lowest outlet is 1,227.0 ft (373.99 m). Figures given herein represent elevations at outlet works and total contents adjusted for wind effect.
The spillway consists of 21 Taintor gates, each 40 ft (12.2 m) wide by 29 ft (8.8 m) high; spillway capacity, 490,000 cfs (13,900 cu m/s) at pool elevation 1,375 ft (419.10 m). Crest of spillway is at elevation 1,346 ft (410.26 m). Normal releases are through 12 tunnels 22 ft (6.7 m) in diameter. Installation of power units in 8 of these tunnels was completed in January 1956; maximum release through power tunnels is 46,000 cfs (1,300 cu m/s); maximum release through 4 other tunnels is 130,000 cfs (3,680 cu m/s) at pool elevation 1,375 ft (419.10 m). Water is used for flood control, navigation, power, and incidental uses.

COOPERATION.--Elevations and contents furnished by Corps of Engineers.

MONTHEND ELEVATION AND CONTENTS AT 2400 HOURS, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	1,356.2	3,945,000	-
Oct. 31.....	1,348.7	3,335,000	-610,000
Nov. 30.....	1,338.8	2,620,000	-715,000
Dec. 31.....	1,346.4	3,155,000	+535,000
CAL YR 1972.....	-	-	+251,000
Jan. 31.....	1,348.4	3,319,000	+164,000
Feb. 28.....	1,356.1	3,943,000	+624,000
Mar. 31.....	1,358.9	4,193,000	+250,000
Apr. 30.....	1,357.3	4,047,000	-146,000
May 31.....	1,356.3	3,967,000	-80,000
June 30.....	1,354.6	3,835,000	-132,000
July 31.....	1,353.3	3,714,000	-121,000
Aug. 31.....	1,355.5	3,900,000	+186,000
Sept. 30.....	1,351.9	3,629,000	-271,000
WTR YR 1973.....	-	-	-316,000

LOCATION.--Lat 43°03'54", long 98°33'11", in NW¼NE¼ sec.8, T.95 N., R.65 W., Charles Mix County, in powerhouse of Fort Randall Dam on Missouri River at Pickstown, 0.8 mi (1.3 km) upstream from Randall Creek, and at mile 879.8 (1,415.6 km).

GAGE.--Totalizing flowmeters on each turbine in Fort Randall powerhouse. Prior to Nov. 10, 1965, water-stage recorder at site 7.0 mi (11.3 km) downstream at datum 1,230.00 ft (374.904 m) above mean sea level and Nov. 10, 1965, to June 30, 1969, at datum 5.00 ft (1.524 m) lower (Corps of Engineers bench mark).

EXTREMES.--Current year: Maximum daily discharge during year, 48,100 cfs (1,360 cu m/s) Oct. 1, 12, 13, 27, 28; minimum daily, 11,400 cfs (323 cu m/s) Mar. 7.
Period of record: Maximum discharge, 447,000 cfs (12,700 cu m/s) Apr. 12, 1952; maximum gage height, 20.82 ft (6.346 m) Apr. 12, 1952 (site and datum then in use); minimum daily discharge, 100 cfs (2.83 cu m/s) Mar. 29, 1962.

REMARKS.--Records good. Flow completely regulated by Lake Francis Case. (See station 06452500.) Many diversions for irrigation above station.

COOPERATION.--Daily discharge determined from flow through turbines furnished by Corps of Engineers.

DAY	UCT	NOV	DEC	JAN	FFB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	48,100	48,000	35,100	16,800	16,400	12,900	12,100	25,100	24,200	26,100	29,200	33,200
2	47,900	48,000	29,500	21,100	16,000	12,700	15,100	22,800	26,500	29,200	29,300	26,000
3	48,000	48,000	50,400	21,300	16,100	17,500	15,100	21,500	20,600	11,500	26,000	29,200
4	48,000	47,900	30,400	20,900	16,300	12,900	15,100	24,300	21,900	25,800	26,900	26,100
5	48,000	47,900	23,300	20,000	16,200	12,700	15,900	26,000	23,400	29,800	23,200	27,200
6	48,000	47,900	20,300	21,000	16,700	11,500	17,900	23,400	24,400	30,500	11,800	31,100
7	48,000	47,900	23,200	20,700	17,600	11,400	17,900	24,500	24,600	11,600	11,200	32,800
8	48,000	47,900	22,800	21,400	19,000	12,000	18,900	22,900	24,900	26,800	11,500	33,900
9	48,000	48,100	23,000	21,200	17,900	12,000	18,800	20,700	28,600	29,300	32,200	26,300
10	47,900	48,000	21,700	20,800	17,500	14,900	20,300	20,800	25,400	27,600	34,100	30,100
11	48,000	48,100	21,800	18,900	17,800	15,000	19,900	22,700	28,500	27,400	34,300	30,700
12	48,100	48,000	21,500	18,500	17,700	14,900	20,300	24,800	28,300	28,500	22,500	31,100
13	48,100	48,000	22,200	17,900	17,600	14,800	22,300	23,400	27,900	27,400	33,800	28,800
14	48,000	47,900	22,000	18,300	15,400	16,600	22,500	28,600	28,000	28,800	15,100	26,500
15	48,000	44,700	19,900	15,700	14,900	16,500	18,800	27,500	26,700	27,700	29,000	25,100
16	48,000	44,800	18,700	15,800	15,100	12,000	18,300	28,400	26,400	30,000	30,300	22,500
17	48,000	44,500	14,800	15,300	16,900	12,500	17,700	28,200	24,100	10,800	29,800	28,600
18	48,000	44,200	14,700	14,300	16,500	13,700	17,900	28,100	28,100	30,900	11,100	30,500
19	47,900	42,500	14,700	15,200	16,900	16,300	19,000	26,500	25,600	32,100	24,200	28,100
20	48,000	43,800	15,000	15,800	16,800	16,200	25,100	23,000	23,500	34,500	32,900	26,300
21	48,000	43,400	15,200	16,000	15,500	17,900	21,300	26,600	23,300	35,600	33,800	27,300
22	48,000	38,500	19,100	16,000	12,000	17,900	17,800	26,700	22,900	29,200	33,200	28,100
23	47,900	34,900	19,400	16,100	12,200	18,700	21,700	27,000	26,300	36,300	27,500	26,600
24	48,000	34,900	15,800	16,700	12,100	20,900	20,900	28,300	27,000	28,200	28,200	28,700
25	48,000	33,000	15,300	17,000	12,300	16,100	24,700	28,300	28,400	29,900	29,100	30,800
26	48,000	33,700	18,400	17,000	11,900	16,000	25,700	28,400	28,300	27,100	26,700	17,300
27	48,100	34,900	17,900	18,100	11,900	12,100	27,200	22,700	29,900	26,200	32,000	25,400
28	48,100	33,300	18,000	19,500	12,900	12,200	27,300	17,400	31,000	30,3		

NIOBRARA RIVER BASIN

95

06464500 Keya Paha River at Wewela, S. Dak.

LOCATION.--Lat 43°01'42", long 99°46'45", in SE¼ sec.24, T.95 N., R.76 W., Tripp County, on left bank 13 ft (4 m) downstream from bridge on U.S. Highway 183, 1.0 mi (1.6 km) north of Wewela, 4.5 mi (7.2 km) upstream from Holt Creek, and 11.5 mi (18.5 km) downstream from Lost Creek.

DRAINAGE AREA.--1,070 sq mi (2,770 sq km), approximately.

PERIOD OF RECORD.--November 1937 to September 1940, October 1947 to current year. Monthly discharge only for October 1947, published in WSP 1309.

GAGE.--Water-stage recorder. Datum of gage is 2,049.78 ft (624.773 m) above mean sea level. Prior to June 21, 1957, nonrecording gage at site 13 ft (4 m) upstream at same datum.

AVERAGE DISCHARGE.--28 years (1938-40, 1947-73), 70.9 cfs (2.008 cu m/s), 51,370 acre-ft/yr (63.3 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 556 cfs (15.7 cu m/s) May 29, gage height, 3.60 ft (1.097 m); maximum gage height, 3.95 ft (1.204 m) Feb. 24, backwater from ice; minimum daily discharge, 13 cfs (0.37 cu m/s) Jan. 8, 9, Aug. 29 to Sept. 1.
Period of record: Maximum discharge, 5,430 cfs (154 cu m/s) Mar. 31, 1952, gage height, 13.08 ft (3.987 m); maximum gage height, 13.5 ft (4.11 m) Mar. 25, 1950, from floodmark, backwater from ice; no flow Jan. 10 to Feb. 15, 1949.

REMARKS.--Records good except those for winter periods, which are poor.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Stage-discharge relation affected by ice Nov. 16 to Mar. 2; shifting-control method used May 29 to July 2)

1.2	13	2.5	210
1.4	29	3.0	325
1.7	68	3.5	475
2.0	118	4.0	655

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24	40	40	22	48	350	123	90	267	55	21	13
2	24	66	35	20	48	300	129	120	210	47	22	14
3	23	85	25	20	48	241	114	130	172	43	22	17
4	23	148	25	18	50	198	99	122	146	39	18	18
5	25	132	20	16	50	161	90	110	125	41	17	19
6	27	70	15	14	48	156	86	96	112	37	17	19
7	27	55	15	14	46	151	81	84	97	33	16	19
8	27	53	16	13	46	135	78	73	87	31	19	19
9	27	52	16	13	48	122	80	71	78	58	20	21
10	26	51	17	14	50	113	78	67	67	46	18	20
11	27	52	17	15	50	114	76	62	60	41	18	19
12	26	59	18	15	55	105	73	57	57	33	20	20
13	25	63	18	20	52	106	69	53	53	29	21	22
14	25	50	18	25	50	156	68	50	51	30	21	23
15	24	38	18	30	50	218	80	48	60	30	22	26
16	25	39	20	40	50	214	83	47	55	28	22	28
17	24	40	22	50	60	192	79	46	50	26	20	32
18	24	40	24	55	100	172	73	46	199	30	19	32
19	24	42	24	50	200	148	75	45	85	29	17	29
20	24	43	22	46	250	128	96	44	62	36	17	27
21	25	42	24	46	260	113	113	44	56	44	16	25
22	26	40	25	45	260	102	115	42	49	39	16	22
23	27	40	25	45	280	99	109	40	46	38	15	21
24	27	42	24	46	260	110	96	41	41	45	15	22
25	27	44	24	48	250	140	87	40	42	40	16	23
26	26	42	24	48	250	145	75	43	38	35	16	27
27	25	42	25	46	300	137	70	110	35	30	15	30
28	26	38	26	46	340	136	69	305	36	27	14	34
29	26	35	25	45	-----	138	66	515	35	26	13	52
30	32	36	24	46	-----	123	71	432	44	24	13	59
31	33	-----	22	46	-----	116	-----	341	-----	23	13	-----
TOTAL	801	1,619	693	1,017	3,599	4,839	2,601	3,414	2,515	1,113	549	752
MEAN	25.8	54.0	22.4	32.8	129	156	86.7	110	83.8	35.9	17.7	25.1
MAX	33	148	40	55	340	350	129	515	267	58	22	59
MIN	23	35	15	13	46	99	66	40	35	23	13	13
AC-FT	1,590	3,210	1,370	2,020	7,140	9,600	5,160	6,770	4,990	2,210	1,090	1,490

CAL YR 1972 TOTAL 19,571 MEAN 53.5 MAX 449 MIN 12 AC-FT 38,820
WTR YR 1973 TOTAL 23,512 MEAN 64.4 MAX 515 MIN 13 AC-FT 46,640

PEAK DISCHARGE (BASE, 250 CFS)

DATE	TIME	G.H.	DISCHARGE
3-1	-	-	380
5-29	1400	3.60	556
6-18	0330	2.80	305

MISSOURI RIVER MAIN STEM

06467000 Lewis and Clark Lake near Yankton, S. Dak.

LOCATION.--Lat 42°50'56", long 97°28'54", in SW¼ sec.7, T.33 N., R.1 W., Cedar County, Nebraska, in powerhouse of Gavins Point Dam on Missouri River, 3.75 mi (6.0 km) southwest of Yankton, 13.6 mi (21.9 km) upstream from James River, 32.5 mi (52.3 km) downstream from Niobrara River, and at mile 811.0 (1,304.9 km).

DRAINAGE AREA.--279,500 sq mi (723,900 sq km), approximately.

PERIOD OF RECORD.--July 1955 to current year. Prior to October 1955, published as Gavins Point Reservoir near Yankton.

GAGE.--Water-stage recorder. Datum of gage is at mean sea level. Prior to Dec. 9, 1955, recorder at temporary location on wall of intake structure unit 3.

EXTREMES.--Current year: Maximum contents, 477,000 acre-ft (588 cu hm) Sept. 13; maximum elevation, 1,208.6 ft (368.38 m) Sept. 14, affected by wind; minimum contents, 372,000 acre-ft (459 cu hm) Mar. 21, elevation, 1,204.8 ft (367.22 m).

Period of record: Maximum contents, 565,000 acre-ft (697 cu hm) Apr. 1, 1960, elevation, 1,210.7 ft (369.02 m), affected by wind; minimum since initial filling, 61,950 acre-ft (75.9 cu hm) Apr. 23, 1956, elevation, 1,188.1 ft (362.13 m).

REMARKS.--Reservoir is formed by earthfill dam; storage began in July 1955. Maximum capacity, 541,000 acre-ft (667 cu hm) below elevation 1,210.0 ft (368.81 m), top of spillway gates. Normal maximum, 477,000 acre-ft (588 cu hm) below elevation 1,208.0 ft (368.20 m). Inactive storage, 156,000 acre-ft (192 cu hm) below elevation 1,195.0 ft (364.24 m). Dead storage, 18,000 acre-ft (22.2 cu hm) below elevation 1,180.0 ft (359.66 m), crest of spillway. Figures given herein represent elevations at powerhouse and total contents adjusted for wind effect.

The spillway consists of 14 Taintor gates, each 40 ft (12.2 m) wide by 30 ft (9.1 m) high; spillway capacity, 280,000 cfs (7,930 cu m/s) at pool elevation 1,210.0 ft (368.81 m). Crest of spillway is at elevation 1,180 ft (359.66 m). Normal releases are through 3 power units, installation completed in January 1957; maximum release through power units is 35,000 cfs (991 cu m/s) at pool elevation, 1,210.0 ft (368.81 m). Water is used for flood control, navigation, power, and incidental uses.

COOPERATION.--Elevations and contents furnished by Corps of Engineers.

MONTHEND ELEVATION AND CONTENTS AT 2400 HOURS, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	1,208.4	472,000	-
Oct. 31.....	1,207.8	452,000	-20,000
Nov. 30.....	1,207.6	449,000	-3,000
Dec. 31.....	1,207.4	441,000	-8,000
CAL YR 1972.....	-	-	-1,000
Jan. 31.....	1,207.9	457,000	+16,000
Feb. 28.....	1,205.7	393,000	-64,000
Mar. 31.....	1,205.7	393,000	0
Apr. 30.....	1,205.4	386,000	-7,000
May 31.....	1,206.4	412,000	+26,000
June 30.....	1,205.7	395,000	-17,000
July 31.....	1,208.1	462,000	+67,000
Aug. 31.....	1,208.1	465,000	+3,000
Sept. 30.....	1,208.2	463,000	-2,000
WTR YR 1973.....	-	-	-9,000

MISSOURI RIVER MAIN STEM

97

06467500 Missouri River at Yankton, S. Dak.

LOCATION.--Lat 42°51'58", long 97°23'37", in SW¼SW¼ sec.18, T.93 N., R.55 W., Yankton County, near left bank in downstream end of left pier of Meridian Highway Bridge on U.S. Highway 81, 5.2 mi (8.4 km) downstream from Gavins Point Dam, 6.0 mi (9.7 km) upstream from James River, and at mile 805.8 (1,296.5 km).

DRAINAGE AREA.--279,500 sq mi (723,900 sq km), approximately.

PERIOD OF RECORD.--October 1930 to current year. Monthly discharge only for some periods, published in WSP 1309. Gage-height records collected at same site March 1873 to November 1886, March 1905 to May 1908 (fragmentary), August 1921 to date (except winter months prior to 1932), are contained in reports of the U.S. Weather Bureau.

GAGE.--Water-stage recorder. Datum of gage is 1,139.68 ft (347.374 m) above mean sea level. Prior to Sept. 20, 1932, nonrecording gage, and Sept. 20, 1932, to Mar. 9, 1967, water-stage recorder at present site and at datum 20.00 ft (6.096 m) higher.

AVERAGE DISCHARGE.--43 years, 25,520 cfs (722.7 cu m/s), 18,490,000 acre-ft/yr (22.8 cu km/yr).

EXTREMES.--Current year: Maximum discharge, 52,600 cfs (1,490 cu m/s) Oct. 1, gage height, 22.57 ft (6.879 m); minimum daily, 16,400 cfs (464 cu m/s) Dec. 19.
Period of record: Maximum discharge, 480,000 cfs (13,600 cu m/s) Apr. 13, 1952; maximum gage height, 35.5 ft (10.82 m) Apr. 13, 14, 1952; minimum daily discharge, 2,700 cfs (76.5 cu m/s) Nov. 15, 16, 1940. Maximum stage known, 50.5 ft Apr. 5, 1881 (ice jam), present datum.

REMARKS.--Records good. Flow completely regulated by Lewis and Clark Lake 5.2 mi (8.4 km) upstream since July 1955. (See station 06467000.) Many diversions for irrigation and water supply above station. Water-quality records for the water year 1973 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	50,300	50,600	36,800	20,200	20,800	20,000	17,900	28,600	28,300	30,000	29,900	33,700
2	49,700	50,500	36,700	20,300	20,800	20,000	17,500	28,700	28,700	30,000	29,800	33,800
3	50,400	50,500	35,200	20,300	20,900	20,000	17,400	28,700	28,700	30,100	29,900	33,000
4	50,300	50,600	32,400	20,300	20,800	20,000	17,300	28,800	28,400	29,900	29,900	32,400
5	50,600	50,700	29,300	20,300	20,700	17,500	17,200	28,800	28,400	29,900	29,800	32,600
6	50,300	50,800	26,000	20,400	20,700	18,500	19,600	28,700	28,600	29,800	30,700	32,600
7	50,200	50,900	24,000	20,400	20,700	20,000	19,800	28,700	30,100	30,000	31,800	32,600
8	50,400	51,100	20,400	20,400	20,600	20,000	20,300	28,000	30,300	30,000	32,100	32,700
9	50,300	51,100	20,200	20,400	20,600	19,900	20,900	24,600	30,200	30,000	31,700	31,900
10	50,300	51,200	20,200	20,500	20,500	20,600	21,000	23,500	30,200	29,000	31,900	31,700
11	50,400	51,200	20,100	20,500	20,500	20,600	21,400	25,200	30,300	28,900	31,900	31,900
12	50,700	51,100	20,100	20,600	20,400	20,800	22,400	27,900	30,200	29,000	32,000	31,900
13	50,400	51,000	20,100	20,600	20,300	21,000	22,300	29,800	30,200	29,700	32,100	31,900
14	50,300	51,100	20,100	20,600	20,300	21,000	22,700	30,000	30,300	30,600	32,900	31,900
15	50,400	51,100	20,100	20,700	20,200	20,600	23,600	30,100	30,300	30,900	32,700	31,500
16	50,400	50,900	20,100	20,700	20,200	20,700	23,500	30,000	29,900	30,800	31,500	31,400
17	50,100	50,800	19,300	21,000	20,200	20,700	22,000	30,000	29,800	31,700	31,500	31,400
18	50,300	50,700	16,600	20,800	20,200	21,000	22,400	30,100	30,000	31,700	32,400	31,400
19	50,500	50,500	16,400	20,800	20,000	20,900	23,000	30,200	28,200	31,900	32,500	31,400
20	50,300	48,600	18,300	20,900	20,000	21,000	23,800	30,200	27,600	31,500	32,700	31,400
21	50,300	46,000	20,500	20,800	20,100	21,100	25,400	30,200	27,700	30,700	32,700	31,300
22	50,200	43,100	20,600	20,600	19,800	21,300	24,800	30,100	29,200	30,600	32,800	31,400
23	50,400	40,300	20,500	21,100	20,000	21,100	25,200	30,200	29,300	29,900	32,200	31,500
24	50,500	37,400	20,500	20,800	20,500	21,200	25,300	30,100	29,200	29,600	31,300	31,500
25	50,400	37,000	20,400	21,000	20,100	20,800	27,000	30,300	29,000	29,700	31,300	31,400
26	50,300	37,000	20,400	20,900	20,000	20,600	29,100	31,400	29,900	29,600	31,300	28,000
27	50,300	36,900	20,400	20,900	19,800	19,600	29,400	28,900	29,800	29,800	32,100	27,400
28	50,300	36,900	20,600	21,000	20,000	18,200	29,300	23,700	29,800	29,900	32,600	31,200
29	50,400	36,800	20,400	21,000	-----	18,100	29,200	23,700	29,800	29,900	32,600	31,200
30	50,600	36,800	20,200	21,000	-----	18,000	29,300	23,800	29,900	29,900	33,500	31,100
31	50,500	-----	20,200	20,900	-----	18,400	-----	25,000	-----	29,700	33,800	-----
TOTAL	1,560.8M	1,403.2M	697,100	640,700	569,700	623,200	690,000	878,000	882,300	934,600	986,000	949,100
MEAN	50,350	46,770	22,490	20,670	20,350	20,100	23,000	28,320	29,410	30,150	31,810	31,640
MAX	50,700	51,200	36,800	21,100	20,900	21,300	29,400	31,400	30,300	31,900	33,800	33,800
MIN	49,700	36,800	16,400	20,200	19,800	17,500	17,200	23,500	27,600	28,900	29,800	27,400
AC-FT	3,096M	2,783M	1,383M	1,271M	1,130M	1,236M	1,369M	1,742M	1,750M	1,854M	1,956M	1,883M
CAL YR 1972	TOTAL 13,677,900			MEAN 37,370	MAX 51,200	MIN 16,400	AC-FT 27,130,000					
WTR YR 1973	TOTAL 10,814,700			MEAN 29,630	MAX 51,200	MIN 16,400	AC-FT 21,450,000					

JAMES RIVER BASIN

06469000 Jamestown Reservoir near Jamestown, N. Dak.

LOCATION.--Lat 46°55'50", long 98°42'23", in SE¼NW¼ sec.24, T.140 N., R.64 W., Stutsman County, North Dakota, on left bank in control house below Jamestown Dam on James River, 1.7 mi (2.7 km) north of Jamestown Post Office, and 3.3 mi (5.3 km) upstream from Pipestem Creek.

DRAINAGE AREA.--1,760 sq mi (4,560 sq km), approximately, of which about 1,010 sq mi (2,620 sq km) is probably noncontributing.

PERIOD OF RECORD.--November 1953 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,400.00 ft (426.720 m) above mean sea level; gage readings have been reduced to elevations above mean sea level. June 22, 1959, to June 3, 1971, at site 0.2 mi (0.3 km) upstream at same datum. Prior to June 22, 1959, nonrecording gages at different locations.

EXTREMES.--Current year: Maximum contents, 29,870 acre-ft (36.8 cu hm) Apr. 7, elevation, 1,430.25 ft (435.940 m); minimum, 24,280 acre-ft (29.9 cu hm) Sept. 20, 21, elevation, 1,427.40 ft (435.072 m).
Period of record: Maximum contents, 103,100 acre-ft (127 cu hm) May 1, 1969, elevation, 1,443.60 ft (440.009 m).

REMARKS.--Reservoir is formed by earth-fill dam, completed Oct. 1, 1953. Closure made May 7, 1953, and filling of dead storage started. Gates initially closed Feb. 8, 1954. Usable capacity, 229,470 acre-ft (283 cu hm) between elevations 1,400 ft (426.720 m), sill of outlet and 1,454 ft (443.179 m), crest of spillway. Dead storage below elevation 1,400 ft (426.720 m), 820 acre-ft (1.01 cu hm). Maximum design pool, 389,000 acre-ft (480 cu hm), elevation, 1,464.6 ft (446.410 m). Figures given herein represent total contents based on capacity table dated Oct. 1, 1965. Reservoir is used for flood control and municipal supply. Records of chemical analyses for the water year 1973 are published in Part 2 of the North Dakota report.

MONTHEND ELEVATION AND CONTENTS AT 2400 HOURS, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	1,430.20	29,760	-
Oct. 31.....	1,429.36	28,010	-1,750
Nov. 30.....	1,429.25	27,780	-230
Dec. 31.....	1,429.27	27,830	+50
CAL YR 1972.....	-	-	-360
Jan. 31.....	1,429.18	27,640	-190
Feb. 28.....	1,429.20	27,680	+40
Mar. 31.....	1,430.13	29,600	+1,920
Apr. 30.....	1,430.19	29,740	+140
May 31.....	1,429.84	28,990	-750
June 30.....	1,429.46	28,220	-770
July 31.....	1,428.54	26,390	-1,830
Aug. 31.....	1,427.85	25,090	-1,300
Sept. 30.....	1,427.87	25,120	+30
WTR YR 1973.....	-	-	-4,660

JAMES RIVER BASIN

99

06470500 James River at La Moure, N. Dak.

LOCATION.--Lat 46°21'20", long 98°18'15", at northeast corner of sec.11, T.133 N., R.61 W., La Moure County, North Dakota, on left bank 80 ft (24 m) downstream from bridge on State Highway 13, 0.5 mi (0.8 km) west of La Moure, and 12 mi (19 km) upstream from Cottonwood Creek.

DRAINAGE AREA.--4,390 sq mi (11,370 sq km), approximately, of which about 2,600 sq mi (6,730 sq km) is probably noncontributing.

PERIOD OF RECORD.--April to July 1903 (gage-height record only), April 1950 to current year. Gage-height records for 1902-11 are contained in reports of the U.S. Weather Bureau.

GAGE.--Water-stage recorder and rubble-masonry control. Datum of gage is 1,290.00 ft (393.192 m) above mean sea level. See WSP 1729 or 1917 for history of changes prior to Apr. 19, 1950.

AVERAGE DISCHARGE.--23 years (1950-73), 82.1 cfs (2.325 cu m/s), 59,480 acre-ft/yr (73.34 cu hm/yr); median of yearly mean discharges, 53 cfs (1.50 cu m/s), 38,400 acre-ft/yr (47.3 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 286 cfs (8.10 cu m/s), gage height, 7.99 ft (2.435 m); no flow June 9, 13, 14, 18, 27, July 1, 5-9, 11-29; minimum gage height, 6.70 ft (2.042 m) July 16, caused by wind. Period of record: Maximum discharge, 6,800 cfs (193 cu m/s) Apr. 14, 1969, gage height, 16.7 ft (4.929 m); no flow at times. Prior to flood of Apr. 14, 1969, a long-time resident said that the flood of May 16, 1950, was the highest since 1881, with stage in either 1942 or 1943 being almost as high owing to large ice jams.

REMARKS.--Records good. Flow regulated by Arrowwood and Jim Lakes, and Jamestown Reservoir with combined capacity of 246,000 acre-ft (303 cu hm), the largest of which is Jamestown Reservoir 85 mi (137 km) upstream. (See station 06469000.) Records of chemical analyses and water temperatures for the water year 1973 are published in Part 2 of the North Dakota report.

REVISIONS.--WSP 1917: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	50	15	14	14	16	13	56	27	9.3	4.8	9.0	4.7
2	50	16	14	14	16	13	54	19	12	6.2	9.4	5.1
3	47	13	12	15	18	16	47	14	17	4.4	7.6	2.1
4	47	14	11	14	18	20	33	9.8	13	3.8	7.6	11
5	54	14	11	14	16	23	40	24	9.9	1.5	7.0	15
6	43	21	12	12	16	26	39	19	8.2	3.2	9.3	11
7	54	11	12	12	16	29	37	16	6.6	6.2	12	7.0
8	52	11	11	12	15	33	29	17	12	.28	12	8.0
9	45	17	11	11	15	38	35	25	7.0	.72	11	8.2
10	60	14	11	12	14	43	24	22	12	.95	9.4	9.6
11	60	15	11	11	14	48	38	19	7.0	.89	8.7	4.1
12	45	13	11	11	14	54	19	13	5.1	1.3	8.7	2.7
13	57	22	11	12	14	57	19	13	2.8	1.8	7.6	4.4
14	57	14	11	14	12	83	32	10	3.4	.22	5.7	5.2
15	47	12	11	12	12	94	31	16	6.4	0	11	4.6
16	54	12	11	12	11	90	19	14	11	.01	8.1	2.3
17	27	12	10	11	11	90	24	6.5	4.2	0	6.9	3.3
18	27	12	11	14	11	149	17	13	2.3	.05	9.7	2.7
19	21	12	11	14	11	260	21	10	8.9	0	13	4.4
20	31	12	12	14	11	276	27	7.9	9.1	0	5.8	1.6
21	34	12	12	14	11	234	43	13	7.4	0	7.8	6.4
22	34	12	12	15	11	198	29	10	12	0	9.8	6.0
23	29	12	14	14	12	184	25	10	8.6	0	6.7	1.9
24	31	13	14	14	12	167	28	17	7.8	.02	8.2	20
25	25	14	14	15	12	130	26	11	12	.33	27	35
26	27	13	14	16	11	97	26	11	14	.73	18	88
27	29	13	14	16	11	111	21	17	4.3	.15	8.9	81
28	12	12	15	16	12	105	18	14	3.9	0	10	82
29	15	12	16	16	-----	76	28	13	2.7	7.2	4.6	83
30	23	13	16	16	-----	63	25	14	3.2	7.6	3.6	66
31	14	-----	16	16	-----	58	-----	11	-----	7.6	2.9	-----
TOTAL	1,201	408	386	423	373	2,878	910	456.2	243.1	59.95	287.0	586.3
MEAN	38.7	13.6	12.5	13.6	13.3	92.8	30.3	14.7	8.10	1.93	9.26	19.5
MAX	60	22	16	16	18	276	56	27	17	7.6	27	88
MIN	12	11	10	11	11	13	17	6.5	2.3	0	2.9	1.6
AC-FT	2,380	809	766	839	740	5,710	1,800	905	482	119	569	1,160
CAL YR 1972	TOTAL	30,294.00	MEAN	82.8	MAX	1,850	MIN	10	AC-FT	60,090		
WTR YR 1973	TOTAL	8,211.55	MEAN	22.5	MAX	276	MIN	0	AC-FT	16,290		

JAMES RIVER BASIN

06471000 James River at Columbia, S. Dak.

LOCATION.--Lat 45°37'05", long 98°19'30", in NE¼NW¼ sec.29, T.125 N., R.62 W., Brown County, on left bank 10 ft (3 m) downstream from highway bridge, 0.8 mi (1.3 km) northwest of Columbia, 2.4 mi (3.9 km) upstream from Chicago and North Western Transportation Co. bridge, 3.6 mi (5.8 km) upstream from Elm River, and 9.4 mi (15.1 km) downstream from Columbia Road Dam.

DRAINAGE AREA.--7,050 sq mi (18,300 sq km), approximately.

PERIOD OF RECORD.--October 1945 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,275.01 ft (388.623 m) above mean sea level. Prior to Oct. 5, 1957, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--28 years, 103 cfs (2.917 cu m/s), 74,620 acre-ft/yr (92.0 cu hm/yr).

EXTREMES.--Current year: Maximum daily discharge, 80 cfs (2.27 cu m/s) Nov. 18; maximum gage height, 7.00 ft (2.134 m) Nov. 27, backwater from ice; no flow for many days.

Period of record: Maximum discharge, 5,420 cfs (153 cu m/s) May 24, 25, 1950, gage height, 16.89 ft (5.148 m), from graph based on gage readings; maximum gage height, 17.09 ft (5.209 m) Apr. 22, 1969; maximum daily reverse flow, 1,860 cfs (52.7 cu m/s) Apr. 8, 1952, backwater from Elm River.

REMARKS.--Records fair. Flow regulated by Arrowwood and Jim Lakes, and Jamestown Reservoir, combined capacity, 246,000 acre-ft (303 cu hm). Regulation by Jamestown Reservoir, capacity, 229,470 acre-ft (283 cu hm), 168 mi (270 km) upstream, since May 1953. Water-quality records for the water year 1973 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.86	62	15	2.0		0	1.4	.77	2.6	.40	.40	
2	.77	59	10	1.0		0	1.4	2.5	2.3	.70	.40	
3	.68	58	9.0	.50		0	1.3	3.0	2.8	1.0	.52	
4	.38	58	8.0	0		0	1.2	2.5	2.8	1.5	.68	
5	.68	58	7.0	0		0	.95	1.6	3.0	2.0	.77	
6	1.2	59	6.0	0		10	1.1	1.2	3.6	3.0	.60	
7	1.1	60	6.0	0		18	1.2	.68	3.7	3.0	.38	
8	.77	61	6.0	0		20	1.2	.25	5.8	3.5	.52	
9	.45	61	6.5	0		20	.95	.04	8.9	3.0	.45	
10	.45	61	6.5	0		21	.95	.04	9.7	3.0	.25	
11	.68	61	6.5	0		21	.95	.09	8.7	2.5	0	
12	.52	57	7.0	0		21	.95	.25	8.0	2.5	0	
13	.52	34	7.0	0		20	.86	.45	8.0	2.0	.19	
14	1.7	57	7.0	0		18	.60	.52	17	2.0	.19	
15	30	70	7.0	0		5.6	.68	.38	16	1.5	.52	
16	40	75	7.5	0		.09	.86	.09	5.4	1.5	.31	
17	43	78	7.5	0		0	.68	0	2.5	1.0	0	
18	45	80	7.5	0		0	.68	0	3.4	1.0	0	
19	45	78	8.0	0		0	.60	0	2.8	.90	0	
20	45	75	8.0	0		0	2.3	0	1.9	.80	0	
21	45	75	8.0	0		0	2.3	0	1.4	.80	0	
22	46	79	7.5	0		0	1.7	0	1.4	.70	0	
23	47	79	7.5	0		0	1.4	.19	1.4	.70	0	
24	48	76	7.5	0		.52	1.4	1.4	1.3	.60	0	
25	48	78	7.0	0		1.9	1.7	4.3	1.2	.60	0	
26	49	68	7.0	0		1.7	1.6	3.9	1.1	.60	0	
27	62	60	6.5	0		1.6	1.4	4.1	1.0	.50	0	
28	69	50	6.5	0		1.6	1.2	5.0	.80	.50	0	
29	73	35	6.0	0	-----	1.5	.86	4.3	.60	.50	0	
30	75	25	4.0	0	-----	1.4	.68	4.5	.50	.40	0	
31	71	-----	3.0	0	-----	1.4	-----	3.7	-----	.40	0	-----
TOTAL	891.76	1,887	223.5	3.50	0	186.31	35.05	45.75	129.60	43.10	6.18	0
MEAN	28.8	62.9	7.21	.11	0	6.01	1.17	1.48	4.32	1.39	.20	0
MAX	75	80	15	2.0	0	21	2.3	5.0	17	3.5	.77	0
MIN	.38	25	3.0	0	0	0	.60	0	.50	.40	0	0
AC-FT	1,770	3,740	443	6.9	0	370	70	91	257	85	12	0
CAL YR 1972	TOTAL	38,415.61	MEAN	105	MAX	705	MIN	-1,180	AC-FT	76,200		
WTR YR 1973	TOTAL	3,451.75	MEAN	9.4	MAX	80	MIN	0	AC-FT	6,850		

JAMES RIVER BASIN

101

06471200 Maple River at North Dakota-South Dakota State line

LOCATION.--Lat 45°56'20", long 98°27'08", in SW¼SE¼ sec.33, T.129 N., R.62 W., Dickey County, N. Dak., on left bank 0.4 mi (0.6 km) upstream from State line, 7.8 mi (12.6 km) northeast of Frederick, S. Dak. and 15.7 mi (25.3 km) upstream from mouth.

DRAINAGE AREA.--750 sq mi (1,940 sq km), approximately, of which about 270 sq mi (699 sq km) is probably noncontributing.

PERIOD OF RECORD.--June 1956 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 1,365 ft (416 m), from topographic map. Prior to June 14, 1962, nonrecording gage at site 0.4 mi (0.6 km) downstream at datum 0.94 ft (0.286 m) lower.

AVERAGE DISCHARGE.--17 years, 18.8 cfs (0.532 cu m/s), 13,620 acre-ft/yr (16.8 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 131 cfs (3.71 cu m/s), Sept. 28, gage height, 5.19 ft (1.582 m); maximum gage height, 5.79 ft (1.765 m) Feb. 18, backwater from ice; no flow for many days.
Period of record: Maximum discharge, 5,930 cfs (168 cu m/s) Apr. 11, 1969, gage height, 15.22 ft (4.639 m); maximum gage height, 16.05 ft (4.892 m) Apr. 11, 1969, backwater from ice; no flow for long periods in each year.

REMARKS.--Records good exc

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Stage-discharge relation affected by ice Feb. 18 to Mar. 28)

2.92	0	3.3	3.1	4.0	26
3.0	.14	3.4	4.9	4.5	59
3.1	.70	3.7	13	5.0	114
3.2	1.7				

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1					0	.22	6.7	1.6		.79		0
2					0	.21	6.1	1.1		2.6		0
3					0	.21	5.8	.70		1.2		0
4					0	.20	4.3	.49		.63		0
5					0	.20	3.1	.49		.22		0
6					0	.18	3.4	.70		.09		0
7					0	.16	3.4	.70		.09		0
8					0	.14	3.1	.70		0		0
9					0	.10	3.4	.70		0		0
10					0	.05	2.6	.78		0		0
11					0	0	3.1	.63		0		0
12					0	0	2.2	.49		0		0
13					0	0	1.8	.37		0		0
14					0	0	2.1	.14		0		0
15					0	0	2.9	.11		0		0
16					0	.05	2.1	.11		0		0
17					0	.10	2.2	.02		0		0
18					.10	.25	2.1	.01		0		0
19					.25	.50	1.8	.01		0		0
20					.25	1.0	1.9	0		0		0
21					.22	2.0	2.3	0		0		0
22					.22	3.5	2.1	.02		0		0
23					.20	5.0	2.2	.01		0		0
24					.20	9.0	2.2	.27		0		0
25					.20	12	2.1	.27		0		0
26					.21	12	2.1	.22		0		0
27					.21	11	1.6	.32		0		0
28					.22	11	1.2	.14		0		71
29					-----	9.6	1.2	.09		0		109
30					-----	8.6	1.5	.02		0		64
31		-----			-----	7.2	-----	0	-----	0		-----
TOTAL	0	0	0	0	2.28	94.47	82.6	11.21	0	5.62	0	244
MEAN	0	0	0	0	.081	3.05	2.75	.36	0	.18	0	8.13
MAX	0	0	0	0	.25	12	6.7	1.6	0	2.6	0	109
MIN	0	0	0	0	0	0	1.2	0	0	0	0	0
AC=FT	0	0	0	0	4.5	187	164	22	0	11	0	484
CAL YR 1972	TOTAL	9,759.16	MEAN	26.7	MAX	2,000	MIN	0	AC=FT	19,360		
WTR YR 1973	TOTAL	440.18	MEAN	1.21	MAX	109	MIN	0	AC=FT	873		

PEAK DISCHARGE (BASE, 50 CFS).--Sept. 28 (2000) 131 cfs (5.19 ft).

JAMES RIVER BASIN

06471500 Elm River at Westport, S. Dak.

LOCATION.--Lat 45°39'22", long 98°29'48", in SW¼NW¼ sec.12, T.125 N., R.64 W., Brown County, on right bank 12 ft (3.7 m) downstream from highway bridge, 0.5 mi (0.8 km) north of Westport, 0.7 mi (1.1 km) upstream from Chicago, Milwaukee, St. Paul and Pacific Railroad bridge, 9.3 mi (15.0 km) downstream from Willow Creek, and 30.4 mi (48.9 km) upstream from mouth.

DRAINAGE AREA.--1,680 sq mi (4,350 sq km), approximately.

PERIOD OF RECORD.--October 1945 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,309.3 ft (399.07 m) above mean sea level. Prior to Aug. 6, 1951, and Apr. 8 to Sept. 9, 1952, nonrecording gage 12 ft (3.7 m) upstream at same datum. Aug. 6, 1951, to Apr. 7, 1952, water-stage recorder at present site and datum.

AVERAGE DISCHARGE.--28 years, 47.1 cfs (1.334 cu m/s), 34,120 acre-ft/yr (42.1 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 24 cfs (0.68 cu m/s) July 1, gage height, 4.77 ft (1.454 m); maximum gage height, 4.79 ft (1.460 m) Mar. 26; minimum daily discharge, 1.3 cfs (0.037 cu m/s) Dec. 31, Jan. 8, 9, Sept. 29, 30.

Period of record: Maximum discharge, 12,600 cfs (357 cu m/s) Apr. 10, 1969, gage height, 22.11 ft (6.739 m); no flow for many days in years prior to 1960.

REMARKS.--Records good. Flow regulated for Aberdeen municipal water supply by Elm Lake and other small reservoirs upstream, combined capacity, about 16,000 acre-ft (19.7 cu hm).

Rating table (gage height, in feet, and discharge, in cubic feet per second)

4.2	0.78	4.5	7.6
4.3	2.0	4.6	12
4.4	4.2	4.8	24

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.2	4.9	4.6	5.2	2.4	6.1	15	3.8	8.4	11	5.2	16
2	7.2	5.2	4.6	3.8	2.4	7.6	13	3.5	8.8	9.6	8.8	15
3	7.2	5.2	4.3	3.5	2.6	8.0	11	3.0	9.6	8.0	8.8	17
4	7.2	5.2	4.6	2.6	2.6	8.4	9.2	2.4	9.2	9.6	8.8	17
5	8.0	5.2	4.6	2.2	2.2	8.8	9.6	2.8	9.2	10	8.8	10
6	8.4	5.2	4.6	1.7	2.2	12	8.8	2.8	9.2	10	7.2	4.0
7	7.6	4.9	4.6	1.4	2.0	13	7.2	2.8	8.4	9.6	4.9	4.0
8	7.6	4.9	4.9	1.3	1.9	12	6.1	2.8	8.4	9.2	5.2	4.9
9	7.2	4.6	4.9	1.3	1.9	10	7.2	2.8	8.0	9.2	4.6	4.9
10	8.0	4.6	4.6	1.7	1.9	10	5.8	2.8	8.0	8.8	6.4	4.6
11	7.6	4.6	4.6	2.0	1.9	11	6.8	3.0	7.6	8.8	13	3.3
12	7.2	4.6	4.6	2.6	2.0	11	4.0	2.8	7.2	8.8	13	3.3
13	7.2	5.8	4.6	3.3	2.6	9.6	4.0	2.4	7.6	9.2	12	4.6
14	6.8	4.6	4.6	3.3	1.9	13	4.0	2.2	8.0	9.6	12	9.2
15	6.5	4.6	4.3	2.8	1.7	14	5.5	3.5	8.0	10	12	9.6
16	6.5	4.9	4.3	2.6	1.4	14	3.8	3.3	7.6	10	12	9.6
17	5.5	4.9	4.6	2.4	1.4	14	3.0	3.5	7.6	10	11	9.2
18	5.2	4.9	4.6	2.4	2.0	14	4.0	3.5	8.4	10	11	8.8
19	5.2	4.9	4.9	2.4	2.2	14	4.6	3.5	7.6	5.5	10	9.2
20	5.5	4.9	4.6	2.0	2.2	12	6.1	3.3	7.2	5.2	9.2	9.2
21	5.2	4.6	4.3	2.2	2.2	9.6	5.8	3.5	6.8	5.2	6.5	11
22	5.2	4.6	4.3	2.4	3.5	8.8	4.6	3.5	6.8	4.9	6.5	8.8
23	5.2	4.6	3.8	2.2	4.3	8.4	4.0	8.0	6.8	5.2	6.1	7.6
24	5.2	4.6	3.5	2.2	4.3	10	5.8	8.8	7.2	5.2	5.8	12
25	5.5	4.6	3.8	2.2	5.8	17	6.1	8.4	6.8	5.2	5.5	8.4
26	5.5	4.3	3.8	2.4	4.3	22	5.8	8.4	6.8	4.9	5.8	8.0
27	5.2	4.6	3.8	2.6	3.8	22	5.5	8.8	6.8	4.3	9.2	4.0
28	4.9	4.6	2.6	2.2	4.3	20	4.9	8.0	7.2	4.3	17	2.0
29	5.2	4.6	2.6	2.0	-----	20	4.9	8.0	8.4	4.6	16	1.3
30	5.2	4.6	3.0	2.0	-----	19	4.6	8.0	8.8	4.6	16	1.3
31	4.9	-----	1.3	2.4	-----	16	-----	8.4	-----	4.6	16	-----
TOTAL	196.0	144.3	128.8	75.3	73.9	395.3	190.7	142.3	236.4	235.1	294.3	237.8
MEAN	6.32	4.81	4.15	2.43	2.64	12.8	6.36	4.59	7.88	7.58	9.49	7.93
MAX	8.4	5.8	4.9	5.2	5.8	22	15	8.8	9.6	11	17	17
MIN	4.9	4.3	1.3	1.3	1.4	6.1	3.0	2.2	6.8	4.3	4.6	1.3
AC=FT	389	286	255	149	147	784	378	282	469	466	584	472

CAL YR 1972 TOTAL 23,186.9 MEAN 63.4 MAX 3,500 MIN 1.2 AC=FT 45,990
WTR YR 1973 TOTAL 2,350.2 MEAN 6.44 MAX 22. MIN 1.3 AC=FT 4,660

PEAK DISCHARGE (BASE, 100 CFS).--No peaks above base.

JAMES RIVER BASIN

103

06473000 James River at Ashton, S. Dak.

LOCATION.--Lat 45°00'02", long 98°28'57", in SE¼SW¼ sec.25, T.118 N., R.64 W., Spink County, on right bank 900 ft (274 m) upstream from highway bridge, 0.9 mi (1.4 km) east of Ashton, 6.3 mi (10.0 km) upstream from Snake Creek, and 14.4 mi (23.2 km) upstream from Turtle Creek.

DRAINAGE AREA.--11,000 sq mi (28,500 sq km), approximately.

PERIOD OF RECORD.--October 1945 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,244.4 ft (379.29 m) above mean sea level. Prior to Nov. 26, 1957, nonrecording gage at site 900 ft (274 m) downstream at same datum.

AVERAGE DISCHARGE.--28 years, 154 cfs (4.361 cu m/s), 111,600 acre-ft/yr (138 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 130 cfs (3.68 cu m/s) Mar. 17; maximum gage height, 5.22 ft (1.591 m) Mar. 17, backwater from ice; no flow for many days.

Period of record: Maximum discharge, 5,680 cfs (161 cu m/s) Apr. 24, 1969, gage height, 20.63 ft (6.288 m); maximum gage height, 21.17 ft (6.453 m) Apr. 13, 1969, backwater from Snake Creek; maximum daily reverse flow, 2,100 cfs (59.5 cu m/s) Apr. 9, 1969, backwater from Snake Creek.

REMARKS.--Records good except those for winter periods or period of backwater from Snake Creek, which are poor. Flow regulated by Arrowwood and Jim Lakes, and Jamestown Reservoir, combined capacity, 246,000 acre-ft (303 cu hm), the largest of which is Jamestown Reservoir, capacity, 229,470 acre-ft (283 cu hm), 285 mi (459 km) upstream. Occasional backwater and reverse flow caused by Snake Creek during most years.

REVISIONS (WATER YEARS).--WSP 1209: 1947.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	54	32	12	4.0	12	64	25	9.4	.60		
2	11	58	29	9.0	4.5	15	62	23	9.1	.75		
3	10	59	26	7.0	4.5	17	60	23	10	.45		
4	11	64	23	5.0	4.0	20	59	22	11	.30		
5	10	71	21	4.5	4.0	25	58	20	11	.30		
6	10	75	20	4.0	4.0	30	57	19	10	.30		
7	9.0	77	20	4.0	3.5	35	56	19	9.6	.15		
8	8.0	79	21	4.0	3.5	45	56	18	8.8	.15		
9	8.0	78	21	4.0	3.0	50	55	16	7.8	.15		
10	9.0	77	23	4.5	2.0	60	53	14	6.9	.15		
11	6.0	76	23	5.0	2.0	70	51	13	5.6	0		
12	6.5	75	25	5.5	2.0	75	49	13	4.6	0		
13	5.0	70	25	5.5	2.0	80	46	13	3.8	0		
14	4.5	48	27	5.5	2.5	85	44	12	2.7	0		
15	4.5	55	27	6.0	2.0	90	42	12	2.2	0		
16	4.0	60	27	6.5	2.0	90	40	11	1.7	0		
17	4.1	60	28	7.0	2.0	95	37	10	1.7	0		
18	4.1	61	28	7.0	2.0	90	36	9.9	1.4	0		
19	3.8	62	28	6.5	2.0	85	34	9.9	1.2	0		
20	4.1	64	28	6.0	2.5	81	31	9.1	1.2	0		
21	3.8	64	27	5.5	2.5	83	29	7.2	1.1	0		
22	3.6	62	27	5.0	2.5	86	29	7.5	1.1	0		
23	3.4	60	25	5.0	2.5	86	29	7.2	.90	0		
24	3.4	55	25	5.0	3.0	86	28	6.9	.90	0		
25	3.8	55	23	4.5	3.5	82	28	7.5	.90	0		
26	4.3	52	23	4.5	5.0	79	27	7.8	.75	0		
27	4.1	52	22	4.0	8.0	76	27	8.6	.75	0		
28	4.1	50	21	4.0	10	73	26	6.7	.75	0		
29	12	45	20	4.0	-----	71	26	8.6	.60	0		
30	35	35	18	4.0	-----	68	25	9.9	.60	0		
31	49	-----	15	4.0	-----	66	-----	9.9	-----	0		
TOTAL	271.1	1,853	748	168.0	95.0	2,006	1,264	399.7	128.05	3.30	0	0
MEAN	8.75	61.8	24.1	5.42	3.39	64.7	42.1	12.9	4.27	.11	0	0
MAX	4.9	79	32	12	10	95	64	25	11	.75	0	0
MIN	3.4	35	15	4.0	2.0	12	25	6.7	.60	0	0	0
AC-FT	538	3,680	1,480	333	188	3,980	2,510	793	254	6.5	0	0
CAL YR 1972	TOTAL	74,084.10		MEAN	202	MAX	797	MIN	3.4	AC-FT	146,900	
WTR YR 1973	TOTAL	6,936.15		MEAN	19.0	MAX	95	MIN	0	AC-FT	13,760	

JAMES RIVER BASIN

06473750 Wolf Creek near Ree Heights, S. Dak.

LOCATION.--Lat 44°36'25", long 99°13'54", in SW¼SW¼ sec.11, T.113 N., R.70 W., Hand County, near right bank on downstream side of highway bridge, 0.3 mi (0.5 m) downstream from small left-bank tributary, 6.5 mi (10.5 km) north of Ree Heights, and 13.8 mi (22.2 km) upstream from Lake Louise dam.

DRAINAGE AREA.--265 sq mi (686 sq km), approximately.

PERIOD OF RECORD.--September 1959 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,614.16 ft (491.996 m) above mean sea level.

AVERAGE DISCHARGE.--14 years, 5.00 cfs (0.142 cu m/s), 3,620 acre-ft/yr (4.46 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 22 cfs (0.62 cu m/s) Mar. 21, gage height, 6.11 ft (1.862 m);

maximum gage height, 6.17 ft (1.881 m) Mar. 7; no flow for many days.

Period of record: Maximum discharge, 990 cfs (28.0 cu m/s) Apr. 5, 1969, gage height, 9.33 ft (2.844 m);

maximum gage height, 9.57 ft (2.917 m) Mar. 14, 1966, backwater from ice; no flow for many days each year.

REMARKS.--Records fair. Flow regulated by small reservoir 0.5 mi (0.8 km) upstream, capacity, about 1,100 acre-ft (1.36 cu hm).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1					0	12	.96					
2					0	10	.63					
3					0	10	.39					
4					0	11	.26					
5					0	13	.14					
6					0	15	.07					
7					0	17	.06					
8					0	15	.05					
9					0	13	.04					
10					0	9.1	.03					
11					0	7.8	.02					
12					0	7.8	.02					
13					0	5.8	.01					
14					0	12	.01					
15					0	18	.02					
16					0	16	.01					
17					0	11	0					
18					0	5.8	0					
19					0	3.8	.14					
20					0	13	.03					
21					0	22	.03					
22					0	16	.02					
23					.10	10	0					
24					.20	10	.01					
25					1.0	12	.02					
26					3.0	11	.01					
27					7.0	7.1	0					
28					10	4.7	0					
29					-----	2.8	0					
30					-----	1.8	0					
31		-----			-----	1.3	-----		-----			-----
TOTAL	0	0	0	0	21.30	324.8	2.98	0	0	0	0	0
MEAN	0	0	0	0	.76	10.5	.099	0	0	0	0	0
MAX	0	0	0	0	10	22	.96	0	0	0	0	0
MIN	0	0	0	0	0	1.3	0	0	0	0	0	0
AC-FT	0	0	0	0	42	644	5.9	0	0	0	0	0

CAL YR 1972 TOTAL 3,113.90 MEAN 8.51 MAX 191 MIN 0 AC-FT 6,180
 WTR YR 1973 TOTAL 349.08 MEAN .96 MAX 22 MIN 0 AC-FT 692

PEAK DISCHARGE (BASE, 40 CFS).--No peaks above base.

JAMES RIVER BASIN

105

06474000 Turtle Creek near Tulare, S. Dak.

LOCATION.--Lat 44°44'06", long 98°35'09", in SE¼SE¼ sec.25, T.115 N., R.65 W., Spink County, on left bank at downstream side of highway bridge, 3.9 mi (6.3 km) west of Tulare and 8.9 mi (14.3 km) downstream from Wolf Creek.

DRAINAGE AREA.--1,120 sq mi (2,900 sq km), approximately.

PERIOD OF RECORD.--August 1953 to September 1956, September 1965 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 1,300 ft (396 m), by barometer. Prior to Oct. 6, 1965, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--11 years, 17.3 cfs (0.490 cu m/s), 12,530 acre-ft/yr (15.4 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 610 cfs (17.3 cu m/s) Mar. 2; maximum gage height, 10.35 ft (3.155 m) Mar. 2, backwater from ice; no flow for many days.
Period of record: Maximum discharge, about 6,000 cfs (170 cu m/s) Apr. 5, 1969; maximum gage height, 18.51 ft (5.642 m) Apr. 5, 1969, backwater from ice; no flow for many days each year.

REMARKS.--Records good except those for winter periods, which are poor.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0	.02	.68	.50	.90	50	32	2.0	.24	.05		
2	0	.06	.60	.55	.90	200	32	2.0	.23	.06		
3	0	.08	.50	.55	.90	550	29	1.6	.24	.06		
4	0	.10	.45	.50	.90	500	27	1.2	.23	.05		
5	0	.13	.42	.50	.85	450	22	1.3	.22	.05		
6	0	.17	.40	.50	.85	350	21	1.2	.22	.03		
7	0	.20	.40	.45	.85	280	21	1.0	.20	.03		
8	0	.23	.40	.45	.80	220	20	.88	.20	.02		
9	0	.27	.40	.50	.80	200	20	.88	.18	.02		
10	0	.30	.40	.55	.80	176	16	.76	.18	.02		
11	0	.34	.41	.60	.85	149	16	.63	.17	.02		
12	0	.40	.41	.60	.85	126	12	.55	.16	.01		
13	0	.55	.42	.65	.85	105	8.4	.49	.14	.01		
14	0	.68	.42	.70	.80	96	7.6	.43	.13	.01		
15	0	.71	.42	.70	.80	83	12	.40	.15	0		
16	0	.68	.41	.75	.75	74	8.4	.37	.19	0		
17	0	.68	.42	.75	.80	67	7.6	.35	.18	0		
18	0	.68	.44	.70	.90	68	4.6	.35	.17	0		
19	0	.65	.44	.70	.90	73	3.9	.34	.15	0		
20	0	.65	.46	.70	.95	66	3.6	.32	.14	0		
21	0	.68	.48	.70	.95	59	6.8	.32	.12	0		
22	0	.68	.49	.75	1.0	54	5.0	.30	.11	0		
23	0	.71	.51	.75	1.0	52	4.2	.30	.10	0		
24	0	.68	.53	.80	1.5	51	4.2	.30	.09	0		
25	0	.68	.53	.80	2.0	48	3.9	.30	.08	0		
26	0	.65	.55	.75	5.0	44	3.4	.29	.09	0		
27	0	.65	.57	.75	10	41	3.0	.28	.08	0		
28	0	.68	.61	.75	30	35	2.2	.27	.07	0		
29	0	.65	.60	.80	-----	27	2.1	.26	.06	0		
30	.01	.65	.55	.85	-----	22	2.1	.26	.06	0		
31	.02	-----	.50	.90	-----	22	-----	.25	-----	0	-----	-----
TOTAL	.03	14.29	14.82	20.50	68.45	4,338	361.0	20.18	4.58	.44	0	0
MEAN	.001	.48	.48	.66	2.44	140	12.0	.65	.014	.0	0	0
MAX	.02	.71	.68	.90	.30	550	32	2.0	.24	.06	0	0
MIN	0	.02	.40	.45	.75	22	2.1	.25	.06	0	0	0
AC=FT	.06	.28	.29	.41	.136	8,600	716	.40	.9.1	.9	0	0

CAL YR 1972 TOTAL 9,796.54 MEAN 26.8 MAX 1,100 MIN 0 AC=FT 19,430

WTR YR 1973 TOTAL 4,842.29 MEAN 13.3 MAX 550 MIN 0 AC=FT 9,600

PEAK DISCHARGE (BASE, 50 CFS).--Mar. 2 (time and stage unknown) 610 cfs.

JAMES RIVER BASIN

06474300 Medicine Creek near Zell, S. Dak.

LOCATION.--Lat 44°45'52", long 98°42'13", in NW¼NW¼ sec.19, T.115 N., R.65 W., Spink County, on downstream side at center of bridge on State Highway 26, 3.8 mi (6.1 km) upstream from Cottonwood Lake and 9.2 mi (14.8 km) south of Zell.

DRAINAGE AREA.--210 sq mi (540 sq km), approximately.

PERIOD OF RECORD.--September 1959 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 1,320 ft (402 m), from topographic map.

AVERAGE DISCHARGE.--14 years, 7.11 cfs (0.201 cu m/s), 5,150 acre-ft/yr (6.35 cu km/yr).

EXTREMES.--Current year: Maximum discharge, 287 cfs (8.13 cu m/s) Feb. 26, gage height, 7.67 ft (2.338 m); minimum daily, 0.01 cfs (0.0003 cu m/s) on several days.

Period of record: Maximum discharge, 2,210 cfs (62.6 cu m/s) Apr. 5, 1969, gage height, 12.41 ft (3.783 m); no flow for many days in most years.

REMARKS.--Records good except those for winter periods, which are poor.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973												
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.03	.05	.12	.02	.02	209	10	2.1	.95	.06	.03	.01
2	.03	.07	.12	.02	.02	147	9.8	1.9	.95	.06	.03	.02
3	.04	.06	.12	.02	.02	96	9.2	1.6	1.4	.05	.03	.03
4	.04	.07	.12	.02	.02	65	8.3	1.6	.95	.05	.02	.01
5	.06	.09	.10	.01	.02	47	7.6	1.5	.95	.05	.03	.01
6	.06	.12	.09	.01	.02	35	7.0	1.4	.95	.05	.03	.01
7	.05	.09	.09	.01	.02	27	6.6	1.3	.85	.05	.03	.01
8	.05	.09	.06	.01	.02	25	5.8	1.2	.80	.04	.03	.01
9	.05	.09	.06	.01	.02	20	5.4	1.2	.54	.04	.03	.01
10	.05	.09	.05	.01	.02	16	5.2	1.1	.46	.04	.04	.01
11	.05	.09	.05	.01	.02	15	4.9	.95	.34	.03	.04	.01
12	.05	.10	.05	.02	.02	14	4.6	.80	.28	.03	.04	.01
13	.05	.10	.04	.02	.02	13	4.0	.75	.26	.03	.05	.01
14	.05	.12	.04	.03	.01	16	3.8	.70	.22	.03	.05	.01
15	.05	.12	.03	.03	.01	19	4.0	.62	.18	.03	.06	.02
16	.05	.12	.03	.03	.01	24	3.6	.50	.16	.03	.04	.01
17	.05	.12	.03	.02	.01	27	3.3	.46	.12	.02	.03	.02
18	.05	.12	.03	.02	.02	23	3.2	.42	.14	.04	.03	.02
19	.05	.13	.03	.02	.02	19	3.0	.34	.10	.03	.03	.02
20	.05	.14	.03	.02	.02	20	3.2	.26	.09	.03	.03	.02
21	.05	.14	.03	.02	.03	19	3.1	.24	.09	.03	.04	.02
22	.05	.14	.03	.03	.05	18	2.9	.22	.08	.03	.03	.02
23	.05	.14	.03	.03	.08	16	2.4	.20	.08	.03	.03	.02
24	.04	.14	.03	.02	1.8	17	2.8	.22	.08	.04	.04	.03
25	.04	.14	.03	.02	10	17	3.0	.24	.07	.03	.03	.03
26	.04	.14	.03	.02	222	17	2.8	.34	.07	.03	.03	.02
27	.04	.14	.03	.02	210	17	2.6	.95	.08	.03	.02	.02
28	.04	.12	.03	.02	160	15	2.4	.85	.06	.03	.02	.02
29	.05	.12	.03	.01	-----	14	2.2	.75	.06	.03	.02	.02
30	.06	.12	.03	.02	-----	12	2.0	.90	.06	.03	.02	.02
31	.05	-----	.02	.02	-----	11	-----	1.1	-----	.03	.02	-----
TOTAL	1.47	3.34	1.63	.59	604.32	1,050	138.7	26.91	11.42	1.13	1.00	.50
MEAN	.047	.11	.053	.019	21.6	33.9	4.62	.87	.38	.037	.032	.017
MAX	.06	.14	.12	.03	222	209	10	2.1	1.4	.06	.06	.03
MIN	.03	.05	.02	.01	.01	11	2.0	.20	.06	.02	.02	.01
AC=FT	2.9	6.6	3.2	1.2	1,200	2,080	275	53	23	2.2	2.0	1.0

CAL YR 1972 TOTAL 4,055.58 MEAN 11.1 MAX 680 MIN .01 AC=FT 8,040

WTR YR 1973 TOTAL 1,841.01 MEAN 5.04 MAX 222 MIN .01 AC=FT 3,650

PEAK DISCHARGE (BASE, 40 CFS).--Feb. 26 (time unknown) 287 cfs (7.67 ft).

JAMES RIVER BASIN

107

06475000 James River near Redfield, S. Dak.

LOCATION.--Lat 44°55'13", long 98°25'52" in SW¼NW¼ sec.28, T.117 N., R.63 W., Spink County, on right bank at downstream side of highway bridge, 5.2 mi (8.4 km) northeast of Redfield and 5.2 mi (8.4 km) downstream from Turtle Creek.

DRAINAGE AREA.--14,800 sq mi (38,300 sq km), approximately.

PERIOD OF RECORD.--March 1950 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,236.3 ft (376.82 m) above mean sea level. Prior to July 26, 1951, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--23 years, 187 cfs (5.296 cu m/s), 135,500 acre-ft/yr (167 cu hm/yr).

EXTREMES.--Current year: Maximum daily discharge, 500 cfs (14.2 cu m/s) Mar. 10; maximum gage height, 9.67 ft (2.947 m) Mar. 6, 7, backwater from ice; no flow for many days.
Period of record: Maximum discharge, 7,310 cfs (207 cu m/s) Apr. 13, 1969, gage height, 24.93 ft (7.599 m); no flow for many days in most years.

REMARKS.--Records good except those for winter periods, which are poor. Flow regulated by Arrowwood and Jim Lakes, and Jamestown Reservoir, combined capacity, 246,000 acre-ft (303 cu hm), the largest of which is Jamestown Reservoir, capacity, 229,470 acre-ft (283 cu hm), 303 mi (488 km) upstream. Low flow affected by wind at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15	13	42	20	5.0	150	124	32	22	.28		
2	15	15	36	15	5.0	180	103	30	23	.17		
3	12	26	32	10	5.0	200	86	34	19	.32		
4	14	28	30	8.0	5.0	250	86	65	16	.24		
5	11	37	28	5.0	4.5	300	94	45	15	.17		
6	11	32	25	4.5	4.5	350	88	29	16	.08		
7	12	36	25	4.5	4.5	400	70	30	17	.04		
8	9.4	50	26	4.0	4.0	450	71	27	12	.30		
9	17	44	26	4.0	4.0	480	59	22	19	.56		
10	17	49	28	4.0	3.5	500	67	20	12	.38		
11	7.0	50	28	4.5	3.0	480	63	17	9.6	.44		
12	8.6	52	30	5.0	2.5	460	69	16	9.9	.12		
13	7.6	48	32	5.0	2.5	420	114	16	12	0		
14	5.1	51	32	5.0	3.0	396	117	15	14	0		
15	8.4	52	32	5.5	3.0	351	64	17	12	0		
16	4.2	52	34	5.5	2.5	309	71	11	7.2	0		
17	4.4	54	34	5.5	2.5	275	70	17	7.2	0		
18	4.6	54	34	6.0	2.5	277	106	12	6.0	0		
19	9.7	53	35	7.0	2.0	258	128	13	3.6	0		
20	13	51	35	7.0	2.0	239	151	18	2.5	0		
21	6.8	51	34	6.5	2.0	252	79	13	2.6	0		
22	5.0	50	32	6.0	4.0	262	59	12	2.7	0		
23	6.1	50	31	5.5	10	236	57	12	2.8	0		
24	7.5	49	30	5.0	15	219	53	9.6	3.5	0		
25	8.6	50	28	5.0	20	200	49	10	2.2	0		
26	8.9	51	28	5.0	30	202	44	14	1.2	0		
27	5.2	54	26	4.5	50	198	46	11	.62	0		
28	8.3	55	24	4.5	100	166	72	13	.44	0		
29	12	54	24	5.0	-----	155	44	12	.22	0		
30	7.3	47	22	5.0	-----	151	39	15	.38	0		
31	8.0	-----	22	5.0	-----	138	-----	18	-----	0		
TOTAL	289.7	1,358	925	192.0	301.5	8,904	2,343	625.6	271.66	3.10	0	0
MEAN	9.35	45.3	29.8	6.19	10.8	287	78.1	20.2	9.06	.10	0	0
MAX	17	55	42	20	100	500	151	65	23	.56	0	0
MIN	4.2	13	22	4.0	2.0	138	39	9.6	.22	0	0	0
AC-FT	575	2,690	1,830	381	598	17,660	4,650	1,240	539	6.1	0	0

CAL YR 1972 TOTAL 104,360.40 MEAN 285 MAX 1,970 MIN 4.0 AC-FT 207,000
WTR YR 1973 TOTAL 15,213.56 MEAN 41.7 MAX 500 MIN 0 AC-FT 30,180

JAMES RIVER BASIN

06476000 James River at Huron, S. Dak.

LOCATION.--Lat 44°21'49", long 98°11'56", in SW¼SE¼NE¼ sec.6, T.110 N., R.61 W., Beadle County, on right bank 15 ft (5 m) upstream from city dam at Huron, 135 ft (41 m) downstream from Chicago and North Western Transportation Co. bridge and 165 ft (50 m) upstream from bridge on business loop U.S. Highway 14.

DRAINAGE AREA.--16,800 sq mi (43,500 sq km), approximately.

PERIOD OF RECORD.--August 1928 to September 1932, August 1943 to current year. Monthly discharge only for some periods, published in WSP 1309. Gage-height records collected at site about 100 ft (30 m) downstream for period of open water each year July 1902 to June 1914 and for period March to June 1915-23 are in reports of U.S. Weather Bureau.

GAGE.--Water-stage recorder and concrete dam. Datum of gage is 1,223.44 ft (372.905 m) above mean sea level. Aug. 29, 1928, to Mar. 15, 1929, nonrecording gage at site 100 ft (30 m) downstream at about same datum. Mar. 16, 1929, to June 30, 1932, nonrecording gage 165 ft (50 m) downstream at present datum. Aug. 3, 1943, to Oct. 17, 1951, nonrecording gage at site 15 ft (5 m) downstream at present site and datum.

AVERAGE DISCHARGE.--34 years, 237 cfs (6.712 cu m/s), 171,700 acre-ft/yr (212 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 1,060 cfs (30.0 cu m/s) Mar. 7, gage height, 9.19 ft (2.801 m); no flow for many days.

Period of record: Maximum discharge, 9,000 cfs (255 cu m/s) Apr. 13, 1969, gage height, 16.70 ft (5.090 m); no flow for long periods in most years.

A flood between Apr. 11 and 13, 1881 reached a stage of 19.8 ft (6.04 m), from U.S. Weather Bureau publication. Flood of Mar. 22, 1922, reached a stage of 16.5 ft (5.03 m).

REMARKS.--Records good above 100 cfs (2.83 cu m/s) and fair below. Flow regulated by Arrowwood and Jim Lakes, and Jamestown Reservoir, combined capacity, 246,000 acre-ft (303 cu hm). Regulation by Jamestown Reservoir, capacity, 229,470 acre-ft (283 cu hm), 365 mi (587 km) upstream, since May 1953. Stage and discharge affected by wind at times. Water-quality records for the water year 1973 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	32	16	56	43	28	424	240	82	.92			
2	30	46	56	46	27	510	237	65	.46			
3	32	30	59	43	24	558	221	62	4.0			
4	27	32	59	40	25	585	177	49	14			
5	43	30	59	40	25	693	158	49	14			
6	32	43	59	36	24	895	160	62	11			
7	30	43	59	36	23	1,040	145	59	7.5			
8	32	43	56	36	23	1,030	139	52	6.5			
9	14	49	59	32	23	947	139	46	1.6			
10	19	49	59	32	24	862	117	52	3.1			
11	32	59	56	30	23	738	121	49	5.3			
12	21	59	52	30	23	660	104	43	2.8			
13	24	62	52	30	25	615	78	36	.62			
14	24	59	52	27	22	584	78	30	0			
15	14	62	49	27	19	539	104	24	0			
16	27	59	52	30	20	479	95	10	0			
17	21	56	49	37	19	434	95	0	.23			
18	16	56	49	50	20	364	82	0	.44			
19	4.1	56	46	54	19	372	78	0	.90			
20	4.1	56	46	54	14	346	36	0	7.6			
21	16	56	46	52	21	295	87	0	5.6			
22	21	56	43	42	30	266	95	0	.49			
23	7.9	56	43	40	68	294	91	0	.21			
24	7.9	56	43	38	183	341	87	7.5	0			
25	7.9	59	40	35	217	340	82	.75	0			
26	9.9	56	40	34	266	305	78	11	0			
27	14	56	36	32	293	286	72	27	0			
28	9.9	56	36	32	321	306	68	4.9	0			
29	7.9	56	36	31	-----	276	68	11	0			
30	24	56	46	29	-----	252	72	6.0	0			
31	16	-----	43	28	-----	244	-----	4.1	-----			
TOTAL	620.6	1,528	1,546	1,146	1,849	15,880	3,404	842.25	87.27	0	0	0
MEAN	20.0	50.9	49.9	37.0	66.0	512	113	27.2	2.91	0	0	0
MAX	43	62	59	54	321	1,040	240	82	14	0	0	0
MIN	4.1	16	36	27	14	244	36	0	0	0	0	0
AC-FT	1,230	3,030	3,070	2,270	3,670	31,500	6,750	1,670	173	0	0	0

CAL YR 1972 TOTAL 150,600.60 MEAN 411 MAX 2,480 MIN 4.1 AC-FT 298,700
 WTR YR 1973 TOTAL 26,903.12 MEAN 73.7 MAX 1,040 MIN 0 AC-FT 53,360

JAMES RIVER BASIN

109

06476500 Sand Creek near Alpena, S. Dak.

LOCATION.--Lat 44°09'15", long 98°26'06", in NE¼NE¼ sec.19, T.108 N., R.63 W., Jerauld County, on left bank 5 ft (2 m) downstream from highway bridge, 4.0 mi (6.4 km) southwest of Alpena, 7.0 mi (11.3 km) upstream from Chicago, Milwaukee, St. Paul and Pacific Railroad bridge, and 10.5 mi (16.9 km) upstream from interlink with Cain Creek.

DRAINAGE AREA.--240 sq mi (622 sq km), approximately.

PERIOD OF RECORD.--March 1950 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 1,315 ft (401 m), by barometer. Prior to Sept. 17, 1951, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--23 years, 10.7 cfs (0.303 cu m/s), 7,750 acre-ft/yr (9.56 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 350 cfs (9.91 cu m/s) Mar. 2; maximum gage height, 11.71 ft (3.569 m) Feb. 25, backwater from ice; no flow for many days.
Period of record: Maximum discharge, 2,240 cfs (63.4 cu m/s) Mar. 28, 1960, gage height, 13.35 ft (4.069 m); maximum gage height, 14.1 ft (4.30 m) Mar. 28, 1950, backwater from ice; no flow for many days in each year.

REMARKS.--Records good except those for winter periods, which are poor.

REVISIONS (WATER YEARS).--WSP 1309: 1950(M).

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Stage-discharge relation affected by ice Nov. 29 to Mar. 5; shifting-control method used Mar. 6-12)

7.4	0	7.8	1.7	9.0	40
7.5	.12	7.9	3.1	9.5	70
7.6	.40	8.4	18	10.0	140
7.7	.88				

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1		0	1.4	.20	12	140	15	4.0	2.5	.02		
2		0	1.3	.17	10	270	13	3.1	4.9	.01		
3		0	1.2	.16	10	290	12	3.4	5.5	0		
4		.01	1.0	.15	9.5	250	10	3.7	4.6	0		
5		.21	.95	.14	9.0	200	9.4	3.1	4.3	0		
6		.82	.80	.13	7.0	173	9.1	2.7	4.0	0		
7		1.5	.65	.12	6.5	164	7.6	2.9	4.0	0		
8		2.0	.50	.11	7.0	178	7.3	2.9	2.5	0		
9		4.0	.46	.10	6.0	111	6.7	2.5	2.5	0		
10		4.9	.42	.16	3.0	66	6.1	2.4	2.4	0		
11		4.3	.38	.22	2.0	56	5.8	2.2	2.2	0		
12		4.3	.34	.30	1.5	52	4.9	2.0	1.8	0		
13		3.7	.32	.50	1.5	42	5.2	1.8	1.7	0		
14		3.7	.30	.75	1.5	42	5.2	1.8	1.6	0		
15		2.9	.28	1.4	1.0	54	4.3	1.7	1.4	0		
16		2.5	.25	1.5	1.0	75	4.6	1.6	1.2	0		
17		2.4	.22	2.0	1.5	57	4.6	1.6	.95	0		
18		2.2	.22	50	1.5	43	4.6	1.5	.88	0		
19		2.2	.23	100	1.8	36	5.5	1.3	.61	0		
20		2.0	.26	50	2.0	31	6.1	1.3	.48	0		
21		1.8	.30	40	2.5	27	4.3	1.0	.40	0		
22		1.8	.30	30	6.0	24	4.0	.95	.40	0		
23		1.6	.30	40	25	21	4.3	.88	.36	0		
24		1.6	.28	60	125	22	4.3	.95	.30	0		
25		1.6	.29	50	210	22	4.3	.88	.27	0		
26		1.6	.30	40	180	23	4.0	1.4	.21	0		
27		1.6	.30	30	160	23	4.0	2.3	.12	0		
28		1.6	.32	20	150	23	3.7	1.7	.06	0		
29		1.4	1.0	16	-----	20	3.1	1.6	.04	0		
30		1.4	.75	14	-----	18	3.7	1.7	.02	0		
31		-----	.40	14	-----	16	-----	2.0	-----	0		
TOTAL	0	59.64	16.02	562.11	953.8	2,569	186.7	62.86	52.20	.03	0	0
MEAN	0	1.99	.52	18.1	34.1	82.9	6.22	2.03	1.74	.001	0	0
MAX	0	4.9	1.4	100	210	290	15	4.0	5.5	.02	0	0
MIN	0	0	.22	.10	1.0	16	3.1	.88	.02	0	0	0
AC=FT	0	118	32	1,110	1,890	5,100	370	125	104	.06	0	0
CAL YR 1972	TOTAL	6,596.98	MEAN	18.0	MAX	758	MIN	0	AC=FT	13,090		
WTR YR 1973	TOTAL	4,462.36	MEAN	12.2	MAX	290	MIN	0	AC=FT	8,850		

PEAK DISCHARGE (BASE, 50 CFS)

DATE	TIME	G.H.	DISCHARGE	DATE	TIME	G.H.	DISCHARGE
1-18	-	-	175	3-2	-	-	350
1-23	-	-	70	3-16	1300	9.54	79
2-25	-	-	300				

JAMES RIVER BASIN

111

06477500 Firesteel Creek near Mount Vernon, S. Dak.

LOCATION.--Lat 43°46'30", long 98°14'33", in SW¼SW¼ sec.26, T.104 N., R.62 W., Davison County, near center of span on downstream side of highway bridge, 4.5 mi (7.2 km) north of Mount Vernon, 5.2 mi (8.4 km) downstream from West Firesteel Creek, and 12 mi (19 km) northwest of Mitchell.

DRAINAGE AREA.--540 sq mi (1,400 sq km), approximately.

PERIOD OF RECORD.--September 1955 to current year.

GAGE.--Nonrecording gage and crest-stage gage. Altitude of gage is 1,310 ft (399 m), from topographic map.

AVERAGE DISCHARGE.--18 years, 26.6 cfs (0.753 cu m/s), 19,270 acre-ft/yr (23.8 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 700 cfs (19.8 cu m/s) Mar. 1; maximum gage height, 9.35 ft (2.850 m) Feb. 25, backwater from ice; no flow for many days.

Period of record: Maximum discharge, 6,610 cfs (187 cu m/s) Apr. 4, 1969, gage height, 15.34 ft (4.676 m), maximum gage height, 17.12 ft (5.218 m) Apr. 3, 1969, backwater from ice; no flow for many days in each year.

REMARKS.--Records good except those for winter periods, which are poor.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Nov. 1 to Dec. 1; stage-discharge relation
affected by ice Dec. 2 to Mar. 3)

2.43	0	2.8	1.6	3.2	15	4.5	119
2.5	.04	2.9	3.0	3.5	34	5.0	174
2.6	.35	3.0	5.5	4.0	72	6.0	342
2.7	.89						

DISCHARGE, IN CURIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.06	.35	.35	.30	8.5	600	35	6.8	16	.65	.06	0
2	.05	.40	.34	.30	9.0	760	34	7.7	12	.40	.04	0
3	.05	.45	.28	.30	10	610	31	7.7	13	.50	.01	.25
4	.01	.45	.23	.28	9.5	344	26	5.5	14	.40	0	.08
5	.02	.45	.20	.28	9.0	253	23	4.8	12	.55	0	.02
6	.01	.40	.16	.25	8.0	216	17	5.5	13	.50	0	.08
7	0	.30	.13	.20	6.5	190	16	4.3	12	.40	0	.06
8	0	.35	.11	.16	5.5	173	17	4.5	8.5	.65	0	.03
9	0	.30	.09	.10	4.6	169	14	3.5	6.4	.60	0	.02
10	.02	.30	.08	.12	5.0	128	12	3.8	6.4	.40	0	.02
11	.06	.16	.09	.15	3.5	108	13	4.0	5.3	.45	0	.02
12	.13	.25	.10	.20	2.8	89	11	3.5	4.8	.35	0	.02
13	.06	.16	.11	.40	2.0	73	10	4.0	2.4	.25	0	.01
14	.16	.71	.13	.60	1.4	73	11	3.0	1.4	.20	0	.01
15	.10	.60	.14	.70	1.0	79	12	2.2	1.4	.25	0	.02
16	.06	.45	.20	.80	1.0	127	10	1.5	1.3	.16	0	.08
17	.25	.45	.20	1.5	1.0	157	7.7	1.1	1.0	.10	0	.10
18	.20	.35	.22	5.0	1.0	119	7.2	1.2	1.1	.06	0	.10
19	.35	.35	.25	20	1.5	109	5.9	1.1	.89	.04	0	.10
20	.25	.13	.30	100	1.5	92	5.3	1.1	.71	.02	0	.02
21	.30	.16	.45	150	1.5	69	7.2	1.0	.60	.01	0	.02
22	.40	.20	.35	100	10	50	5.3	.89	.65	.02	0	0
23	.40	.25	.30	90	100	48	5.9	1.0	.65	.02	0	0
24	.40	.35	.34	75	300	48	5.3	.83	.40	.35	0	0
25	.50	.45	.40	50	400	52	4.5	.77	.30	.45	0	.02
26	.25	.25	.50	50	500	46	4.3	1.7	.20	.25	0	.13
27	.16	.35	.45	30	400	42	3.8	5.9	.05	.20	0	.16
28	.13	.45	.40	20	300	49	3.5	8.1	.06	.16	0	.10
29	.06	.60	.40	10	-----	47	3.5	13	.08	.06	0	.16
30	.08	.45	.38	8.0	-----	45	4.0	11	.10	.10	0	.20
31	.30	-----	.35	8.5	-----	40	-----	14	-----	.06	0	-----
TOTAL	4.82	10.87	8.03	723.14	2,103.8	5,005	365.4	134.99	136.69	8.61	.11	1.83
MEAN	.16	.36	.26	23.3	75.1	161	12.2	4.35	4.56	.28	.004	.061
MAX	.50	.71	.50	150	500	760	35	14	16	.65	.06	.25
MIN	0	.13	.08	.10	1.0	40	3.5	.77	.05	.01	0	0
AC=FT	9.6	22	16	1,430	4,170	9,930	725	268	271	17	.2	3.6
CAL YR 1972 TOTAL	15,905.66											
WTR YR 1973 TOTAL	8,503.29											
MEAN 43.5												
MAX 998												
MIN 0												
AC=FT 31,550												
MIN 0												
AC=FT 16,870												

PEAK DISCHARGE (BASE, 100 CFS)

DATE	TIME	G.H.	DISCHARGE	DATE	TIME	G.H.	DISCHARGE
1-21	-	-	175	3-1	-	-	700
2-25	-	-	500	3-17	0700	5.01	175

JAMES RIVER BASIN

06478500 James River near Scotland, S. Dak.

LOCATION (revised).--Lat 43°11'09", long 97°38'07", in SW¼SW¼ sec.30, T.97 N., R.57 W., Hutchinson County, on right bank 5.0 ft (2 m) downstream from highway bridge, 0.3 mi (0.5 km) upstream from Dawson Creek and 5.2 mi (8.4 km) northeast of Scotland.

DRAINAGE AREA.--21,550 sq mi (55,810 sq km), approximately.

PERIOD OF RECORD.--September 1928 to current year. Monthly discharge only for some periods, published in WSP 1309.

GAGE (revised).--Water-stage recorder and rock and earth control. Datum of gage is 1,168.51 ft (356.162 m) above mean sea level. Prior to Nov. 28, 1972, at site 0.25 mi (0.8 km) downstream at present datum.

AVERAGE DISCHARGE.--45 years, 386 cfs (10.93 cu m/s), 279,700 acre-ft/yr (345 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 3,510 cfs (99.4 cu m/s) Mar. 15, gage height, 13.71 ft (4.179 m); minimum daily, 5.7 cfs (0.161 cu m/s) Aug. 27.
Period of record: Maximum discharge, 15,200 cfs (430 cu m/s) Apr. 3, 1962, gage height, 18.74 ft (5.712 m); no flow for many days in some years.

REMARKS.--Records good except those for winter periods, which are poor. Flow regulated by Arrowwood and Jim Lakes, and Jamestown Reservoir, combined capacity, 246,000 acre-ft (303 cu hm), the largest of which is Jamestown Reservoir, capacity, 229,470 acre-ft (283 cu hm), 527 mi (848 km) upstream. Occasional backwater caused by Dawson Creek; reverse flow occurred for part of May 15, 1961, from information by local residents. Water-quality records for the water year 1973 are published in Part 2 of this report.

REVISIONS (WATER YEARS).--WSP 786: Drainage area. WSP 956: 1937-38. WSP 1279: 1932, 1948.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	61	77	94	76	143	1,450	1,020	226	98	26	13	6.9
2	56	107	89	89	150	1,900	962	238	107	27	13	7.9
3	58	109	78	96	150	2,150	893	250	113	25	12	15
4	58	106	72	96	143	2,250	808	238	129	24	12	16
5	58	97	71	86	111	2,200	716	226	125	24	10	14
6	61	99	71	72	106	2,200	625	238	114	24	10	11
7	63	107	70	70	115	2,850	571	238	106	22	11	9.1
8	64	111	72	67	93	3,120	533	238	89	20	10	8.5
9	58	108	72	63	86	3,110	490	244	84	20	11	8.2
10	56	108	72	60	90	3,100	458	276	75	21	11	7.9
11	56	112	71	57	87	3,170	417	270	67	20	10	7.9
12	58	113	70	54	87	3,210	393	244	67	20	10	8.0
13	66	113	70	52	75	3,240	362	220	70	19	10	8.6
14	70	112	69	56	70	3,380	324	190	62	18	10	8.8
15	68	109	70	60	60	3,490	334	166	55	18	10	9.4
16	70	102	71	65	55	3,500	357	158	51	17	9.9	9.8
17	68	94	71	81	50	3,450	352	146	52	16	8.9	11
18	68	93	73	142	45	3,350	335	132	74	16	8.7	11
19	68	94	79	236	45	3,220	315	126	60	15	7.7	11
20	64	97	81	220	50	3,060	328	115	54	15	7.3	10
21	60	101	85	254	55	2,900	322	101	53	15	6.9	10
22	60	105	82	292	60	2,710	360	98	51	15	8.8	9.7
23	70	107	87	273	80	2,470	394	98	49	15	6.6	8.4
24	72	107	89	250	450	2,210	360	93	42	16	6.3	12
25	64	111	90	234	1,000	1,910	322	87	35	17	6.3	17
26	60	124	86	208	1,250	1,600	282	85	33	17	6.2	26
27	58	123	87	188	1,350	1,300	256	104	29	17	5.7	28
28	58	105	88	158	1,380	1,160	232	118	31	16	5.8	37
29	60	87	96	144	-----	1,250	214	118	30	16	6.1	64
30	61	87	105	138	-----	1,200	214	104	27	15	6.8	60
31	70	-----	87	148	-----	1,090	-----	97	-----	14	6.7	-----
TOTAL	1,942	3,125	2,468	4,085	7,436	77,200	13,549	5,282	2,032	580	277.7	472.1
MEAN	62.6	104	79.6	132	266	2,490	452	170	67.7	18.7	8.96	15.7
MAX	72	124	105	292	1,380	3,500	1,020	276	129	27	13	64
MIN	56	77	69	52	45	1,090	214	85	27	14	5.7	6.9
AC-FT	3,850	6,200	4,900	8,100	14,750	153,100	26,870	10,480	4,030	1,150	551	936
CAL YR 1972	TOTAL	272,989.0	MEAN	746	MAX	4,010	MIN	33	AC-FT	541,500		
WTR YR 1973	TOTAL	118,448.8	MEAN	325	MAX	3,500	MIN	5.7	AC-FT	234,900		

VERMILLION RIVER BASIN

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06478540 Little Vermillion River near Salem, S. Dak.
(Hydrologic bench-mark station)

LOCATION.--Lat 43°47'39", long 97°22'02", in SW¼ sec.19, T.104 N., R.54 W., McCook County, on right wingwall at downstream end of culvert on county highway, 2.0 mi (3.2 km) upstream from small left-bank tributary and 5.2 mi (8.4 km) northeast of Salem.

DRAINAGE AREA.--51.0 sq mi (132 sq km), approximately.

PERIOD OF RECORD.--October 1966 to current year.

GAGE.--Water-stage recorder and concrete dam.

AVERAGE DISCHARGE.--7 years, 2.34 cfs (0.0663 cu m/s), 1,700 acre-ft/yr (2.10 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 96 cfs (2.72 cu m/s) Mar. 6, gage height, 5.99 ft (1.826 m); no flow for many days.
Period of record: Maximum discharge, 596 cfs (16.9 cu m/s) Apr. 7, 1969, gage height, 7.58 ft (2.310 m); maximum gage height, 8.53 ft (2.600 m) Apr. 5, 1969, backwater from ice; no flow for many days each year.

REMARKS.--Records good except those for winter periods, which are poor.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1					0	6.0	3.1	.40				
2					0	27	2.6	.46				
3					0	46	2.0	.26				
4					0	60	1.5	.22				
5					0	81	1.0	.22				
6					0	93	.75	.19				
7					0	91	.60	.24				
8					0	81	.46	.17				
9					0	56	.40	.10				
10					0	42	.24	.01				
11					0	31	.22	0				
12					0	24	.17	0				
13					0	20	.11	0				
14					0	22	.12	0				
15					0	16	.28	0				
16					0	16	.35	0				
17					0	14	.21	0				
18					0	11	.17	0				
19					0	8.7	.18	0				
20					0	6.6	.35	0				
21					0	4.8	.26	0				
22					0	4.4	.19	0				
23					.25	4.1	.12	0				
24					6.0	5.1	.10	0				
25					1.0	5.1	.11	0				
26					.10	4.4	.06	0				
27					.10	3.6	.03	0				
28					.20	4.1	0	0				
29					-----	4.4	0	0				
30					-----	4.1	.03	0				
31		-----			-----	3.6	-----	0	-----			-----
TOTAL	0	0	0	0	7.65	802.0	15.71	2.27	0	0	0	0
MEAN	0	0	0	0	.27	25.9	.52	.073	0	0	0	0
MAX	0	0	0	0	6.0	93	3.1	.46	0	0	0	0
MIN	0	0	0	0	0	3.6	0	0	0	0	0	0
AC=FT	0	0	0	0	15	1,590	31	4.5	0	0	0	0

CAL YR 1972 TOTAL 392.88 MEAN 1.07 MAX 29 AC=FT 779
WTR YR 1973 TOTAL 827.63 MEAN 2.27 MAX 93 MIN 0 AC=FT 1,640

PEAK DISCHARGE (BASE, 10 CFS)

DATE	TIME	G.H.	DISCHARGE
3- 6	0400	5.99	96
3-14	0030	4.75	24

VERMILLION RIVER BASIN

06478690 West Fork Vermillion River near Parker, S. Dak.

LOCATION.--Lat 43°24'55", long 97°12'18", in NE¼NE¼ sec.10, T.99 N., R.54 W., Turner County, near center of span at downstream side of bridge, 3.7 mi (6.0 km) northwest of Parker and 13.9 mi (22.4 km) upstream from confluence with East Fork Vermillion River.

DRAINAGE AREA.--370 sq mi (958 sq km), approximately.

PERIOD OF RECORD.--August 1961 to current year.

GAGE.--Nonrecording gage and crest-stage gage. Altitude of gage is 1,340 ft (408 m), from topographic map.

AVERAGE DISCHARGE.--12 years, 23.1 cfs (0.654 cu m/s), 16,740 acre-ft/yr (20.6 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 665 cfs (18.8 cu m/s) Mar. 6, gage height, 7.81 ft (2.380 m); minimum daily, 0.04 cfs (0.001 cu m/s) Sept. 29.

Period of record: Maximum discharge, 4,340 cfs (123 cu m/s) Mar. 28, 1962, gage height, 12.33 ft (3.758 m); no flow for many days in most years.

REMARKS.--Records good except those for winter periods, which are poor.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.10	.53	.44	.40	1.1	200	53	13	1.4	.41	.13	.10
2	.08	.68	.44	.39	1.2	350	46	14	1.4	.37	.13	.10
3	.08	.74	.42	.37	1.2	420	41	14	1.4	.33	.13	.10
4	.06	.86	.40	.34	2.2	430	35	16	5.6	.29	.13	.08
5	.05	.80	.39	.31	4.5	489	31	17	5.2	.29	.11	.08
6	.06	.80	.38	.28	6.0	583	27	18	3.8	.29	.11	.08
7	.06	.74	.36	.27	3.0	565	25	20	3.3	.26	.11	.08
8	.06	.74	.33	.25	2.5	380	24	20	3.1	.26	.10	.08
9	.05	.74	.32	.24	2.0	235	23	21	2.0	.23	.11	.10
10	.05	.74	.30	.23	1.8	176	21	20	1.8	.20	.11	.10
11	.10	.74	.28	.22	1.4	193	20	18	1.5	.17	.11	.10
12	.08	.68	.25	.21	1.0	221	19	17	1.5	.17	.11	.10
13	.08	.63	.23	.20	.80	158	18	12	1.2	.15	.11	.11
14	.10	.58	.20	.26	.70	294	18	6.8	1.2	.13	.11	.13
15	.10	.49	.18	.33	.60	251	17	3.1	1.1	.13	.11	.11
16	.11	.49	.16	.37	.60	157	17	3.8	1.0	.11	.11	.10
17	.11	.49	.19	5.0	.55	118	17	3.6	.93	.13	.11	.13
18	.13	.49	.23	20	.50	98	16	3.6	.86	.11	.11	.10
19	.13	.49	.26	16	.60	82	15	3.3	.86	.11	.11	.10
20	.15	.49	.28	14	.65	70	15	3.1	.80	.11	.11	.10
21	.20	.49	.29	13	.70	62	15	2.7	.80	.10	.11	.10
22	.29	.49	.30	11	1.0	53	15	2.5	.74	.10	.11	.10
23	.41	.49	.31	9.0	15	53	14	2.2	.68	.13	.11	.10
24	.49	.49	.32	6.0	145	50	14	2.2	.63	.17	.11	.10
25	.53	.49	.33	5.5	140	61	14	2.0	.63	.17	.11	.10
26	.45	.45	.35	4.0	130	60	14	2.0	.58	.17	.11	.13
27	.41	.45	.36	2.3	125	59	14	1.9	.53	.17	.11	.10
28	.33	.45	.37	1.5	115	59	14	1.6	.53	.17	.11	.06
29	.37	.45	.38	1.3	-----	56	14	1.6	.45	.15	.11	.04
30	.37	.45	.39	1.0	-----	55	13	1.5	.45	.15	.13	.11
31	.49	-----	.40	1.0	-----	53	-----	1.5	-----	.15	.11	-----
TOTAL	6.04	17.64	9.84	115.27	704.60	6,091	639	269.0	45.97	5.88	3.50	2.92
MEAN	.20	.59	.32	3.72	25.2	196	21.3	8.68	1.53	.19	.11	.097
MAX	.53	.86	.44	20	145	583	53	21	5.6	.41	.13	.13
MIN	.05	.45	.16	.20	.50	50	13	1.5	.45	.10	.10	.04
AC=FT	12	35	20	229	1,400	12,080	1,270	534	91	12	6.9	5.8

CAL YR 1972 TOTAL 9,947.61 MEAN 27.2 MAX 700 MIN 0 AC=FT 19,730
WTR YR 1973 TOTAL 7,910.70 MEAN 21.7 MAX 583 MIN .04 AC=FT 15,690

PEAK DISCHARGE (BASE, 150 CFS)

DATE	TIME	G.H.	DISCHARGE	DATE	TIME	G.H.	DISCHARGE
2-25	-	-	170	3-12	0200	5.03	248
3- 6	2200	7.81	665	3-14	1700	5.81	332

VERMILLION RIVER BASIN

115

06479000 Vermillion River near Wakonda, S. Dak.

LOCATION.--Lat 42°59'27", long 96°57'49", in SW¼NW¼ sec.2, T.94 N., R.52 W., Clay County, on left bank 40 ft (12 m) downstream from bridge on State Highway 19, 4.3 mi (6.9 km) downstream from Frog Creek, 7.4 mi (11.9 km) southeast of Wakonda, and 29.6 mi (47.6 km) upstream from mouth.

DRAINAGE AREA.--1,680 sq mi (4,351 sq km), approximately.

PERIOD OF RECORD.--October 1945 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,150.9 ft (350.79 m) above mean sea level, levels by Corps of Engineers. Prior to Sept. 2, 1954, nonrecording gage and crest-stage gage at site 40 ft (12 m) upstream at same datum. Since Dec. 27, 1951, supplementary nonrecording gage on relief bridge.

AVERAGE DISCHARGE.--28 years, 120 cfs (3.398 cu m/s), 86,940 acre-ft/yr (107 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 2,000 cfs (56.6 cu m/s) Mar. 9; maximum gage height, 15.27 ft (4.654 m) Mar. 6, backwater from ice; minimum daily discharge, 3.7 cfs (0.10 cu m/s) Sept. 24.

Period of record: Maximum discharge, 9,880 cfs (280 cu m/s) Apr. 8, 1969; maximum gage height, 17.17 ft (5.233 m) Apr. 6, 1969; no flow at times in 1951, 1956-59.

REMARKS.--Records good except those for winter periods, which are poor. At times during periods of high stage, part of flow leaves main channel through levee breaks and bypasses gage through overflow channel on left bank. Water-quality records for the water year 1973 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	21	12	13	35	360	467	125	82	40	19	7.4
2	16	28	11	12	40	575	448	140	72	50	18	7.2
3	19	28	10	11	45	825	415	140	67	64	17	9.7
4	18	27	9.5	10	40	1,150	366	139	63	68	16	9.4
5	13	27	9.0	9.0	35	1,500	325	127	68	64	16	7.5
6	15	27	8.5	8.0	30	1,750	299	115	75	60	15	6.7
7	15	24	8.5	7.0	28	1,860	275	108	66	50	15	7.0
8	14	22	8.5	6.0	26	1,920	254	103	60	45	15	8.6
9	15	22	8.5	5.0	24	1,960	238	98	51	57	16	8.7
10	15	21	8.5	5.0	23	1,610	219	92	46	74	17	7.7
11	19	20	8.0	5.5	22	1,200	207	86	43	79	17	7.1
12	19	21	7.5	6.0	21	1,040	198	80	42	70	16	7.1
13	19	22	7.5	7.0	20	1,070	185	77	41	60	16	7.7
14	20	21	7.5	8.0	18	1,290	174	72	40	56	15	8.0
15	23	23	7.0	9.0	16	1,330	200	68	40	52	15	7.9
16	22	18	6.5	10	14	1,470	275	65	39	48	14	8.2
17	22	23	7.5	15	13	1,280	288	63	40	44	13	14
18	22	24	8.5	50	14	937	245	61	65	41	9.4	18
19	21	24	12	175	16	707	212	58	90	37	7.8	9.9
20	22	23	12	200	18	574	198	55	108	33	7.6	5.8
21	22	22	13	175	20	500	190	54	99	30	7.7	4.4
22	22	20	14	125	24	449	184	53	80	27	8.1	4.0
23	21	20	13	85	30	413	170	51	70	26	8.1	3.8
24	20	19	12	65	250	456	156	50	60	28	8.3	3.7
25	18	18	12	50	260	542	149	49	50	30	8.2	4.0
26	18	21	13	40	210	608	141	54	45	28	7.5	6.2
27	19	20	14	35	240	562	135	80	40	26	7.1	6.7
28	18	18	15	30	275	480	129	96	39	24	6.8	10
29	18	14	15	30	-----	451	122	102	39	22	7.5	25
30	18	12	15	30	-----	480	118	106	39	20	7.9	24
31	20	-----	14	30	-----	503	-----	97	-----	20	8.1	-----
TOTAL	579	650	328.0	1,266.5	1,807	29,852	6,982	2,664	1,759	1,373	380.1	265.4
MEAN	18.7	21.7	10.6	40.9	64.5	963	233	85.9	58.6	44.3	12.3	8.85
MAX	23	28	15	200	275	1,960	467	140	108	79	19	25
MIN	13	12	6.5	5.0	13	360	118	49	39	20	6.8	3.7
AC-FT	1,150	1,290	651	2,510	3,580	59,210	13,850	5,280	3,490	2,720	754	526

CAL YR 1972 TOTAL 52,551.1 MEAN 144 MAX 2,420 MIN 1.7 AC-FT 104,200
WTR YR 1973 TOTAL 47,906.0 MEAN 131 MAX 1,960 MIN 3.7 AC-FT 95,020

PEAK DISCHARGE (BASE, 1,000 CFS)

DATE	TIME	G.H.	DISCHARGE
3-9	0300	15.14	2,000
3-16	1500	13.92	1,500

BIG SIOUX RIVER BASIN

06479438 Big Sioux River near Watertown, S. Dak.

LOCATION.--Lat 45°00'22", long 97°09'53", in NE¼NE¼NE¼ sec.16, T.118 N., R.52 W., Codington County, on left bank at downstream side of county highway bridge, 4.9 mi (7.9 km) downstream from Mahoney Creek, 6.5 mi (10.5 km) upstream from inlet-outlet to Lake Kampeska, and 7.5 mi (12.1 km) northwest of Watertown.

DRAINAGE AREA.--241 sq mi (624 sq km), approximately.

PERIOD OF RECORD.--October 1972 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,725.81 ft (526.027 m) above mean sea level (South Dakota Department of Highways bench mark).

EXTREMES.--Current year: Maximum discharge, 414 cfs (11.7 cu m/s) Mar. 15, gage height, 8.11 ft (2.472 m); minimum daily, 0.06 cfs (0.002 cu m/s) Aug. 7.

REMARKS.--Records good except those for winter periods, which are poor. Water-quality records for the water year 1973 are published in Part 2 of this report.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Stage-discharge relation affected by ice Dec. 3 to Mar. 9)

3.4	0	4.0	11	6.0	137
3.5	.39	4.5	31	7.0	246
3.6	1.8	5.0	61	8.0	394
3.7	4.0				

DISCHARGE, IN CURIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.5	10	10	.68	2.3	65	48	34	45	3.8	.31	.27
2	4.2	12	9.8	.74	2.6	70	46	42	36	4.0	.23	.58
3	4.0	15	8.0	.75	3.0	100	42	89	31	3.1	.31	.50
4	4.0	18	7.0	.73	3.5	150	39	89	27	.95	.19	.58
5	4.2	21	6.2	.70	3.8	180	36	72	21	.69	.15	.50
6	5.8	22	5.4	.67	3.6	200	36	58	21	1.8	.23	.58
7	4.0	22	4.5	.64	3.4	240	34	48	17	2.9	.06	.50
8	5.0	22	3.9	.61	3.2	230	33	41	15	3.1	.27	.44
9	6.0	21	3.4	.58	3.1	155	32	34	14	2.4	.27	.44
10	7.9	20	2.7	.56	2.9	138	29	29	12	1.8	.27	.44
11	8.6	19	2.1	.54	2.8	154	29	26	11	1.3	.31	.35
12	8.4	17	1.7	.55	2.6	148	28	23	10	.58	.23	.35
13	6.8	17	1.3	.58	2.5	156	27	23	9.6	.50	.31	.27
14	8.4	16	1.1	.64	2.4	136	27	20	9.1	.58	.95	.31
15	8.0	15	.90	.72	2.3	306	28	18	8.6	.58	1.8	.31
16	7.4	14	.70	.86	2.1	224	29	17	7.2	.58	1.8	.35
17	7.0	13	.55	1.0	2.0	148	29	16	6.5	.58	1.3	.39
18	6.3	12	.47	1.2	2.2	106	30	14	6.1	.58	.95	.31
19	5.6	12	.44	1.5	3.0	83	30	14	5.4	.50	.31	.58
20	6.8	12	.43	1.7	3.5	69	32	13	5.6	.39	.27	.35
21	6.5	12	.46	2.0	4.0	61	43	13	5.4	.35	.39	.31
22	7.0	11	.50	2.0	6.0	56	59	12	4.9	.44	.35	.19
23	7.5	11	.54	1.9	9.0	52	55	12	4.7	.39	.35	.69
24	8.1	11	.58	1.8	13	52	49	16	4.2	.58	.69	.50
25	7.4	12	.57	1.9	17	57	45	30	4.0	.50	.58	.69
26	7.2	13	.55	2.3	40	66	43	124	3.3	.44	.44	.80
27	8.1	13	.53	2.7	90	72	41	136	2.0	.35	.39	.44
28	8.4	12	.51	2.8	75	70	39	116	2.2	.31	.27	.44
29	7.7	12	.53	2.7	-----	63	36	89	2.7	.31	.23	.39
30	8.1	11	.57	2.5	-----	57	34	73	3.1	.35	.27	.35
31	9.6	-----	.62	2.4	-----	52	-----	57	-----	.35	.39	-----
TOTAL	208.5	448	76.55	40.95	310.8	3,716	1,108	1,398	354.6	35.08	14.87	13.20
MEAN	6.73	14.9	2.47	1.32	11.1	120	36.9	45.1	11.8	1.13	.48	.44
MAX	9.6	22	10	2.8	90	306	59	136	45	4.0	1.8	.80
MIN	4.0	10	.43	.54	2.0	52	27	12	2.0	.31	.06	.19
AC=FT	414	889	152	81	616	7,370	2,200	2,770	703	70	29	26

WTR YR 1973 TOTAL 7,724.55 MEAN 21.2 MAX 306 MIN .06 AC=FT 15,320

PEAK DISCHARGE (BASE, 300 CFS).--Mar. 15 (1100) 414 cfs (8.11 ft).

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LOCATION.--Lat 44°54'17", long 97°03'31", in NE¼NW¼ sec.34, T.117 N., R.52 W., Codington County, on right bank 5 ft (2 m) downstream from bridge, 4.7 mi (7.6 km) upstream from mouth, and 2.8 mi (4.5 km) east of Watertown.

PERIOD OF RECORD.--September 1971 to current year.

EXTREMES.--September 1971: Maximum daily discharge during period, 0.50 cfs (0.014 cu m/s) Sept. 1; no flow Sept. 16-23, 30.

Water year 1972: Maximum discharge, 1,220 cfs (34.6 cu m/s) May 29, gage height, 6.23 ft (1.899 m); maximum gage height, 9.86 ft (3.001 m) Mar. 15, backwater from ice; no flow Oct. 1, 9.

Water year 1973: Maximum discharge, 325 cfs (9.20 cu m/s) Mar. 7; maximum gage height, 5.68 ft (1.731 m) Feb. 24, backwater from ice; no flow for many days.

REMARKS.--Records fair except those for winter periods, which are poor. Water-quality records for the water year 1973 are published in Part 2 of this report.

[illegible]

BIG SIOUX RIVER BASIN

06479515 Willow Creek near Watertown, S. Dak.--Continued

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972												
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0	11	8.3	.85	.04	.24	44	163	149	26	20	6.7
2	.02	12	8.3	.70	.03	.30	44	336	130	24	18	7.0
3	.02	9.6	9.5	.58	.03	.34	38	118	118	22	17	5.9
4	.02	8.7	8.3	.45	.03	.30	38	104	106	21	15	5.3
5	.01	6.6	8.3	.40	.03	.26	38	95	96	20	14	5.3
6	.01	7.3	8.3	.35	.02	.40	40	86	86	20	18	3.8
7	.01	5.7	6.5	.30	.02	.60	40	83	78	21	19	3.5
8	.01	5.0	6.5	.35	.02	1.2	33	81	75	22	20	3.5
9	0	4.7	6.5	.45	.02	3.0	34	76	71	23	18	3.5
10	.02	4.7	6.5	.50	.02	8.0	34	71	69	23	17	3.5
11	.03	4.7	6.5	.45	.02	20	36	68	64	20	20	3.5
12	.04	4.7	5.9	.40	.03	50	192	74	57	20	26	3.5
13	.04	5.3	5.9	.35	.03	120	225	113	51	19	24	3.9
14	.04	5.9	5.9	.30	.03	350	84	199	49	18	17	3.7
15	.05	5.9	5.9	.20	.03	250	67	137	45	18	14	3.3
16	6.4	8.7	5.9	.17	.04	170	61	102	42	17	14	3.3
17	1.3	16	5.3	.14	.05	110	57	86	40	16	8.4	3.4
18	4.3	30	4.3	.18	.06	56	55	70	44	14	7.1	3.2
19	8.2	22	3.7	.21	.09	42	56	62	158	12	6.9	3.3
20	6.6	20	3.1	.25	.12	54	56	58	93	12	6.2	3.5
21	5.1	22	2.6	.27	.11	496	58	50	64	18	6.0	2.0
22	3.5	16	2.2	.23	.10	140	68	55	51	25	8.9	2.0
23	2.5	12	1.9	.16	.09	64	66	542	44	25	8.3	2.5
24	1.9	10	2.0	.12	.11	56	60	207	39	20	6.1	2.5
25	1.0	9.5	2.1	.09	.13	50	57	227	36	19	7.7	2.0
26	.56	9.5	2.2	.06	.16	54	54	128	32	56	7.4	2.0
27	1.7	7.7	1.9	.04	.18	38	52	140	30	69	5.1	2.5
28	1.8	8.3	1.6	.03	.19	52	54	191	54	40	4.7	2.0
29	2.1	8.3	1.4	.02	.21	50	57	452	39	27	4.7	1.8
30	8.1	8.3	1.2	.03	-----	44	58	501	29	21	4.3	2.3
31	7.5	-----	1.0	.04	-----	46	-----	199	-----	20	3.5	-----
TOTAL	62.88	310.1	149.5	8.67	2.04	2,326.64	1,856	4,874	2,039	728	388.3	104.2
MEAN	2.03	10.3	4.82	.28	.070	75.1	61.9	157	68.0	23.5	12.5	3.47
MAX	8.2	30	9.5	.85	.21	496	225	542	158	69	26	7.0
MIN	0	4.7	1.0	.02	.02	.24	33	50	29	12	3.5	1.8
AC-FT	125	615	297	17	4.0	4,610	3,680	9,670	4,040	1,440	770	207
WTR YR 1972 TOTAL 12,849.33 MEAN 35.1 MAX 542 MIN 0 AC-FT 25,490												

PEAK DISCHARGE (BASE, 200 CFS)

DATE	TIME	G.H.	DISCHARGE	DATE	TIME	G.H.	DISCHARGE
3-15	-	-	500	5-14	1145	4.58	227
3-21	0800	6.01	1,050	5-23	0700	6.18	1,180
4-12	2000	5.45	665	5-29	2245	6.23	1,220
5-1	2315	5.45	665	6-19	1300	4.60	231

BIG SIOUX RIVER BASIN

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06479515 Willow Creek near Watertown, S. Dak.--Continued

DISCHARGE, IN CURIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973												
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.0	2.5	3.5	.92	1.9	65	29	20	14	4.1		.01
2	2.7	5.9	3.5	.88	1.9	75	28	40	13	4.7		.02
3	2.5	8.0	2.5	.84	2.5	85	26	46	14	3.5		.06
4	2.0	8.7	1.5	.80	3.0	95	24	30	14	3.5		.04
5	3.2	7.6	1.5	.76	3.6	100	24	24	14	3.0		.01
6	4.9	6.8	1.4	.73	3.5	120	24	23	13	3.0		0
7	4.9	5.9	1.2	.70	3.3	250	23	26	12	2.0		0
8	4.7	5.9	1.0	.67	3.2	82	23	28	10	.50		0
9	4.1	5.9	.85	.64	3.1	50	23	23	10	.35		0
10	3.9	5.3	.75	.60	2.9	56	22	20	9.5	.50		0
11	4.1	5.3	.65	.37	2.8	46	23	17	9.5	.35		0
12	6.7	4.9	.55	.28	2.7	92	20	17	9.5	.18		0
13	5.7	3.9	.50	.27	2.6	58	19	17	8.9	.06		0
14	6.3	4.1	.45	.28	2.5	46	19	16	8.9	0		0
15	7.1	3.8	.40	.35	2.3	86	17	14	8.3	0		0
16	5.1	3.5	.38	.55	2.2	42	17	11	8.3	0		0
17	4.5	3.5	.35	.75	2.1	30	18	11	7.7	0		0
18	5.0	3.5	.36	1.2	2.3	27	18	11	8.3	0		0
19	5.3	3.5	.37	1.4	2.6	24	19	11	7.1	0		0
20	5.3	3.5	.39	1.5	3.1	24	20	11	7.7	.06		0
21	5.3	4.1	.44	1.4	4.5	23	25	10	7.1	.05		0
22	5.3	4.1	.52	1.3	20	23	22	9.5	6.5	.02		0
23	5.7	4.1	.65	1.1	70	23	21	9.1	7.1	.03		0
24	5.9	4.1	.80	.95	100	25	22	10	6.5	.11		.01
25	6.5	4.1	.76	1.1	95	33	23	15	5.3	.12		.03
26	6.9	3.0	.74	1.5	85	35	22	19	5.3	.11		.03
27	6.4	4.7	.72	2.5	75	33	20	19	5.3	.05		.01
28	5.1	4.7	.70	3.2	60	32	20	29	4.7	.02		0
29	2.5	4.1	.85	2.8	-----	32	20	30	4.7	.01		.01
30	2.5	3.5	1.0	2.4	-----	32	20	20	3.0	0		0
31	2.5	-----	.95	1.8	-----	30	-----	17	-----	0		-----
TOTAL	144.6	142.5	30.23	34.54	563.6	1,774	651	603.6	263.2	26.32	0	.23
MEAN	4.66	4.75	.98	1.11	20.1	57.2	21.7	19.5	8.77	.85	0	.008
MAX	7.1	8.7	3.5	3.2	100	250	29	46	14	4.7	0	.06
MIN	2.0	2.5	.35	.27	1.9	23	17	9.1	3.0	0	0	0
AC=FT	287	283	60	69	1,120	3,520	1,290	1,200	522	52	0	.5
CAL YR 1972	TOTAL	12,645.18	MEAN	34.5	MAX	542	MIN	.02	AC=FT	25,080		
WTR YR 1973	TOTAL	4,233.82	MEAN	11.6	MAX	250	MIN	0	AC=FT	8,400		

PEAK DISCHARGE (BASE, 200 CFS).--Mar. 7 (time and stage unknown) 325 cfs.

06479529 Stray Horse Creek near Castlewood, S. Dak.

LOCATION.--Lat 44°43'52", long 96°57'23", in NE¼NE¼NW¼ sec.33, T.115 N., R.51 W., Hamlin County, on right bank at downstream side of bridge on State Highway 22, 3.5 mi (5.6 km) east of Castlewood, 6.4 mi (10.3 km) upstream from mouth, and 7.0 mi (11.3 km) north of Dempster.

DRAINAGE AREA.--73.7 sq mi (191 sq km), approximately.

PERIOD OF RECORD.--October 1968 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 1,705 ft (520 m), from topographic map.

AVERAGE DISCHARGE.--5 years, 13.8 cfs (0.391 cu m/s), 10,000 acre-ft/yr (12.3 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 290 cfs (8.21 cu m/s) Mar. 6; maximum gage height, 8.06 ft (2.457 m) Feb. 24, backwater from ice; no flow for many days July to September.

Period of record: Maximum discharge, 14,000 cfs (396 cu m/s) Apr. 7, 1969, gage height, 14.65 ft (4.465 m), from rating curve extended above 3,500 cfs (99.1 cu m/s) on basis of contracted-opening measurement of peak flow; no flow for many days each year.

REMARKS.--Records good except those for winter periods, which are poor. Water-quality records for the water year 1973 are published in Part 2 of this report.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Stage-discharge relation affected by ice Dec. 6 to Mar. 9)

4.3	0	4.9	6.4
4.4	.35	5.2	15
4.5	.85	5.5	27
4.6	1.6	6.0	61
4.7	2.8	6.5	113

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.70	2.5	2.3	1.3	1.9	40	12	5.2	5.5	.08	.07	0
2	.65	12	2.1	1.3	2.1	50	11	9.9	4.0	.30	.07	0
3	.70	17	2.0	1.3	2.3	100	10	25	3.5	.23	.11	.02
4	.60	12	1.6	1.2	2.6	110	9.2	17	2.8	.13	.08	.04
5	.70	9.3	1.6	1.2	2.8	200	8.7	11	2.2	.10	.03	.02
6	1.3	8.0	1.5	1.2	2.7	240	8.4	8.6	1.8	.12	0	.01
7	1.6	7.0	1.4	1.1	2.4	125	8.0	7.4	1.5	.14	0	0
8	1.6	6.0	1.3	1.1	2.2	50	7.9	6.4	1.3	.10	.28	0
9	1.2	5.1	1.2	1.1	2.0	40	7.4	6.3	1.1	.11	.24	.01
10	1.6	4.9	1.1	1.0	1.9	45	6.6	5.4	.86	.14	.10	.03
11	3.4	4.4	1.0	.94	1.7	65	6.6	4.6	.80	.10	.04	.01
12	3.4	4.0	.95	.94	1.6	90	6.3	3.8	.74	.07	.04	0
13	2.4	4.2	.88	.96	1.5	47	5.9	3.3	.68	.04	.04	0
14	2.0	3.2	.80	.98	1.4	89	5.7	2.9	.64	0	.04	0
15	1.8	2.9	.72	1.0	1.3	93	6.0	2.6	.60	.03	.04	.06
16	1.6	2.9	.68	1.1	1.2	47	6.2	2.2	.51	0	.07	.17
17	1.5	2.9	.65	1.2	1.1	24	6.8	2.0	.41	0	.04	.17
18	1.6	2.9	.65	1.3	1.3	18	7.0	1.9	.47	0	0	.13
19	1.5	2.9	.66	1.3	1.5	15	6.9	1.6	.45	0	0	.10
20	1.5	2.9	.68	1.4	1.9	12	7.7	1.5	.44	0	0	.07
21	1.5	2.9	.74	1.5	1.8	11	7.5	1.6	.33	0	0	.07
22	1.5	2.9	.78	1.5	1.5	10	8.4	1.5	.28	0	0	.11
23	1.6	2.8	.84	1.4	60	10	7.8	1.3	.28	.09	0	.07
24	1.8	2.6	.86	1.3	75	12	6.8	1.5	.21	.23	.05	.14
25	2.0	2.6	.82	1.5	50	20	6.5	1.9	.22	.24	.12	.31
26	2.3	2.6	.80	1.7	45	24	5.7	2.2	.17	.19	.15	.27
27	2.2	2.6	.82	1.9	40	18	5.3	3.6	.06	.13	.09	.21
28	2.0	2.6	.86	1.8	35	16	5.1	13	.06	.10	0	.17
29	1.8	2.4	.90	1.8	-----	16	4.7	21	.03	.07	0	.13
30	1.8	2.3	1.1	1.7	-----	14	4.3	13	.01	.07	0	.11
31	2.3	-----	1.3	1.8	-----	13	-----	8.0	-----	.10	0	-----
TOTAL	52.15	143.3	33.59	40.82	359.2	1,664	216.4	197.2	31.95	2.91	1.70	2.43
MEAN	1.68	4.78	1.08	1.32	12.8	53.7	7.21	6.36	1.094	.094	.055	.081
MAX	3.4	17	2.3	1.9	75	240	12	25	5.5	.30	.28	.31
MIN	.60	2.3	.65	.94	1.1	10	4.3	1.3	.01	0	0	0
AC=FT	103	284	67	81	712	3,300	429	391	63	5.8	3.4	4.8
CAL YR 1972	TOTAL 8,606.13	MEAN 23.5	MAX 946	MIN .03	AC=FT 17,070							
WTR YR 1973	TOTAL 2,745.65	MEAN 7.52	MAX 240	MIN 0	AC=FT 5,450							

PEAK DISCHARGE (BASE, 175 CFS).--Mar. 6 (time and stage unknown) 290 cfs.

BIG SIOUX RIVER BASIN

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06479640 Hidewood Creek near Estelline, S. Dak.

LOCATION.--Lat 44°36'42", long 96°54'17", in SW¼NW¼ sec.12, T.113 N., R.51 W., Hamlin County, on left bank at upstream side of highway bridge, 2.7 mi (4.3 km) north of Estelline, 2.8 mi (4.5 km) southeast of Dempster, and 4.7 mi (7.6 km) upstream from mouth.

DRAINAGE AREA.--164 sq mi (425 sq km), approximately.

PERIOD OF RECORD.--October 1968 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 1,665 ft (508 m), from topographic map.

AVERAGE DISCHARGE.--5 years, 32.3 cfs (0.915 cu m/s), 23,400 acre-ft/yr (28.9 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 450 cfs (12.7 cu m/s) Mar. 7; maximum gage height, 7.22 ft (2.201 m) Mar. 7, backwater from ice; minimum daily discharge, 0.06 cfs (0.002 cu m/s) Sept. 23.
Period of record: Maximum discharge, 3,630 cfs (103 cu m/s) Apr. 7, 1969, gage height, 11.36 ft (3.463 m), corrected; maximum gage height, 11.55 ft (3.520 m) Apr. 8, 1969, backwater from collapsed bridge; no flow at times in 1969, 1971.

REMARKS.--Records fair except those for winter periods, which are poor. Water-quality records for the water year 1973 are published in Part 2 of this report.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 13 to Dec. 2, Mar. 11-18; stage-discharge relation affected by ice Dec. 3 to Mar. 10)

2.2	0	2.8	14
2.3	.20	3.2	38
2.4	.95	3.5	64
2.5	2.2	4.0	110
2.6	4.6		

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.4	4.1	2.9	2.3	4.0	75	67	24	27	2.6	.38	1.3
2	2.4	14	3.1	2.5	4.7	85	61	35	23	4.5	.61	1.3
3	2.4	24	3.1	2.7	5.8	100	56	42	20	5.5	.71	1.1
4	2.1	16	3.1	2.5	8.0	120	51	34	18	4.0	.63	.42
5	4.0	10	3.0	2.3	10	150	46	29	17	2.8	.41	.35
6	5.3	8.3	2.8	2.3	11	180	45	27	16	1.8	.36	.20
7	4.4	5.8	2.6	2.1	10	350	44	28	16	1.4	.40	.20
8	5.2	4.6	2.4	2.5	9.0	200	41	27	13	1.4	.68	.18
9	6.8	3.5	2.2	2.5	7.5	180	39	26	12	1.7	.62	.20
10	6.2	2.6	2.0	2.1	6.0	170	38	25	9.7	2.1	.72	.20
11	6.6	2.4	1.8	2.2	5.0	179	36	23	8.2	1.7	.65	.16
12	6.1	2.4	1.7	2.2	4.0	312	33	20	7.9	1.4	.58	.14
13	5.4	5.9	1.5	2.2	3.3	150	31	19	7.3	1.4	.58	.12
14	5.1	3.8	1.4	2.3	2.8	157	30	17	5.9	1.5	.42	.16
15	4.0	3.0	1.3	2.3	2.5	203	31	16	5.2	1.7	.42	.16
16	5.1	2.9	1.2	2.4	2.2	136	31	15	4.3	1.7	.50	.16
17	3.0	2.7	1.2	2.5	2.0	100	32	14	3.6	1.8	.58	.14
18	2.4	2.3	1.2	2.6	2.1	87	30	13	3.8	1.8	.50	.10
19	3.2	2.5	1.2	2.6	2.4	78	29	12	3.4	1.2	.58	.08
20	2.8	2.9	1.3	2.7	3.5	72	29	13	3.4	1.1	.50	.08
21	3.4	2.7	1.4	2.7	5.0	67	33	13	2.9	1.0	.58	.10
22	3.6	2.8	1.5	2.6	10	64	31	13	3.0	1.0	.95	.08
23	3.4	2.9	1.5	2.5	50	63	29	15	2.5	1.3	1.2	.06
24	3.1	3.4	1.6	2.4	130	65	26	17	1.9	1.6	1.2	.10
25	3.3	3.5	1.6	2.5	100	76	26	20	2.1	1.8	1.2	.16
26	3.1	3.4	1.7	3.5	90	77	25	22	2.7	1.9	.95	.14
27	2.9	3.7	1.8	4.3	80	69	24	27	2.0	1.3	.95	.14
28	2.8	3.3	1.8	4.1	70	67	22	35	2.0	.70	1.1	.18
29	3.7	3.1	1.9	3.8	-----	68	21	55	2.3	.52	1.2	.12
30	3.3	3.3	2.0	3.5	-----	72	21	45	2.3	.39	1.1	.14
31	3.5	-----	2.1	3.4	-----	68	-----	35	-----	.39	1.1	-----
TOTAL	121.0	155.8	59.9	83.1	640.8	3,040	1,058	756	248.4	55.00	22.36	7.97
MEAN	3.90	5.19	1.93	2.68	22.9	124	35.3	24.4	8.28	1.77	.72	.27
MAX	6.8	24	3.1	4.3	130	350	67	55	27	5.5	1.2	1.3
MIN	2.1	2.3	1.2	2.1	2.0	63	21	12	1.9	.39	.36	.06
AC-FT	240	309	119	165	1,270	7,620	2,100	1,500	493	109	44	16
CAL YR 1972 TOTAL	10,683.75			45.6	944							
WTR YR 1973 TOTAL	7,048.33			19.3	350							

PEAK DISCHARGE (BASE, 300 CFS)

DATE TIME G.H. DISCHARGE

3- 7 - - 450
3-12 0930 5.92 390

06479910 Sixmile Creek near Brookings, S. Dak.

LOCATION.--Lat 44°20'46", long 96°44'51", in NE¼SE¼ sec.7, T.110 N., R.49 W., Brookings County, on left bank 8 ft (2 m) downstream from bridge, 0.7 mi (1.1 km) upstream from Interstate Highway 29 and 2.7 mi (4.3 km) northeast of Brookings.

DRAINAGE AREA.--54.0 sq mi (140 sq km), approximately.

PERIOD OF RECORD.--September 1970 to current year. February 1951 to August 1970 (gage heights and discharge measurements only in files of Corps of Engineers).

GAGE.--Water-stage recorder. Datum of gage is 1,620.57 ft (493.950 m) above mean sea level (levels by Corps of Engineers). Prior to Sept. 1, 1970, at datum 1.00 ft (0.305 m) higher.

EXTREMES.--Current year: Maximum discharge, 325 cfs (9.20 cu m/s) Mar. 6; maximum gage height, 5.96 ft (1.817 m) Mar. 6, backwater from ice; no flow for many days.

Period of record: Maximum discharge, 405 cfs (11.5 cu m/s) May 29, 1972, gage height, 6.71 ft (2.045 m); maximum gage height, 7.26 ft (2.213 m) Mar. 12, 1972, backwater from ice; no flow for many days in each year.

REMARKS.--Records good except those for winter periods, which are poor. Water-quality records for the water year 1973 are published in Part 2 of this report.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 7, 10-18; stage-discharge relation affected by ice Dec. 2 to Mar. 6)

0.68	0	1.0	2.2	2.0	38
.70	.04	1.1	5.0	3.0	90
.80	.30	1.4	16	4.0	157
.90	.98				

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.98	3.7	4.6	.20	.92	14	13	7.9	5.7	.01		0
2	.98	7.4	2.5	.19	.90	20	13	8.8	4.3	.21		0
3	.98	7.8	1.8	.19	1.1	30	12	8.6	4.1	.09		0
4	.98	6.4	1.3	.18	1.2	65	12	11	3.4	.06		0
5	1.3	8.2	1.1	.18	1.4	110	11	10	2.9	.04		0
6	2.2	8.2	.99	.18	1.3	290	11	8.3	2.2	0		0
7	2.4	6.8	.90	.17	1.2	273	11	7.3	2.3	0		0
8	2.4	5.7	.75	.17	1.2	97	11	6.3	1.8	0		0
9	2.1	5.4	.65	.17	1.1	34	9.9	5.7	1.5	.09		0
10	1.9	5.4	.60	.18	1.0	21	9.9	4.6	1.2	.20		0
11	1.9	4.6	.55	.20	.90	17	9.3	4.1	.92	.11		0
12	1.9	4.3	.45	.22	.80	64	8.6	3.6	.92	.05		0
13	1.8	6.8	.40	.25	.75	58	8.5	3.3	1.0	0		0
14	1.8	7.8	.35	.30	.65	52	8.5	3.3	.81	0		0
15	1.8	6.8	.28	.35	.55	68	9.7	2.9	.64	0		0
16	1.8	3.7	.23	.40	.50	42	11	2.6	.34	0		0
17	1.8	3.4	.19	.50	.45	24	11	2.4	.33	0		0
18	1.6	3.4	.16	.60	.40	17	11	2.2	.33	0		0
19	1.6	3.4	.14	.70	.50	14	11	2.7	.48	0		0
20	1.6	3.4	.12	.80	.60	13	11	1.7	.50	0		0
21	1.9	3.7	.12	.90	.75	13	10	1.7	.39	0		0
22	2.1	5.4	.13	.88	1.2	12	9.9	1.6	.22	0		0
23	2.1	6.0	.13	.86	3.0	12	9.3	1.4	.22	0		0
24	2.1	6.0	.14	.83	10	12	7.9	1.8	.08	0		0
25	2.1	3.7	.14	.80	28	14	7.9	2.4	0	0		0
26	2.1	7.8	.15	.88	22	14	7.2	2.5	0	0		0
27	2.1	5.0	.16	1.0	18	16	7.1	3.5	0	0		.03
28	1.8	5.7	.17	1.2	16	15	6.6	4.8	0	0		.22
29	1.8	6.4	.18	1.1	-----	15	6.3	4.7	0	0		.22
30	2.1	5.7	.19	.98	-----	14	6.0	10	0	0		.20
31	3.4	-----	.20	.96	-----	14	-----	8.9	-----	0		-----
TOTAL	57.42	168.0	19.77	16.52	116.37	1,474	291.6	150.6	36.58	.86	0	.67
MEAN	1.85	5.60	.64	.53	4.16	47.5	9.72	4.86	1.22	.028	0	.022
MAX	3.4	8.2	4.6	1.2	28	290	13	11	5.7	.21	0	.22
MIN	.98	3.4	.12	.17	.40	12	6.0	1.4	0	0	0	0
AC=FT	114	333	39	33	231	2,920	578	299	73	1.7	0	1.3
CAL YR 1972 TOTAL	4,282.38											
WTR YR 1973 TOTAL	2,332.39											
MEAN	11.7											
MAX	324											
MIN	0											
AC=FT	8,490											

PEAK DISCHARGE (BASE, 100 CFS)

DATE	TIME	G.H.	DISCHARGE
3-6	-	-	325
3-12	1745	4.17	142

BIG SIOUX RIVER BASIN

123

06480000 Big Sioux River near Brookings, S. Dak.

LOCATION.--Lat 44°10'48", long 96°44'55", in NW¼NW¼ sec.8, T.108 N., R.49 W., Moody County, on right bank 3 ft (1 m) downstream from highway bridge, 2.2 mi (3.5 km) downstream from Medary Creek and 9.5 mi (15.3 km) southeast of Brookings.

DRAINAGE AREA.--4,420 sq mi (11,450 sq km), approximately, of which about 1,970 sq mi (5,100 sq km) is probably noncontributing.

PERIOD OF RECORD.--August 1953 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,551.91 ft (473.022 m) above mean sea level. Prior to May 30, 1959, nonrecording gage at present site and datum.

AVERAGE DISCHARGE.--20 years, 169 cfs (4.786 cu m/s), 122,400 acre-ft/yr (151 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 3,010 cfs (85.2 cu m/s) Mar. 8, gage height, 10.26 ft (3.127 m); minimum daily, 11 cfs (0.31 cu m/s) Sept. 1.

Period of record: Maximum discharge, 33,900 cfs (960 cu m/s) Apr. 9, 1969, gage height, 14.77 ft (4.502 m); no flow at times in 1956, 1959.

REMARKS.--Records good except those for winter periods, which are poor. Water-quality records for the water year 1973 are published in Part 2 of this report.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 13 to Nov. 29, Mar. 7 to Apr. 1, Apr. 14 to May 13; stage-discharge relation affected by ice Nov. 30 to Mar. 6)

1.7	7.0	3.0	145	8.0	1,210
1.8	16	4.0	288	10.0	2,070
2.0	35	6.0	697	11.0	3,690
2.5	86				

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	138	153	110	46	57	400	698	325	220	65	23	11
2	134	206	105	45	57	550	666	355	206	81	23	12
3	131	256	98	43	58	725	627	371	203	73	23	16
4	127	272	92	41	60	1,050	586	377	193	72	22	16
5	128	287	85	39	60	1,500	559	393	193	65	22	17
6	147	280	80	36	58	1,900	542	387	183	58	21	16
7	155	252	78	33	55	2,210	513	354	167	55	23	15
8	157	233	75	30	52	2,940	495	331	156	52	31	16
9	157	222	73	28	50	2,650	475	312	146	59	28	16
10	153	211	70	30	48	1,900	441	297	137	57	26	16
11	153	202	68	32	49	1,470	437	283	135	50	28	14
12	150	194	65	34	50	1,300	421	273	136	47	24	12
13	151	188	62	35	49	1,380	415	255	125	44	21	12
14	146	149	60	37	48	1,540	419	240	117	42	20	13
15	142	150	58	39	46	1,620	429	229	115	40	19	17
16	140	161	55	41	44	1,600	443	220	110	38	19	19
17	138	168	53	43	43	1,450	467	208	103	36	17	19
18	136	186	52	46	44	1,270	461	199	103	35	16	18
19	132	182	50	52	46	1,100	453	191	97	34	15	16
20	130	180	49	60	48	963	445	183	96	33	14	17
21	135	179	48	58	50	877	427	178	98	32	14	17
22	139	169	47	56	55	811	401	174	94	31	15	17
23	138	162	46	54	60	755	397	167	86	33	14	16
24	133	169	45	52	67	742	389	166	80	34	16	15
25	130	180	44	50	75	772	371	171	75	33	16	17
26	130	161	46	49	140	788	348	172	71	31	16	24
27	131	150	47	48	200	782	336	190	70	30	14	29
28	129	137	49	50	300	781	329	198	71	28	13	24
29	128	128	50	52	-----	785	317	195	69	27	12	24
30	132	120	49	53	-----	770	306	211	65	24	12	23
31	146	-----	48	55	-----	736	-----	226	-----	23	12	-----
TOTAL	4,316	5,687	1,957	1,367	1,969	38,117	13,613	7,831	3,720	1,362	589	514
MEAN	139	190	63.1	44.1	70.3	1,230	454	253	124	43.9	19.0	17.1
MAX	157	287	110	60	300	2,940	698	393	220	81	31	29
MIN	127	120	44	28	43	400	306	166	65	23	12	11
AC-FT	8,560	11,280	3,880	2,710	3,910	75,610	27,000	15,530	7,380	2,700	1,170	1,020

CAL YR 1972 TOTAL 175,065.9 MEAN 478 MAX 4,850 MIN 4.0 AC-FT 347,200
WTR YR 1973 TOTAL 81,042.0 MEAN 222 MAX 2,940 MIN 11 AC-FT 160,700

PEAK DISCHARGE (BASE, 1,000 CFS)

DATE	TIME	G.H.	DISCHARGE
3- 8	2100	10.26	3,010
3-15	2300	8.96	1,650

BIG SIOUX RIVER BASIN

06481000 Big Sioux River near Dell Rapids, S. Dak.

LOCATION.--Lat 43°47'25", long 96°44'42", in NW¼NW¼ sec.29, T.104 N., R.49 W., Minnehaha County, on left bank at downstream side of highway bridge, 0.2 mi (0.3 km) downstream from confluence of divided channels and 3.0 mi (4.8 km) southwest of Dell Rapids.

DRAINAGE AREA.--5,060 sq mi (13,100 sq km), approximately, of which about 1,970 sq mi (5,100 sq km) is probably noncontributing.

PERIOD OF RECORD.--May 1948 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,455.99 ft (443.786 m) above mean sea level. Prior to Nov. 11, 1949, nonrecording gage and Nov. 11, 1949, to Sept. 30, 1951, water-stage recorder, at present site at datum 0.04 ft (0.012 m) lower.

AVERAGE DISCHARGE.--25 years, 275 cfs (7.788 cu m/s), 199,200 acre-ft/yr (246 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 3,700 cfs (105 cu m/s) Mar. 9; maximum gage height, 12.06 ft (3.676 m) Mar. 9, backwater from ice; minimum daily, 14 cfs (0.40 cu m/s) Sept. 13, 14.
Period of record: Maximum discharge, 41,300 cfs (1,170 cu m/s) Apr. 9, 1969, gage height, 16.47 ft (5.020 m); minimum daily, 0.20 cfs (0.006 cu m/s) Jan. 31, Feb. 1, 1965.

REMARKS.--Records good except those for winter periods, which are poor. Water-quality records for the water year 1973 are published in Part 2 of this report.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 11-17, May 1-7, Aug. 3 to Sept. 15;
stage-discharge relation affected by ice Dec. 1 to Mar. 10)

2.7	5	4.0	230	8.0	1,650
2.9	18	5.0	525	10.0	2,550
3.1	36	6.0	875	12.0	4,440
3.3	66				

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	169	180	135	75	98	500	916	445	260	86	31	16
2	167	212	130	70	100	800	882	445	268	97	30	16
3	161	233	95	67	103	1,200	844	475	265	93	30	22
4	153	280	105	63	107	1,700	796	502	251	90	28	23
5	154	323	115	60	110	2,100	752	502	235	89	30	21
6	170	330	118	55	113	2,300	718	493	224	84	29	19
7	170	333	122	50	116	2,800	677	495	219	81	31	18
8	170	322	127	45	113	3,000	650	469	207	74	31	16
9	182	293	132	40	110	3,600	621	431	195	75	30	16
10	188	274	127	43	105	3,200	599	405	186	75	29	16
11	186	250	122	47	95	2,970	573	385	172	71	31	15
12	184	245	117	50	85	3,300	557	367	173	67	29	15
13	183	226	110	52	80	2,320	544	351	165	60	27	14
14	179	199	105	55	75	2,200	529	336	167	55	27	14
15	178	178	100	60	70	2,280	534	321	160	53	30	18
16	170	156	97	65	65	2,240	548	299	145	51	30	22
17	165	164	93	70	70	2,100	585	289	141	49	27	23
18	165	187	88	75	75	1,950	617	278	149	44	25	25
19	165	194	85	86	80	1,710	623	267	141	42	24	25
20	166	198	80	100	88	1,480	592	254	132	40	23	26
21	167	200	80	92	95	1,290	567	243	127	40	23	27
22	163	192	78	88	103	1,140	560	230	123	39	20	27
23	163	185	77	85	110	1,030	536	220	123	41	18	28
24	164	189	75	82	200	942	515	214	122	46	20	31
25	165	184	75	80	350	930	508	211	111	46	20	29
26	167	184	80	82	450	926	495	211	102	44	21	34
27	160	187	83	85	400	926	472	224	96	43	20	36
28	158	198	87	88	350	954	456	232	93	42	18	34
29	158	152	90	90	-----	967	435	237	85	40	16	51
30	160	138	85	92	-----	960	434	240	83	39	16	48
31	170	-----	80	95	-----	947	-----	246	-----	33	16	-----
TOTAL	5,220	6,586	3,093	2,187	3,916	54,762	18,135	10,317	4,920	1,829	780	725
MEAN	168	220	99.8	70.5	140	1,767	605	333	164	59.0	25.2	24.2
MAX	188	333	135	100	450	3,600	916	502	268	97	31	51
MIN	153	138	75	40	65	500	434	211	83	33	16	14
AC-FT	10,350	13,060	6,130	4,340	7,770	108,600	35,970	20,460	9,760	3,630	1,550	1,440

CAL YR 1972 TOTAL 204,330.5 MEAN 558 MAX 3,630 MIN 8.0 AC-FT 405,300
WTR YR 1973 TOTAL 112,470.0 MEAN 308 MAX 3,600 MIN 14 AC-FT 223,100

PEAK DISCHARGE (BASE, 1,000 CFS).--Mar. 9 (time and stage unknown) 3,700 cfs, 1965

BIG SIOUX RIVER BASIN

125

06481500 Skunk Creek at Sioux Falls, S. Dak.

LOCATION.--Lat 43°32'01", long 96°47'26", in NW¼SW¼ sec.24, T.101 N., R.50 W., Minnehaha County, on right bank 5 ft (2 m) downstream from bridge on Marion Road, 1.3 mi (2.1 km) upstream from mouth, 1.8 mi (2.9 km) downstream from small right-bank tributary, and 4.0 mi (6.4 km) southwest of Sioux Falls.

DRAINAGE AREA.--570 sq mi (1,480 sq km), approximately.

PERIOD OF RECORD.--May 1948 to September 1971 (published as "near Sioux Falls"). October 1971 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,405.10 ft (428.274 m) above mean sea level (Corps of Engineers bench mark). Prior to Oct. 24, 1949, nonrecording gage, and Oct. 24, 1949, to Apr. 28, 1972, water-stage recorder, both at site 1.9 mi (3.1 km) upstream at datum 10.19 ft (3.106 m) higher.

AVERAGE DISCHARGE.--25 years, 50.4 cfs (1.427 cu m/s), 36,510 acre-ft/yr (45.0 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 1,850 cfs (52.4 cu m/s) Mar. 6, gage height, 8.18 ft (2.493 m); minimum daily, 0.18 cfs (0.005 cu m/s) Sept. 14.

Period of record: Maximum discharge, 29,400 cfs (833 cu m/s) June 17, 1957, gage height, 17.78 ft (5.419 m), site and datum then in use, from rating curve extended above 8,100 cfs (229 cu m/s) on basis of slope-area measurement of peak flow; no flow at times in many years.

REMARKS.--Records good except those for winter periods, which are poor. Water-quality records for the water year 1973 are published in Part 2 of this report.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Jan. 1, Aug. 1-26, Sept. 19-30;
stage-discharge relation affected by ice Jan. 2 to Mar. 5)

2.2	0.10	2.6	6.0	4.0	195
2.3	.30	2.8	18	5.0	465
2.4	.80	3.1	40	7.0	1,220
2.5	2.5	3.5	86		

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.8	17	14	13	6.2	290	222	77	24	4.2	1.6	1.3
2	9.3	30	12	8.5	6.8	510	215	86	24	5.3	1.6	2.0
3	9.3	35	7.1	6.6	8.0	625	198	87	25	4.9	1.8	2.8
4	8.2	36	6.6	5.7	9.0	560	182	80	31	6.3	2.5	2.0
5	8.2	35	6.6	4.0	8.5	440	172	76	28	8.8	2.3	1.5
6	10	34	6.6	3.5	8.0	1,180	165	70	24	9.3	2.3	1.3
7	11	29	6.6	3.0	7.5	890	155	70	21	12	3.2	1.1
8	9.3	26	6.6	2.8	7.0	500	145	70	19	12	3.6	1.6
9	11	25	6.6	2.5	6.4	332	136	67	16	11	2.3	1.3
10	12	23	6.0	2.6	6.0	288	112	64	14	14	1.8	1.3
11	14	21	5.3	2.8	7.0	560	124	61	12	9.8	1.8	.73
12	13	23	5.3	3.0	7.5	958	120	58	12	7.1	1.6	.65
13	12	23	5.3	3.3	6.5	574	116	52	11	6.6	2.0	.55
14	10	18	5.0	4.2	6.0	878	106	50	11	1.5	1.8	.18
15	8.8	18	5.0	5.2	5.5	703	108	47	11	2.8	1.8	.28
16	9.3	18	4.6	6.5	5.0	453	112	43	9.7	2.8	1.1	.28
17	8.8	18	4.6	8.0	7.0	354	112	39	8.6	2.2	1.1	.45
18	8.8	18	4.6	10	9.0	312	102	36	9.2	2.0	.80	.48
19	8.8	18	4.6	9.0	12	285	95	32	8.8	1.6	1.3	.50
20	9.8	18	4.6	8.5	15	260	90	29	8.4	1.3	1.1	.44
21	11	18	3.9	8.0	20	240	92	28	8.2	.97	1.1	.45
22	12	18	4.6	7.5	25	225	86	24	7.7	1.3	.97	.51
23	12	16	5.6	6.5	35	220	81	23	7.6	1.5	.70	.52
24	12	14	5.3	8.0	50	252	77	21	6.6	3.6	.60	.48
25	14	17	5.3	10	100	280	77	21	7.1	4.6	.55	.65
26	14	14	5.3	14	180	265	74	22	5.7	2.8	.65	1.7
27	15	16	5.3	9.5	124	240	69	30	5.1	2.3	.65	1.9
28	13	11	5.6	7.5	92	230	67	34	4.5	2.0	.65	1.4
29	12	16	10	6.0	-----	248	66	34	4.2	2.3	.65	5.0
30	12	14	19	5.7	-----	245	64	31	3.8	2.2	.80	6.3
31	16	-----	16	5.9	-----	228	-----	28	-----	2.0	1.3	-----
TOTAL	344.4	637	213.5	201.3	779.9	13,625	3,540	1,490	388.2	151.07	46.02	39.65
MEAN	11.1	21.2	6.89	6.49	27.9	440	118	48.1	12.9	4.87	1.48	1.32
MAX	16	36	19	14	180	1,180	222	87	31	14	3.6	6.3
MIN	8.2	11	3.9	2.5	5.0	220	64	21	3.8	.97	.55	.18
AC-FT	683	1,260	423	399	1,550	27,030	7,020	2,960	770	300	91	79
CAL YR 1972	TOTAL 26,957.05	MEAN 73.7	MAX 1,570	MIN .25	AC-FT 53,470							
WTR YR 1973	TOTAL 21,456.04	MEAN 58.8	MAX 1,180	MIN .18	AC-FT 42,560							

PEAK DISCHARGE (BASE, 500 CFS)

DATE	TIME	G.H.	DISCHARGE	DATE	TIME	G.H.	DISCHARGE
3- 3	-	-	1,000	3-12	0100	6.71	1,090
3- 6	1915	8.18	1,850	3-14	1000	6.33	946

06482020 Big Sioux River at North Cliff Avenue, at Sioux Falls, S. Dak.

LOCATION.--Lat 43°34'01", long 96°42'39", in SW¼NW¼ sec.10, T.101 N., R.49 W., Minnehaha County, on right bank 20 ft (6 m) downstream from bridge on North Cliff Avenue and 4.1 mi (6.6 km) upstream from Slip Up Creek.

DRAINAGE AREA.--5,770 sq mi (14,940 sq km), approximately, of which about 1,970 sq mi (5,100 sq km) is probably noncontributing.

PERIOD OF RECORD.--March 1962 to September 1971 (gage heights and discharge measurements only in files of Corps of Engineers). October 1971 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,294.18 ft (394.466 m) above mean sea level (levels by Corps of Engineers). Prior to Dec. 15, 1971, nonrecording gage 20 ft (6 m) upstream at same datum.

EXTREMES.--Current year: Maximum discharge, 5,880 cfs (167 cu m/s) Mar. 13, gage height, 16.38 ft (4.993 m); minimum daily, 30 cfs (0.85 cu m/s) Sept. 1, 2.
Period of record: Maximum discharge, 5,880 cfs (167 cu m/s) Mar. 13, 1973, gage height, 16.38 ft (4.993 m); minimum daily, 2.1 cfs (0.059 cu m/s) Jan. 14, 1972.
Flood of Apr. 10, 1969, reached a stage of 27.45 ft (8.367 m), discharge, 40,700 cfs (1,150 cu m/s).

REMARKS.--Records good. Water-quality records for the water year 1973 are published in Part 2 of this report.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 24 to Nov. 12, Dec. 19 to Feb. 1, Mar. 3 to Apr. 27)

4.9	28	7.0	480
5.2	56	9.0	1,140
5.5	110	12.0	2,470
6.0	215	15.0	4,490

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	198	268	220	112	117	950	1,240	564	298	112	51	30
2	200	331	180	110	118	1,600	1,180	540	322	126	42	30
3	195	295	150	112	119	2,000	1,130	546	321	117	51	58
4	188	235	120	100	115	2,300	1,090	558	328	109	45	38
5	190	347	125	90	132	2,600	1,050	556	296	105	42	35
6	213	371	130	84	141	2,820	1,020	545	284	102	45	34
7	202	369	135	84	147	2,800	962	542	280	101	59	33
8	200	234	150	81	150	2,810	902	527	275	92	48	33
9	207	347	146	81	140	2,770	892	499	254	140	43	31
10	207	311	158	76	132	2,760	864	456	244	100	42	33
11	220	305	148	72	128	2,760	780	420	231	89	41	34
12	221	300	138	69	130	3,010	690	396	228	84	38	33
13	216	290	134	67	134	3,950	741	375	216	83	42	32
14	214	275	132	72	122	3,600	708	373	206	79	41	34
15	203	260	128	76	115	3,200	738	362	208	74	40	34
16	213	240	121	85	111	2,600	705	346	194	75	40	32
17	162	230	120	89	110	2,400	714	331	178	70	39	37
18	96	240	120	124	109	2,150	730	323	208	70	38	37
19	120	250	118	161	117	2,000	734	309	179	69	40	35
20	216	260	118	160	124	1,820	711	290	172	69	39	35
21	216	260	118	136	128	1,750	678	285	168	68	41	34
22	218	265	120	116	135	1,620	660	295	160	65	36	36
23	217	260	118	107	149	1,500	648	259	152	69	36	35
24	151	250	110	110	264	1,400	629	262	148	85	35	41
25	226	240	112	105	550	1,300	613	246	153	69	34	42
26	226	235	116	110	700	1,290	595	269	142	64	32	82
27	229	240	117	111	850	1,280	568	304	134	63	33	56
28	223	250	113	108	700	1,300	550	292	123	69	31	55
29	152	250	136	112	-----	1,320	523	291	96	65	31	142
30	242	245	146	120	-----	1,320	542	305	104	57	32	70
31	251	-----	131	117	-----	1,290	-----	306	-----	54	32	-----
TOTAL	6,232	8,253	4,128	3,161	5,987	66,270	23,587	11,972	6,302	2,594	1,239	1,291
MEAN	201	275	133	102	214	2,138	786	386	210	83.7	40.0	43.0
MAX	251	371	220	161	850	3,950	1,240	564	328	140	59	142
MIN	96	230	107	67	109	950	523	246	96	54	31	30
AC=FT	12,360	16,370	8,190	6,270	11,880	131,400	46,780	23,750	12,500	5,150	2,460	2,560

CAL YR 1972 TOTAL 235,394.2 MEAN 643 MAX 3,910 MIN 2.1 AC=FT 866,900
WTR YR 1973 TOTAL 141,016.0 MEAN 386 MAX 3,950 MIN 30 AC=FT 279,700

PEAK DISCHARGE (BASE, 1,000 CFS).--Mar. 13 (1245) 5,880 cfs (16.38 ft).

BIG SIOUX RIVER BASIN

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06482610 Split Rock Creek at Corson, S. Dak.

LOCATION.--Lat 43°36'59", long 96°33'54", in NE¼NW¼ sec.26, T.102 N., R.48 W., Minnehaha County, on left bank 6 ft (2 m) downstream from highway bridge, 0.3 mi (0.5 km) east of Corson and 3.4 mi (5.5 km) upstream from mouth.

DRAINAGE AREA.--475 sq mi (1,230 sq km), approximately.

PERIOD OF RECORD.--October 1965 to current year. February 1951 to September 1965 (gage heights and discharge measurements only in files of Corps of Engineers).

GAGE.--Water-stage recorder. Datum of gage is 1,304.22 ft (397.526 m) above mean sea level (levels by Corps of Engineers). Prior to Aug. 15, 1964, nonrecording gage at datum 0.15 ft (0.046 m) higher and Aug. 15, 1964, to Sept. 3, 1970, nonrecording gage at present site and datum.

AVERAGE DISCHARGE.--8 years, 63.4 cfs (1.795 cu m/s), 45,930 acre-ft/yr (56.6 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 840 cfs (23.8 cu m/s) Mar. 11, gage height, 5.14 ft (1.567 m); maximum gage height, 6.23 ft (1.899 m) Mar. 6, backwater from ice; minimum daily discharge, 1.8 cfs (0.051 cu m/s) Aug. 29, Sept. 2.

Period of record: Maximum discharge, 17,800 cfs (504 cu m/s) Apr. 8, 1969, gage height, 15.00 ft (4.572 m); no flow at times most years.

Maximum stage since 1951, 15.41 ft (4.697 m) June 17, 1957, discharge not determined.

REMARKS.--Records good except those for winter periods, which are poor. Water-quality records for the water year 1973 are published in Part 2 of this report.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Stage-discharge relation affected by ice Nov. 30 to Mar. 9; shifting-control method used Apr. 24 to May 29)

1.62	1.8	2.1	22	3.0	155
1.7	3.4	2.3	41	4.0	395
1.8	7.2	2.6	84	5.0	750
2.0	17				

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	23	17	43	42	270	75	52	31	8.5	9.6	2.2
2	12	39	16	35	40	310	75	64	33	13	8.4	1.8
3	12	41	15	27	44	350	69	64	32	18	7.8	4.0
4	11	39	14	22	50	330	64	59	35	16	7.2	7.5
5	10	33	13	18	58	280	62	56	30	13	6.6	5.7
6	16	34	11	14	53	330	60	54	25	14	6.2	4.5
7	16	33	12	10	48	403	56	52	23	15	5.7	4.8
8	18	30	12	9.3	44	410	55	49	21	16	5.2	5.4
9	17	28	11	9.0	40	320	54	44	20	17	6.0	4.2
10	18	27	10	8.9	42	295	44	42	18	18	5.6	3.2
11	18	26	10	8.7	45	368	44	38	16	17	5.2	3.0
12	20	25	9.9	8.6	50	578	46	35	16	17	4.8	2.8
13	17	26	9.7	8.5	47	401	48	34	16	16	4.8	2.8
14	17	23	9.6	8.6	44	674	45	32	15	15	4.6	3.0
15	17	20	9.5	8.8	40	654	55	30	15	14	3.9	3.2
16	16	23	9.3	26	37	431	64	28	14	13	3.6	4.8
17	15	23	9.3	70	35	416	63	27	13	12	3.3	6.0
18	15	24	9.0	160	39	288	60	26	14	11	3.0	3.4
19	15	25	8.7	240	44	191	64	26	15	10	4.4	3.2
20	16	25	8.7	210	55	139	67	25	14	9.5	3.4	3.0
21	16	25	8.8	190	65	114	62	25	15	8.9	3.2	3.0
22	16	25	9.0	145	85	97	56	25	14	8.6	3.0	3.4
23	17	24	8.8	90	130	87	50	23	13	8.7	2.2	3.2
24	17	23	8.5	62	300	90	48	24	12	9.4	2.0	3.2
25	17	21	8.8	48	280	94	47	25	12	9.9	2.2	3.4
26	15	28	9.2	64	260	94	45	24	11	9.1	2.4	7.4
27	17	22	9.3	135	240	94	43	32	9.4	8.4	2.2	10
28	17	25	10	260	230	89	40	35	8.8	9.4	2.0	9.6
29	17	21	12	205	-----	86	37	38	8.3	10	1.8	21
30	16	19	60	120	-----	86	39	33	8.0	11	2.0	25
31	20	-----	52	70	-----	80	-----	31	-----	10	2.0	-----
TOTAL	494	800	421.1	2,334.4	2,487	8,449	1,637	1,152	527.5	386.4	134.3	167.7
MEAN	15.9	26.7	13.6	75.3	88.8	273	54.6	37.2	17.6	12.5	4.33	5.59
MAX	20	41	60	260	300	674	75	64	35	18	9.6	25
MIN	10	19	8.5	8.5	35	80	37	23	8.0	8.4	1.8	1.8
AC-FT	980	1,590	835	4,630	4,930	16,760	3,250	2,280	1,050	766	266	333

CAL YR 1972 TOTAL 26,110.10 MEAN 71.3 MAX 1,700 MIN .60 AC-FT 51,790
WTR YR 1973 TOTAL 18,990.40 MEAN 52.0 MAX 674 MIN 1.8 AC-FT 37,670

PEAK DISCHARGE (BASE, 500 CFS)

DATE	TIME	G.H.	DISCHARGE
3-11	2100	5.14	840
3-14	1900	5.07	810

BIG SIOUX RIVER BASIN

06485500 Big Sioux River at Akron, Iowa

LOCATION.--Lat 42°49'42", long 96°33'45", in NW¼SW¼ sec.31, T.93 N., R.48 W., Plymouth County, Iowa, on left bank at west edge of Akron, 0.6 mi (1.0 km) downstream from bridge on State Highway 48, and 2.3 mi (3.7 km) upstream from Union Creek.

DRAINAGE AREA.--9,030 sq mi (23,390 sq km), approximately, of which about 1,970 sq mi (5,100 sq km) is probably noncontributing.

PERIOD OF RECORD.--October 1928 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,118.90 ft (341.041 m) above mean sea level. Prior to Dec. 3, 1934, nonrecording gage at bridge 300 ft (91 m) upstream at same datum.

AVERAGE DISCHARGE.--45 years, 862 cfs (24.41 cu m/s), 624,500 acre-ft/year (770 cu hm/yr).

EXTREMES.--Current year: Maximum discharge, 12,500 cfs (354 cu m/s) Mar. 5; maximum gage height, 18.74 ft (5.712 m) Mar. 5, backwater from ice; minimum daily discharge, 130 cfs (3.68 cu m/s) Aug. 22.
Period of record: Maximum discharge, 80,800 cfs (2,290 cu m/s) Apr. 9, 1969, gage height, 22.99 ft (7.007 m); minimum daily, 7 cfs (0.20 cu m/sec) Feb. 26-28, 1936.

REMARKS.--Records good except those for the winter months, which are poor. Water-quality records for the water year 1973 are published in Part 2 of this report.

REVISIONS (WATER YEARS).--WSP 1309: 1929(M), 1931-33(M), 1936(M), 1938(M), 1940(M). WSP 1389: Drainage area.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Nov. 23 to Dec. 1, Mar. 7-20, May 24, 25, June 18 to July 15, Sept. 4-30; stage-discharge relation affected by ice Dec. 2 to Mar. 6)

2.6	116	10.0	3,050
3.3	260	15.0	6,490
4.5	615	17.0	10,200
6.0	1,140	18.0	12,700

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	386	389	425	1,500	610	1,900	2,620	1,190	941	443	328	151
2	374	461	400	1,200	620	2,700	2,550	1,230	885	587	285	150
3	368	605	370	675	630	3,750	2,470	1,300	850	515	258	150
4	356	790	360	500	630	5,700	2,360	1,300	839	689	241	149
5	347	808	350	425	600	11,100	2,230	1,310	839	710	220	157
6	353	815	345	400	570	12,100	2,130	1,280	818	640	206	161
7	350	780	340	380	550	12,000	2,040	1,230	780	573	200	166
8	362	759	335	350	530	9,810	1,950	1,210	734	500	211	169
9	374	755	330	325	515	7,980	1,850	1,180	682	661	238	172
10	368	734	320	300	500	6,620	1,730	1,140	643	923	215	165
11	371	706	310	310	480	5,630	1,650	1,080	608	916	202	159
12	371	688	290	315	450	6,290	1,590	1,020	580	689	187	152
13	368	682	275	320	420	7,790	1,570	979	545	542	181	153
14	377	650	260	325	400	8,620	1,490	937	530	473	172	152
15	374	601	235	330	370	8,530	1,490	902	524	422	166	154
16	374	566	220	400	340	8,330	1,770	874	509	389	159	153
17	356	570	225	960	300	7,610	1,970	843	491	356	151	157
18	350	587	225	1,400	305	6,070	2,000	815	1,120	333	146	156
19	344	573	230	1,700	310	5,020	1,940	787	2,070	313	142	157
20	350	556	230	1,750	320	4,290	1,840	759	1,500	303	137	152
21	362	562	235	1,450	330	3,770	1,780	731	1,110	293	131	150
22	362	566	235	1,200	340	3,360	1,690	710	839	280	130	150
23	368	562	240	950	475	3,060	1,600	685	734	273	195	146
24	362	566	250	700	1,250	2,950	1,530	675	661	278	543	144
25	362	566	255	630	1,150	2,960	1,470	654	615	285	455	150
26	356	542	260	615	1,200	3,000	1,410	654	615	283	268	167
27	359	545	270	590	1,250	3,060	1,360	717	563	283	213	168
28	359	524	280	570	1,300	2,960	1,310	797	527	263	190	191
29	353	476	350	580	-----	2,830	1,260	878	494	250	174	262
30	356	434	875	590	-----	2,750	1,210	920	467	425	164	282
31	377	-----	1,350	600	-----	2,680	-----	955	-----	488	155	-----
TOTAL	11,249	18,418	10,675	22,340	16,745	175,220	53,860	29,742	23,113	14,378	6,663	4,945
MEAN	363	614	344	721	598	5,652	1,795	959	770	464	215	165
MAX	386	815	1,350	1,750	1,300	12,100	2,620	1,310	2,070	923	543	282
MIN	344	389	220	300	300	1,900	1,210	654	467	250	130	144
AC-FT	22,310	36,530	21,170	44,310	33,210	347,500	106,800	58,990	45,840	28,520	13,220	9,810
CAL YR 1972	TOTAL 481,602	MEAN 1,316	MAX 10,100	MIN 68	AC-FT 955,300							
WTR YR 1973	TOTAL 387,348	MEAN 1,061	MAX 12,100	MIN 130	AC-FT 768,300							

PEAK DISCHARGE (BASE, 3,500 CFS)

DATE	TIME	G.H.	DISCHARGE
3-5	-	-	12,500
3-14	1900	16.62	8,710

DISCHARGE AT PARTIAL-RECORD STATIONS

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As the number of streams on which streamflow information is likely to be desired far exceeds the number of stream-gaging stations feasible to operate at one time, the Geological Survey collects limited streamflow data at sites other than stream-gaging stations. When limited streamflow data are collected on a systematic basis over a period of years for use in hydrologic analyses, the site at which the data are collected is called a partial-record station. Data collected at these partial-record stations are usable in low-flow or floodflow analyses, depending on the type of data collected.

Crest-stage partial-record stations

The following table contains annual maximum discharge for crest-stage stations. A crest-stage gage is a device which will register the peak stage occurring between inspections of the gage. A stage-discharge relation for each gage is developed from discharge measurements made by indirect measurements of peak flow or by current meter. The date of the maximum discharge is not always certain but is usually determined by comparison with nearby continuous-record stations, weather records, or local inquiry. Only the maximum discharge for each water year is given. Information on some lower floods may have been obtained, and discharge measurements may have been made for purposes of establishing the stage-discharge relation, but these are not published herein. The years given in the period of record represent water years for which the annual maximum has been determined.

Annual maximum discharge at crest-stage partial-record stations during water year 1973							
Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Dis-charge (cfs)
Minnesota River basin							
05289950	Little Minnesota River tributary at Sisseton, S. Dak.	Lat 45°39'38", long 97°94'21", in NW¼ sec.32, T.126 N., R.51 W., Roberts County, at culvert on State Highway 10, 0.6 mile west of Sisseton.	a4.0	1970-73	5-24-73	5.52	61
05290300	North Fork Whetstone River tributary near Wilmot, S. Dak.	Lat 45°26'02", long 96°57'33", in SE¼ sec.18, T.123 N., R.50 W., Roberts County, at culvert on county highway, 6.0 miles northwest of Wilmot.	a2.0	1970-73	3-14-73	b7.71	c40
05292600	North Fork Yellow Bank River tributary near Stockholm, S. Dak.	Lat 45°06'24", long 96°49'06", in NW¼ sec.22, T.119 N., R.50 W., Grant County, at culvert on State Highway 20, 1.0 mile northwest of Stockholm.	a7.0	1970-73	3-14-73	5.58	101
Spring Creek basin							
06354845	Spring Creek tributary near Greenway, S. Dak.	Lat 45°54'45", long 99°36'48", in SW¼ sec.12, T.128 N., R.73 W., McPherson County, at culvert on State Highway 47, 4.8 miles east of Greenway.	a3.0	1970-73	9- 3-73	5.88	91
Grand River basin							
06355400	North Fork Grand River tributary near Lodgepole, S. Dak.	Lat 45°55'45", long 102°39'04", in NW¼ sec.28, T.23 N., R.12 E., Perkins County, at culvert on county highway, 9.0 miles north of Lodgepole.	a3.0	1970-73	4-20-73	4.01	(+)
06356050	Wide Sandy Creek near Buffalo, S. Dak.	Lat 45°30'57", long 103°32'40", in NW¼ sec.20, T.18 N., R.5 E., Harding County, at bridge on U.S. Highway 85, 4.5 miles south of Buffalo.	38.8	1956, 1958-73 ^d	3-14-73	b4.30	(+)
06356150	North Jack Creek near Ludlow, S. Dak.	Lat 45°47'15", long 103°23'43", in SW¼NW¼ sec.16, T.21 N., R.6 E., Harding County, at culvert on U.S. Highway 85, 3.4 miles southwest of Ludlow.	a1.71	1970-73	4-20-73 5- 9-72	4.55 3.46	41 11
06356600	South Fork Grand River tributary near Bison, S. Dak.	Lat 45°35'54", long 102°39'28", in NE¼ sec.21, T.19 N., R.12 E., Perkins County, at culvert on county highway, 10 miles northwest of Bison.	a1.0	1970-73	4-20-73	b4.40	c30
06358350	Claymore Creek tributary near Trail City, S. Dak.	Lat 45°29'14", long 100°34'54", in NW¼ sec.32, T.18 N., R.29 E., Corson County, at culvert on county highway, 7.3 miles east of Trail City.	1.98	1956-73 ^d	3-14-73	b3.87	(+)
06358400	Claymore Creek tributary No. 2 near Trail City, S. Dak.	Lat 45°29'14", long 100°35'30", in NE¼ sec.31, T.18 N., R.29 E., Corson County, at culvert on county highway, 7.0 miles east of Trail City.	.15	1956-73 ^d	3-14-73	b3.64	(+)
Deadman Creek basin							
06358520	Deadman Creek tributary near Mobridge, S. Dak.	Lat 45°28'12", long 100°29'46", in NW¼ sec.1, T.17 N., R.29 E., Dewey County, at culvert on county highway, 5.5 miles southwest of Mobridge.	.28	1956-73	5-28-73	5.96	32

DISCHARGE AT PARTIAL-RECORD STATIONS

Annual maximum discharge at crest-stage partial-record stations during water year 1973.--Continued

Annual maximum discharge at crest-stage partial-record stations during water year 1973--continued							
Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Discharge (cfs)
Blue Blanket Creek basin							
06358540	Blue Blanket Creek tributary near Glenham, S. Dak.	Lat 45°32'12", long 100°12'01", in NW¼NW¼ sec.30, T.124 N., R.77 W., Walworth County, at culvert on U.S. Highway 12, 3.5 miles east of Glenham.	^a 0.58	1970-73	3-14-73	^b 3.51	^c 4.5
Moreau River basin							
06358550	Battle Creek tributary near Castle Rock, S. Dak.	Lat 45°02'57", long 103°32'56", in NE¼ sec.31, T.13 N., R.5 E., Butte County, at culvert on U.S. Highway 85, 8.7 miles northwest of Castle Rock.	^a 1.0	1969-73	4-20-73	4.12	40
06358600	South Fork Moreau River tributary near Redig, S. Dak.	Lat 45°11'45", long 103°34'09", in SE¼ sec.1, T.14 N., R.4 E., Butte County, at culvert on former U.S. Highway 85, 5 miles south of Redig, 26.2 miles south of Buffalo.	11.3	1956, 1958-73	3-14-73	^b 2.76	^c 20
06358620	Sand Creek tributary near Redig, S. Dak.	Lat 45°13'21", long 103°32'56", in NE¼ sec.31, T.15 N., R.5 E., Harding County, at culvert on U.S. Highway 85, 3.5 miles south of Redig.	.06	1956, 1958-73 ^e	1973	(f)	(+)
06358750	North Fork Moreau River tributary near Redig, S. Dak.	Lat 45°19'51", long 103°32'57", in SE¼ sec.19, T.16 N., R.5 E., Harding County, at culvert on U.S. Highway 85, 4.1 miles north of Redig, 17.7 miles south of Buffalo.	4.00	1956, 1958-73 ^e	1973	(f)	(+)
06359000	Moreau River at Bixby, S. Dak.	Lat 45°08'37", long 102°33'30", in SE¼ SW¼ sec.29, T.14 N., R.13 E., Perkins County, at highway bridge, 0.4 mile south of Bixby, 3.5 miles downstream from proposed Bixby damsite.	1,570	1948-69 [†] , 1970-73	6- 3-73	7.81	2,780
06359300	Deep Creek tributary near Maurine, S. Dak.	Lat 45°01'34", long 102°32'29", in SW¼SE¼ sec.4, T.12 N., R.13 E., Meade County, at culvert on U.S. Highway 212, 2.6 miles east of Maurine.	^a 1.32	1970-73	1973	(g)	(+)
06359700	Thunder Butte Creek tributary near Meadow, S. Dak.	Lat 45°26'39", long 102°05'21", in SE¼ sec.12, T.17 N., R.16 E., Perkins County, at culvert on State Highway 20, 8.5 miles southeast of Meadow, 15.7 miles west of Glad Valley.	^a 3.0	1970-73	4-20-73	3.76	20
06359800	Thunder Butte Creek tributary near Glad Valley, S. Dak.	Lat 45°26'39", long 102°01'01", in SW¼ sec.10, T.17 N., R.17 E., Perkins County, at culvert on State Highway 20, 12.2 miles west of Glad Valley.	^a 8.0	1970-73	3-14-73	^b 5.63	^c 50
06359850	Elm Creek tributary near Dupree, S. Dak.	Lat 45°03'12", long 101°38'39", in SW¼ sec.26, T.13 N., R.20 E., Ziebach County, at culvert on U.S. Highway 212, 1.8 miles west of Dupree.	^a 5.0	1970-73	5-14-70 5-23-71 1973	3.11 3.66 (g)	^h 42 ^h 110 ^c 25
06360350	Little Moreau River tributary near Firesteel, S. Dak.	Lat 45°24'16", long 101°13'30", in NE¼SE¼ sec.25, T.17 N., R.23 E., Dewey County, at culvert on State Highway 63, 3.5 miles southeast of Firesteel.	^a 2.75	1970-73	6-12-70 3-14-73	2.71 ^b 4.85	^h 1.0 ^c 20
Swan Creek basin							
06361020	Swan Lake Creek tributary near Bowdle, S. Dak.	Lat 45°26'57", long 99°44'34", in SW¼ sec.23, T.123 N., R.74 W., Walworth County, at culvert on U.S. Highway 12, 3.7 miles west of Bowdle.	^a 10.0	1970-73	3-14-73	^b 5.01	^c 15
Cheyenne River basin							
06396200	Fiddle Creek near Edgemont, S. Dak.	Lat 43°18'16", long 103°59'46", in SE¼ sec.33, T.8 S., R.1 E., Fall River County, at culvert on U.S. Highway 18 and 85A, 9 miles west of Edgemont.	1.97	1956-73	3- -73	1.40	3.5

DISCHARGE AT PARTIAL-RECORD STATIONS

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Annual maximum discharge at crest-stage partial-record stations during water year 1973.--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Dis-charge (cfs)
Cheyenne River basin - Continued							
06396300	Cottonwood Creek tributary near Edgemont, S. Dak.	Lat 43°17'35", long 103°52'20", in SW¼ sec.3, T.9 S., R.2 E., Fall River County, at culvert on U.S. Highway 18 and 85A, 2.5 miles west of Edgemont.	0.20	1956-73	9- 2-73	3.10	(+)
06396350	Red Canyon Creek tributary near Pringle, S. Dak.	Lat 43°32'22", long 103°39'20", in SW¼ sec.9, T.6 S., R.2 E., Custer County, at culvert on State Highway 89, 0.5 mile northwest of Argyle, and 5.5 miles southwest of Pringle.	a.2	1970-73	9- 2-73	(g)	i12
06399300	Hat Creek tributary near Ardmore, S. Dak.	Lat 43°05'42", long 103°40'25", in NW¼ sec.16, T.11 S., R.4 E., Fall River County, at culvert on State Highway 71, 5.0 miles north of Ardmore.	3.74	1956-73	4-30-73	4.12	3.5
06399700	Pine Creek near Ardmore, S. Dak.	Lat 43°11'14", long 103°38'24", in NW¼ sec.15, T.10 S., R.4 E., Fall River County, at bridge on State Highway 71, 11.5 miles north of Ardmore.	5.47	1956-73	7-20-73	6.44	j710
06400900	Horsehead Creek tributary near Smithwick, S. Dak.	Lat 43°17'16", long 103°19'08", in NW¼ sec.8, T.9 S., R.7 E., Fall River County, at culvert on U.S. Highway 18 and 385, 12 miles southeast of Hot Springs, and 5.3 miles west of Smithwick.	a1.5	1969-73	7-18-69 6-12-70 5-23-71 7-21-72 1973	7.6 3.09 4.09 2.76 (g)	h90 h2.8 h12 h1.0 i6.7
06402100	Fall River tributary at Hot Springs, S. Dak.	Lat 43°24'58", long 103°29'18", in NW¼NE¼ sec.26, T.7 S., R.5 E., Fall River County, at culvert on State Highway 71, 0.5 mile south of Hot Springs.	a3.8	1970-73	1973	(g)	i13
06403800	Battle Creek tributary near Keystone, S. Dak.	Lat 43°55'28", long 103°27'44", in NW¼ NE¼NE¼ sec.36, T.1 S., R.5 E., Pennington County, at culvert on U.S. Highway 16, 2.8 miles northwest of Keystone.	.88	1956-73	4-20-73	4.08	1.3
06406100	Battle Creek tributary near Hermosa, S. Dak.	Lat 43°50'10", long 103°09'43", in SE¼NE¼ sec.33, T.2 S., R.8 E., Custer County, at culvert on county highway, 1.3 miles east of Hermosa.	a3.50	1970-73	4-20-73	(g)	c20
06406800	Newton Fork near Hill City, S. Dak.	Lat 43°58'03", long 103°38'24", in NE¼NE¼ sec.16, T.1 S., R.4 E., Pennington County, at culvert on Forest Service Road 17, 3.9 miles northwest of Hill City.	a8.25	1969-73	7-16-69 5-13-70 6- 6-71 6-15-72 5-28-73	3.53 3.47 3.62 3.70 3.44	h13 h8.3 h21 h27 6.5
06406900	Palmer Creek near Hill City, S. Dak.	Lat 43°56'12", long 103°30'36", in NE¼SE¼NW¼ sec.27, T.1 S., R.5 E., Pennington County, at culvert on U.S. Highway 16, 3.0 miles east of Hill City.	8.24	1956-73	5-28-73	4.19	(+)
06406950	Horse Creek at Highway 385, near Hill City, S. Dak.	Lat 43°59'19", long 103°29'33", in SW¼ sec.2, T.1 S., R.5 E., Pennington County, at culvert on U.S. Highway 385, 0.4 mile downstream from small right bank tributary and 6.4 miles northeast of Hill City.	10.1	1972-73	6- 5-73	(f)	(+)
06408850	Silver Creek near Rochford, S. Dak.	Lat 44°07'24", long 103°41'53", in NE¼NE¼ sec.24, T.2 N., R.3 E., Pennington County, at culvert on Forest Service Road 291, 0.3 mile upstream from mouth, and 1.1 miles east of Rochford.	a6.20	1969-73	5-27-73	3.44	4.3
06408900	Heeley Creek near Hill City, S. Dak.	Lat 43°58'57", long 103°50'02", in NW¼NW¼ sec.12, T.1 S., R.2 E., Pennington County, at culvert on Forest Service Road 291, 2.8 miles south of Deerfield, and 13.5 miles northwest of Hill City.	a4.86	1969-73	4-15-73	b4.33	c7.5

DISCHARGE AT PARTIAL-RECORD STATIONS

Annual maximum discharge at crest-stage partial-record stations during water year 1973.--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Dis-charge (cfs)
Cheyenne River basin - Continued							
06421750	Rapid Creek tributary near Farmingdale, S. Dak.	Lat 43°56'30", long 102°48'43", in SE½SW¼ sec.21, T.1 S., R.11 E., Pennington County, at culvert on State Highway 40, 3.8 miles southeast of Farmingdale.	a1.51	1970-73	3-23-73	b4.02	c10
06422395	Boxelder Creek at Benchmark near Nemo, S. Dak.	Lat 44°13'25", long 103°34'36", in NE½NE¼ sec.13, T.3 N., R.4 E., Lawrence County, at bridge on Nemo Road, 0.3 mile downstream from Hay Creek and 4.3 miles northwest of Nemo.	37.2	1972-73	1973	(f)	(+)
06423250	Boxelder Creek tributary at New Underwood, S. Dak.	Lat 44°05'47", long 102°50'30", in SE½SW¼ sec.30, T.2 N., R.11 E., Pennington County, at culvert on former U.S. Highway 14 and 16, 0.1 mile west of New Underwood.	a.14	1970-73	3-23-73	b3.49	c5.0
06423400	Bull Creek tributary near Wall, S. Dak.	Lat 43°53'55", long 102°14'18", in NW½SW¼ sec.5, T.2 S., R.16 E., Pennington County, at culvert on U.S. Highway 16A, 6.2 miles south of Wall.	a.41	1970-73	5-27-73	3.69	16
06432200	Polo Creek near Whitewood, S. Dak.	Lat 44°27'49", long 103°43'41", in SW¼ sec.23, T.6 N., R.3 E., Lawrence County, at bridge on U.S. Highway 85, 4.3 miles west of Whitewood.	10.6	1956-73	1973	(f)	(+)
06434800	Owl Creek tributary near Belle Fourche, S. Dak.	Lat 44°49'32", long 103°51'06", in NW½SE¼ sec.15, T.10 N., R.2 E., Butte County, at culvert on U.S. Highway 85, 10.2 miles north of Belle Fourche.	a3.06	1970-73	6-10-72 1973	3.04 (e)	h60 f50
06436770	Dry Creek tributary near Newell, S. Dak.	Lat 44°48'13", long 103°25'03", in NW¼ sec.29, T.10 N., R.6 E., Butte County, at culvert on State Highway 79, 5.8 miles north of Newell.	a.5	1970-73	4-20-73	b3.95	c4.0
06437100	Boulder Creek near Deadwood, S. Dak.	Lat 44°23'28", long 103°39'38", in NE½SW¼ sec.17, T.5 N., R.4 E., Lawrence County, at culvert on U.S. Highway 14A, 3.5 miles east of Deadwood.	1.69	1956-73	4-23-73	b5.93	c45
06439050	Cherry Creek tributary near Avance, S. Dak.	Lat 44°48'33", long 102°03'18", in SW¼ sec.21, T.10 N., R.17 E., Meade County, at culvert on State Highway 73, 12.5 miles southeast of Avance.	.60	1956-73	5-25-57 3-21-60 7-27-61 4-10-63 6- 8-64 3-28-65 6-25-68 6-25-69 8- 5-70 6-18-71 5-22-72 3- -73	3.22 2.80 3.20 3.27 2.99 2.68 2.85 2.94 3.19 4.11 3.07 b3.06	h31 h16 h30 h32 h23 h12 h18 h21 h20 h59 h15 c10
06439060	Cherry Creek tributary No. 2 near Avance, S. Dak.	Lat 44°48'15", long 102°03'18", in NW¼ sec.28, T.10 N., R.17 E., Meade County, at culvert on State Highway 73, 12.5 miles southeast of Avance.	.11	1956-73	1973	(g)	i7.0
06439080	Cherry Creek tributary No. 3 near Avance, S. Dak.	Lat 44°51'03", long 102°03'36", in SW¼ sec.3, T.10 N., R.17 E., Meade County, at bridge on State Highway 73, 11 miles southeast of Avance.	4.58	1956-73	5-27-73	3.29	78
06439100	Beaver Creek near Faith, S. Dak.	Lat 44°56'21", long 102°02'37", in SW¼ sec.3, T.11 N., R.17 E., Meade County, at bridge on State Highway 73, 6 miles south of Faith.	37.1	1956-73	5-27-73	6.55	135
06439400	Plum Creek tributary near Milesville, S. Dak.	Lat 44°21'34", long 101°25'42", in S½ sec.26, T.5 N., R.22 E., Haakon County, at culvert on State Highway 34, 14.5 miles southeast of Milesville.	a.5	1970-73	5-27-73	3.35	4.6

DISCHARGE AT PARTIAL-RECORD STATIONS

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Annual maximum discharge at crest-stage partial-record stations during water year 1973.--Continued

Annual maximum discharge at crest-stage partial-record stations during water year 1973--Continued					Annual maximum		
Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Date	Gage height (feet)	Dis-charge (cfs)
Bad River basin							
06440700	Brady Creek tributary near Philip, S. Dak.	Lat 43°55'14", long 101°39'40", in NE¼NE¼ sec.36, T.1 S., R.20 E., Jackson County, at culvert on State Highway 73, 8.1 miles south of Philip.	^a 4.85	1970-73	5-27-73	4.25	(+)
06441200	Powell Creek tributary near Fort Pierre, S. Dak.	Lat 44°22'39", long 100°35'16", in NW¼SW¼ sec.23, T.5 N., R.29 E., Stanley County, at culvert on U.S. Highway 14, 10.2 miles west of Fort Pierre.	^a 4	1970-73	3-14-73	^b 4.99	^c 25
Hilgers Gulch basin							
06441530	Hilgers Gulch tributary near Pierre, S. Dak.	Lat 44°23'52", long 100°18'57", in SE¼SW¼SE¼ sec.22, T.111 N., R.79 W., Hughes County, at culvert on U.S. Highway 14 and 83, 1 mile upstream from mouth, and 3 miles northeast of Pierre.	^a 1.25	1968-73	1973	(g)	ⁱ 33
06441580	Hilgers Gulch at Pierre, S. Dak.	Lat 44°22'10", long 100°20'30", in SE¼SW¼ sec.33, T.111 N., R.79 W., Hughes County, on right bank at culvert on Church Street, 0.7 mile upstream from mouth, in city of Pierre.	^a 7.0	1967-73	1973	(g)	ⁱ 160
Mush Creek basin							
06441650	Mush Creek near Pierre, S. Dak.	Lat 44°20'13", long 100°12'42", in NE¼ sec.16, T.110 N., R.78 W., Hughes County, at bridge on State Highway 34, 7.5 miles east of Pierre.	14.6	1956-73	1973	(g)	ⁱ 32
Unnamed Missouri River tributaries							
06441670	Missouri River tributary near Pierre, S. Dak.	Lat 44°20'09", long 100°11'39", in NE¼ sec.15, T.110 N., R.78 W., Hughes County, at culvert on State Highway 34, 7.8 miles east of Pierre.	.42	1956-73	5-27-73	1.80	7.2
06441750	Missouri River tributary near Canning, S. Dak.	Lat 44°19'57", long 100°09'54", in NW¼ sec.13, T.110 N., R.78 W., Hughes County, at culvert on State Highway 34, 8 miles southwest of Canning.	.20	1956-73	5-27-73	1.91	8.0
06442050	Missouri River tributary near DeGrey, S. Dak.	Lat 44°17'45", long 99°58'58", in SW¼ sec.28, T.110 N., R.76 W., Hughes County, at culvert on State Highway 34, 3.2 miles northwest of DeGrey.	1.64	1956-73	5-27-73	1.57	45
Medicine Creek basin							
06442350	North Fork Medicine Creek near Vivian, S. Dak.	Lat 43°57'06", long 100°19'25", in SW¼ sec.28, T.106 N., R.79 W., Lyman County, at bridge on U.S. Highway 83, 2.5 miles northwest of Vivian.	45.9	1956-73	5-27-73	2.46	14
06442380	Medicine Creek tributary near Vivian, S. Dak.	Lat 44°05'47", long 100°19'39", in SE¼ sec.5, T.107 N., R.79 W., Lyman County, at culvert on former U.S. Highway 83, 12 miles northwest of Vivian.	.30	1956-73 ^d	1973	(f)	^c 5.0
06442400	Medicine Creek tributary No. 2 near Vivian, S. Dak.	Lat 44°02'03", long 100°19'28", in NE¼ sec.32, T.107 N., R.79 W., Lyman County, at culvert on U.S. Highway 83, 8 miles northwest of Vivian.	8.62	1956-73	5-27-73	3.74	65

Annual maximum discharge at crest-stage partial-record stations during water year 1973.--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Dis-charge (cfs)
Crow Creek basin							
06442850	Elm Creek tributary near Ree Heights, S. Dak.	Lat 44°25'05", long 99°12'17", in NW¼SW¼ sec.13, T.111 N., R.70 W., Hand County, at culvert on county highway, 6.5 miles south of Ree Heights.	^a 1.0	1969-73	3-14-73	^b 5.63	^c 25
06442960	Smith Creek tributary near Gann Valley, S. Dak.	Lat 44°01'34", long 98°43'41", in NE¼SE¼ sec.34, T.107 N., R.66 W., Jerauld County, at culvert on county highway, 8.7 miles southwest of Wessington Springs and 13.0 miles east of Gann Valley.	^a 7.0	1972-73	3-14-73	^b 4.52	^c 20
White River basin							
06445700	White River at Slim Butte, S. Dak.	Lat 43°04'33", long 102°48'41", in SE¼SE¼ sec.23, T.36 N., R.47 W., Shannon County, on left bank 300 ft downstream from highway bridge, 1,300 ft downstream from Janis Creek, 0.5 mile east of village of Slim Butte, 8.8 miles southwest of Oglala, and 12.2 miles downstream from Nebraska-South Dakota State line.	1,500	1962-70 ⁺ 1972-73	3-25-73	7.0	250
06445990	South Fork Black-tail Creek tributary near Oelrichs, S. Dak.	Lat 43°11'18", long 103°08'20", in NW¼ sec.14, T.10 S., R.8 E., Fall River County, at culvert on U.S. Highway 18, 4.2 miles east of Oelrichs.	^a 3.60	1969-73	1973	(g)	^c 5.0
06446200	White River near Rockyford, S. Dak.	Lat 43°30'52", long 102°29'30", in SW¼NW¼ sec.19, T.41 N., R.43 W., Shannon County, on right bank at downstream side of highway bridge, 0.7 mile upstream from Porcupine Creek, and 1.8 miles northeast of village of Rockyford.	3,000	1964-70 ⁺ 1972-73	4-18-73	6.89	2,020
06446250	Porcupine Creek tributary near Rockyford, S. Dak.	Lat 43°26'05", long 102°25'45", in SE¼SE¼ sec.17, T.40 N., R.43 W., Shannon County, at culvert on county road, 5 miles southeast of village of Rockyford.	^a 1.66	1968, 1970-73	3-14-73	6.15	217
06446300	Big Hollow Creek tributary near Scenic, S. Dak.	Lat 43°42'25", long 102°31'15", in SE¼NW¼ sec.12, T.4 S., R.14 E., Pennington County, at culvert on county road, 4.9 miles south of Scenic.	^a 2.67	1968, 1970-73	7-20-73	9.21	425
06446400	Cain Creek tributary at Imlay, S. Dak.	Lat 43°42'59", long 102°23'23", in SE¼NW¼ sec.12, T.4 S., R.14 E., Pennington County, at bridge on State Highway 40, 0.5 mile east of Imlay.	14.0	1956-73	^k 6-19-72 ^k 5-27-73	^k 4.25 ^k 4.61	^k 205 ^k 275
06446430	White River tributary near Conata, S. Dak.	Lat 43°50'48", long 102°12'33", in NE¼NW¼ sec.28, T.2 S., R.16 E., Pennington County, in Badlands National Monument, at culvert on U.S. Highway 16A, 8 miles northwest of Conata.	.17	1956-58, 1960-73	^k 8- 2-72 ^k 5-27-73	^k 4.83 ^k 4.76	^k 70 ^k 67
06446550	White River tributary near Interior, S. Dak.	Lat 43°44'51", long 101°56'50", in SE¼ sec.27, T.3 S., R.18 E., Jackson County, in Badlands National Monument, at culvert on U.S. Highway 16A, 2.3 miles northeast of Interior.	.14	1956-73	9- 2-73	5.45	183
06446800	Cottonwood Creek near Wanblee, S. Dak.	Lat 43°34'35", long 101°32'15", in NW¼NW¼ sec.31, T.42 N., R.35 W., Washabaugh County, at culvert on State Highway 40, 6.2 miles east of Wanblee.	^a 1.7	1971-73	9- 2-73	5.09	68
06447200	Black Pipe Creek tributary near Norris, S. Dak.	Lat 43°27'42", long 101°08'05", in NW¼NW¼ sec.8, T.40 N., R.32 W., Mellette County, at culvert on State Highway 63, 3.2 miles east of Norris.	^a 4.25	1971-73	5-27-73	4.32	35

DISCHARGE AT PARTIAL-RECORD STATIONS

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Annual maximum discharge at crest-stage partial-record stations during water year 1973.--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Dis-charge (cfs)
White River basin - Continued							
06447490	Little White River tributary near Martin, S. Dak.	Lat 43°10'20", long 101°41'02", in SE¼SW¼ sec.15, T.37 N., R.37 W., Bennett County, at culvert on U.S. Highway 18, 2.3 miles east of Martin.	^a 8.9	1971-73	1973	(g)	ⁱ 20
06449700	Little Oak Creek near Mission, S. Dak.	Lat 43°19'45", long 100°42'33", in NW¼ sec.25, T.39 N., R.29 W., Todd County, at culvert on U.S. Highway 83, 3.2 miles northwest of Mission.	2.62	1956-73	1973	(f)	(+)
06451750	Cottonwood Creek tributary near Winner, S. Dak.	Lat 43°28'11", long 100°01'13", in NW¼ sec.24, T.99 N., R.78 W., Tripp County, at culvert on U.S. Highway 18, 7.5 miles west of Winner.	^a 4.0	1971-73	5-27-73	4.18	123
Fivemile Creek basin							
06452250	Fivemile Creek tributary near Iona, S. Dak.	Lat 43°29'23", long 99°26'08", in SE¼ sec.11, T.99 N., R.73 W., Gregory County, at culvert on State Highway 47, 3.8 miles south of Iona.	^a 2.0	1970-73	3-14-73	^b 3.60	^c 30
Choteau Creek basin							
06453150	Choteau Creek tributary near Tripp, S. Dak.	Lat 43°14'20", long 98°02'35", in NE¼NW¼ sec.10, T.97 N., R.61 W., Hutchinson County, at culvert on U.S. Highway 18, 3.7 miles west of Tripp.	^a 3	1970-73	3-14-73	^b 4.28	^c 30
06453250	Choteau Creek tributary near Wagner, S. Dak.	Lat 43°04'54", long 98°19'04", in NE¼NW¼ sec.5, T.95 N., R.63 W., Charles Mix County, at culvert on State Highway 46, 1.1 miles west of Wagner.	^a 16.4	1970-73	3-14-73	^b 5.36	^c 50
Niobrara River basin							
06463950	Rock Creek tributary near Olsonville, S. Dak.	Lat 43°01'22", long 100°35'21", in NE¼SE¼ sec.3, T.35 N., R.28 W., Todd County, at culvert on U.S. Highway 83, 7.5 miles south of Olsonville.	^a 8.1	1970-73	5-27-73	3.04	(+)
James River basin							
06471050	Elm River tributary near Leola, S. Dak.	Lat 45°50'40", long 98°46'03", in NE¼SE¼ sec.3, T.127 N., R.66 W., McPherson County, at culvert on county highway, 12.2 miles northeast of Leola.	14.7	1956-73	3-14-73	^b 3.77	^c 30
06471400	Willow Creek tributary near Leola, S. Dak.	Lat 45°44'10", long 98°45'45", in SW¼ sec.11, T.126 N., R.66 W., McPherson County, at culvert on former State Highway 10, 8.5 miles northeast of Leola.	3.74	1956-73	3-14-73	^b 1.65	^c 7.5
06471450	Willow Creek tributary near Barnard, S. Dak.	Lat 45°44'12", long 98°37'42", in SW¼ sec.11, T.126 N., R.65 W., Brown County, at culvert on former State Highway 10, 6.5 miles west of Barnard.	.18	1956-73	3-14-73	^b 4.76	^c 10
06471750	Foot Creek tributary near Leola, S. Dak.	Lat 45°41'01", long 98°55'55", in SE¼ sec.32, T.126 N., R.67 W., McPherson County, at culvert on State Highway 45, 2.5 miles south of Leola.	^a 4.5	1971-73	3-14-73	^b 3.88	^c 15
06472250	Mud Creek tributary No. 2 near Groton, S. Dak.	Lat 45°26'36", long 98°02'52", in SE¼ sec.21, T.123 N., R.60 W., Brown County, at culvert on U.S. Highway 12, 2.7 miles east of Groton.	60.0	1960-73	5-24-73	4.15	56

Annual maximum discharge at crest-stage partial-record stations during water year 1973.--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Discharge (cfs)
James River basin - Continued							
06472500	Mud Creek near Stratford, S. Dak.	Lat 45°16'13", long 98°17'16", in NW¼NW¼ sec.27, T.121 N., R.62 W., Brown County, at highway bridge, 3.3 miles south of Stratford, 14.7 miles upstream from mouth.	1730	1955-69 ⁺ 1970-73	3-12-73	3.48	62
06473300	Preachers Run tributary at Ipswich, S. Dak.	Lat 45°27'08", long 99°01'45", in SE¼ sec.21, T.123 N., R.68 W., Edmunds County, at culvert on county highway, 0.3 mile north of U.S. Highway 12, at Ipswich.	a5.0	1971-73	1973	(g)	i37
06473350	South Fork Snake Creek tributary near Seneca, S. Dak.	Lat 45°03'00", long 99°23'36", in SE¼NE¼ sec.9, T.118 N., R.71 W., Faulk County, at culvert on U.S. Highway 212, 5.3 miles east of Seneca.	a7.0	1971-73	3-14-73	b4.96	c30
06473400	North Fork Snake Creek tributary near Wecota, S. Dak.	Lat 45°09'26", long 99°07'26", in NE¼NE¼ sec.3, T.119 N., R.69 W., Faulk County, at culvert on county highway, 1.1 miles south of Wecota.	a3.0	1971-73	3-14-73	b5.01	c10
06473500	South Fork Snake Creek near Athol, S. Dak.	Lat 45°03'04", long 98°44'14", in SE¼NE¼ sec.11, T.118 N., R.66 W., Faulk County, on left bank at upstream side of highway bridge, 2.9 miles downstream from Perry Creek and 7.5 miles northwest of Athol.	a820	1950-72 ⁺ 1973	3- 9-73	9.65	47
06473820	Shaefer Creek near Orient, S. Dak.	Lat 44°46'46", long 99°02'39", in NW¼NW¼ sec.17, T.115 N., R.68 W., Hand County, on downstream side of bridge on county highway, 8.5 miles southeast of Orient.	45.1	1956-73	3-14-73	b3.50	c150
06473850	Shaefer Creek tributary near Orient, S. Dak.	Lat 44°43'49", long 98°59'17", in SE¼NE¼ sec.34, T.115 N., R.68 W., Hand County, at culvert on State Highway 45, 13 miles southeast of Orient.	6.08	1956-73	3-14-73	b5.77	c75
06473880	Shaefer Creek tributary near Miller, S. Dak.	Lat 44°42'20", long 98°59'17", in NE¼ sec.10, T.114 N., R.68 W., Hand County, at culvert on State Highway 45, 13 miles north of Miller.	5.75	1956-73	5-27-73	3.07	10
06475500	Dry Run near Frankfort, S. Dak.	Lat 44°56'17", long 98°19'43", in NW¼NW¼ sec.20, T.117 N., R.62 W., Spink County, at highway bridge, 400 ft downstream from small right-bank tributary, 4.4 miles north of Frankfort, and 8.1 miles upstream from mouth.	225	1955-69 ⁺ 1970-73	3- -73	b5.23	c20
06475550	Dry Run tributary near Frankfort, S. Dak.	Lat 44°55'45", long 98°18'31", in W¼NW¼SW¼ sec.21, T.117 N., R.62 W., Spink County, on left bank at culvert on county highway, 0.6 mile upstream from mouth, and 3.5 miles north of Frankfort.	a4.5	1967-73	3- -73	b3.56	c10
06475850	Foster Creek tributary near Carpenter, S. Dak.	Lat 44°37'59", long 98°03'42", in SE¼SE¼ sec.32, T.114 N., R.60 W., Spink County, at culvert on State Highway 28, 7.3 miles west of Carpenter.	a3.7	1972-73	3-14-73	b4.21	c20
06475950	Shue Creek tributary near Yale, S. Dak.	Lat 44°27'48", long 97°59'18", in NW¼SW¼ sec.36, T.112 N., R.60 W., Beadle County, at culvert on county highway, 2 miles north of Yale.	a8.0	1968-73	3-14-73	b3.72	c10
06477140	Rock Creek tributary near Roswell, S. Dak.	Lat 44°02'24", long 97°42'34", in SW¼SW¼ sec.29, T.107 N., R.57 W., Miner County, at culvert on county highway, 2.2 miles north of Roswell.	a6.0	1970-73	3- -73	b5.60	(+)

DISCHARGE AT PARTIAL-RECORD STATIONS

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Annual maximum discharge at crest-stage partial-record stations during water year 1973.--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Dis-charge (cfs)
James River basin - Continued							
06477150	Rock Creek near Fulton, S. Dak.	Lat 43°45'39", long 97°54'25", in NW¼NW¼ sec.3, T.103 N., R.59 W., Hanson County, near right bank on downstream wingwall of highway bridge, 4.9 miles northwest of Fulton and 9.5 miles upstream from mouth.	270	1966-72 ⁺ 1973	3- 6-73	b7.03	c450
06477400	Firesteel Creek tributary near Wessington Springs, S. Dak.	Lat 44°04'26", long 98°34'52", in NW¼ sec.13, T.107 N., R.65 W., Jerauld County, at culvert on State Highway 34, 0.8 mile west of Wessington Springs.	a1.0	1968-73	3-14-73	b5.74	c25
06478050	Enemy Creek tributary near Mount Vernon, S. Dak.	Lat 43°36'19", long 98°15'55", in NE¼SE¼ sec.28, T.102 N., R.62 W., Davison County, at culvert on county highway, 7.3 miles south of Mount Vernon.	a2.5	1969-73	4- 8-69 6-16-70 6-28-71 5-27-72 3-14-73	5.0 5.54 4.97 5.88 b5.63	h43 h82 h41 h115 c15
06478200	Coffee Creek tributary near Parkston, S. Dak.	Lat 43°27'26", long 97°59'42", in SE¼SE¼ sec.24, T.100 N., R.61 W., Hutchinson County, at culvert on State Highway 37, 4.2 miles north of Parkston.	a.5	1968-73	3-14-73	b4.71	c30
06478260	North Branch Dry Creek near Parkston, S. Dak.	Lat 43°22'13", long 97°50'42", in NE¼ sec.29, T.99 N., R.59 W., Hutchinson County, at bridge on county highway, 7.5 miles southeast of Parkston.	37.0	1956-73	3-14-73	b4.92	c200
06478280	South Branch Dry Creek near Parkston, S. Dak.	Lat 43°21'22", long 97°49'35", in NW¼ sec.33, T.99 N., R.59 W., Hutchinson County, at bridge on county highway, 8.3 miles southeast of Parkston.	17.1	1956-73	3-14-73	b3.92	c40
06478300	Dry Creek near Parkston, S. Dak.	Lat 43°22'18", long 97°49'23", in SE¼ sec.21, T.99 N., R.59 W., Hutchinson County, at bridge on county highway, 8.5 miles southeast of Parkston.	76.8	1956-73	3-14-73	b3.95	c45
06478400	Lonetree Creek tributary near Kaylor, S. Dak.	Lat 43°17'18", long 97°50'10", in NE¼SE¼ sec.20, T.98 N., R.59 W., Hutchinson County, at culvert on county highway, 7.2 miles north of Kaylor.	a1.5	1970-73	3-14-73	b4.22	c30
Vermillion River basin							
06478630	West Fork Vermillion River near DeSmet, S. Dak.	Lat 44°12'54", long 97°33'04", in NW¼SW¼ sec.27, T.109 N., R.56 W., Kingsbury County, at culvert on State Highway 25, 11.5 miles south of DeSmet.	a8.0	1970-73	3- -73	b3.84	(+)
06478650	West Fork Vermillion River tributary near Monroe, S. Dak.	Lat 42°28'35", long 97°15'39", in SW¼SW¼ sec.17, T.100 N., R.54 W., Turner County, at culvert on county highway, 3.2 miles north of Marion, and 2.2 miles west of Monroe.	a1.0	1969-73	3- -73	b5.76	c25
06478800	Saddlerock Creek near Canton, S. Dak.	Lat 43°12'20", long 96°43'37", in NW¼SW¼ sec.23, T.97 N., R.50 W., Lincoln County, at bridge on county highway, 9.6 miles southwest of Canton.	14.8	1956-73	4-15-73	4.60	92
06478820	Saddlerock Creek tributary near Beresford, S. Dak.	Lat 43°12'21", long 96°45'51", in NE¼ NW¼NW¼ sec.21, T.97 N., R.50 W., Lincoln County, at culvert on county highway, 9 miles north of Beresford.	a2.32	1956-73 ⁿ	3-14-73	b4.27	(+)
06478840	Saddlerock Creek near Beresford, S. Dak.	Lat 43°12'55", long 96°49'33", in SE¼SE¼ sec.14, T.97 N., R.51 W., Lincoln County, at bridge on county highway 9.5 miles northwest of Beresford.	26.3	1956-70, 1972-73	4-15-73	4.47	100

Annual maximum discharge at crest-stage partial-record stations during water year 1973.--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Dis-charge (cfs)
Vermillion River basin - Continued							
06478950	Ash Creek near Beresford, S. Dak.	Lat 43°05'01", long 96°50'08", in NE¼NW¼ sec.2, T.95 N., R.51 W., Clay County, at culvert on State Highway 46, 2.1 miles west of Beresford.	a5.1	1969-73	3-14-73	b4.97	c240
06479020	Smoky Run near Irene, S. Dak.	Lat 43°04'56", long 97°19'12", in SE¼SE¼SE¼ sec.34, T.96 N., R.55 W., Yankton County, at culvert on State Highway 46, 0.1 mile west of Mayfield, and 8.0 miles west of Irene.	a7.0	1969-73	3-14-73	b5.46	c30
Big Sioux River basin							
06479240	Big Sioux River tributary No. 2 near Summit, S. Dak.	Lat 45°13'45", long 97°06'05", in SW¼ sec.30, T.121 N., R.51 W., Grant County, at culvert on U.S. Highway 81, 5.8 miles southwest of Summit, 11.5 miles southeast of Waubay.	.26	1956-73	3-14-73	b2.02	c2.5
06479260	Big Sioux River tributary near South Summit, S. Dak.	Lat 45°13'30", long 97°06'27", in SE¼ sec.25, T.121 N., R.52 W., Grant County, at culvert on county highway, 6.5 miles southwest of Summit, 11.5 miles southeast of Waubay.	6.60	1956-73	5-24-73	4.27	90
06479350	Soo Creek tributary near South Shore, S. Dak.	Lat 45°06'22", long 97°01'12", in NW¼NE¼ sec.24, T.119 N., R.52 W., Codington County, at culvert on State Highway 20, 3.8 miles west of South Shore.	a1.2	1970-73	3-14-73	b5.85	c50
06479370	Big Sioux River tributary near Wallace, S. Dak.	Lat 45°05'40", long 97°31'15", in NW¼NE¼ sec.26, T.119 N., R.56 W., Clark County, at culvert on State Highway 20, 3 miles northwest of Wallace.	a.5	1969-73	3- -73	b3.91	c3.0
06479550	Dolph Creek tributary near Lake Norden, S. Dak.	Lat 44°35'15", long 97°19'37", in SW¼SW¼ sec.16, T.113 N., R.54 W., Hamlin County, at culvert on State Highway 28, 5.4 miles west of Lake Norden.	a7.0	1970-73	3- -73	b4.90	(+)
06479750	Peg Munky Run near Estelline, S. Dak.	Lat 44°34'22", long 96°51'15", in N¼ sec.29, T.113 N., R.50 W., Deuel County, at bridge on State Highway 28, 2.5 miles east of Estelline.	25.4	1956-73	3- -73	b6.00	c250
06479800	North Deer Creek near Estelline, S. Dak.	Lat 44°27'44", long 96°47'13", in SE¼ sec.35, T.112 N., R.50 W., Brookings County, at bridge on U.S. Highway 77, 9.8 miles southeast of Estelline.	48.3	1956-73	7- 4-62 7-28-63 6-16-70 5-30-72 7- 2-73	7.61 7.52 8.79 8.35 5.56	o820 o660 o5,000 h3,100 h112
06479810	North Deer Creek tributary near Brookings, S. Dak.	Lat 44°22'44", long 96°47'14", in NW¼SW¼NW¼ sec.36, T.111 N., R.50 W., Brookings County, at culvert on U.S. Highway 77, 4.5 miles north of Brookings.	a.5	1969-73	3-14-73	b5.43	c15
06479900	Sixmile Creek tributary near Brookings, S. Dak.	Lat 44°22'57", long 96°40'48", in NW¼ sec.35, T.111 N., R.49 W., Brookings County, at bridge on county highway, 7.3 miles northeast of Brookings.	9.42	1956-73	3-14-73	b5.30	c75
06479950	Deer Creek near Brookings, S. Dak.	Lat 44°23'03", long 96°37'19", in SW¼ sec.29, T.111 N., R.48 W., Brookings County, at bridge on county highway, 9.8 miles northeast of Brookings.	4.21	1956-73	7-26-72 3-14-73	k4.56 b3.91	k95 c20
06480720	Bachelor Creek tributary near Wentworth, S. Dak.	Lat 44°00'28", long 97°00'02", in NE¼NE¼NW¼ sec.7, T.106 N., R.51 W., Lake County, at culvert on State Highway 34, 1.8 miles northwest of Wentworth.	a1.0	1969-73	3-14-73	b5.68	c25

DISCHARGE AT PARTIAL-RECORD STATIONS

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Annual maximum discharge at crest-stage partial-record stations during water year 1973.--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Dis-charge (cfs)
Big Sioux River basin - Continued							
06482600	West Pipestone Creek tributary near Garretson, S. Dak.	Lat 43°42'12", long 96°36'43", in SE¼SE¼ sec.20, T.103 N., R.48 W., Minnehaha County, at culvert on county highway, 5.3 miles west of Garretson.	^a 2.20	1969-73	9-29-73	10.71	566
06482870	Little Beaver Creek tributary near Canton, S. Dak.	Lat 43°15'27", long 96°37'59", in NE¼ sec.4, T.97 N., R.49 W., Lincoln County, at culvert on county highway, 4.0 miles southwest of Canton.	.22	1956-73	3-14-73	^b 3.06	^c 25
06485550	West Union Creek near Alcester, S. Dak.	Lat 42°56'18", long 96°38'00", in SW¼SE¼ sec.21, T.94 N., R.49 W., Union County, at culvert on county highway, 5.7 miles south of Alcester.	^a 3.62	1969-73	6-18-73	4.60	425

- (+) Discharge not determined
 (*) Operated as a continuous-record gaging station
 a Approximate
 b Backwater from ice
 c Estimated
 d Discontinued October 1973
 e Discontinued March 1973
 f Peak stage not determined
 g Peak stage did not reach bottom of gage
 h Not previously published
 i Less than
 j Peak discharge may have been greater
 k Corrected
 l About 270 sq mi probably noncontributing
 m About 730 sq mi probably noncontributing
 n Prior to Aug. 7, 1968, at old site 1,000 ft downstream at datum 6.60 ft lower
 o Revised

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