Surface Water Supply of the United States 1956

Part 6-A. Missouri River Basin above Sioux City, Iowa

Prepared under the direction of J. V. B. WELLS, *Chief, Surface Water Branch*

GEOLOGICAL SURVEY WATER-SUPPLY PAPER 1439

Prepared in cooperation with the States of Iowa, Montana, Nebraska, North Dakota, South Dakota, and Wyoming, and with other agencies

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PREFACE

This report was prepared by the Geological Survey in cooperation with the States of Iowa, Montana, Nebraska, North Dakota, South Dakota, and Wyoming, and with other agencies, by personnel of the Water Resources Division, C. G. Paulsen, chief, succeeded by L. B. Leopold, under the general direction of J. V. B. Wells, chief, Surface Water Branch, and B. J. Peterson, chief, Basic Records Section.

The data were collected and computed under supervision of district engineers, Surface Water Branch, as follows:

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T. R. Newell	Boise, Idaho
Frank Stermitz	Helena, Mont.

CALENDAR FOR WATER YEAR 1956

OCTOBER 1955

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NOVEMBER 1955

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JANUARY 1956

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FEBRUARY 1956

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JUNE 1956

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JULY 1956

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AUGUST 1956

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SEPTEMBER 1956

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SURFACE WATER SUPPLY OF MISSOURI RIVER BASIN ABOVE SIOUX CITY, IOWA, 1956

SCOPE OF WORK

This volume is one of a series of 18 reports presenting measurements of stage, discharge, and content of streams, lakes, and reservoirs in the United States during the water year ending September 30, 1956. Since 1888, when the United States Geological Survey first studied streamflow in relation to problems of irrigation, similar measurements have been made at more than 13,500 gaging stations in the 48 States and at many others in the Territories of Alaska and Hawaii. On September 30, 1956, the Geological Survey and cooperating organizations were maintaining 6,910 gaging stations, including those in Alaska and Hawaii. Discharge measurements only were made at many other points in the 1956 water year. The name of each stream measured at points other than gaging stations is not listed in the index to this report. Only the major river basins in which measurements were made are listed under the item "Discharge measurements" in the index.

COOPERATION

Many State, municipal, and private organizations have cooperated with the Geological Survey in this work by either furnishing or helping to collect data. Organizations that supplied data are acknowledged in station descriptions, and organizations that assisted in the collection of data through cooperative agreements with the Survey are:

Iowa: Iowa Geological Survey, H. G. Hershey, director and State geologist; and State Highway Commission, J. G. Butter, chief engineer, and Mark Morris, director of research; Iowa Natural Resources Council, R. G. Bullard, acting director.

Montana: Office of the State Engineer, F. E. Buck; State Water Conservation Board; city of Bozeman.

Nebraska: Department of Roads and Irrigation, L. N. Ress, State engineer, through the Bureau of Irrigation, Water Power and Drainage, D. S. Jones, Jr., chief, and the Bureau of Highways, H. G. Schlitt, deputy State engineer.

North Dakota: State Water Conservation Commission, M. W. Hoisveen, chief engineer.

South Dakota: Water Resources Commission, J. W. Grimes, chief engineer.

Wyoming: Office of the State Engineer, L. C. Bishop.

Assistance in the form of funds or services was given by the Corps of Engineers, Department of the Army, in collecting records published herein for 71 stations, of which 4 were in Iowa, 13 in Montana, 4 in Nebraska, 18 in North Dakota, 30 in South Dakota, and 2 in Wyoming.

Assistance was also furnished by the Bureau of Reclamation and the Office of Indian Affairs of the United States Department of the Interior; the Soil Conservation Service of the United States Department of Agriculture; and the United States Department of State.

The following organization aided in collecting records:

Montana: The Montana Power Co.

On waters adjacent to the international boundary, certain gaging stations are maintained by the United States (or Canada) under agreement with Canada (or the United States) and the records are obtained and compiled in a manner equally acceptable in both countries. These stations are designated herein as "International gaging stations."

DIVISION OF WORK

The stream-gaging work was done by the Water Resources Division of the Geological Survey under the direction of personnel shown in the preface. The data for stations in the several States were collected and prepared for publication in the district offices listed below.

State	District office	Address
Iowa a/	Iowa City	508 Hydraulic Laboratory, University of Iowa.
Montana b/	Helena	409 Federal Building.
Nebraska c/	Lincoln	510 Rudge-Guenzel Building.
North Dakota d/	Bismarck	202½ Third Street.
South Dakota e/	Bismarck, N. Dak	202½ Third Street.
Wyoming f/	Denver, Colo	Denver Federal Center.

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a/ Except for Big Sioux River at Akron.
b/ Except for Madison River near West Yellowstone.
c/ Including Keyapaha River at Wewela, S. Dak.
d/ Including Big Sioux River at Akron, Iowa.
e/ Except Keyapaha River at Wewela.
f/ Except for stations in Yellowstone National Park.
Note.--Stations in Yellowstone National Park are collected under the supervision of the Boise district, 429 Federal Building, Boise, Idaho.

Information of a more detailed nature than that published for most of the gaging stations given in this report is on file in the district offices listed above. Provisional records of discharge prior to publication, and other unpublished data concerning the gaging-station records may usually be obtained from the district office.

DEFINITION OF TERMS AND ABBREVIATIONS

The terms of streamflow and other hydrologic data, as used in this report, are defined as follows:

Cubic foot per second (cfs) is the rate of discharge of a stream whose channel is 1 square foot in cross-sectional area and whose average velocity is 1 foot per second.

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.

Runoff in inches is the depth to which an area would be covered if all the water draining from it in a given period were uniformly distributed on its surface. The term is used for comparing runoff with rainfall, which is also usually expressed in inches.

Acre-foot is the quantity of water required to cover an acre to the depth of 1 foot and is equivalent to 43,560 cubic feet. The term is commonly used in relation to storage for irrigation.

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, 1.983471 acre-feet, or 646,317 gallons, and represents a runoff of 0.0372 inch from 1 square mile

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.

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, a long reach of the channel, or an artificial structure.

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

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

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

DOWNSTREAM ORDER OF LISTING GAGING STATIONS

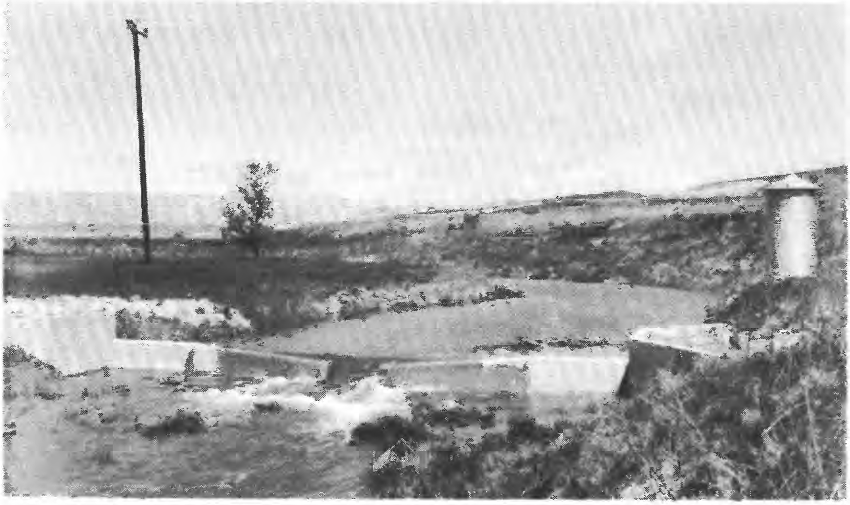
Beginning with the series of reports for the water year ending September 30, 1951, the order of listing gaging-station records was changed. In this report, in a downstream direction along the main stem all stations on a tributary entering above a main-stem station are listed before that station. If a tributary enters between two main-stem stations, it is listed between them. A similar order is followed in listing stations on first rank, second rank, and other ranks of tributaries. To indicate the rank of any tributary on which a gaging station is situated and the stream to which it is immediately tributary, each indention in the listing of gaging stations in the table of contents of this report represents one rank. This downstream order and system of indention show which gaging stations are on tributaries between any two stations on a main stem and the rank of the tributary on which each gaging station is situated.

The order of listing used before the publication of the 1951 report listed first all stations on the main stem from headwaters toward mouth, then all stations on the uppermost tributary to the main stem from the tributary's source to mouth, and then all stations from source to mouth of the uppermost tributary to the tributary.

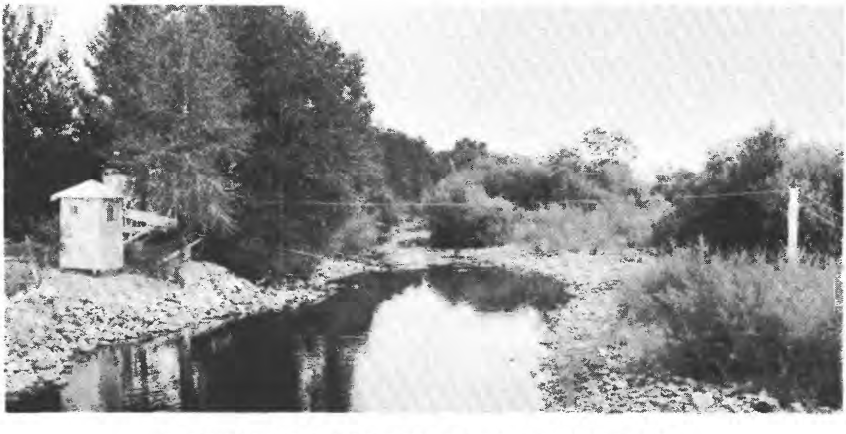
EXPLANATION OF DATA

The base data collected at gaging stations consist of records of stage and measurements of discharge. In addition, observations of factors affecting the stage-discharge relation, weather records, and other information are used to supplement base data in determining the daily flow. The records of stage are obtained either from direct readings on a nonrecording gage or from a water-stage recorder that gives a continuous record of fluctuations. Measurements of discharge are made with a current meter by the general methods adopted by the Geological Survey on the basis of experience in stream gaging since 1888. These methods are described in Water-Supply Paper 888 and are also outlined in standard textbooks on the measurement of stream discharge. Typical structures in use at gaging stations are shown in figure 1.

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 determinations of peak discharge (such as slope-area or contracted-opening determinations, computation of flow over dams or weirs, and by other methods), velocity-area studies, and logarithmic plotting. The application of the daily mean gage height to those rating tables 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



A. NIOBRARA RIVER BELOW BOX BUTTE RESERVOIR, NEBR.



B. NORTH POPO AGIE RIVER NEAR LANDER, WYO.

FIGURE 1.—GAGING-STATION STRUCTURES.

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 essentially the shifting-control method.

At some 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 requisite 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. If so, the rate of change in stage is used as a factor in the determination of discharge.

At most gaging stations in the northern part of the United States and at some in the mountainous regions of other parts the stage-discharge relation is affected by ice during 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 engineers, and comparable records of discharge for other stations in the same or nearby basins. If the stage-discharge relation is affected by ice, this information is given in a note to the table. No mention is made of occasional days of ice effect if the degree of accuracy of daily records is not changed.

The data herein presented generally comprise a description of the station, a skeleton rating table, and a table showing the daily discharge and monthly and yearly discharge and runoff of the stream. Records are published for the water year which begins on October 1 and ends on September 30. A calendar for the water year 1956 is shown on page IV for the purpose of finding the day of the week for any date.

The description of the station gives the location, drainage area, records available, type and history of gages, average discharge, extremes of discharge, general remarks, and notations of revisions of the previously published record. 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 unless otherwise noted. Under "Records available" are given the periods for which there are published records generally equivalent to those at the present site. Under "Gage" are given the type of gage currently in use and 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 records available. Under "Average discharge" is given the average discharge for the number of years indicated. It is not given for stations having fewer than five complete years of record or for stations where changes in water development during the period of record cause the figure to have little significance. Under "Extremes" are given the maximum discharge and gage height; the minimum discharge if there is little or no regulation; the minimum daily discharge if there is extensive regulation (also the minimum discharge if useful); and the minimum gage height (unless it is of no importance). In the first paragraph, the data given are for the complete current water year unless otherwise specified. In the second paragraph, the data given are for the periods of record within the calendar year dates in the heading (not necessarily those for the complete years indicated by the heading dates). Reliable information concerning major floods that have occurred outside the period of record are given in the third or last paragraph under "Extremes." Unless otherwise qualified, the maximum discharge corresponds to the crest stage obtained by use of a water-stage recorder, a crest-stage indicator, 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, it is given separately. Information pertaining to the accuracy of the records and conditions which affect the natural flow at the gaging station is 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 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 are concerned in the revision, 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 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 all stations except those at which the daily discharge for the greater part of the open-water period was determined by the shifting-control method, the slope method, or other special methods involving an equivalent adjustment to the gage height of more than one-tenth foot. Skeleton rating tables are generally not published for stations on canals.

For stations equipped with water-stage recorders, except those on streams subject to sudden or rapid fluctuation, the daily table gives the discharge corresponding to the daily mean gage height. For stations subject to such fluctuation the daily mean gage height may not indicate the true daily mean discharge, which must be obtained by averaging the discharge for parts of the day or by using the discharge integrator, an instrument for obtaining the daily mean discharge from a continuous gage-height graph and containing, as an essential element, a curve representing the stage-discharge relation at the station. For stations equipped with nonrecording gages, the table of daily discharge gives the discharge corresponding to once-daily readings of the gage, or to the mean of twice-daily readings, or to the mean gage height determined from gage-height graphs based on gage readings. For periods of rapidly changing stage, the daily mean discharge is determined from gage-height graphs based on gage readings, the frequency of which is stated in the station description.

In the table of daily discharge, the figures for the maximum day and the minimum day for each month are underlined. If the figure is repeated, it is underlined only on the first day of its occurrence.

In the monthly summary below the daily table, the line headed "Total" gives the sum of the daily figures; it is the total cfs-days for the month. The line headed "Mean" gives the average flow in cubic feet per second during the month. Runoff for the month 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 for cubic feet per second per square mile and runoff in inches are omitted if the drainage area includes large noncontributing areas, or if the average annual rainfall over the drainage basin is usually less than 20 inches.

In the yearly summary below the monthly summary, the figures of maximum are the maximum daily discharges, not the momentary discharges when the water was at crest stage. Likewise, the minimums in this summary are the minimum daily discharges.

Peak discharges and the times of their occurrence and corresponding gage heights of most stations are listed below the table of daily and monthly discharge. 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 will be presented. Peak discharges are not published for canals, ditches, drains, or for any stream for which the peaks are subject to substantial control by man.

Footnotes to the table of daily discharge indicate periods when discharge was computed or estimated by unusual or special methods during periods of no gage-height record and ice effect, or by other effects that reduce the degree of accuracy of the records. Days on which discharge measurements were made are indicated by asterisk and footnote unless they were made at frequent regular intervals, in which instance the general frequency of discharge measurements is given under "Remarks" in the station description.

For most gaging stations on lakes and reservoirs the data presented comprise a description of the station and a monthly summary table of stage and contents. For some reservoirs a table showing daily contents or stage is given. A skeleton table of capacity at given stages is published each year for all reservoirs for which records are published on a daily basis, but it is not published for reservoirs for which only monthly data are given.

Discharge measurements and determinations of peak flows made at sites other than gaging stations are listed at the end of each report.

ACCURACY OF FIELD DATA AND COMPUTED RESULTS

The accuracy of streamflow 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 states the degree of accuracy of the records. "Excellent" indicates that, in general, the error in the daily records is believed to be less than 5 percent; "good," less than 10 percent; "fair," less than 15 percent; and "poor," probably more than 15 percent. The records of monthly and yearly mean discharge and runoff are, in general, more nearly accurate than the daily records.

Runoff at some stations, as indicated by the monthly mean, may vary widely from natural runoff, owing to diversion, consumption, regulation by storage, increase or decrease in evaporation due to artificial causes, or to other factors. For such stations, figures of cubic feet per second per square mile and runoff in inches are not published unless storage or diversion records are included to indicate the extent of the regulation or diversion, or unless satisfactory adjustments can be made for changes in contents of reservoirs or for other changes incident to use and control. 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 when relatively large negative adjustments are made or when evaporation is large in comparison with the observed discharge.

Many gaging stations on streams in the irrigated areas of the United States are situated above most of the diversions from those streams, and therefore the discharge recorded does not actually show the water supply available at the stations for further development, because water must first be supplied to existing irrigation systems.

PUBLICATIONS

To facilitate publications of the annual series of reports, the area of the United States is divided into 14 parts whose boundaries coincide with certain natural drainage lines. Formerly, the results of streamflow measurements were published in 14 volumes, one for each of the 14 parts. Beginning with the reports for 1951, the records are published in 18 volumes, there being 2 volumes each for Parts 1, 2, 3, and 6. The boundaries of the various parts are indicated by the following list and the map in figure 2.

Part 1. North Atlantic slope basins, in two volumes:
    A, North Atlantic slope basins, Maine to Connecticut.
    B, North Atlantic slope basins, New York to York River.
2. South Atlantic slope and eastern Gulf of Mexico basins, in two volumes:
    A, South Atlantic slope basins, James River to Savannah River.
    B, South Atlantic slope and eastern Gulf of Mexico basins, Ogeechee River to Pearl River.
3. Ohio River basin, in two volumes:
    A, Ohio River basin except Cumberland and Tennessee River basins.
    B, Cumberland and Tennessee River basins.
4. St. Lawrence River basin.
5. Hudson Bay and upper Mississippi River basins.
6. Missouri River basin, in two volumes:
    A, Missouri River basin above Sioux City, Iowa.
    B, Missouri River basin below Sioux City, Iowa.
7. Lower Mississippi River basin.
8. Western Gulf of Mexico basins.
9. Colorado River basin.
10. The Great Basin.
11. Pacific slope basins in California.
12. Pacific slope basins in Washington and upper Columbia River basin.
13. Snake River basin.
14. Pacific slope basins in Oregon and lower Columbia River basin.

Water-supply papers and other publications of the Geological Survey containing data on the water resources of the United States may be purchased or consulted as follows:

1. Copies may be purchased from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., who will, on application, furnish lists giving prices. A list of Geological Survey publications may also be obtained by applying to the Director, Geological Survey, Washington, D. C.

2. Sets of the reports may be consulted in the libraries of the principal cities in the United States.

3. Sets are available for consultation in the offices of the Water Resources Division of the Geological Survey. Addresses of the offices in the area covered by this report are given on page 2.

Early records of the flow of streams in the United States are published in the reports listed on page 10. In many of these reports records for years earlier than those

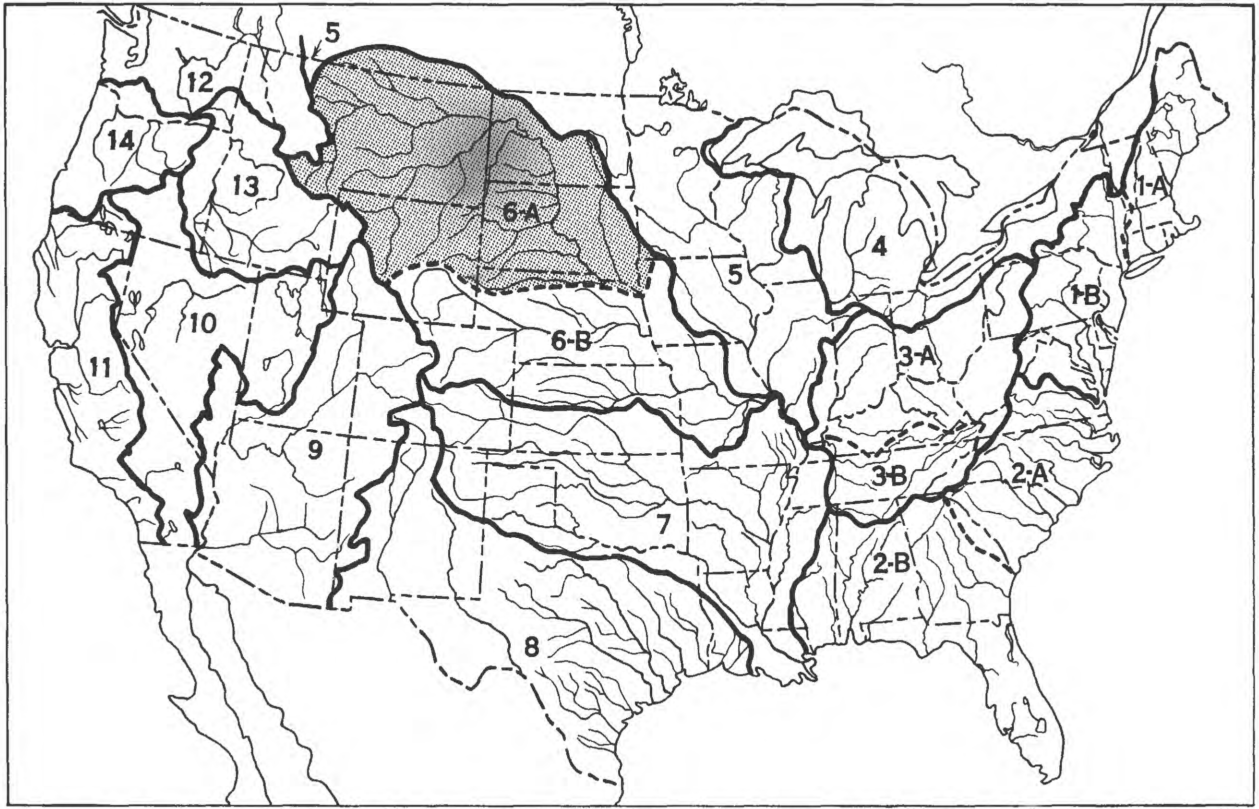

5
12
14
13
6-A
11
10
6-B
9
5
4
1-A
1-B
3-A
3-B
2-A
7
2-B
8

Figure 2.--Map of the United States showing areas covered by the 18 annual volumes on surface-water supply. The area covered by this report is shaded.

indicated have been included for some streams.

Streamflow data for the years 1884-1901, in reports of the Geological Survey

(A = Annual Report; B = Bulletin)

Report	Character of data	Year
10th A, pt. 2	Descriptive information only.	
11th A, pt. 2	Monthly discharge and descriptive information	1884 to September 1890.
12th A, pt. 2	....do	1884 to June 30, 1891.
13th A, pt. 3	....do	1884-92.
14th A, pt. 2	Monthly discharge	1888-93.
B 131	Descriptions, measurements, gage heights, and ratings	1893-94.
16th A, pt. 2	Descriptive information only.	
B 140	Descriptions, measurements, gage heights, ratings, and monthly discharge.	1895.
WSP 11	Gage heights	1896.
18th A, pt. 4	Descriptions, measurements, ratings, and monthly discharge.	1895-96.
WSP 15	Descriptions, measurements, and gage heights of streams east of the Mississippi River, and Missouri River and tributaries above Kansas River.	1897.
WSP 16	Descriptions, measurements, and gage heights of streams west of the Mississippi River, except Missouri River and tributaries above Kansas River.	1897.
19th A, pt. 4	Descriptions, measurements, ratings, and monthly discharge.	1897.
WSP 27	Measurements, ratings, and gage heights of streams east of the Mississippi River, and Missouri River and tributaries.	1898.
WSP 28	Measurements, ratings, and gage heights of streams west of the Mississippi River, except Missouri River and tributaries.	1898.
20th A, pt. 4	Monthly discharge	1898.
WSP 35 to 39.	Descriptions, measurements, gage heights, and ratings	1899.
21st A, pt. 4	Monthly discharge	1899.
WSP 47 to 52.	Descriptions, measurements, gage heights, and ratings	1900.
22d A, pt. 4.	Monthly discharge	1900.
WSP 65, 66	Descriptions, measurements, gage heights, and ratings	1901.
WSP 75	Monthly discharge	1901.

Reports on surface-water supply containing records from 1899 to date for drainage basins in this report are listed below. The data for any particular gaging station will, in general, be found in the reports covering the years during which the station was maintained. Before 1951, records for the Missouri River basin above Sioux City, Iowa, were included with those of the other rivers of the Missouri River basin.

Numbers of water-supply papers containing results of stream measurements in Missouri River basin above Sioux City, Iowa, 1899-1956

Year	WSP	Year	WSP	Year	WSP	Year	WSP	Year	WSP
1899	[a]36, 37	1912	326	1925	606	1937	826	1949	1146
1900	49	1913	356	1926	626	1938	856	1950	1176
1901	66, 75	1914	386	1927	646	1939	876	1951	1209
1902	84	1915	406	1928	666	1940	896	1952	1239
1903	99	1916	436	1929	686	1941	926	1953	1279
1904	130	1917	456	1930	701	1942	956	1954	1339
1905	172	1918	476	1931	716	1943	976	1955	1389
1906	208	1919-20	506	1932	731	1944	1006	1956	1439
1907-8	246	1921	526	1933	746	1945	1036		
1909	266	1922	546	1934	761	1946	1056		
1910	286	1923	566	1935	786	1947	1086		
1911	306	1924	586	1936	806	1948	1116		

[a] Gallatin River.

The records at most of the stations discussed in these reports extend over many years. Discharge measurements at many points other than regular gaging stations have been made each year and are published at the end of each report. The streams and points of measurement are listed in the same order as the streams and gaging stations in the body of the report. An index of the records obtained before 1904 has been published in Water-Supply Paper 119.

Each of the reports on the surface-water supply for the year 1939 (Water-Supply Paper 876 for the Missouri River basin above Sioux City, Iowa) contains, for the area included in that report, a summary of yearly discharge at gaging stations at which 10 or more complete years of record had been collected. These summaries were reprinted separately.

Reports also have been published that are compilations of records for various areas, usually a single State or drainage basin. These reports contain records previously published (some of which may have been revised), as well as some records not contained in the annual series of water-supply papers. The following table lists reports of this type for Missouri River basin above Sioux City, Iowa.

Reports containing compilations of records of discharge by States and drainage basins

WSP	Period	Report
230.........	1894-1906	Surface water supply of Nebraska.
469.........	1894-1921	Surface waters of Wyoming and their utilization.
491.........	1898-1917	Water supply of St. Mary and Milk Rivers (Mont., Canada).
917.........	1881-1938	Surface waters of Missouri and St. Mary River basins (Mont.).

Records of discharge have been published also in State reports. Some of these are not contained in the publications of the Geological Survey or are revisions of records previously published in its water-supply papers. The following table contains a list of these reports for the area covered by this report.

State reports containing compilations of records of discharge

State	Period	Report	Issued by
Iowa..........	1873-1932	Stream-flow records of Iowa................	State Planning Board.
Do.........	1873-1940	Water-Supply Bull. 1, Summaries of yearly and flood flow relating to Iowa streams..	Iowa Geological Survey.
Do.........	1941-42	Water-Supply Bull. 2, Surface water resources of Iowa.	Do.
Do.........	1942-50	Water-Supply Bull. 3, Surface water resources of Iowa.	Do.
Montana.......	1889-1911	5th biennial report.......................	Office of the State Engineer.
Do.........	1881-1938	Special Rept. 10, vols. 1-4, Water resources of Montana.	Montana Agricultural Experiment Station.
Nebraska......	1894-1914	1st hydrographic report....................	Bureau of Water Power, Irrigation, and Drainage.
Do.........	1914-28	2nd hydrographic report....................	Do.
North Dakota..	1919-21	Report to Governor of North Dakota on flood control.	State engineer.
Do.........	1882-1925	Surface water supply of North Dakota (with 12th biennial report).	Do.
Do.........	1882-1938	Surface water in North Dakota..............	State Planning Board.
Do.........	1882-1944	Supplement B, 4th biennial report..........	State Water Conservation Commission.

Note.--In addition to the records contained in the reports listed above, the following States have issued annual or biennial reports in which are contained records of discharge: Montana, Nebraska, North Dakota, South Dakota, and Wyoming.

The reports listed in the foregoing tables contain the customary records of discharge collected during the systematic operation of gaging stations. Detailed information on the stage and discharge of many streams during major floods has been included in special reports on these floods published by the Geological Survey or other agencies. The more recent of these special reports also contain other pertinent hydrologic information and analyses and compilations of data relating to earlier notable floods. The following is a list of these reports:

Report	Issued by
WSP 147: Destructive floods in the United States in 1904.	U. S. Geological Survey.
WSP 162: Destructive floods in the United States in 1905.	Do.
WSP 520-G: Some floods in the Rocky Mountain region.	Do.
WSP 771: Floods in the United States, magnitude and frequency.	Do.
WSP 847: Maximum discharges at stream-measurement stations through September 1938.	Do.
WSP 1137-A: Missouri River Basin Floods of April-May 1950 in North and South Dakota.	Do.
WSP 1137-I: Summary of floods in the United States during 1950.	Do.
WSP 1260-B: Floods of 1952 in the Missouri River basin.	Do.
WSP 1320-A: Floods of June 1953 in Northwestern Iowa.	Do.
WSP 1320-B: Missouri River Basin Floods of 1953 in Montana.	Do.
Bull. 1: Iowa floods, magnitude and frequency.	Iowa Highway Research Board.
Floods in Nebraska, magnitude and frequency.	Nebraska State Department of Roads and Irrigation.

RECORDS OF DISCHARGE COLLECTED BY AGENCIES OTHER THAN THE GEOLOGICAL SURVEY

Records of daily discharge for South Cottonwood Creek near Gallatin Gateway and Rocky Creek (East Gallatin River) near Bozeman, Mont., have been collected by Mortana State College, Civil Engineering Department, since 1954.

HYDROLOGIC CONDITIONS

During the water year 1956 streamflow was in the median range in most of the area covered by this report. The only excessive flow was in the upper Yellowstone River basin, in almost every month, and in parts of North and South Dakota in March and August. A cloudburst on August 10 produced a peak discharge of about 1,700 cubic feet per second per square mile from about 0.4 square mile on an area just east of Pierre, S. Dak. Deficient streamflow occurred at the key gaging station on Big Sioux River at Akron, Iowa, in all except two months; record-low flows for the month were recorded in November and December. Bad River near Fort Pierre, S. Dak., was dry for the entire month of September. For three key gaging stations in the area covered by this report a comparison of monthly and yearly mean discharges for the 1956 water year with the median discharges for the 25-year period (1921-45) is shown in figure 3 on opposite page.

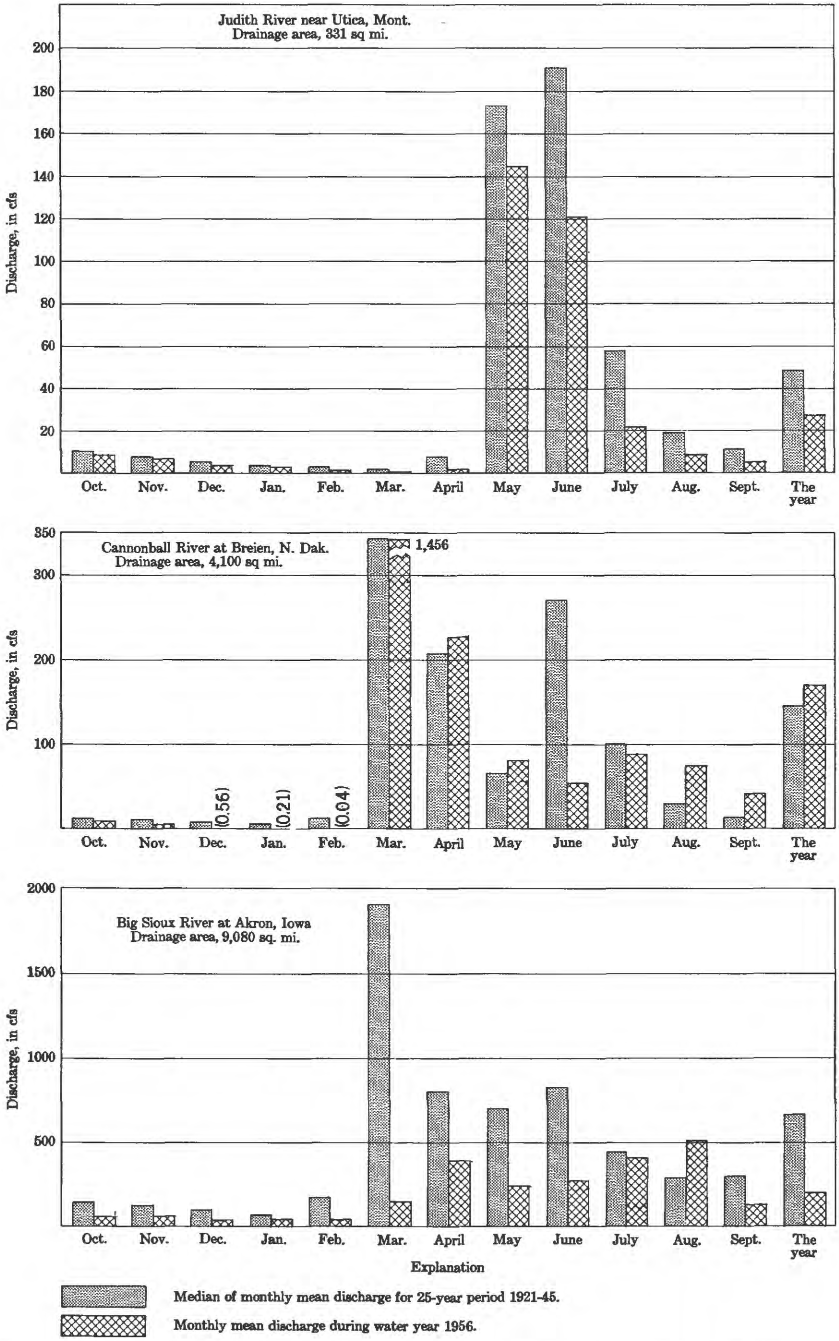


Figure 3. Comparison of discharge at three key gaging stations during 1956 water year with median discharge for 25-year period.

MISSOURI RIVER MAIN STEM

Red Rock River at Kennedy Ranch, near Lakeview, Mont.

Location.--Lat 44°39', long 112°03', near center of sec. 2, T. 14 S., R. 4 W., on right bank at Kennedy Ranch, 4 miles upstream from Long Creek and 14 miles northwest of Lakeview.

Drainage area.--318 sq mi.

Records available.--July 1936 to September 1956 (no winter records 1943-56).

Gage.--Water-stage recorder and wooden control. Datum of gage is 6,596.37 ft above mean sea level, unadjusted. Prior to Sept. 30, 1936, staff gage and Oct. 1, 1936, to Aug. 27, 1942, water-stage recorder, at site 1 mile upstream at different datum.

Extremes.--Maximum discharge recorded during year, 596 cfs Apr. 24 (gage height, 3.77 ft); minimum daily, 25 cfs Nov. 24.

1936-56: Maximum discharge recorded, 1,360 cfs Apr. 30, 1952 (gage height, 5.24 ft); minimum, 1.5 cfs Sept. 2, 1940.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of about 6,000 acres above station.

Revisions (water years).--WSP 1086: 1946. WSP 1339: 1937.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.5	21	2.6	260
1.7	41	3.0	393
2.0	90	3.5	535
2.3	160	4.0	681

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	45	45					80	426	310	84	44	31
2	48	45						374	278	88	45	33
3	48	42						333	*274	94	45	28
4	*48	45						330	282	*80	41	30
5	48	50						289	285	77	38	32
6	40	55						271	264	79	37	32
7	40	57						271	249	77	38	33
8	49	55						230	230	73	38	34
9	45	57						223	216	66	38	34
10	48	58						230	213	55	39	37
11	45	51					300	210	206	71	39	38
12	42	42						206	184	80	38	41
13	55	40						203	169	66	38	42
14	60	38						230	175	65	38	41
15	60	36						200	175	58	41	38
16	60	32					550	190	166	55	40	36
17	63	30						187	166	55	39	37
18	63	30						181	136	51	39	40
19	63	32						187	119	51	39	41
20	60	34						193	138	49	40	42
21	66	35						203	181	48	39	42
22	68	33						210	131	48	37	*36
23	65	30						213	131	45	*36	37
24	68	25					*584	216	133	45	36	42
25	69	26					565	230	122	44	34	42
26	71	28					554	256	115	41	34	42
27	54	30					543	282	110	41	36	42
28	61	30					524	285	106	40	37	44
29	55	30					488	320	92	47	34	44
30	63	30			------		463	323	86	47	33	47
31	57	------			------		------	320	------	45	28	------
Total	1,727	1,171	-	-	-	-	10,421	7,795	5,442	1,865	1,178	1,138
Mean	55.7	39.0	-	-	-	-	347	251	181	60.2	38.0	37.9
Ac-ft	3,430	2,320	-	-	-	-	20,670	15,460	10,790	3,700	2,340	2,260

Calendar year : Max Min Mean Ac-ft
Water year : Max Min Mean Ac-ft

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 2-6, 13-22. No gage-height record Nov. 23-30; Apr. 1-23; discharge estimated on basis of weather records, storage in Lima Reservoir, and records for station below Lima Reservoir.

Red Rock River below Lima Reservoir, near Monida, Mont.

Location.--Lat 44°39'20", long 112°22'00", in SW¼ sec. 32, T. 13 S., R. 6 W., or right bank just downstream from Lima Reservoir, 7 miles northwest of Monida.

Drainage area.--560 sq mi, approximately.

Records available.--July 1911 to September 1918, May 1925 to September 1956. No winter records for some years prior to 1941. Prior to October 1950, published as "below Red Rock Reservoir."

Gage.--Water-stage recorder and 40-foot Cippoletti weir. Altitude of gage is 6,530 ft (estimated from spillway elevation based on Montana State Water Conservation Board datum). July to December 1911, staff gage at site 900 ft downstream at different datum. 1912-13, float gage; 1914-18, 1925-27, reference point; 1928 to Mar. 31, 1934, staff gage; all at present site and datum. Apr. 1 to Oct. 21, 1934, staff gage at upstream face of dam at different datum. Oct. 22, 1934, to May 7, 1939, staff gage at present site and datum.

Average discharge.--26 years (1911-16, 1917-18, 1925-28, 1929-30, 1934-35, 1941-56), 154 cfs (111,500 acre-ft per year).

Extremes.--Maximum discharge during year, 547 cfs May 28 (gage height, 2.42 ft); minimum, 13 cfs Oct. 29.

1911-18, 1925-56: Maximum discharge observed, 2,500 cfs May 15, 1933 (gage height, 5.40 ft), estimated release to prevent failure of dam; no flow at times.

Remarks.--Records good except those for period of no gage-height record, which are poor. Flow regulated by Lima Reservoir (see p. 238). No storage during 1934. Diversions for irrigation of about 10,000 acres above reservoir.

Revisions (water years).--WSP 1389: 1912, 1934.

Rating table, water year 1955-56 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 24 to July 11)

0.2	14	1.0	145
.4	36	1.5	273
.6	66	2.0	435
.8	102	2.5	621

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	18	19	21	23	22	22	16	159	432	386	282	34
2	18	19	21				17	159	435	386	279	34
3	18	19	21				17	237	*481	383	276	34
4	*18	19	21				17	259	524	*376	276	35
5	19	19	21				17	259	536	376	270	35
6	19	19	21				17	259	532	376	267	30
7	19	19	21				17	259	536	366	265	30
8	19	19	21				17	259	536	344	259	29
9	18	19	21				17	259	536	340	253	29
10	18	18	22	22			17	259	532	337	247	29
11	18	18	22				17	259	532	301	240	32
12	18	18	22				17	259	528	285	185	35
13	18	18	22			20	17	259	528	266	34	35
14	18	18	22			20	48	259	528	233	26	35
15	18	18	22			20	64	259	528	213	25	35
16	16	18	22			20	80	344	524	213	24	35
17	16	18	22			20	85	360	493	213	24	35
18	16	18	22			20	85	428	474	205	24	35
19	17	18	22			20	85	449	470	200	25	35
20	18	20	22			20	106	449	470	197	32	35
21	18	20	22			20	121	452	466	197	35	36
22	18	*20	23			20	123	456	446	197	36	*36
23	18	20	23			18	123	456	435	195	*35	36
24	18	20	23			18	*123	499	435	195	35	36
25	18	20	23			18	145	532	422	192	35	36
26	18	20	23			18	156	536	397	192	35	36
27	18	20	23			*18	156	536	393	192	35	36
28	19	21	*23			18	156	536	393	222	35	36
29	16	21	23			18	156	438	390	269	34	36
30	19	21	23		------	17	156	331	390	282	34	36
31	19	------	23		------	16	------	347	------	282	34	------
Total	556	574	683	691	638	623	2,188	10,812	14,322	8,411	3,696	1,026
Mean	17.9	19.1	22.0	22.3	22.0	20.1	72.9	349	477	271	119	34.2
Ac-ft	1,100	1,140	1,350	1,370	1,270	1,240	4,340	21,450	28,410	16,680	7,330	2,040

Calendar year 1955: Max 577	Min 12	Mean 114	Ac-ft 82,350
Water year 1955-56: Max 536	Min -	Mean 121	Ac-ft 87,720

* Discharge measurement made on this day.

Note.--No gage-height record Jan. 1 to Mar. 12; discharge estimated on basis of scattered gage readings.

Red Rock River near Dell, Mont.

Location.--Lat 44°47', long 112°43', in NW¼ sec. 20, T. 12 S., R. 9 W., on right bank half a mile downstream from Sage Creek and 4½ miles northwest of Dell.

Drainage area.--1,420 sq mi, approximately.

Records available.--June 1942 to September 1956 (no winter records).

Gage.--Water-stage recorder and concrete control. Altitude of gage is 5,870 ft (by barometer).

Extremes.--Maximum discharge recorded during year, 182 cfs Aug. 5 (gage height, 2.83 ft); minimum recorded, 17 cfs June 3.
1942-56: Maximum discharge, 1,480 cfs June 9, 1944 (gage height, 4.85 ft), from rating curve extended above 600 cfs; minimum daily, 1.6 cfs May 20, 1945.

Remarks.--Records fair except those for Nov. 13-30, which are poor. Some regulation by Lima Reservoir (see p. 238). Diversions for irrigation of about 35,000 acres of which about 2,000 acres lie below station.

Revisions (water years).--WSP 1339: 1947-49.

Rating table, water year 1955-56 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Aug. 11 to Sept. 30)

1.9	16
2.0	26
2.2	58
2.4	98
2.8	197

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	37	40					-	27	a33	54	167	23
2	37	40					-	27	24	68	164	22
3	37	40					-	27	*18	78	162	21
4	*37	47					-	32	18	*84	173	20
5	37	62					-	33	18	86	173	23
6	37	62					-	a33	24	96	160	32
7	39	60					-	a34	30	100	157	29
8	39	62					-	36	30	102	152	24
9	37	64					-	36	30	94	152	26
10	37	70					-	a34	33	94	140	32
11	37	66					-	a34	36	100	137	30
12	37	56					-	a36	40	115	133	27
13	39	a54					-	37	51	119	102	26
14	42	a54					-	37	54	113	66	34
15	40	a47					-	37	58	111	66	36
16	40	a44					-	33	66	102	62	33
17	40	a50					-	29	72	94	51	34
18	40	a63					-	a33	56	78	44	37
19	39	a75					-	a36	47	62	37	40
20	37	a83					-	39	53	56	30	40
21	37	a92					-	a37	47	66	24	42
22	37	*97					-	a39	45	56	23	*44
23	37	a93					-	a42	49	54	*22	45
24	37	a85					*32	a45	56	53	23	47
25	39	a78					33	a49	53	62	23	45
26	39	a78					33	51	47	56	23	44
27	39	a80					33	56	51	51	23	44
28	40	a80					32	64	60	47	30	42
29	37	a76					30	a86	54	68	36	30
30	37	a74			------		29	a51	51	108	33	26
31	39	------			------		------	a37	------	142	26	------
Total	1,183	1,972	-	-	-	-	-	1,227	1,304	2,569	2,614	998
Mean	38.2	65.7	-	-	-	-	-	39.6	43.5	82.9	84.3	33.3
Ac-ft	2,350	3,910	-	-	-	-	-	2,430	2,590	5,100	5,180	1,980

Calendar year : Max Min Mean Ac-ft
Water year : Max Min Mean Ac-ft

* Discharge measurement made on this day.
a No gage-height record; discharge interpolated or estimated on basis of 1 discharge measurement, weather records, and comparison with records for station below Lima Reservoir.

Grasshopper Creek near Dillon, Mont.

Location.--Lat 45°07', long 112°48', in NW¼ sec. 26, T. 8 S., R. 10 W., on left bank 1¼ miles upstream from mouth and 11 miles southwest of Dillon.

Drainage area.--350 sq mi, approximately.

Records available.--March 1921 to June 1933, October 1945 to December 1953, March 1955 to September 1956. Only one year of winter records prior to 1945.

Gage.--Water-stage recorder. Altitude of gage is 5,350 ft (from topographic map). Prior to June 30, 1933, staff or chain gage at site 1,000 ft downstream at different datum. Oct. 11, 1945, to May 15, 1946, staff gage at same site and datum.

Average discharge.--10 years (1922-23, 1945-53, 1956), 58.0 cfs (41,990 acre-ft per year).

Extremes.--Maximum discharge during year, 1,870 cfs Mar. 24 (gage height, 6.47 ft in gage well, 7.33 ft from outside gage), from rating curve extended above 600 cfs on basis of slope-area determination of peak flow; minimum, 7.2 cfs Sept. 17.

1921-33, 1945-53, 1955-56: Maximum discharge, that of Mar. 24, 1956; no flow July 5-11, Aug. 3, 1930, Aug. 5, 6, 1931 (water diverted for irrigation).

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of about 12,500 acres above station.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.6	6.0	2.5	88
1.8	13	3.0	190
2.0	25	4.0	510
2.2	46	5.0	950

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	17	45	40	35	18	24	107	96	294	17	40	19
2	17	50	45	35	20	23	68	88	*273	23	39	16
3	17	52	40	37	21	22	58	83	264	53	33	14
4	*17	52	30	43	23	21	62	95	255	*72	33	13
5	18	51	25	45	23	20	72	110	230	62	33	12
6	19	51	25	45	23	20	56	103	198	54	34	11
7	19	58	30	45	23	20	59	112	185	48	35	11
8	19	57	35	43	23	20	51	121	165	32	37	11
9	19	51	30	40	20	20	65	110	133	23	35	13
10	18	54	30	38	20	18	96	119	123	22	32	12
11	21	61	30	38	20	18	145	139	112	20	33	14
12	21	40	35	38	20	18	131	141	98	24	33	17
13	22	18	40	38	20	18	114	118	85	28	32	14
14	22	15	30	37	20	18	109	103	78	36	23	13
15	22	15	20	35	14	18	112	98	80	33	29	11
16	22	13	20	35	10	20	125	102	105	27	27	8.1
17	26	20	20	34	10	20	125	116	139	23	26	7.5
18	29	40	20	33	12	20	114	131	110	19	26	8.1
19	30	59	20	*35	15	20	100	137	86	16	27	8.4
20	31	65	20	35	20	20	96	170	71	18	25	8.4
21	31	69	25	38	25	25	95	195	91	19	24	*8.1
22	31	*54	40	38	*28	90	100	210	102	20	18	8.7
23	30	45	80	35	28	350	107	225	82	16	*13	10
24	30	42	60	35	28	771	121	267	71	11	13	11
25	31	46	50	30	28	472	135	356	75	13	13	11
26	34	47	45	25	28	267	*112	377	65	14	12	12
27	38	47	43	24	26	*133	123	398	50	14	14	14
28	40	46	*40	23	25	102	137	586	37	29	16	14
29	42	46	38	20	25	95	121	482	28	31	16	16
30	45	45	35	18	------	131	98	430	21	39	16	16
31	48	------	35	18	------	131	------	370	------	38	18	------
Total	826	1,354	1,076	1,068	616	2,965	3,014	6,188	3,706	894	813	362.3
Mean	26.6	45.1	34.7	34.5	21.2	95.6	100	200	124	28.8	26.2	12.1
Ac-ft	1,640	2,690	2,130	2,120	1,220	5,880	5,980	12,270	7,350	1,770	1,610	719

Calendar year 1955: Max - Min - Mean - Ac-ft -
Water year 1955-56: Max 771 *Min 7.5 Mean 62.5 Ac-ft 45,380

Peak discharge (base, 110 cfs).--Mar. 24 (3:30 a.m.) 1,870 cfs (6.47 ft); Apr. 11 (4 p.m.) 154 cfs (2.93 ft); May 28 (1 a.m.) 679 cfs (4.49 ft); June 17 (5 to 8 a.m.) 147 cfs (2.88 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 1, 2, 12-18, Dec. 3 to Mar. 23.

Beaverhead River at Barratts, Mont.

Location.--Lat 45°07', long 112°45', in SE¼ sec. 19, T. 8 S., R. 9 W., on left bank 1 mile upstream from Barratts, 2 miles downstream from Grasshopper Creek, and 8¼ miles southwest of Dillon.

Drainage area.--2,740 sq mi, approximately.

Records available.--August 1907 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 5,268.00 ft above mean sea level, datum of 1929. Prior to Oct. 19, 1934, staff or chain gage at same site and datum.

Average discharge.--43 years (1907-11, 1914-31, 1934-56), 408 cfs (295,400 acre-ft per year).

Extremes.--Maximum discharge during year, 1,770 cfs Mar. 25 (gage height, 3.74 ft); minimum, 192 cfs July 28 (gage height, 0.71 ft).

1907-56: Maximum discharge, 3,720 cfs June 20, 1908 (gage height, 6.1 ft); minimum recorded, 69 cfs Jan. 30, 1938.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Some regulation by Lima Reservoir (see p. 238). Diversions for irrigation of about 90,000 acres above station.

Revisions (water years).--WSP 1086: Drainage area. WSP 1279: 1908(M), 1929(M), 1935-36.

Rating tables, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 24		Mar. 25 to Sept. 30			
0.7	198	0.8	224	2.0	755
1.0	316	1.0	297	3.0	1,330
2.0	790	1.5	500	3.6	1,690
3.0	1,340				

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	253	308	374	320	270	292	510	369	1,280	275	320	278
2	260	316	387	310	270	292	409	339	*1,140	293	324	260
3	260	336	378	305	270	292	381	316	1,070	413	327	253
4	241	353	370	305	272	290	377	327	1,060	430	339	253
5	*245	353	360	308	275	288	389	362	980	*413	343	249
6	249	336	349	310	278	285	350	369	870	a410	350	242
7	249	341	345	312	280	285	346	389	799	a407	354	249
8	241	353	353	312	280	285	331	426	733	a404	350	256
9	237	370	345	312	280	285	335	438	635	a401	335	260
10	237	374	349	310	280	280	373	464	565	a398	350	256
11	221	383	345	310	280	280	442	486	520	a395	343	256
12	233	336	349	310	280	282	455	600	455	a392	339	267
13	241	325	345	310	280	285	413	525	409	389	327	275
14	253	315	340	310	275	285	393	442	377	377	290	260
15	249	305	335	310	265	288	405	389	385	369	301	260
16	245	310	330	305	260	292	430	358	460	354	275	249
17	253	320	330	300	265	296	464	358	560	335	278	249
18	253	350	330	300	275	300	438	365	545	327	271	249
19	253	366	325	*300	285	300	393	393	464	308	264	242
20	253	383	316	300	296	308	373	496	405	278	256	246
21	256	404	324	302	312	324	377	655	460	275	253	*249
22	260	*387	345	305	*308	409	385	711	460	275	246	249
23	260	374	436	305	300	900	413	766	421	260	238	253
24	256	370	396	302	288	1,280	438	920	401	253	*246	253
25	264	374	361	300	288	1,510	426	1,200	397	242	253	253
26	268	378	349	298	292	1,410	*381	1,320	365	235	249	249
27	292	374	*357	295	292	*816	438	1,410	327	235	256	249
28	296	378	353	290	288	575	478	1,620	301	324	253	246
29	296	387	350	285	288	535	447	1,620	305	282	246	246
30	308	383	340	280	------	550	393	1,680	282	312	249	238
31	312	------	330	275	------	565	------	1,470	------	297	267	------
Total	7,994	10,642	10,896	9,396	8,172	14,664	12,183	21,583	17,431	10,358	9,092	7,594
Mean	258	355	351	303	282	473	406	696	581	334	293	253
Ac-ft	15,860	21,110	21,610	18,640	16,210	29,090	24,160	42,810	34,570	20,540	18,030	15,060

Calendar year 1955: Max 1,060 Min 202 Mean 306 Ac-ft 221,400
Water year 1955-56: Max 1,680 Min 221 Mean 383 Ac-ft 277,700

Peak discharge (base, 800 cfs).--Mar. 25 (10:30 a.m.) 1,770 cfs (3.74 ft); May 30 (7 to 11 a.m.) 1,730 cfs (3.67 ft).

* Discharge measurement made on this day.

a No gage-height record; discharge interpolated.

Note.--Stage-discharge relation affected by ice Nov. 13-18, Dec. 5, 14-19, Dec. 29 to Feb. 19, Mar. 4-14.

Blacktail Creek near Dillon, Mont.

Location.--Lat 45°03', long 112°33', in SE¼ sec. 14, T. 9 S., R. 8 W., on left bank 12½ miles southeast of Dillon and 14 miles upstream from mouth.

Records available.--April 1946 to December 1953, April 1955 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 5,667.59 ft above mean sea level, datum of 1929 (levels by Bureau of Reclamation).

Average discharge.--8 years (1946-53, 1955-56), 57.9 cfs (41,850 acre-ft per year).

Extremes.--Maximum discharge during year, 144 cfs May 29 (gage height, 2.00 ft); maximum gage height, 3.87 ft Mar. 7 (backwater from ice); minimum daily discharge, 10 cfs Feb. 16-18.

1946-53, 1955-56: Maximum discharge, 399 cfs June 11, 1947 (gage height, 2.83 ft); maximum gage height, 4.62 ft Feb. 26, 1952 (backwater from ice); minimum discharge, 5.6 cfs Nov. 9, 1952.

Remarks.--Records fair except those for period of ice effect, which are poor. Diversions for irrigation of about 4,000 acres above station.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	45	55	20	18	12	27	25	45	111	41	38	32
2	42	57	20	27	12	29	24	44	*115	41	33	27
3	39	41	18	35	15	30	24	42	116	*49	32	27
4	39	34	18	40	20	29	27	45	115	46	31	30
5	*41	34	20	40	25	26	27	47	109	45	31	30
6	44	34	18	40	24	24	24	50	105	42	32	30
7	44	34	18	40	22	23	27	51	100	40	31	30
8	44	32	18	40	20	22	27	50	88	39	30	30
9	42	34	19	40	20	22	30	51	82	39	30	30
10	41	39	20	40	20	18	34	59	80	36	31	28
11	39	35	22	40	23	15	36	58	79	39	30	30
12	38	32	24	40	25	13	36	66	74	41	31	32
13	38	29	24	40	25	13	36	62	70	36	30	28
14	36	23	20	40	22	14	36	54	66	32	27	28
15	36	17	18	37	17	15	36	51	66	33	28	28
16	35	13	17	34	10	15	40	50	66	32	28	27
17	34	12	16	34	10	20	54	49	68	30	30	27
18	32	12	15	35	10	23	44	51	60	28	31	26
19	32	17	15	*40	12	27	40	59	54	27	30	26
20	35	23	20	45	14	27	36	68	52	26	31	*26
21	35	25	25	45	16	27	36	70	56	26	34	26
22	35	25	30	45	*20	36	40	76	59	25	*31	28
23	34	*25	35	40	20	40	45	84	55	24	27	30
24	34	23	30	35	20	45	44	95	54	22	27	28
25	32	22	27	30	20	39	*42	107	58	23	28	26
26	34	23	30	25	20	32	*45	109	54	20	31	26
27	35	25	30	24	20	*26	58	118	49	24	31	25
28	35	25	*28	24	20	25	65	130	45	38	32	26
29	38	25	27	23	20	23	54	136	42	33	31	28
30	39	23	17	20	------	26	46	116	40	41	34	28
31	44	------	15	15	------	26	------	113	------	40	34	------
Total	1,171	848	674	1,071	534	777	1,138	2,206	2,188	1,058	955	843
Mean	37.8	28.3	21.7	34.5	18.4	25.1	37.9	71.2	72.9	34.1	30.8	28.1
Ac-ft	2,320	1,680	1,340	2,120	1,060	1,540	2,260	4,380	4,340	2,100	1,890	1,670

Calendar year 1955: Max - Min - Mean - Ac-ft -
Water year 1955-56: Max 136 Min 10 Mean 36.8 Ac-ft 26,700

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 13 to Mar. 18 (no gage-height record Nov. 16-22).

Beaverhead River at Blaine, Mont.

Location.--Lat 45°23', long 112°27', in NW¼SE¼ sec. 22, T. 5 S., R. 7 W., on left bank at downstream side of bridge on State Highway 41, 11½ miles upstream from Ruby River and 14½ miles northeast of Dillon.

Drainage area.--3,630 sq mi, approximately.

Records available.--August 1935 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 4,810 ft (by barometer). Prior to Feb. 17, 1949, wire-weight gage at bridge half a mile upstream at different datum. Feb. 17, 1949, to June 28, 1951, wire-weight gage at present site and datum.

Average discharge.--21 years, 394 cfs (285,200 acre-ft per year).

Extremes.--Maximum discharge during year, 1,430 cfs Mar. 26 (gage height, 6.68 ft); maximum gage height, 7.23 ft Nov. 20 (backwater from ice); minimum discharge, 40 cfs June 16-17, 20.

1935-56: Maximum discharge observed, 3,130 cfs June 12, 1944 (gage height, 6.76 ft, site and datum then in use); maximum gage height, that of Nov. 20, 1955; minimum daily discharge, 7.0 cfs May 25, 1940.

Remarks.--Records good except those for periods of ice effect, which are poor. Some regulation by Lima Reservoir (see p. 238). Diversions for irrigation of about 115,000 acres above station.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 17-31, May 25 to June 27)

2.3	40	4.0	388
2.6	76	5.0	730
3.0	141	6.0	1,200
3.5	254	7.0	1,770

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	283	368	573	490	410	400	649	426	915	84	91	298
2	259	405	576	496	405	402	580	394	*619	124	112	322
3	244	435	576	499	400	405	515	360	573	290	105	333
4	251	473	570	505	405	394	496	366	509	423	101	349
5	251	509	556	496	410	394	499	417	469	*417	107	363
6	*275	515	552	489	420	374	496	417	435	394	117	366
7	293	505	548	492	420	382	457	420	385	397	110	374
8	288	512	535	489	415	391	457	435	320	360	126	391
9	275	535	538	476	430	397	438	450	259	333	138	391
10	283	548	522	476	440	377	435	466	209	264	152	377
11	270	542	535	473	450	355	466	482	164	218	150	377
12	231	500	532	469	465	377	519	545	129	206	147	374
13	236	460	525	469	420	397	519	584	96	181	152	391
14	238	450	502	466	385	380	482	505	78	166	139	377
15	264	440	492	469	300	368	476	411	55	181	131	338
16	277	460	482	460	200	382	492	344	43	147	136	325
17	272	500	470	469	200	394	570	283	49	121	138	301
18	257	550	470	453	320	411	545	228	57	109	158	288
19	233	590	480	*463	385	408	499	190	52	85	162	275
20	233	600	510	460	395	429	457	195	46	68	158	254
21	228	610	550	463	400	423	426	204	47	58	150	*231
22	223	610	580	463	420	441	420	236	55	58	139	218
23	228	*602	627	463	*500	594	*450	202	72	62	186	223
24	233	591	634	450	432	934	499	216	82	56	*177	216
25	218	580	562	405	405	1,240	489	352	107	53	173	186
26	228	584	548	408	435	*1,350	450	559	110	51	181	192
27	259	584	548	432	417	1,370	457	703	110	51	209	195
28	309	576	*515	423	408	839	515	901	91	52	218	190
29	328	580	469	405	411	687	505	1,030	84	73	221	195
30	352	576	463	423	------	683	460	1,040	82	75	236	199
31	366	------	482	417	------	664	------	1,080	------	84	267	------
Total	8,185	15,790	16,522	14,311	11,503	17,042	14,718	14,441	6,382	5,241	4,787	8,909
Mean	264	526	533	462	397	550	491	466	213	169	154	297
Ac-ft	16,230	31,320	32,770	28,390	22,820	33,800	29,190	28,640	12,660	10,400	9,490	17,670

Calendar year 1955: Max 634 Min 24 Mean 307 Ac-ft 222,200
Water year 1955-56: Max 1,370 Min 43 Mean 377 Ac-ft 273,400

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 12-22, Dec. 17-20, Jan. 1, Feb. 1-23.

Ruby River above reservoir, near Alder, Mont.

Location.--Lat 45°11', long 112°09', in SW¼SW¼ sec. 31, T. 7 S., R. 4 W., on left bank at Puller Hot Springs, a quarter of a mile upstream from Cottonwood Creek, 6 miles above Ruby dam, and 10 miles south of Alder.

Drainage area.--537 sq mi.

Records available.--May 1938 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 5,440.2 ft above mean sea level (river-profile survey). Prior to Sept. 9, 1938, wire-weight gage at bridge 1,500 ft downstream at datum 5.2 ft lower. Sept. 9, 1938, to Sept. 30, 1955, at site 500 ft downstream at datum 0.5 ft lower.

Average discharge.--18 years, 160 cfs (115,800 acre-ft per year).

Extremes.--Maximum discharge during year, 960 cfs May 28 (gage height, 4.70 ft); minimum, 74 cfs July 27 (gage height, 2.30 ft).

1938-56: Maximum discharge, 1,230 cfs May 21, 1948; maximum gage height, 3.92 ft June 10, 1947; minimum discharge, 47 cfs Aug. 17, 18, 1940 (gage height, 0.92 ft), but may have been less during periods of ice effect.

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of about 3,000 acres above station.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.2	65
2.5	116
3.0	240
4.0	630
4.6	910

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	87	110	116	112	b95	97	106	158	680	122	93	88
2	87	108	118	114	b98	97	97	*153	666	124	92	88
3	85	120	114	116	b100	99	94	153	580	133	87	92
4	82	129	112	114	b105	97	*99	160	544	135	83	92
5	83	129	b110	116	b110	97	101	198	558	133	83	92
6	*82	124	b112	114	b110	*97	90	198	452	129	83	94
7	80	126	114	114	b105	97	99	210	380	116	87	94
8	80	129	118	114	*b98	97	103	228	345	114	*90	92
9	80	133	112	112	b98	95	99	250	334	110	90	94
10	82	133	116	112	99	95	110	258	310	108	94	92
11	90	133	114	112	99	97	139	258	306	106	95	90
12	95	114	116	112	101	99	135	264	278	*105	95	87
13	94	b104	116	114	99	95	135	250	258	105	92	82
14	92	b100	b114	112	99	94	148	234	*234	97	92	85
15	92	b100	b112	114	b96	92	160	228	222	97	95	88
16	92	b102	b108	112	b94	94	172	250	219	95	94	94
17	94	b107	b106	114	b92	97	180	314	216	92	94	94
18	101	b115	b105	110	b92	103	158	396	192	88	90	90
19	101	120	b108	114	b95	110	158	*472	175	85	92	*88
20	101	129	112	112	b100	116	165	528	175	83	92	88
21	101	137	114	112	106	114	182	*639	170	83	92	90
22	97	126	118	112	99	135	198	729	158	82	92	92
23	99	120	135	112	99	146	200	774	146	80	88	94
24	99	120	155	108	99	182	200	860	146	78	85	94
25	99	*120	133	b108	97	275	188	885	151	77	92	90
26	101	118	129	b105	97	200	178	796	139	77	95	88
27	110	118	129	b102	97	131	195	860	133	76	88	87
28	118	118	114	b100	97	118	213	900	133	80	85	90
29	120	118	*114	b98	97	116	182	*860	129	83	85	92
30	126	116	b115	b95	-----	112	162	778	124	92	88	90
31	120	- -	b115	b95	-----	108	------	684	------	94	90	------
Total	2,970	3,576	3,624	3,411	2,873	3,602	4,446	13,925	8,553	3,079	2,793	2,711
Mean	95.8	119	117	110	99.1	116	148	449	285	99.3	90.1	90.4
Ac-ft	5,890	7,090	7,190	6,770	5,700	7,140	8,820	27,620	16,960	6,110	5,540	5,380

Calendar year 1955:	Max 870	Min -	Mean 165	Ac-ft 119,300
Water year 1955-56:	Max 900	Min 76	Mean 152	Ac-ft 110,200

Peak discharge (base, 560 cfs).--May 28 (4 p.m.) 960 cfs (4.70 ft).

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Ruby River near Alder, Mont.

Location.--Lat 45°17'30", long 112°06'00", in NW¼NE¼ sec. 28, T. 6 S., R. 4 W., on left bank 200 ft upstream from highway bridge, 2½ miles south of Alder, 3 miles downstream from Ruby River Reservoir, and 6 miles upstream from Alder Creek.

Records available.--April 1929 to June 1939, July 1946 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 5,190 ft (from topographic map). Prior to Apr. 28, 1932, staff gage at site 1,200 ft downstream at different datum. Apr. 28, 1932, to June 30, 1939, staff gage at bridge 200 ft downstream at different datum.

Average discharge.--15 years (1929-30, 1934-38, 1946-56), 93.8 cfs (67,910 acre-ft per year).

Extremes.--Maximum discharge during year, 389 cfs May 29 (gage height, 3.44 ft); maximum gage height, 3.76 ft Dec. 30 (backwater from ice); minimum daily discharge, 15 cfs Feb. 1-3, 17, 18.

1929-39, 1946-56: Maximum discharge, 1,380 cfs June 11, 1947 (gage height, 5.35 ft), from rating curve extended above 800 cfs by logarithmic plotting; minimum daily, 0.3 cfs Apr. 12, 1938.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Flow regulated by Ruby River Reservoir (see p. 238). Diversions for irrigation of about 9,500 acres of which about 5,000 acres lie below station.

Rating tables, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Nov. 2)

Oct. 1 to Mar. 5		Mar. 6 to Sept. 30			
1.9	35	1.8	12	2.4	81
2.2	68	1.9	17	2.9	206
2.5	122	2.1	35	3.4	374
3.0	262				

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	154	103	141	30	15	40	28	56	282	29	47	42
2	103	109	139	34	15	40	28	56	225	27	44	43
3	77	114	136	37	15	40	28	*57	109	59	34	42
4	41	120	130	40	16	40	27	57	*197	174	30	38
5	77	122	125	42	18	40	*27	58	183	138	29	33
6	*64	120	120	45	20	*43	27	58	169	109	30	25
7	63	120	115	45	22	35	27	58	114	100	32	25
8	70	120	110	45	*25	32	27	58	60	85	*35	24
9	68	127	107	45	27	29	26	74	39	65	39	22
10	77	127	104	43	27	27	31	118	32	54	36	23
11	90	129	100	41	27	25	30	114	58	*30	42	23
12	92	124	100	39	25	28	25	111	85	21	42	23
13	90	120	100	37	22	32	22	111	135	26	42	22
14	87	110	95	35	20	31	19	111	243	43	44	21
15	85	100	90	33	18	30	19	111	247	42	47	21
16	87	100	80	30	16	31	26	111	228	38	32	22
17	88	105	70	32	15	30	47	111	166	28	30	22
18	97	115	60	33	15	32	47	109	145	30	29	22
19	97	125	50	35	17	28	47	155	114	33	28	*26
20	99	150	50	35	20	28	48	192	76	32	27	33
21	103	160	52	35	30	28	50	174	76	28	25	31
22	90	165	54	35	40	28	50	169	76	25	27	30
23	85	160	58	33	43	28	52	177	77	25	26	28
24	82	155	60	30	40	29	54	209	77	20	24	23
25	78	*146	58	28	35	29	52	209	85	20	25	21
26	77	144	54	25	30	28	52	374	96	28	26	20
27	82	141	50	24	30	28	54	323	89	32	26	19
28	88	139	45	22	30	27	54	330	81	34	27	16
29	97	139	*40	20	35	27	54	359	78	28	29	16
30	101	139	35	18	------	27	56	*334	36	26	35	19
31	101	-----	30	16	------	27	------	292	------	32	39	------
Total	2,690	3,848	2,558	1,042	708	967	1,134	4,836	3,678	1,461	1,028	775
Mean	86.8	128	82.5	33.6	24.4	31.2	37.8	156	123	47.1	33.2	25.8
Ac-ft	5,340	7,630	5,070	2,070	1,400	1,920	2,250	9,590	7,300	2,900	2,040	1,540

Calendar year 1955:	Max 530	Min 15	Mean 103	Ac-ft 74,910
Water year 1955-56:	Max 374	Min 15	Mean 67.6	Ac-ft 49,050

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* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 13-17, Dec. 4 to Feb. 22, Mar. 7, 10-12, 14, 15, 28, Apr. 6 (no gage-height record Nov. 18-24, Feb. 23 to Mar. 5; discharge estimated on basis of weather records).

Ruby River at Laurin, Mont.

Location.--Lat 45°21', long 112°07', in SW¼SE¼ sec. 32, T. 5 S., R. 4 W., on right bank 200 ft downstream from highway bridge in Laurin and three-quarters of a mile upstream from Alder Creek.

Records available.--August 1946 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 5,045 ft (from topographic map).

Average discharge.--10 years, 87.6 cfs (63,420 acre-ft per year).

Extremes.--Maximum discharge during year, 250 cfs May 29 (gage height, 3.98 ft); maximum gage height, 4.13 ft Nov. 17 (backwater from ice); minimum daily discharge, 10 cfs Feb. 15-17.

1946-56: Maximum discharge, 980 cfs June 11, 1947 (gage height, 6.43 ft); minimum daily, 10 cfs Feb. 19, 20, 1955, Feb. 15-17, 1956.

Remarks.--Records good except those for periods of ice effect, which are poor. Flow regulated by Ruby River Reservoir (see p. 238). Diversions for irrigation of about 13,000 acres of which about 2,000 acres lie below station. The flow of Clear Creek (secondary channel of Ruby River) which begins approximately 3 miles upstream and returns to the river approximately 3 miles downstream is not included in discharge.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 24 to June 1)

2.7	20
3.0	61
3.5	172
4.0	297

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	119	86	90	25	12	25	32	52	162	37	34	41
2	95	90	93	27	12	25	32	52	143	40	34	44
3	76	93	90	28	13	25	29	*50	82	59	28	43
4	55	95	85	30	14	25	30	52	*108	101	25	41
5	67	97	80	33	15	25	*30	52	108	97	23	38
6	*61	95	82	35	20	*28	29	52	115	82	22	34
7	59	95	83	35	*21	25	32	52	95	76	22	32
8	59	93	82	35	23	23	32	52	72	63	26	33
9	59	97	80	34	23	20	29	53	52	53	*28	30
10	61	103	77	33	20	20	34	86	37	47	28	29
11	72	106	77	30	20	22	34	86	37	47	29	28
12	72	99	77	30	20	24	32	86	52	*34	29	33
13	72	95	77	29	18	27	30	86	63	29	28	29
14	72	90	76	29	13	25	27	86	150	32	29	28
15	76	80	72	28	10	25	27	86	165	32	34	26
16	76	80	65	28	10	25	30	86	162	32	36	23
17	69	85	55	27	10	28	50	84	117	30	33	23
18	78	90	45	27	12	32	50	84	103	30	33	22
19	86	95	40	30	14	33	50	103	86	32	29	*21
20	86	100	38	29	15	34	50	126	70	32	29	26
21	84	105	35	29	20	40	50	117	63	30	28	28
22	84	110	33	29	25	41	52	110	56	29	26	28
23	78	108	33	29	26	43	53	117	55	28	26	26
24	76	103	32	28	26	56	55	136	61	25	28	25
25	70	*101	30	25	25	53	53	122	61	21	27	30
26	70	97	29	18	25	47	55	227	58	27	28	29
27	72	93	29	17	25	40	53	200	53	33	29	29
28	76	90	29	16	25	36	53	197	52	33	28	28
29	80	90	*27	15	25	33	53	227	49	28	29	28
30	84	90	25	15	-----	32	53	*197	41	28	36	28
31	86	- - -	25	14	------	32	------	167	------	29	38	------
Total	2,330	2,851	1,791	837	537	969	1,219	3,283	2,528	1,296	902	903
Mean	75.2	95.0	57.8	27.0	18.5	31.3	40.6	106	84.3	41.8	29.1	30.1
Ac-ft	4,620	5,650	3,550	1,660	1,070	1,920	2,420	6,510	5,010	2,570	1,790	1,790

Calendar year 1955: Max 434 Min 10 Mean 74.9 Ac-ft 54,230
Water year 1955-56: Max 227 Min 10 Mean 53.1 Ac-ft 38,560

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 13-22, Dec. 4-21, 25, Dec. 28 to Jan. 10, Jan. 13-18, Jan. 24 to Mar. 15.

Ruby River near Twin Bridges, Mont.

Location.--Lat 45°30', long 112°20', near west line of sec. 10, T. 4 S., R. 6 W., on right bank at upstream side of highway bridge, 1¼ miles upstream from mouth and 2½ miles south of Twin Bridges.

Drainage area.--986 sq mi.

Records available.--August to October 1940, July 1941 to June 1943, July 1946 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 4,670 ft (by barometer). Prior to June 30, 1943, staff gage at same site at different datum.

Average discharge.--11 years (1941-42, 1946-56), 203 cfs (147,000 acre-ft per year).

Extremes.--Maximum discharge during year, 475 cfs May 30 (gage height, 4.87 ft); minimum, 13 cfs June 14.

1940-43, 1946-56: Maximum discharge, 1,500 cfs June 12, 1947 (gage height, 6.89 ft); minimum daily, 1.8 cfs May 20, 21, 26, 27, 1954.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Some regulation by Ruby River Reservoir, 24 miles above station (see p. 238). Diversions for irrigation of about 28,500 acres of which 500 acres lie below station.

Rating tables, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 25 to June 2)

Oct. 1 to Mar. 15		Mar. 16 to Sept. 30			
2.9	74	2.3	13	3.5	170
3.0	91	2.5	23	4.0	291
3.5	196	2.7	38	5.0	645
4.0	324	3.0	77		
4.5	476				

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	367	267	273	105	90	100	134	136	326	71	49	107
2	341	273	273	105	90	102	126	132	288	96	45	112
3	302	280	270	107	90	105	121	*130	250	177	43	115
4	267	293	254	110	95	102	117	140	*206	206	40	123
5	227	304	250	115	105	95	*115	142	177	245	45	114
6	*247	299	240	120	110	*94	110	124	142	270	49	114
7	242	288	230	125	115	90	115	123	114	268	54	117
8	237	291	220	125	*121	95	123	121	77	255	53	119
9	232	291	210	130	115	95	121	123	54	220	*53	138
10	225	302	200	130	115	92	115	150	48	183	54	148
11	239	291	190	130	115	90	119	181	38	163	62	144
12	265	290	190	125	110	90	119	204	22	*138	64	166
13	262	285	185	125	105	90	117	192	16	119	61	185
14	262	280	180	122	100	95	114	185	16	114	59	170
15	257	275	170	120	100	100	112	181	41	117	62	170
16	249	270	160	115	95	112	114	177	76	100	64	170
17	247	270	150	115	92	123	124	174	96	88	52	174
18	249	280	140	115	90	138	138	172	76	82	46	172
19	262	290	130	115	90	140	136	172	65	76	62	*157
20	260	300	125	118	92	138	134	204	53	80	59	159
21	252	310	125	120	100	142	134	215	66	98	53	168
22	252	310	125	122	105	150	136	218	61	100	48	163
23	244	*293	130	122	110	181	140	230	62	95	45	170
24	249	291	135	120	110	213	152	235	79	88	43	174
25	244	286	130	118	105	270	146	278	91	79	42	168
26	227	286	125	114	100	296	146	273	87	64	41	163
27	239	285	120	110	95	230	152	315	85	66	49	157
28	242	285	115	108	95	183	148	321	72	61	57	159
29	249	280	*112	105	98	161	140	412	79	65	70	163
30	260	280	110	100	------	148	136	*463	71	64	83	163
31	267	------	105	95	------	140	------	402	------	52	96	------
Total	7,964	8,625	5,372	3,606	2,953	4,200	3,854	6,525	2,934	3,900	1,703	4,522
Mean	257	288	173	116	102	135	128	210	97.8	126	54.9	151
Ac-ft	15,800	17,110	10,660	7,150	5,860	8,330	7,640	12,940	5,820	7,740	3,380	8,970

	Max		Min		Mean		Ac-ft	
Calendar year 1955:	Max	457	Min	74	Mean	186	Ac-ft	134,400
Water year 1955-56:	Max	463	Min	16	Mean	153	Ac-ft	111,400

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* Discharge measurement made on this day.

Note.--No gage-height record Nov. 12-22, 27-30. Stage-discharge relation affected by ice Dec. 5 to Mar. 15 (no gage-height record Dec. 19 to Mar. 5). Discharge for periods of no gage-height record estimated on basis of 4 discharge measurements, weather records, and records for nearby streams.

Big Hole River near Melrose, Mont.

Location.--Lat 45°32', long 112°42', in SW¼ sec. 34, T. 3 S., R. 9 W., on left bank at downstream side of bridge on U. S. Highway 91, an eighth of a mile downstream from Rock Creek and 8 miles south of Melrose.

Drainage area.--2,470 sq mi, approximately.

Records available.--March 1924 to September 1956 (records for 1924-32 fragmentary).

Gage.--Water-stage recorder. Altitude of gage is 5,031 ft (by barometer). Prior to June 14, 1927, water-stage recorder and July 17, 1927, to Sept. 30, 1931, chain gage, at site 1½ miles upstream at different datum.

Average discharge.--24 years (1932-56), 1,128 cfs (816,600 acre-ft per year).

Extremes.--Maximum discharge during year, 11,800 cfs May 27 (gage height, 7.19 ft); minimum, 122 cfs Nov. 15 (gage height, 0.99 ft).

1924-56: Maximum discharge, 23,000 cfs June 14, 1927, when Wise River Reservoir Dam failed (gage height, 14.0 ft, from floodmark, site and datum then in use), from rating curve extended above 8,000 cfs; maximum discharge unaffected by dam failure, 14,100 cfs June 3, 1948 (gage height, 7.76 ft); minimum observed, 49 cfs Aug. 17, 1931 (gage height, 0.70 ft, site and datum then in use).

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of about 136,000 acres above station.

Rating tables, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to May 19

1.1	160	2.5	1,040
1.5	313	3.0	1,630
2.0	620	3.5	2,360

Note.--Same as following table above 3.5 ft.

May 20 to Sept. 30

1.2	255	4.0	3,200
1.6	420	5.0	5,340
2.0	660	6.0	7,940
2.5	1,120	7.0	11,100
3.0	1,690	7.1	11,500
3.5	2,360		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	299	392	501	543	230	350	802	2,360	9,220	1,250	676	362
2	299	349	494	571	230	360	778	2,180	9,030	1,210	639	342
3	308	414	468	522	230	360	746	2,110	8,360	*1,300	618	330
4	323	508	456	543	320	350	754	2,160	7,770	1,460	590	322
5	*318	543	403	508	240	*345	746	2,520	7,320	1,590	572	314
6	333	529	480	494	250	340	714	2,580	6,370	1,500	566	306
7	344	444	420	456	250	330	738	2,780	5,360	1,400	566	306
8	349	438	403	468	240	330	738	3,110	4,600	1,230	560	318
9	354	515	410	438	230	320	722	3,480	4,130	1,090	518	318
10	344	571	426	420	230	310	826	3,720	3,900	1,000	536	306
11	338	641	474	438	230	310	1,040	3,840	3,740	960	536	306
12	333	543	468	403	230	300	1,440	3,820	3,520	1,030	512	310
13	328	238	409	390	240	300	1,940	3,560	3,220	1,050	492	310
14	328	172	370	380	240	310	2,660	3,130	2,990	1,060	455	302
15	349	333	349	370	240	320	3,240	2,880	2,990	1,030	445	294
16	333	430	340	360	240	330	3,720	2,940	3,720	960	435	290
17	323	508	340	350	250	350	3,980	3,360	3,860	911	420	290
18	313	543	340	*345	260	370	3,560	4,160	3,740	884	400	286
19	328	585	360	340	280	390	3,460	5,080	3,070	812	370	*286
20	328	557	400	330	300	444	3,680	6,290	2,760	758	346	283
21	328	*571	430	330	320	474	4,000	7,490	3,040	740	330	280
22	328	585	460	330	330	571	4,310	8,540	3,060	724	*318	286
23	338	613	550	320	320	754	*4,510	9,580	2,830	676	310	286
24	333	613	600	300	310	904	4,420	10,200	2,570	632	306	294
25	323	578	662	290	310	904	3,960	*11,100	2,390	611	298	290
26	333	536	648	280	320	*786	3,460	11,100	2,150	590	302	290
27	370	501	*706	270	330	683	3,150	11,400	1,900	578	318	286
28	364	515	641	260	335	690	3,160	11,200	1,640	604	334	286
29	375	522	564	250	340	714	2,900	10,900	1,490	646	330	298
30	398	487	522	240	------	770	2,570	10,200	1,340	692	354	306
31	450	----	522	230	------	818	------	9,350	------	708	392	------
Total	10,512	14,774	14,616	11,769	7,785	14,887	72,724	177,120	122,080	29,686	13,804	9,083
Mean	339	492	471	380	251	480	2,424	5,714	4,069	958	445	303
Ac-ft	20,850	29,300	28,990	23,340	15,440	29,530	144,200	351,300	242,100	58,880	27,390	18,020

Calendar year 1955:	Max	6,010	Min	160	Mean	988	Ac-ft	715,500
Water year 1955-56:	Max	11,400	Min	172	Mean	1,363	Ac-ft	989,300

Peak discharge (base, 3,400 cfs).--Apr. 23 (6 to 8 a.m.) 4,680 cfs (4.72 ft); May 12 (4 to 10 p.m.) 3,900 cfs (4.36 ft); May 27 (4 p.m.) 11,800 cfs (7.19 ft); June 18 (5:30 a.m.) 3,880 cfs (4.35 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 16, Dec. 9, 16-24, Jan. 13 to Mar. 19.

Birch Creek near Glen, Mont.

Location.--Lat 45°23', long 112°48', in SE¼SE¼ sec. 23, T. 5 S., R. 10 W., on left bank 1¾ miles downstream from Sheep Creek and 8 miles southwest of Glen.

Records available.--May 1946 to September 1953, April 1955 to September 1956. Prior to October 1950, published as "near Reichle."

Gage.--Water-stage recorder. Altitude of gage is 5,840 ft (from topographic map). Prior to Nov. 16, 1949, at site 1½ miles upstream at different datum.

Average discharge.--8 years (1946-53, 1955-56), 30.6 cfs (22,150 acre-ft per year).

Extremes.--Maximum discharge during year, 246 cfs June 6 (gage height, 3.78 ft); maximum gage height, 4.50 ft Jan. 30 (backwater from ice); minimum discharge, 2.2 cfs Nov. 15-17 (gage height, 1.42 ft).

1946-53, 1955-56: Maximum discharge, that of June 6, 1956; maximum gage height recorded, 4.75 ft Dec. 12, 1947, site and datum then in use (backwater from ice); minimum discharge observed, 1.2 cfs Nov. 22, 1952 (gage height, 1.47 ft), discharge measurement.

Remarks.--Records good except those for periods of ice effect, no gage-height record, or backwater from beaver dams, which are poor. No diversion above station. Some regulation at lakes in headwaters. Recorded diversions from Willow and Bond Creeks into Birch Creek above station for 1956 are listed below (additional diversions from Willow Creek outside of recorded period unknown).

Date	Mean (cfs)	Runoff in acre-feet
Apr. 17-30..........	2.86	79
May 1-31............	11.7	722
June 1-30...........	28.9	1,720
July 1-31...........	12.6	774
The period........	15.7	3,295

Cooperation.--Diversion record furnished by water commissioner.

Rating table, water year 1955-56, except periods of ice effect and backwater from beaver dams (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Aug. 10 to Sept. 30)

1.4	1.8	2.2	24
1.6	4.5	2.5	44
1.8	8	2.9	93
2.0	15	3.6	209

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	11	15	13	a9	a7	7.0	12	20	184	60	38	a11
2	11	15	13	a10	a7	7.0	13	20	206	61	36	
3	11	22	12	a10	a7	7.0	14	20	189	*74	34	a10
4	11	22	10	a10	a8	7.2	13	20	199	62	29	
5	*11	20	8.6	b10	a8	7.2	13	20	194	62	18	
6	10	18	12	10	a8	7.8	15	21	207	56	22	
7	10	17	11	10	a8	8.3	14	24	151	54	26	
8	9.8	22	10	10	a8	7.6	15	26	150	50	26	
9	9.8	19	12	9.2	a8	7.2	15	27	168	50	22	
10	9.2	26	11	10	a8	7.0	18	26	173	50	17	
11	12	18	12	9.8	a8	7.2	18	26	175	47	17	
12	20	10	11	9.5	a8	8.3	18	25	163	41	16	
13	22	5.8	7.8	9.2	a7	8.6	18	24	155	40	16	
14	21	4.8	b7	10	a6	8.0	19	23	148	38	15	a9
15	21	2.4	b7	7.2	a5	7.6	21	26	151	42	16	
16	20	2.2	b6	9.8	a5	7.4	22	32	150	53	15	
17	20	2.5	b6	9.8	a5	b8	21	44	122	54	15	
18	20	4.2	b6	*b9	a6	b8	20	*60	106	56	14	
19	23	6.0	b7	b9	a7	b9	22	86	106	61	13	
20	22	8.0	b8	8.9	a7	b10	24	106	122	69	12	8.9
21	20	*9.5	b11	a10	a8	b11	28	135	106	70	11	9.8
22	21	9.5	b22	a11	a8	b16	31	146	92	66	*11	9.5
23	21	10	b16	a11	7.4	b18	*35	153	86	65	10	9.5
24	20	12	13	b10	7.2	b18	38	173	90	64	9.8	*9.5
25	20	13	11	b9	7.2	b14	35	*166	83	64	10	9.2
26	20	14	12	b8	7.2	*b12	27	161	76	60	11	8.9
27	19	13	*11	b8	7.0	b12	24	173	74	60	11	8.9
28	20	13	b11	b8	7.0	b12	24	168	64	58	a11	14
29	20	14	b9	b7	7.0	b12	22	161	53	52		16
30	20	13	b9	b7	------	13	21	163	52	47		16
31	18	------	b9	b7	------	13	------	173	------	42		------
Total	523.8	380.9	324.4	286.4	207.0	306.4	630	2,448	3,995	1,728	534.8	306.2
Mean	16.9	12.7	10.5	9.24	7.14	9.88	21.0	79.0	133	55.7	17.3	10.2
Ac-ft	1,040	756	643	568	411	608	1,250	4,860	7,920	3,430	1,060	607

Calendar year 1955: Max - Min - Mean - Ac-ft -
Water year 1955-56: Max 207 Min 2.2 Mean 31.9 Ac-ft 23,150

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* Discharge measurement made on this day.

a No gage-height record (stage-discharge relation affect by ice during most of periods Jan. 1-4, 21-23, Feb. 1-22); discharge estimated on basis of 3 discharge measurements, recorded range in stage, weather records, and records for nearby stations.

b Stage-discharge relation affected by ice.

Note.--Backwater from beaver dams, Oct. 1-5.

Whitetail Creek near Whitehall, Mont.

Location.--Lat 46°01'22", long 112°12'27", in SE¼ sec. 10, T. 3 N., R. 5 W., on left bank 4 miles downstream from Whitetail Reservoir, 12 miles northwest of Whitehall, and 13½ miles upstream from mouth.

Records available.--November 1949 to November 1953, March 1955 to September 1956 (no winter record after 1951).

Gage.--Water-stage recorder. Datum of gage is 5,640.52 ft above mean sea level, datum of 1929, supplementary adjustment of 1952.

Extremes.--Maximum discharge during water year, 55 cfs May 29 (gage height, 3.37 ft); minimum not determined.

1949-53, 1955-56: Maximum discharge, 126 cfs May 18, 1951 (gage height, 4.22 ft); minimum recorded, 0.8 cfs Nov. 15, 1951 (gage height, 1.77 ft).

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Flow regulated by Whitetail Reservoir (capacity, 5,500 acre-ft).

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Aug. 5 to Sept. 30)

1.9	0.9	2.7	19
2.1	3.3	3.0	33
2.3	6.7	3.4	57
2.5	12		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	15	3.3	b2				a4	3.8	44	19	37	18
2	15	3.3						3.8	38	19	37	17
3	*15	3.0						3.9	35	19	37	17
4	15	2.9						3.8	31	18	37	17
5	15	3.0						3.9	28	18	36	17
6	15	3.3	b1.5					4.4	26	18	19	17
7	15	3.6						4.5	23	18	19	17
8	15	3.2						5.6	21	18	19	17
9	15	2.8						7.6	19	18	*19	17
10	15	*3.6						7.4	18	18	19	17
11	15	b2						6.9	21	18	19	17
12	14							6.1	32	*18	19	17
13	11							5.6	30	22	18	17
14	9.3							5.8	27	35	18	17
15	9.0							6.3	26	36	18	16
16	13							7.8	26	35	19	16
17	12							8.8	25	35	19	17
18	12						*4.5	9.9	24	35	18	*17
19	12						4.6	10	23	36	18	17
20	9.9						5.6	12	22	39	18	17
21	7.8						6.3	17	21	38	18	17
22	7.8						6.1	22	20	38	18	17
23	6.3						5.2	28	19	39	18	16
24	4.6						5.0	32	20	39	18	16
25	5.2						4.4	35	19	39	18	16
26	3.9						4.4	37	19	38	19	15
27	3.0						4.2	46	18	39	18	15
28	2.6						4.0	*51	18	38	18	15
29	4.0						3.9	52	18	38	18	15
30	3.8				------		3.9	51	18	38	19	15
31	3.3	------			------		------	48	------	37	18	------
Total	319.5	72.0	49.0	-	-	-	130.1	546.9	729	913	663	496
Mean	10.3	2.40	1.58	-	-	-	4.34	17.6	24.3	29.5	21.4	16.5
Ac-ft	634	143	97	-	-	-	258	1,080	1,450	1,810	1,320	984

Calendar year	: Max	Min	Mean	Ac-ft
Water year	: Max	Min	Mean	Ac-ft

* Discharge measurement made on this day.
a No gage-height record; discharge estimated.
b Stage-discharge relation affected by ice.

Boulder River above Rock Creek, near Basin, Mont.

Location.--Lat 46°15', long 112°30', in SW¼ sec. 20, T. 6 N., R. 7 W., on left bank half a mile upstream from Rock Creek, 3 miles upstream from Thunderbolt Creek, and 12 miles west of Basin.

Records available.--April to September 1936 (published as "at CCC Camp near Bernice"), June 1946 to November 1953, April 1955 to September 1956 (seasonal records only after 1955).

Gage.--Water-stage recorder. Altitude of gage is 6,240 ft (from topographic map). Prior to Sept. 12, 1936, staff gage at site a quarter of a mile downstream at different datum.

Average discharge.--7 years (1946-53), 11.7 cfs (8,470 acre-ft per year).

Extremes.--Maximum discharge recorded during water year, 106 cfs May 22; maximum gage height, 2.52 ft Apr. 21; minimum discharge not determined.

1936, 1946-53, 1955-56: Maximum discharge, 582 cfs May 19, 1948 (gage height, 3.72 ft); minimum daily, 0.5 cfs Jan. 28, 29, 1951, Mar. 23, 1953.

Remarks.--Records good except those for periods of no gage-height record, which are poor. No diversion above station.

Rating table, water year 1955-56 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 22 to June 20)

0.7	0.7	1.4	11
.8	1.2	1.6	18
1.0	3.0	2.0	46
1.2	5.8	2.5	95

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.1	2.2	1.7				a8	17	38	6.2	2.5	2.2
2	2.0	2.3	1.7				a7	15	38	7.1	2.3	1.9
3	*1.9	2.6	1.7				a6	14	32	12	2.2	1.8
4	1.9	2.6	1.7				a6	13	29	9.8	2.0	1.8
5	1.9	2.7	1.7				a5	14	25	6.6	2.1	1.8
6	2.0	5.0	1.6				a5	16	23	*6.8	2.2	1.8
7	2.0	2.8	1.6				a5	21	22	5.8	2.2	1.8
8	1.9	2.2	1.5				a5	33	18	5.2	2.2	1.8
9	1.8	2.5	1.4				a6	61	17	4.8	2.2	1.8
10	1.8	*3.4	1.4				a12	65	16	4.4	*2.4	1.8
11	1.8	4.2	1.4				a20	55	14	4.8	2.1	1.8
12	1.8	3.8	1.4				a25	46	*14	6.8	1.9	1.8
13	1.8	2.6	1.5				a30	43	13	4.7	1.8	1.9
14	1.9	2.2	1.4				a35	37	12	4.4	1.7	2.2
15	1.9	2.0	1.4				a40	39	13	4.1	1.8	1.9
16	1.9	1.4	1.4				a45	50	30	4.0	1.8	1.7
17	1.8	1.2	(*) a1.5				a50	60	20	3.4	1.9	1.6
18	1.9	1.1					a52	*72	14	3.2	1.8	*1.6
19	1.8	1.4					*54	87	12	3.1	1.7	1.6
20	1.8	2.0					a54	87	12	3.1	1.8	1.7
21	1.8	2.0					55	94	17	3.2	1.6	1.8
22	1.8	1.9					47	95	12	2.9	1.5	1.9
23	1.9	1.8					38	90	9.5	2.5	1.4	1.8
24	1.8	1.7					31	87	16	2.3	1.4	1.8
25	1.8	1.7					25	79	11	2.3	1.8	1.8
26	1.8	1.7					25	74	9.2	2.1	2.1	1.7
27	1.8	1.7					22	78	8.2	2.6	2.4	1.6
28	1.8	1.7					21	*65	7.3	2.9	2.5	1.8
29	1.8	1.7					18	56	6.6	2.8	2.3	1.9
30	2.1	1.7			------		17	48	6.2	2.8	3.4	1.8
31	2.7	------			------		------	42	------	2.4	3.1	------
Total	58.8	67.8	47.0	-	-	-	769	1,653	515.0	139.1	64.1	54.2
Mean	1.90	2.26	1.52	-	-	-	25.6	53.3	17.2	4.49	2.07	1.81
Ac-ft	117	134	93	-	-	-	1,530	3,280	1,020	276	127	108

Calendar year : Max Min Mean Ac-ft
Water year : Max Min Mean Ac-ft

Peak discharge (base, 50 cfs).--Apr. 21 (10:30 to 11:30 p.m.) 87 cfs (2.52 ft); May 10 (2 to 3 a.m.) 81 cfs (2.48 ft); May 22 (2 to 3 a.m.) 106 cfs (2.47 ft).

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of 2 discharge measurements, engineers' notes, weather records, and records for station near Boulder.

Boulder River near Boulder, Mont.

Location (revised).--Lat 46°12'40", long 112°05'25", in NE¼SW¼ sec. 3, T. 5 N., R. 4 W., on left bank at downstream side of highway bridge, three-quarters of a mile downstream from Muskrat Creek, and 2 miles east of Boulder.

Records available.--April 1929 to September 1931, March 1934 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 4,813 ft (by barometer). Prior to Aug. 29, 1946, chain gage at same site and datum.

Average discharge.--23 years (1930-31, 1934-56), 112 cfs (81,080 acre-ft per year).

Extremes.--Maximum discharge during year, 1,760 cfs May 22 (gage height, 9.71 ft); minimum, 12 cfs Aug. 14-25.

1929-31, 1934-56: Maximum discharge, 2,620 cfs May 22, 1948 (gage height, 10.37 ft); no flow July 15-17, 21, 1931.

Remarks.--Records good. Diversions for irrigation of about 3,500 acres above station.

Revisions (water years).--WSP 1279: 1931.

Rating table, water year 1955-56 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 25 to June 2)

5.5	9.0	7.5	318
5.6	14	8.0	495
5.8	27	8.5	710
6.0	45	9.0	1,000
6.5	107	9.5	1,410
7.0	191	10.0	2,080

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	31	26	31	32	33	32	100	191	634	68	18	30
2	30	24	32	31	33	32	*79	180	598	75	17	23
3	*28	33	31	31	32	32	83	174	515	92	15	22
4	27	35	30	32	30	32	80	176	455	110	14	22
5	28	36	29	32	29	32	73	183	396	89	13	21
6	29	25	29	33	29	31	66	187	350	*88	13	21
7	30	26	30	33	29	31	67	191	312	79	13	20
8	32	33	29	33	29	32	65	250	268	68	14	19
9	32	34	29	32	31	32	69	434	233	61	14	19
10	31	42	29	30	31	35	94	531	217	54	*15	19
11	31	40	29	30	31	31	145	519	193	65	15	19
12	32	19	31	29	32	31	197	444	174	74	15	19
13	32	15	28	*29	31	29	238	410	157	65	14	19
14	33	18	26	29	32	29	288	385	136	59	12	19
15	32	26	23	30	33	29	357	410	140	53	12	18
16	32	24	22	30	34	28	396	539	282	45	12	18
17	31	22	22	29	32	30	399	725	255	35	12	17
18	31	21	26	30	31	32	340	1,000	202	32	12	*16
19	32	23	26	31	30	40	*300	1,210	160	30	12	15
20	31	32	26	31	30	53	347	1,240	140	26	12	15
21	32	*36	*27	31	30	59	402	1,450	157	26	12	15
22	34	33	40	32	30	91	427	1,600	141	24	12	15
23	35	32	49	31	30	182	357	1,490	125	21	12	16
24	32	32	47	30	32	212	340	1,450	160	21	12	16
25	31	31	43	32	32	193	291	1,260	153	19	12	16
26	30	32	39	32	32	143	263	1,090	124	17	14	16
27	29	31	43	32	*32	89	230	1,120	106	19	16	15
28	30	31	40	31	32	87	230	1,020	89	22	16	15
29	31	31	35	32	32	88	214	*899	79	21	18	16
30	32	31	33	32	------	128	199	766	71	21	21	16
31	31	------	32	32	------	130	------	688	------	19	34	------
Total	962	874	986	964	904	2,055	6,736	22,212	7,022	1,498	453	547
Mean	31.0	29.1	31.8	31.1	31.2	66.3	225	717	234	48.3	14.6	18.2
Ac-ft	1,910	1,730	1,960	1,910	1,790	4,080	13,360	44,060	13,930	2,970	899	1,080

Calendar year 1955:	Max 710	Min 10	Mean 113	Ac-ft 81,850
Water year 1955-56:	Max 1,600	Min 12	Mean 124	Ac-ft 89,680

Peak discharge (base, 420 cfs).--Apr. 22 (3 to 6 a.m.) 441 cfs (7.88 ft); 12 p.m. May 10 to 3 a.m. May 11, 551 cfs (8.14 ft); May 22 (3 a.m.) 1,760 cfs (9.71 ft).

* Discharge measurement made on this day.

Jefferson River at Sappington, Mont.

Location.--Lat 45°48'15", long 111°45'05", in SE¼ sec. 29, T. 1 N., R. 1 W., on right bank at upstream side of bridge on State Highway 1, 1 mile northeast of Sappington and 5½ miles upstream from Willow Creek.

Drainage area.--8,980 sq mi, approximately.

Records available.--September 1896 to December 1905, August 1938 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 4,170 ft (from topographic map). Sept. 10, 1896, to Dec. 31, 1905, chain gage at railroad bridge 1½ miles upstream at different datum.

Average discharge.--22 years (1896-98, 1902-4, 1938-56), 2,137 cfs (1,547,000 acre-ft per year).

Extremes.--Maximum discharge during year, 13,300 cfs May 29 (gage height, 9.37 ft); maximum gage height, 10.12 ft Dec. 23 (backwater from ice); minimum discharge, 386 cfs Aug. 25 (gage height, 2.14 ft).

1896-1905, 1938-56: Maximum discharge observed, 21,000 cfs June 23, 1899 (gage height, 9.65 ft, site and datum then in use), from rating curve extended above 10,000 cfs by logarithmic plotting; minimum, 134 cfs Aug. 12, 1940 (gage height, 1.49 ft).

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of about 345,000 acres above station. Some regulation by Lima Reservoir and since 1938 by Ruby River Reservoir (see p. 238), and several minor reservoirs.

Revisions (water years).--WSP 1389: 1899, 1900, 1902(M), 1904(M).

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 23 to Apr. 8)

2.1	370	6.0	4,900
2.5	550	7.0	6,830
3.0	870	8.0	9,270
3.5	1,280	9.0	12,200
4.0	1,820	9.4	13,400
5.0	3,230		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,010	1,170	1,650	1,350	850	1,300	2,130	*3,680	11,700	1,480	580	610
2	1,010	*1,170	1,550	1,350	850	1,300	2,060	3,360	10,900	1,400	598	640
3	*988	1,230	1,500	1,400	850	1,300	*1,940	3,130	10,500	1,580	598	676
4	940	1,300	1,450	1,450	850	1,300	1,830	3,070	9,900	1,760	556	706
5	926	1,410	1,400	1,500	900	*1,250	1,770	3,150	9,050	2,040	556	718
6	919	1,460	1,350	1,550	900	1,200	1,720	3,420	8,420	2,250	*562	751
7	948	1,460	1,350	1,550	900	1,150	1,670	3,450	7,580	2,160	562	758
8	972	1,390	1,400	1,550	950	1,100	1,680	3,580	6,340	2,040	598	800
9	988	1,380	1,450	1,500	950	1,050	1,640	3,940	5,370	*1,880	646	849
10	980	1,430	1,500	1,500	900	1,050	1,610	4,450	4,760	1,710	658	898
11	980	1,500	1,540	1,450	900	1,050	1,660	4,810	4,410	1,570	670	*898
12	972	1,490	*1,670	1,400	950	1,050	1,880	5,100	4,120	1,430	676	863
13	980	1,440	1,680	1,350	1,000	1,050	2,280	5,040	3,810	1,360	658	884
14	964	905	1,500	1,300	1,000	1,050	2,740	4,770	3,420	1,240	622	912
15	964	525	1,230	1,300	950	1,100	3,490	4,310	3,150	1,150	595	870
16	972	1,000	1,210	1,250	950	1,150	4,010	3,970	3,070	1,130	586	821
17	972	1,500	1,110	1,250	950	1,200	4,600	3,990	3,600	1,020	574	786
18	956	1,700	1,100	1,250	1,000	1,250	4,950	4,360	3,870	926	515	779
19	948	1,800	1,100	1,200	1,000	1,300	4,620	5,030	3,760	870	495	737
20	948	1,800	1,150	1,200	1,050	1,350	4,500	5,920	3,250	772	495	706
21	933	1,750	1,300	1,150	1,100	1,450	4,650	7,020	2,900	737	495	694
22	948	1,750	1,400	1,150	1,150	1,700	5,010	8,160	3,040	676	475	694
23	926	1,800	1,500	*1,150	1,200	2,190	5,340	9,270	3,010	646	446	688
24	926	1,800	1,600	1,100	1,200	2,580	5,470	10,200	2,910	592	426	694
25	948	1,800	1,650	1,100	1,250	3,090	5,540	*11,200	2,780	545	426	700
26	926	1,700	1,650	1,050	1,250	3,210	5,100	11,900	2,640	515	398	682
27	940	1,650	1,650	1,000	1,300	2,940	4,620	12,400	2,390	480	394	712
28	1,010	1,650	1,600	950	1,300	2,730	4,300	12,700	2,130	460	410	718
29	1,040	1,700	1,550	900	1,300	2,390	4,280	13,200	1,880	465	442	751
30	1,090	1,700	1,500	900	------	2,110	4,020	13,000	1,660	500	485	737
31	1,120	------	1,400	900	------	2,100	------	*12,600	------	545	530	------
Total	30,144	44,360	44,690	39,000	29,700	50,040	101,110	204,180	146,320	35,929	16,727	22,732
Mean	972	1,479	1,442	1,258	1,024	1,614	3,370	6,586	4,877	1,159	540	758
Ac-ft	59,790	87,990	88,640	77,360	58,910	99,250	200,500	405,000	290,200	71,260	33,180	45,090

Calendar year 1955:	Max 6,810	Min 257	Mean 1,651	Ac-ft 1,200,000
Water year 1955-56:	Max 13,200	Min 394	Mean 2,090	Ac-ft 1,517,000

Peak discharge (base, 6,000 cfs).--May 29 (7:30 p.m.) 13,300 cfs (9.37 ft).

* *Discharge measurement made on this day.*

Note.--Stage-discharge relation affected by ice Nov. 18 to Dec. 10; Dec. 18 to Mar. 22.

Willow Creek near Harrison, Mont.

Location.--Lat 45°43', long 111°44', in NW¼ sec. 28, T. 1 S., R. 1 W., on left bank 1¼ miles upstream from Willow Creek Dam, 2½ miles northeast of Harrison, and 11 miles upstream from mouth.

Drainage area.--88.4 sq mi.

Records available.--April 1938 to September 1956 (no winter records prior to 1947).

Gage.--Water-stage recorder and concrete control. Altitude of gage is 4,750 ft (from topographic map). Prior to Oct. 8, 1946, at datum 0.22 ft higher.

Average discharge.--10 years (1946-56), 35.8 cfs (25,920 acre-ft per year).

Extremes.--Maximum discharge during year, 242 cfs May 29 (gage height, 2.46 ft); maximum gage height recorded, 2.71 ft Feb. 26 (backwater from ice); minimum discharge, 1.4 cfs Sept. 17 (gage height, 0.39 ft).

1938-56: Maximum discharge, 725 cfs June 27, 1944 (gage height, 4.05 ft, datum then in use); minimum, that of Sept. 17, 1956.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of about 12,500 acres above station.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.3	1.4	1.0	43
.4	3.7	1.5	101
.5	7.3	2.0	171
.6	12	2.5	248
.8	26		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.1	10	22	14	10	25	34	*18	180	32	4.4	2.8
2	4.1	20	21	15	10	26	33	18	186	32	4.4	2.3
3	3.7	17	20	15	12	24	*38	18	178	38	4.8	2.1
4	3.7	16	20	16	14	22	37	18	183	38	4.1	2.3
5	4.1	*16	24	16	15	21	39	18	168	32	3.2	2.6
6	*4.4	14	28	17	*16	20	36	20	139	28	*3.2	2.6
7	4.4	16	32	17	16	*19	33	22	105	28	4.1	2.3
8	3.7	15	34	18	17	19	34	20	88	27	3.7	2.3
9	3.7	16	36	18	17	20	36	18	92	23	3.7	2.3
10	3.7	17	38	19	18	18	38	17	98	27	3.5	2.3
11	4.4	18	40	19	19	16	39	16	109	*29	3.0	*2.3
12	4.8	16	*41	18	20	15	38	16	110	29	3.0	2.3
13	4.8	16	32	18	22	15	38	16	104	26	3.0	2.3
14	5.1	15	20	17	22	15	37	16	96	25	2.6	2.3
15	5.5	14	16	16	20	16	39	14	93	24	2.8	1.9
16	5.5	14	15	15	18	20	42	12	93	23	2.6	1.6
17	5.5	14	14	15	16	30	41	11	79	20	2.3	1.6
18	5.9	15	13	14	15	40	28	12	65	18	2.3	1.6
19	6.9	20	12	14	14	60	24	22	57	15	2.6	1.6
20	6.9	25	14	15	14	70	26	35	45	11	2.3	1.6
21	7.3	25	16	16	15	52	22	55	44	9.6	2.1	1.9
22	8.2	23	18	16	17	58	21	71	44	9.2	1.9	1.9
23	9.6	22	18	15	18	80	23	85	40	8.2	1.9	1.9
24	8.2	23	18	14	19	78	22	91	38	8.2	1.9	1.6
25	7.3	24	17	14	20	73	22	115	38	7.3	2.1	1.6
26	6.9	22	16	13	21	58	18	111	38	6.2	2.3	1.6
27	8.2	21	15	13	22	45	18	115	33	5.5	2.3	1.6
28	8.2	22	14	12	23	47	16	*146	32	5.5	2.6	1.6
29	8.2	23	13	12	24	35	17	226	32	5.1	2.3	1.6
30	9.6	23	13	11	------	33	18	201	32	4.4	2.6	2.1
31	11	------	14	10	------	34	------	180	------	4.1	2.8	------
Total	187.6	552	664	472	504	1,104	907	1,753	2,639	598.3	90.4	60.4
Mean	6.05	18.4	21.4	15.2	17.4	35.6	30.2	56.5	88.0	19.3	2.92	2.01
Ac-ft	372	1,090	1,320	936	1,000	2,190	1,800	3,480	5,230	1,190	179	120

Calendar year 1955: Max 127 Min 2.6 Mean 21.6 Ac-ft 15,670
Water year 1955-56: Max 226 Min 1.6 Mean 26.0 Ac-ft 18,910

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* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 10 to Mar. 20 (no gage-height record Nov. 27 to Dec. 11, Dec. 26 to Feb. 5, Mar. 14, 15; discharge estimated on basis of 2 discharge measurements, engineer's notes, and weather records).

Willow Creek near Willow Creek, Mont.

Location.--Lat 45°45', long 111°39', in SW¼ sec. 18, T. 1 S., R. 1 E., on left bank at upstream side of highway bridge, 3 miles downstream from Willow Creek Reservoir, 5½ miles south of town of Willow Creek, and 6 miles upstream from mouth.

Drainage area.--164 sq mi.

Records available.--September 1919 to December 1932, May 1946 to December 1953, April 1955 to October 1956 (discontinued). Few winter records prior to 1948.

Gage.--Water-stage recorder. Altitude of gage is 4,340 ft (from topographic map). Prior to June 14, 1920, staff gage at site half a mile downstream at different datum. June 14, 1920, to Dec. 9, 1932, chain gage at present site at different datum. May 9 to June 30, 1946, staff gage at site 500 ft downstream at datum 1.5 ft higher. July 1, 1946, to Sept. 30, 1947, wire-weight gage at present site and datum. Oct. 1, 1947, to Nov. 28, 1949, staff gage at site half a mile downstream at different datum.

Average discharge.--9 years (1920-21, 1922-23, 1947-53, 1955-56), 52.6 cfs (38,080 acre-ft per year).

Extremes.--Maximum discharge during year, 211 cfs June 4 (gage height, 4.43 ft); minimum recorded, 17 cfs Mar. 19 (gage height, 2.31 ft), but may have been less during periods of no gage-height record.

1919-32, 1946-53, 1955-56: Maximum discharge observed, 650 cfs July 31, 1948 (gage height, 5.20 ft, site and datum then in use), from rating curve extended above 140 cfs by logarithmic plotting; minimum daily, 0.3 cfs Feb. 1, 1951.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Flow regulated since 1937 by Willow Creek Reservoir (see p. 238). Diversions for irrigation of about 12,800 acres above station.

Revisions (water years).--WSP 1389: 1920(M), 1926, 1929(M), 1931.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	39	35				20	47	*48	167	49	37	51
2	39	34				20	46	48	176	50	37	51
3	39	34				20	*44	47	187	50	38	51
4	39	34				19	68	48	194	46	40	51
5	39	*34				19	83	47	189	39	42	51
6	*39	34			(*)	19	74	47	177	39	*42	51
7	39	34				*19	77	47	159	39	43	51
8	39	34				24	75	47	142	44	55	51
9	38	34				18	75	47	132	*68	55	51
10	39	33				20	74	47	132	78	57	50
11	39	33				19	73	47	130	97	57	51
12	38	31	(*)			19	75	47	133	97	45	51
13	37	26				19	75	46	150	97	31	51
14	38	22				19	75	39	150	98	31	*51
15	38	18	24	18	20	19	75	24	153	98	31	51
16	38	18				19	74	24	148	98	31	52
17	38	18				19	75	24	132	93	31	52
18	38	20				19	75	24	120	89	30	52
19	39	26				18	76	24	93	79	24	52
20	39	26				19	75	24	85	79	26	53
21	39	26				19	76	24	68	79	38	53
22	39	26				20	77	24	68	79	38	54
23	38	26				19	77	24	67	79	38	54
24	35	26				20	77	36	66	71	44	54
25	35	26				33	76	50	65	49	52	55
26	36	24				47	76	65	65	47	53	41
27	35	24				46	69	78	65	50	53	26
28	35	23				41	48	*91	66	52	52	26
29	35	23				42	48	111	65	49	52	26
30	36	22			------	41	48	130	58	46	52	26
31	36	------			------	40	------	155	------	37	51	------
Total	1,170	824	744	558	580	755	2,083	1,584	3,602	2,065	1,306	1,440
Mean	37.7	27.5	24	18	20	24.4	69.4	51.1	120	66.6	42.1	48.0
Ac-ft	2,320	1,630	1,480	1,110	1,150	1,500	4,130	3,140	7,140	4,100	2,590	2,860

Calendar year 1955: Max - Min - Mean - Ac-ft -
Water year 1955-56: Max 194 Min - Mean 45.7 Ac-ft 33,150

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* Discharge measurement made on this day.

Note.--No gage-height record Nov. 12 to Mar. 6 (stage-discharge relation affected by ice during most of period), Mar. 15-17; discharge estimated on basis of 3 discharge measurements, records for station near Harrison and Willow Creek Reservoir, and weather records.

Discharge, in cubic feet per second, 1956

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
Oct. 1	26	Oct. 9	26	Oct. 17	19	Oct. 25	a20
2	26	10	23	18	19	26	a20
3	26	11	19	19	*20	27	a20
4	26	12	19	20	a20	28	a20
5	26	13	19	21	a20	29	a20
6	26	14	19	22	a20	30	a20
7	26	15	18	23	a20	31	a20
8	26	16	18	24	a20		
Total............							667
Mean............							21.5
Runoff in acre-feet............							1,320

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of weather records.

Madison River near West Yellowstone, Mont.

Location.--Lat 44°39', long 111°04', on left bank a quarter of a mile upstream from Riverside ranger station, 1½ miles east of West Yellowstone and west boundary of Yellowstone National Park, and 12½ miles downstream from confluence of Firehole and Gibbon Rivers.

Drainage area.--419 sq mi.

Records available.--June 1913 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 6,650 ft (from topographic map). Prior to Oct. 20, 1918, staff gage and Oct. 20, 1918, to June 29, 1930, staff gage or water-stage recorder, at sites 2½ miles upstream at different datums. Supplementary staff gage a quarter of a mile downstream at different datum used at times during 1927-30.

Average discharge.--40 years (1913-17, 1918-21, 1923-56), 474 cfs (343,200 acre-ft per year).

Extremes.--Maximum discharge during year, 2,150 cfs May 24 (gage height, 3.44 ft); minimum, 259 cfs Dec. 15.

1913-56: Maximum discharge, that of May 24, 1956; maximum gage height, about 10.0 ft Jan. 8, 1937 (ice jam); minimum discharge, 100 cfs (estimated) Feb. 7, 1933.

Revisions.--The maximum discharge for the water year 1942 has been revised to 1,220 cfs May 27, 1942 (gage height, 2.63 ft), superseding figure published in WSP 956.

Remarks.--Records excellent. No regulation or diversion above station.

Cooperation.--Water-stage recorder inspected by officials of National Park Service.

Revisions.--Revised figures of discharge, in cubic feet per second, for high-water period in the water year 1942, superseding those published in WSP 956, are given herewith:

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
1942		1942-Con.		1942-Con.		1942-Con.		1942-Con.	
Apr. 1	312	Apr. 14	494	Apr. 27	425	May 10	510	May 23	690
2	312	15	485	28	425	11	510	24	832
3	318	16	433	29	425	12	543	25	897
4	339	17	425	30	433	13	518	26	1,030
5	358	18	462	May 1	418	14	470	27	1,120
6	339	19	455	2	418	15	502	28	918
7	339	20	462	3	440	16	510	29	801
8	345	21	500	4	433	17	485	30	832
9	345	22	600	5	447	18	477	31	759
10	377	23	550	6	447	19	447		
11	397	24	550	7	418	20	447		
12	440	25	500	8	425	21	485		
13	462	26	450	9	470	22	569		

Month	Cfs-days	Maximum	Minimum	Mean	Per square mile	Runoff	
						Inches	Acre-feet
April 1942	12,757	600	312	425	1.01	1.13	25,300
May	18,268	1,120	418	589	1.41	1.62	36,230
Water year 1941-42	143,148	1,120	245	392	.936	12.70	283,900
Calendar year 1942	142,933	1,120	245	392	.936	12.68	283,500

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	371	384	398	450	351	391	404	593	1,640	612	497	450
2	378	378	*411	442	321	391	404	565	1,660	640	488	442
3	378	384	404	426	350	398	384	593	1,570	750	497	442
4	371	391	391	426	371	398	384	630	1,500	649	480	442
5	378	404	384	442	398	404	384	750	1,430	612	480	434
6	378	384	398	434	398	391	364	770	1,310	593	473	426
7	378	378	391	419	398	371	371	781	1,160	574	473	426
8	378	378	378	419	384	398	391	869	1,110	565	480	434
9	364	378	391	411	378	384	378	935	1,120	565	473	442
10	364	404	378	411	384	384	391	990	1,100	557	488	457
11	404	398	384	411	391	364	434	979	1,070	557	473	480
12	391	384	384	411	398	364	465	891	1,040	574	473	583
13	384	360	371	*419	391	384	457	803	1,030	548	465	488
14	378	404	350	419	398	371	480	739	1,010	540	457	450
15	378	371	298	419	398	364	514	770	1,000	531	465	442
16	371	321	364	434	371	364	548	869	979	522	465	442
17	371	338	398	411	370	364	557	1,060	891	522	473	442
18	371	398	391	411	384	364	557	1,220	803	514	465	434
19	378	391	404	411	384	378	574	1,350	792	514	465	434
20	426	465	398	404	391	384	612	1,490	*803	505	465	434
21	411	540	404	404	391	378	668	1,610	858	514	457	442
22	465	442	442	411	391	391	709	1,750	825	514	450	442
23	442	404	729	419	*398	398	709	1,860	729	497	*442	442
24	391	404	836	411	398	411	760	*1,970	729	*497	442	442
25	384	398	593	404	384	442	729	1,950	729	497	442	434
26	391	391	531	411	398	450	729	1,970	678	497	442	434
27	398	398	514	434	391	404	781	1,930	668	488	442	434
28	*384	404	480	411	398	384	709	1,830	649	497	457	457
29	384	398	434	411	398	384	*688	1,740	649	514	457	*457
30	404	404	440	404	------	384	630	1,660	621	522	473	450
31	404	-----	457	398	------	*384	------	1,650	------	497	457	------
Total	12,048	11,876	13,526	12,948	11,156	12,021	16,165	37,567	30,153	16,978	14,456	13,458
Mean	389	396	436	418	385	388	539	1,212	1,005	548	466	449
Cfsm	0.928	0.945	1.04	0.998	0.919	0.926	1.29	2.89	2.40	1.31	1.11	1.07
In.	1.07	1.05	1.20	1.15	0.99	1.07	1.43	3.33	2.68	1.51	1.28	1.19
Ac-ft	23,900	23,560	26,830	25,680	22,130	23,840	32,060	74,510	59,810	33,680	28,670	26,690

Calendar year 1955: Max 1,040 Min 298 Mean 456 Cfsm 1.09 In. 14.78 Ac-ft 330,100
Water year 1955-56: Max 1,970 Min 298 Mean 553 Cfsm 1.32 In. 17.95 Ac-ft 401,400

Peak discharge (base, 950 cfs).--Dec. 24 (1 a.m.) 1,060 cfs (2.58 ft); May 11 (6 to 8 a.m.) 1,030 cfs (2.57 ft); May 24 (9 to 11 a.m.) 2,150 cfs (3.44 ft).

* Discharge measurement made on this day.

Madison River below Hebgen Lake, near Grayling, Mont.

Location.--Lat 44°52'00", long 111°20'15", near northeast corner of sec. 22, T. 11 S., R. 3 E., on right bank 500 ft downstream from Hebgen Dam, 8 miles northwest of Grayling, and 17 miles upstream from West Fork.

Drainage area.--904 sq mi.

Records available.--October 1938 to September 1956. Published as "below Hebgen Reservoir" prior to Oct. 1, 1949.

Gage.--Water-stage recorder. Altitude of gage is 6,455 ft (from topographic map). Prior to July 13, 1943, staff gage in stilling well at same site and datum.

Average discharge.--18 years 949 cfs (687,000 acre-ft per year), adjusted for storage.

Extremes.--Maximum discharge during year, 2,920 cfs June 4 (gage height, 2.82 ft); minimum daily, 311 cfs May 25.

1938-56: Maximum discharge observed, 5,980 cfs June 3, 1943 (gage height, 3.69 ft); minimum daily, 5 cfs June 11-24, 1948, when all gates were closed.

Remarks.--Records good. Flow completely regulated by Hebgen Lake (see p. 238). Diversions for irrigation of about 1,100 acres above station.

Rating table, water year 1955-56 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Sept. 21-30)

0.9	290	2.0	1,610
1.1	440	2.5	2,450
1.5	900	3.0	3,500

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,220	1,740	809	970	710	674	1,170	520	2,470	1,070	796	1,050
2	1,170	1,710	809	970	698	674	1,170	540	2,630	1,100	783	1,010
3	1,150	1,740	809	956	686	674	1,190	490	2,740	1,260	900	998
4	1,150	*1,710	809	942	686	674	1,180	416	2,800	1,280	1,210	998
5	*1,140	1,710	809	942	686	686	1,150	440	*2,820	1,280	1,310	1,240
6	1,170	1,800	796	928	686	686	1,140	470	2,590	1,140	1,250	1,310
7	1,180	1,720	796	914	686	686	1,120	510	2,360	1,050	*1,220	1,260
8	1,220	1,670	796	914	686	686	1,150	470	1,720	1,050	1,180	1,240
9	1,190	1,740	809	900	686	686	1,110	400	1,350	1,040	1,150	1,250
10	1,240	1,750	809	900	686	686	1,140	460	1,450	*998	1,120	1,220
11	1,190	1,710	796	900	686	686	1,150	480	1,560	861	1,100	1,240
12	1,150	1,720	796	900	686	686	1,120	432	1,330	874	1,070	*1,210
13	1,140	1,670	*783	900	686	686	1,140	408	1,250	900	1,040	1,180
14	1,180	1,610	783	887	686	686	1,180	408	1,220	900	1,030	1,180
15	1,240	1,420	770	887	686	698	1,170	432	1,100	874	1,010	1,220
16	1,180	887	734	887	686	698	1,140	432	1,100	874	984	1,280
17	1,150	783	686	874	686	698	1,140	424	1,120	861	970	1,240
18	1,330	783	698	874	686	698	1,120	440	1,100	861	956	1,210
19	1,670	796	710	874	686	698	934	384	1,110	874	942	1,250
20	1,630	796	758	874	686	686	551	408	887	861	942	1,210
21	1,630	809	796	861	686	686	573	351	796	861	984	1,240
22	1,610	809	796	861	686	686	540	346	822	848	1,010	1,250
23	1,610	809	809	874	674	686	551	450	914	861	1,050	1,220
24	1,640	822	835	874	674	746	584	346	1,050	848	1,030	1,280
25	1,660	809	848	874	674	861	551	311	928	848	1,030	1,280
26	1,580	809	928	861	674	1,010	460	440	887	848	1,070	1,280
27	1,610	809	998	861	674	1,150	480	432	914	809	1,040	1,280
28	1,790	809	998	*861	*674	1,170	*490	895	942	770	1,030	1,240
29	1,710	822	998	770	674	1,210	510	*1,450	1,040	770	1,080	1,250
30	1,630	809	970	710	-------	*1,190	520	1,600	1,050	796	1,110	1,250
31	1,670	-------	984	710	-------	1,190	-------	2,080	-------	783	1,080	-------
Total	42,830	37,581	25,525	27,310	19,846	24,317	27,424	17,665	44,050	29,050	32,477	36,366
Mean	1,382	1,253	823	881	684	784	914	570	1,468	937	1,048	1,212
Ac-ft	84,950	74,540	50,630	54,170	39,360	48,230	54,390	35,040	87,370	57,620	64,420	72,130
(†)	-45,100	-30,500	+800	-8,000	+300	-9,000	+11,400	+117,400	+38,200	+700	-20,700	-29,400

Adjusted for change in contents in Hebgen Lake

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Mean	648	740	836	751	689	638	1,106	2,479	2,110	948	711	718
Cfsm	0.717	0.819	0.925	0.831	0.762	0.706	1.22	2.74	2.33	1.05	0.787	0.794
In.	0.83	0.91	1.07	0.96	0.82	0.81	1.36	3.16	2.60	1.21	0.91	0.89
Ac-ft	39,850	44,040	51,430	46,170	39,660	39,230	65,790	152,440	125,570	58,320	43,720	42,730

Observed

Calendar year 1955:	Max 1,800	Min 152	Mean 813	Ac-ft 588,900
Water year 1955-56:	Max 2,820	Min 311	Mean 996	Ac-ft 722,800

Adjusted

Calendar year 1955:	Mean 848	Cfsm 0.938	In. 12.75	Ac-ft 614,100
Water year 1955-56:	Mean 1,032	Cfsm 1.14	In. 15.53	Ac-ft 749,000

* Discharge measurement made on this day.

† Change in contents in Hebgen Lake, in acre-feet, furnished by The Montana Power Co.

Madison River near Cameron, Mont.

Location.--Lat 45°14'00", long 111°45'00", at center of south line of sec. 8, T. 7 S., R.1 W., on right bank 30 ft downstream from Varney Bridge, 1½ miles downstream from Wigwam Creek, and 4 miles northwest of Cameron.

Records available.--November 1951 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 5,135 ft (from topographic map).

Extremes.--Maximum discharge during year, 5,980 cfs June 2 (gage height, 4.39 ft); maximum gage height recorded, 8.11 ft Feb. 23 (backwater from ice); minimum daily discharge, 730 cfs May 4.

1951-56: Maximum discharge, 6,670 cfs June 7, 1952 (gage height, 4.61 ft); maximum gage height recorded, 8.37 ft Feb. 27, 1955 (backwater from ice); minimum daily discharge, 315 cfs Nov. 23, 1954.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Flow regulated at Hebgen Lake (see p. 238). Diversions for irrigation of about 5,300 acres above station.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.2	730	4.0	4,810
2.6	1,450	4.5	6,320
3.0	2,250		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,510	1,910	998	1,230	762	b870	1,410	842	5,370	1,650	1,020	1,330
2	1,490	1,850	1,030	1,230	762	b860	1,370	*842	5,550	1,630	1,020	1,290
3	1,430	1,890	1,020	1,180	794	b850	1,390	858	5,430	1,790	1,030	1,250
4	1,430	1,910	980	1,200	842	b850	*1,410	730	5,520	1,850	1,330	1,230
5	*1,410	*1,870	962	1,210	890	b840	1,370	762	*5,640	1,790	1,530	1,410
6	1,410	1,970	1,030	1,210	890	b830	1,330	842	4,980	1,710	1,510	1,590
7	1,410	1,930	1,050	1,180	*890	b820	1,310	890	4,150	1,550	*1,510	1,550
8	1,450	1,890	998	1,200	890	b820	1,330	998	3,760	1,510	1,490	1,510
9	1,430	1,910	1,050	1,140	858	b820	1,330	926	3,160	1,510	1,450	1,550
10	1,470	1,990	1,020	1,160	874	b810	1,350	980	3,290	*1,490	1,410	1,530
11	1,510	1,930	1,030	1,180	926	a800	1,430	1,090	3,500	1,330	1,370	1,590
12	1,430	1,910	1,050	1,160	944	a800	1,390	962	3,370	1,290	1,350	*1,590
13	1,390	1,830	*998	1,160	944	a800	1,370	858	2,950	1,290	1,310	1,550
14	1,410	1,830	926	1,140	926	a800	1,490	762	2,780	1,270	1,290	1,490
15	1,490	1,670	874	1,160	858	a800	1,510	794	2,610	1,270	1,270	1,490
16	1,450	1,160	b870	1,160	778	a810	1,510	842	2,490	1,230	1,250	1,570
17	1,390	890	b850	1,180	b760	a830	1,530	1,070	2,270	1,210	1,230	1,550
18	1,410	980	842	1,120	b770	a850	1,470	1,230	2,010	1,200	1,200	1,510
19	1,870	1,030	944	1,140	b780	a860	1,490	1,530	1,990	1,180	1,210	1,530
20	1,890	1,030	908	1,140	b790	a860	944	1,650	1,970	1,200	1,180	1,490
21	1,870	1,070	1,020	1,120	b800	a860	926	2,010	1,870	1,180	1,180	1,490
22	1,850	1,030	1,030	1,120	b820	a870	962	2,210	1,670	1,160	1,250	1,550
23	1,870	998	1,200	1,120	b840	a880	962	2,660	1,570	1,160	1,250	1,510
24	1,850	998	1,210	1,070	b860	a900	1,020	3,070	1,810	1,140	1,250	1,550
25	1,870	1,020	1,140	1,070	b870	a1,000	1,020	3,110	1,790	1,140	1,230	1,590
26	1,810	1,020	1,160	1,110	b870	a1,300	858	3,140	1,610	1,120	1,310	1,550
27	1,750	1,020	1,330	1,140	b870	a1,350	890	3,550	1,570	1,140	1,290	1,590
28	2,010	1,030	1,270	1,110	b870	1,390	874	*3,570	1,610	1,070	1,270	1,590
29	1,910	998	1,200	1,030	b870	1,410	858	4,290	1,650	1,050	1,290	1,570
30	1,870	998	1,200	826	------	1,430	858	4,230	1,730	1,120	1,410	1,610
31	1,790	------	1,270	794	------	1,390	------	4,420	------	1,070	1,370	------
Total	50,130	43,562	32,460	34,990	24,598	29,360	36,962	55,718	89,670	41,300	40,060	45,200
Mean	1,617	1,452	1,047	1,129	848	947	1,232	1,797	2,989	1,332	1,292	1,507
Ac-ft	99,430	86,400	64,380	69,400	48,790	58,230	73,310	110,500	177,900	81,920	79,460	89,650

Calendar year 1955:	Max 3,370	Min 400	Mean 1,150	Ac-ft 832,600
Water year 1955-56:	Max 5,640	Min 730	Mean 1,432	Ac-ft 1,039,000

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* Discharge measurement made on this day.

a No gage-height record (stage-discharge relation affected by ice during most of this period); discharge estimated on basis of records for station below Hebgen Lake and weather records.

b Stage-discharge relation affected by ice (no gage-height record Feb. 19, 20, Feb. 27 to Mar. 5).

Madison River below Ennis Lake, near McAllister, Mont.

Location.--Lat 45°29'25", long 111°38'00", in NW¼ sec. 17, T. 4 S., R. 1 E., on right bank 500 ft downstream from Madison powerplant, 1½ miles downstream from Ennis Lake, and 6 miles northeast of McAllister.

Drainage area.--2,180 sq mi, approximately.

Records available.--January 1890 to November 1894 (gage heights only 1893-94), August to November 1910, October 1938 to September 1956. Published as "near Red Bluff" 1890-94, as "near Norris" in 1910 and as "below Madison Reservoir" 1938-49.

Gage.--Water-stage recorder. Altitude of gage is 4,700 ft (from topographic map). Prior to Oct. 1, 1938, staff gages at site 9 miles downstream at different datum. Oct. 1, 1938, to May 6, 1941, float gage in wooden stilling well at present site at different datum. May 7, 1941, to Jan. 13, 1945, float and staff gages in concrete stilling well, at present site and datum.

Average discharge.--18 years (1938-56), 1,608 cfs (1,164,000 acre-ft per year), unadjusted.

Extremes.--Maximum discharge during year, 6,330 cfs June 3 (gage height, 6.76 ft); minimum daily, 927 cfs Feb. 17-19.

1938-56: Maximum discharge observed, 7,750 cfs June 2, 3, 1943 (gage height, 7.70 ft); minimum daily, 409 cfs Apr. 27, 1941.

Remarks.--Records good. Flow regulated by Hebgen and Ennis Lakes (see p. 238). Diversions for irrigation of about 23,000 acres above station.

Rating table, water year 1955-56 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-21, Apr. 2-4, July 16 to Sept. 30)

1.3	920	4.0	3,180
1.5	1,060	5.0	4,250
2.0	1,410	7.0	6,750
3.0	2,210		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,590	2,120	1,400	1,460	a1,050	1,150	1,730	1,200	5,260	1,580	1,220	1,380
2	1,610	2,210	1,400	1,460	a1,030	1,160	1,700	*1,180	5,600	1,610	1,190	1,350
3	1,630	2,230	1,340	1,440	a1,010	1,190	1,700	1,190	5,800	1,720	1,190	1,260
4	1,590	2,160	1,300	1,480	a990	1,210	*1,690	1,190	5,890	1,790	1,160	1,310
5	1,580	*2,180	1,240	1,470	976	1,190	1,660	1,180	*5,930	1,830	1,260	1,320
6	*1,600	2,190	1,140	1,520	997	1,170	1,640	1,160	5,790	1,840	1,490	1,380
7	1,620	2,240	1,140	1,520	*1,040	*1,160	1,630	1,190	5,220	1,780	1,850	1,610
8	1,590	2,260	1,170	1,500	1,070	1,100	1,600	1,210	3,840	1,710	*1,830	1,640
9	1,590	2,240	1,170	1,420	1,050	1,070	1,640	1,240	3,370	1,670	1,720	1,550
10	1,600	2,230	1,210	1,400	1,000	1,100	1,630	1,280	3,360	1,620	1,690	1,560
11	1,580	2,230	1,220	1,420	990	1,070	1,640	1,320	3,200	*1,590	1,610	1,540
12	1,630	2,200	1,240	1,430	1,040	1,030	1,710	1,420	3,250	1,550	1,580	*1,680
13	1,630	a2,200	*1,260	1,440	1,090	1,040	1,660	1,400	3,230	1,420	1,460	1,840
14	1,630	a2,200	1,210	1,440	1,120	1,060	1,670	1,340	3,080	1,280	1,280	1,770
15	1,640	a2,200	1,140	1,360	1,100	1,100	1,720	1,270	2,730	1,280	1,310	1,660
16	1,660	a2,200	1,110	1,280	1,020	1,080	1,720	1,240	2,610	1,210	1,330	1,600
17	1,660	a2,200	1,180	1,300	927	1,100	1,720	1,260	2,490	1,190	1,330	1,630
18	1,670	a2,200	1,120	1,340	927	1,140	1,680	1,330	2,200	1,170	1,330	1,630
19	1,660	a2,200	1,090	1,350	927	1,240	1,690	1,480	2,010	1,200	1,330	1,620
20	1,540	a1,400	1,210	1,360	934	1,330	1,630	1,680	1,680	1,230	1,330	1,640
21	1,580	1,700	1,390	1,370	941	1,720	1,430	1,930	1,480	1,240	1,310	1,640
22	1,770	1,700	1,620	1,370	1,020	1,910	1,360	2,670	1,240	1,240	1,330	1,640
23	1,930	1,590	1,750	1,330	1,100	1,810	1,330	3,100	1,260	1,240	1,310	1,660
24	2,010	1,490	1,810	1,330	1,160	1,810	1,300	3,310	1,400	1,240	1,330	1,650
25	2,000	1,460	1,750	1,230	1,170	1,850	1,310	4,030	1,560	1,240	1,320	1,700
26	2,010	1,400	1,700	1,160	1,120	2,220	1,300	4,200	1,470	1,230	1,310	1,750
27	2,060	1,370	1,740	1,160	1,120	2,200	1,280	4,110	1,430	1,230	1,350	1,720
28	2,070	1,320	1,690	1,170	1,140	1,930	1,250	4,600	1,490	1,230	1,330	1,790
29	2,180	1,350	1,580	1,130	1,110	1,820	1,230	5,240	1,520	1,210	1,330	1,880
30	2,210	1,400	1,400	1,090	------	1,790	1,210	5,160	1,540	1,220	1,350	1,800
31	2,150	------	1,380	a1,070	------	1,740	------	5,080	------	1,220	1,390	------
Total	54,270	58,070	42,100	41,800	30,169	43,490	46,460	69,190	90,930	43,810	43,150	48,200
Mean	1,751	1,936	1,358	1,348	1,040	1,403	1,549	2,232	3,031	1,413	1,392	1,607
Ac-ft	107,600	115,200	83,500	82,910	59,840	86,260	92,150	137,200	180,400	86,900	85,590	95,600

Calendar year 1955: Max 3,800 Min 850 Mean 1,407 Ac-ft 1,019,000
Water year 1955-56: Max 5,930 Min 927 Mean 1,671 Ac-ft 1,213,000

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* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of powerplant outflow record and records for nearby stations.

Taylor Creek near Grayling, Mont.

Location.--Lat 45°04', long 111°12', in NW¼ sec. 11, T. 9 S., R. 4 E., on right bank half a mile upstream from mouth and 17 miles north of Grayling.

Records available.--June 1946 to November 1953, April 1955 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 6,600 ft (by barometer).

Average discharge.--8 years (1946-53, 1955-56), 97.4 cfs (70,510 acre-ft per year).

Extremes.--Maximum discharge during year, 902 cfs June 1 (gage height, 4.15 ft); minimum observed, 7.6 cfs Feb. 24 (discharge measurement).
1946-53, 1955-56: Maximum discharge, 1,020 cfs June 6, 1952 (gage height, 4.32 ft); minimum observed, that of Feb. 24, 1956.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. One diversion for irrigation of about 10 acres above station. Natural storage at lakes in headwaters.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.2	19	2.0	94
1.4	32	2.3	145
1.6	50	3.0	360
1.8	70	4.0	830

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	29	b22	a16	a16	a12	a16	a25	53	780	190	82	46
2	28	b20						50	780	188	77	43
3	27	b20						52	745	175	75	42
4	27	*b23						62	760	162	71	42
5	*28	b24						68	715	152	67	41
6	26	b25					a40	86	575	158	66	39
7	27	b26						97	490	155	*66	39
8	27							122	521	148	64	39
9	26							135	580	145	63	43
10	26							129	635	*150	61	46
11	34						a60	120	715	141	60	47
12	30							107	630	141	58	*49
13	28	a20						93	*580	139	55	50
14	28		(*) b16					87	530	135	54	45
15	28							93	516	129	57	40
16	27		b18			a20		129	472	120	55	38
17	26							190	368	113	53	36
18	26						*81	249	336	108	52	35
19	26						68	314	353	105	52	34
20	27						78	372	372	104	51	33
21	26						89	472	368	108	49	35
22	28						92	566	283	102	48	32
23	26						90	*665	258	98	46	31
24	24				(*)		86	690	276	93	46	31
25	26						71	715	262	92	46	31
26	26			(*)		a25 (*)	68	720	246	88	46	29
27	25						70	760	249	88	47	29
28	26						63	740	249	95	47	34
29	27		a18				58	750	245	95	46	33
30	28				------		52	695	216	94	57	31
31	25	------			------		------	710	------	86	49	------
Total	838	650	528	496	348	590	1,711	10,091	14,105	3,897	1,766	1,143
Mean	27.0	21.7	17.0	16.0	12.0	19.0	57.0	326	470	126	57.0	38.1
Ac-ft	1,660	1,290	1,050	984	690	1,170	3,390	20,020	27,980	7,730	3,500	2,270

Calendar year 1955: Max - Min - Mean - Ac-ft -
Water year 1955-56: Max 780 Min - Mean 98.8 Ac-ft 71,730

Peak discharge (base, 300 cfs).--May 26 (11 to 12 p.m.) 878 cfs (4.11 ft); June 1 (11 p.m.) 902 cfs (4.15 ft); June 10 (8:30 p.m.) 750 cfs (3.89 ft); June 21 (12:30 a.m.) 424 cfs (3.19 ft).

* Discharge measurement made on this day.

a No gage-height record (stage-discharge relation affected by ice during most of these periods); discharge estimated on basis of 6 discharge measurements, weather records, and records for nearby streams.

b Stage-discharge relation affected by ice.

Gallatin River near Gallatin Gateway, Mont.

Location.--Lat 45°30', long 111°16', in NE¼ sec. 18, T. 4 S., R. 4 E., on left bank a quarter of a mile downstream from Spanish Creek and 8 miles south of Gallatin Gateway.

Drainage area.--828 sq mi.

Records available.--August 1889 to June 1894, June 1930 to September 1956. Published as West Gallatin River near Bozeman, 1889-94.

Gage.--Water-stage recorder. Datum of gage is 5,167.7 ft above mean sea level, datum of 1929, supplementary adjustment of 1940. August 1889 to June 1894 chain gage at approximately same site and datum. June 1930 to Oct. 20, 1932, wire-weight gages at two sites within three-quarters of a mile of present site at different datums.

Average discharge.--29 years (1889-92, 1930-56), 735 cfs (532,100 acre-ft per year).

Extremes.--Maximum discharge during year, 7,030 cfs May 28 (gage height, 5.57 ft); minimum, 200 cfs Dec. 14 (gage height, 0.95 ft).

1889-94, 1930-56: Maximum discharge observed, 8,060 cfs June 20, 1892, June 2, 1894 (gage height, 7.70 ft, site and datum then in use), from rating curve extended above 3,000 cfs by logarithmic plotting; minimum, 117 cfs Jan. 19, 1935 (gage height, 0.68 ft).

Remarks.--Records good. Diversions for irrigation of about 1,400 acres above station.

Revisions (water years).--WSP 896: Drainage area. WSP 1389: 1892(M), 1893-94.

Rating table, water year 1955-56 (gage height, in feet, and discharge, in cubic feet per second)

0.9	205	3.0	1,880
1.2	310	5.0	5,720
1.5	460	5.5	6,870
2.0	820		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	380	298	294	266	235	256	282	562	6,160	1,370	646	466
2	380	290	298	256	249	256	263	541	6,320	1,320	625	449
3	375	*342	274	252	266	252	256	534	5,880	1,310	604	432
4	*370	360	260	260	278	246	270	562	5,770	1,230	590	438
5	385	355	246	263	282	242	290	668	5,410	1,180	576	432
6	375	306	270	263	290	238	252	732	4,460	1,140	562	427
7	375	314	260	256	290	232	266	796	3,680	1,140	576	422
8	375	324	226	252	270	238	294	937	3,600	1,070	569	427
9	370	332	260	249	266	242	294	1,080	3,900	1,020	541	444
10	360	360	256	249	266	232	346	1,100	4,100	1,020	534	454
11	405	346	263	260	274	229	380	1,110	4,300	*1,000	534	460
12	390	278	266	263	278	235	370	1,020	4,100	964	520	466
13	380	242	249	266	256	246	390	928	*3,840	955	508	*490
14	375	263	*208	263	252	238	444	856	3,540	901	*490	444
15	375	260	205	256	246	235	502	865	3,400	874	502	427
16	370	246	246	263	246	238	562	1,060	3,180	847	502	416
17	365	260	256	266	249	242	555	1,460	2,640	812	490	405
18	360	294	249	260	252	242	555	1,920	2,290	788	478	405
19	365	314	274	266	252	249	590	2,450	2,260	764	478	400
20	370	365	270	266	260	260	668	2,880	2,300	740	472	395
21	365	375	263	270	266	263	780	3,680	2,370	732	466	416
22	375	314	298	274	263	266	838	4,360	1,960	708	454	405
23	370	282	365	282	260	306	812	*4,890	1,800	684	449	395
24	350	286	380	252	*256	416	804	5,130	1,780	676	449	395
25	355	274	319	232	256	438	716	5,700	1,750	660	449	395
26	355	282	302	*252	256	405	684	5,480	1,660	653	444	385
27	360	278	302	263	256	324	*684	5,880	1,630	660	449	380
28	355	290	256	263	256	286	660	6,730	1,620	684	460	405
29	355	282	220	249	252	*274	611	6,500	1,570	660	460	405
30	375	286	214	242	------	294	569	5,680	1,480	684	527	395
31	337	-----	256	242	-----	294	-----	5,390	------	660	496	------
Total	11,452	9,098	8,305	8,016	7,578	8,414	14,987	81,481	98,750	27,906	15,900	12,675
Mean	369	303	268	259	261	271	500	2,628	3,292	900	513	422
Cfsm	0.446	0.366	0.324	0.313	0.315	0.327	0.604	3.17	3.98	1.09	0.620	0.510
In.	0.51	0.41	0.37	0.36	0.34	0.38	0.67	3.66	4.44	1.25	0.71	0.57
Ac-ft	22,710	18,050	16,470	15,900	15,030	16,690	29,730	161,600	195,900	55,350	31,540	25,140

Calendar year 1955: Max 4,000 Min 205 Mean 626 Cfsm 0.756 In. 10.24 Ac-ft 452,900
Water year 1955-56: Max 6,730 Min 205 Mean 832 Cfsm 1.00 In. 13.67 Ac-ft 604,100

Peak discharge (base, 2,900 cfs).--May 28 (11 p.m.) 7,030 cfs (5.57 ft); June 2 (1 a.m.) 6,820 cfs (5.49 ft); June 10 (12 p.m.) 4,600 cfs (4.51 ft).

* Discharge measurement made on this day.

East Gallatin River at Bozeman, Mont.

Location.--Lat 45°42'00", long 111°01'45", near center of south line sec. 31, T. 1 S., R. 6 E., on left bank 100 ft upstream from highway bridge, 500 ft downstream from Bozeman Creek, half a mile upstream from Bridger Creek, and half a mile north of Bozeman.

Drainage area.--149 sq mi.

Records available.--August 1939 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 4,701.6 ft above mean sea level, datum of 1929 (unadjusted).

Average discharge.--17 years, 87.2 cfs (63,130 acre-ft per year).

Extremes.--Maximum discharge during year, 451 cfs May 25 (gage height, 4.18 ft); maximum gage height, 4.33 ft Dec. 19, Feb. 17 (backwater from ice); minimum daily discharge, 20 cfs Nov. 16.

1939-56: Maximum discharge, 1,240 cfs June 4, 1953 (gage height, 6.09 ft, from high-water mark in well); minimum, 12 cfs Dec. 9, 1944, Mar. 24-26, 1955.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of about 4,000 acres above station. Some diurnal fluctuation caused by mill above station.

Rating tables water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting control method used Aug. 14-17)

Oct. 1 to Feb. 22		Feb. 23 to Sept. 30			
2.3	38	2.0	22	3.0	156
2.5	58	2.1	28	3.5	262
3.0	146	2.3	43	4.0	395
		2.5	66	4.5	562

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	42	52	46	b30	a25	38	82	148	246	53	27	36
2	41	55	44	b35	a25	38	74	146	230	56	29	34
3	42	*54	b40	b40	b28	37	71	146	215	57	28	35
4	*42	59	b42	b45	b32	38	109	143	198	58	27	35
5	42	56	b44	46	b35	39	114	145	174	57	27	36
6	42	49	b46	45	b35	b37	87	156	158	56	27	37
7	42	49	47	43	b33	b36	100	158	139	56	30	36
8	42	50	b46	42	b30	35	116	182	124	54	29	32
9	39	51	45	b42	b30	b33	133	206	109	49	29	34
10	39	52	b45	42	b33	b30	214	235	102	*44	28	34
11	47	47	44	40	b35	b25	174	257	95	45	28	37
12	49	b45	48	40	b37	b28	170	288	*77	44	28	44
13	48	b40	b45	41	b40	b30	198	279	61	42	27	*43
14	48	b30	b35	b40	b38	b32	226	246	57	39	*25	37
15	47	b25	*b24	b37	b35	b35	232	237	61	37	27	36
16	46	b20	b23	b35	b25	40	241	264	62	35	27	34
17	47	b25	b25	b35	b25	42	204	298	65	34	26	34
18	47	b35	b25	b38	b30	42	192	346	58	34	27	34
19	46	b50	b25	b40	b35	44	192	363	52	34	29	33
20	46	b60	b40	b40	a40	47	213	363	52	32	28	34
21	46	58	b60	b40	a50	48	232	389	62	29	28	38
22	52	51	72	42	a46	58	226	*392	58	29	29	36
23	57	b50	80	41	*44	104	196	378	58	29	28	35
24	54	49	61	*b50	42	154	*186	363	62	27	28	34
25	50	47	b55	b47	b40	166	168	404	69	27	30	34
26	51	48	52	b42	b40	143	158	341	61	28	31	34
27	57	b47	51	b37	b40	104	158	324	57	28	32	34
28	54	b46	b40	a32	38	*93	150	341	54	29	32	40
29	54	b45	b30	a28	38	89	152	346	56	27	35	41
30	57	45	b25	a26	------	104	150	304	53	27	41	41
31	54	------	b27	a25	------	98	------	267	------	26	41	------
Total	1,470	1,390	1,332	1,206	1,024	1,887	4,918	8,455	2,925	1,222	908	1,082
Mean	47.4	46.3	43.0	38.9	35.3	60.9	164	273	97.5	39.4	29.3	36.1
Ac-ft	2,920	2,760	2,640	2,390	2,030	3,740	9,750	16,770	5,800	2,420	1,800	2,150

Calendar year 1955: Max 395 Min 12 Mean 83.8 Ac-ft 60,700
Water year 1955-56: Max 404 Min 20 Mean 76.0 Ac-ft 55,170

Peak discharge (base, 300 cfs).--Apr. 10 (6 p.m.) 413 cfs (4.06 ft); May 12 (9 to 11 p.m.) 322 cfs (3.74 ft); May 25 (5:30 to 7 a.m.) 451 cfs (4.18 ft).

* Discharge measurement made on this day.

a No gage-height record (stage-discharge relation affected by ice during all or part of these periods); discharge estimated on basis of 1 discharge measurement and weather records.

b Stage-discharge relation affected by ice.

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Bridger Creek near Bozeman, Mont.

Location.--Lat 45°42'20", long 110°57'40", in NE¼SE¼ sec. 34, T. 1 S., R. 6 E., on right bank 3 miles upstream from mouth and 3 miles northeast of Bozeman.

Drainage area.--62.2 sq mi.

Records available.--January 1946 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 4,960 ft (from topographic map). Prior to June 28, 1946, staff gage at same site and datum.

Average discharge.--10 years, 35.2 cfs (25,480 acre-ft per year).

Extremes.--Maximum discharge during year, 293 cfs May 22 (gage height, 2.64 ft); minimum daily, 2.0 cfs Jan. 31.

1946-56: Maximum discharge, 902 cfs June 3, 1953 (gage height, 4.90 ft, from reconstructed gage-height graph), from rating curve extended above 380 cfs; minimum, 0.9 cfs Mar. 23, 1953, Aug. 30, 1954; minimum gage height, 0.31 ft Mar. 23, 1953.

Remarks.--Records good except those for period of ice effect, which are poor. Diversions for irrigation of about 1,200 acres above station.

Rating tables, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to May 16				May 17 to Sept. 30			
0.6	5.2	1.5	55	0.6	5.2	1.5	58
.8	9.0	2.0	136	.8	9.5	2.0	145
1.0	15	2.1	154	1.0	17	2.6	283
1.2	27			1.2	28		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.8	8.4	7.4	5.1	2.3	5.9	21	58	143	22	8.8	9.0
2	6.8	8.6	7.3	5.8	2.6	6.0	19	59	135	21	11	8.0
3	6.6	*8.4	7.2	6.3	3.3	5.7	18	59	117	22	11	8.0
4	*6.6	9.0	7.1	6.7	4.0	5.5	20	58	114	22	11	8.0
5	7.6	10	7.0	7.0	5.1	5.1	21	58	104	21	9.5	8.2
6	7.4	9.0	6.9	7.1	5.5	5.0	18	62	93	23	9.0	7.8
7	7.0	9.5	6.9	7.1	5.2	5.0	20	65	82	22	9.8	7.5
8	7.0	8.6	6.7	7.0	4.9	4.7	22	80	72	20	9.5	7.5
9	6.8	8.8	6.6	6.9	5.2	4.6	25	99	68	20	8.8	7.5
10	6.8	9.0	6.5	6.8	5.7	4.5	35	116	65	*19	8.2	7.0
11	7.6	8.5	6.2	6.6	5.9	4.5	35	128	61	20	7.8	8.0
12	8.0	8.0	5.9	6.5	5.8	4.5	33	138	*58	20	7.8	9.8
13	8.0	7.5	5.5	6.4	5.7	4.6	43	131	56	18	7.2	*12
14	7.2	6.5	4.5	6.2	5.6	4.7	58	122	52	17	*6.3	9.2
15	7.4	5.5	*4.1	5.6	5.3	5.0	72	124	50	15	6.5	8.0
16	7.2	5.0	4.0	5.3	5.0	5.3	85	152	50	14	6.1	7.8
17	7.2	5.0	3.9	5.3	5.0	5.5	80	186	48	14	5.7	8.0
18	7.2	5.5	3.7	5.3	5.4	6.0	79	216	44	15	5.6	7.8
19	7.2	6.5	3.6	5.4	6.0	7.0	82	252	41	14	5.7	6.6
20	7.2	7.5	4.0	5.5	6.4	7.6	94	264	38	13	6.1	6.3
21	7.2	8.4	5.5	5.5	6.9	8.0	109	276	39	13	6.1	7.2
22	8.0	8.5	6.1	5.5	6.9	9.0	112	*276	35	12	5.7	7.2
23	8.4	7.5	7.0	5.3	*6.8	24	97	273	34	11	5.6	7.2
24	7.8	7.5	7.2	4.8	6.5	44	*88	276	35	10	5.4	7.0
25	7.6	8.1	7.5	*4.0	6.0	*48	72	257	33	10	5.7	7.0
26	7.8	8.0	7.5	3.8	5.8	42	68	228	31	9.8	5.9	6.8
27	8.6	7.7	7.5	3.5	5.5	30	65	213	27	8.2	7.2	6.5
28	8.4	7.5	7.4	3.4	5.5	29	61	204	24	8.0	7.2	7.2
29	8.4	7.5	7.0	3.0	5.4	27	59	193	22	7.5	7.5	7.8
30	8.6	7.4	5.7	2.4	------	25	58	173	21	7.8	11	8.5
31	9.0	-----	5.0	2.0	-------	24	-----	156	------	7.5	11	------
Total	233.4	232.9	188.4	167.1	155.2	416.7	1,669	4,952	1,792	476.8	239.7	234.4
Mean	7.53	7.76	6.08	5.39	5.35	13.4	55.6	160	59.7	15.4	7.73	7.81
Cfsm	0.121	0.125	0.098	0.087	0.086	0.215	0.894	2.57	0.960	0.248	0.124	0.126
In.	0.14	0.14	0.11	0.10	0.09	0.25	1.00	2.96	1.07	0.29	0.14	0.14
Ac-ft	463	462	374	331	308	827	3,310	9,820	3,550	946	475	465

Calendar year 1955:	Max	174	Min	1.0	Mean	26.2	Cfsm	0.421	In.	5.71	Ac-ft 18,970
Water year 1955-56:	Max	276	Min	2.0	Mean	29.4	Cfsm	0.473	In.	6.43	Ac-ft 21,330

Peak discharge (base, 75 cfs).--Mar. 23 (8:30 a.m.) 104 cfs (1.83 ft); Apr. 22 (12:30 a.m.) 116 cfs (1.93 ft); May 22 (1 a.m.) 293 cfs (2.64 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 11 to Mar. 22.

Hyalite Creek at Hyalite ranger station, near Bozeman, Mont.

Location.--Lat 45°33'40", long 111°04'10" in NW¼SE¼ sec. 23, T. 3 S., R. 5 E., on right bank three-quarters of a mile south of Hyalite ranger station, 7¾ miles south of Bozeman, and 20 miles upstream from mouth.

Drainage area.--48.4 sq mi.

Records available.--August 1895 to October 1900 and May 1902 to September 1903 (fragmentary), October to November 1904, September 1934 to September 1956. Published as Middle Creek near Bozeman 1895-1900, 1902-3.

Gage.--Water-stage recorder. Datum of gage is 5,539.6 ft above mean sea level, datum of 1929, supplementary adjustment of 1940. August 1895 to October 1900, May 1902 to September 1903, and October to November 1904 staff or wire-weight gages at site about half a mile upstream at different datum. Sept. 13, 1934, to May 13, 1948, water-stage recorder at site a quarter of a mile downstream at different datum.

Average discharge.--22 years, 57.0 cfs (41,270 acre-ft per year), adjusted for storage.

Extremes.--Maximum discharge during year, 516 cfs Mar. 28 (gage height, 2.36 ft); maximum gage height, 3.31 ft Dec. 31 (backwater from ice); minimum daily discharge, 7 cfs Jan. 31 to Feb. 2.

1895-1900, 1902-3, 1934-56: Maximum discharge observed, 956 cfs June 14, 1898 (gage height, 2.10 ft, site and datum then in use); minimum, 0.4 cfs Feb. 2, 1939 (gage height, 1.16 ft, site and datum then in use).

Remarks.--Records good except those for period of ice effect, which are poor. Flow regulated by Middle Creek Reservoir (capacity, 8,070 acre-ft) since March 1951 (see

Revisions (water years).--WSP 84: 1898-99.

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 8 to June 4, July 15 to Aug. 31)

1.0	12	1.5	70
1.1	17	1.7	135
1.2	24	2.0	290
1.3	34	2.5	670

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	28	33	10	8	7	13	17	34	128	128	113	40
2	28	34	10	8	7	13	17	36	120	120	105	40
3	27	*22	10	9	8	13	20	36	139	42	98	40
4	*27	21	10	10	8	13	17	36	279	87	92	39
5	29	20	10	11	9	14	17	42	385	87	87	37
6	29	23	11	12	10	14	26	47	*332	92	84	37
7	29	23	11	12	10	13	17	52	248	90	81	36
8	29	20	10	13	9	12	18	62	230	90	81	36
9	28	20	10	13	9	12	18	68	214	90	81	34
10	28	21	10	13	8	11	20	70	220	90	78	34
11	30	20	11	13	9	10	20	68	236	*92	70	36
12	29	18	11	14	10	9	20	62	248	95	68	36
13	29	17	11	14	10	9	23	44	230	95	68	*34
14	29	15	11	13	9	10	28	42	230	92	*70	34
15	29	14	*11	12	8	12	33	56	230	90	68	33
16	29	12	9	11	8	13	36	87	230	87	68	33
17	28	12	9	11	8	14	36	114	204	90	68	33
18	28	12	8	11	8	13	39	113	178	92	62	33
19	28	12	8	12	8	13	45	113	161	98	52	32
20	28	13	9	13	9	14	56	105	156	95	45	32
21	28	13	11	13	12	14	64	108	169	87	45	34
22	29	13	12	12	13	14	54	*148	156	87	47	32
23	29	13	12	12	*12	14	54	165	148	90	47	32
24	28	13	11	*11	12	17	48	169	144	105	47	31
25	28	12	11	11	12	18	39	183	139	109	45	31
26	29	12	12	10	11	19	*39	178	131	124	45	31
27	29	12	12	9	11	56	39	156	128	120	47	30
28	29	11	11	9	12	*110	39	161	128	120	47	31
29	28	11	10	8	12	18	37	139	128	120	45	31
30	29	11	9	8	-------	16	34	116	128	120	47	30
31	30	-------	8	7	-------	17	-------	124	-------	124	42	-------
Total	885	503	319	343	279	558	970	2,934	5,797	3,048	2,043	1,022
Mean	28.5	16.8	10.3	11.1	9.62	18.0	32.3	94.6	193	98.3	65.9	34.1
Ac-ft	1,760	998	633	680	553	1,110	1,920	5,820	11,500	6,050	4,050	2,030
(†)	-40	+130	+740	+470	+320	+320	+800	+1,370	+340	-2,760	-2,100	-180
	Adjusted for change in contents in Middle Creek Reservoir											
Mean	28.0	19.0	22.3	18.7	15.2	233	45.7	117	199	53.5	31.7	31.1
Cfsm	0.579	0.393	0.461	0.386	0.314	0.481	0.944	2.42	4.11	1.11	0.655	0.643
In.	0.67	0.44	0.53	0.45	0.34	0.55	1.05	2.79	4.59	1.27	0.76	0.72
Ac-ft	1,720	1,130	1,370	1,150	873	1,430	2,720	7,190	11,840	3,290	1,950	1,850

Observed

Calendar year 1955: Max 338 Min 7.4 Mean 57.3 Ac-ft 41,510
Water year 1955-56: Max 385 Min 7 Mean 51.1 Ac-ft 37,100

Adjusted

Calendar year 1955: Mean 56.1 Cfsm 1.16 In. 15.75 Ac-ft 40,640
Water year 1955-56: Mean 50.3 Cfsm 1.04 In. 14.16 Ac-ft 36,510

* Discharge measurement made on this day.

† Change in contents, in acre-feet, in Middle Creek Reservoir, furnished by Montana Water Conservation Board.

Note.--Stage-discharge relation affected by ice Nov. 12 to Mar. 16 (no gage-height record Jan. 1-13; discharge estimated on the basis of 1 discharge measurement, weather records, and records for nearby streams).

Gallatin River at Logan, Mont.

Location.--Lat 45°53', long 111°26', in NE¼ sec. 35, T. 2 N., R. 2 E., on right bank at highway bridge half a mile west of Logan and 5 miles upstream from mouth.

Drainage area.--1,805 sq mi.

Records available.--January 1895 to December 1898, January 1900 to December 1905, August 1928 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 4,082.3 ft above mean sea level, datum of 1929, supplementary adjustment of 1940. Prior to Aug. 10, 1928, staff or wire-weight gages at several sites within half a mile of present site at various datums. Aug. 10, 1928, to Oct. 7, 1941, wire-weight gage at present site and datum.

Average discharge.--32 years (1895-98, 1902-5, 1928-32, 1934-56), 949 cfs (687,000 acre-ft per year).

Extremes.--Maximum discharge during year, 7,190 cfs May 29 (gage height, 7.97 ft); maximum gage height, 8.83 ft Dec. 19 (backwater from ice); minimum discharge, 290 cfs July 25 (gage height, 2.64 ft).

1895-1905, 1928-56: Maximum discharge, 7,870 cfs June 5, 1948 (gage height, 8.40 ft); minimum observed, 130 cfs July 19, 1939 (gage height, 2.04 ft).

Flood of June 21, 1899, reached a stage of 6.25 ft, site and datum then in use (discharge, 9,840 cfs).

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of about 110,000 acres above station.

Revisions (water years).--WSP 1389: 1898-99, 1903, 1905, 1929(M), 1935-36(M), 1938-39(M), 1941(M).

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.6	285	5.0	2,320
3.0	470	6.0	3,780
3.5	760	8.0	7,240
4.0	1,170		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	550	654	781	500	500	600	1,050	1,170	6,000	654	357	582
2	550	*672	809	550	500	600	934	1,110	6,210	660	352	560
3	*550	802	774	600	500	600	878	1,100	6,180	636	348	560
4	545	809	753	600	550	600	894	1,130	5,890	600	366	570
5	555	732	725	650	550	550	1,170	1,200	5,690	570	366	576
6	570	690	802	650	550	550	942	1,290	5,120	545	381	570
7	570	666	760	600	550	550	870	1,330	3,970	525	397	565
8	570	666	760	600	550	550	926	1,440	3,080	505	413	565
9	555	704	725	600	600	550	974	1,670	3,000	490	429	565
10	540	732	732	650	650	550	1,060	1,820	3,030	*470	444	565
11	582	823	732	650	650	550	1,210	1,880	3,140	465	445	570
12	618	767	700	650	650	600	1,050	2,070	*2,990	465	445	606
13	594	725	650	650	600	600	1,040	1,950	2,720	445	430	*630
14	588	718	600	600	550	600	1,050	1,720	2,450	420	411	642
15	576	624	550	600	550	600	1,120	1,590	2,370	402	*406	594
16	576	600	*480	600	550	600	1,200	1,630	2,360	380	425	576
17	576	700	450	600	600	650	1,230	1,920	2,040	370	425	565
18	588	900	400	600	650	700	1,180	2,380	1,720	362	430	550
19	588	1,100	450	650	650	750	1,150	2,920	1,440	339	440	540
20	576	1,180	600	650	700	800	1,170	3,360	1,280	330	445	530
21	582	982	900	650	700	850	1,240	3,910	1,280	316	445	540
22	594	918	1,100	650	*650	950	1,460	4,740	1,250	316	440	545
23	630	823	1,000	650	600	1,200	*1,570	5,370	1,070	312	430	540
24	618	816	750	*650	600	2,300	1,500	5,670	998	303	445	535
25	600	802	650	600	600	*2,700	1,420	*6,140	1,030	308	475	530
26	606	809	500	600	600	2,070	1,330	6,270	950	339	490	525
27	624	795	450	550	600	1,280	1,340	6,230	870	339	525	525
28	636	788	400	500	600	1,020	1,300	6,410	795	334	525	540
29	636	774	400	500	600	998	1,250	7,010	732	339	530	550
30	654	788	400	500	------	1,230	1,200	6,900	684	357	555	550
31	684	------	450	500	------	1,290	------	6,180	------	375	570	------
Total	18,281	23,559	20,233	18,600	17,200	28,038	34,708	99,510	80,339	13,271	13,585	16,861
Mean	590	785	653	600	593	904	1,157	3,210	2,678	428	438	562
Ac-ft	36,260	46,730	40,130	36,890	34,120	55,610	68,840	197,400	159,400	26,320	26,950	33,440

Calendar year 1955: Max 3,780 Min 294 Mean 846 Ac-ft 612,600
Water year 1955-56: Max 7,010 Min 303 Mean 1,050 Ac-ft 762,100

Peak discharge (base, 2,700 cfs).--Mar. 25 (time and discharge unknown); May 29 (8 to 9 p.m.) 7,190 cfs (7.97 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 16-19, Dec. 12 to Mar. 25. No gage-height record Dec. 19, 21, Dec. 25 to Jan. 22, Jan. 29 to Feb. 7, Feb. 16-21, Feb. 25 to Mar. 25, Aug. 6-10; discharge estimated on basis of 4 discharge measurements, engineer's notes, weather records, and records for station near Gallatin Gateway.

Missouri River at Toston, Mont.

Location.--Lat 46°08'45", long 111°25'15", in NW¼ sec. 36, T. 5 N., R. 2 E., on left bank 2 miles southeast of Toston, 4½ miles upstream from Crow Creek, and 7 miles downstream from Sixteen Mile Creek.

Records available.--April 1910 to December 1916, April 1941 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 3,920 ft (from topographic map). Apr. 5, 1910, to Dec. 20, 1916, chain gage at bridge 2 miles downstream at different datum.

Average discharge.--15 years (1941-56), 5,077 cfs (3,676,000 acre-ft per year).

Extremes.--Maximum discharge during year, 25,100 cfs May 30 (gage height, 10.65 ft); minimum, 1,600 cfs about July 28 (gage height, 3.13 ft).

1910-16, 1941-56: Maximum discharge, 32,000 cfs June 6, 1948 (gage height, 11.77 ft); minimum, 562 cfs Apr. 30, 1941 (gage height, 1.68 ft); minimum daily, 1,100 cfs Feb. 10, 1914.

Remarks.--Records excellent except those for periods of ice effect or no gage-height record, which are poor. Some regulation by six reservoirs on tributaries (see p. 238). Diversions for irrigation of about 535,000 acres, of which 12,000 acres lie below station.

Revisions (water years).--WSP 1209: 1948.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

3.2	1,640	7.0	10,200
3.5	2,080	8.0	13,700
4.0	2,870	9.0	17,600
5.0	4,780	10.0	22,000
6.0	7,200	11.0	27,200

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3,140	3,800	4,220	3,200	1,900	3,260	5,460	6,530	22,800	3,700	2,000	2,340
2	3,160	*3,960	4,320	3,600	1,900	3,390	5,200	6,040	22,400	3,530	2,000	2,410
3	*3,190	4,300	4,000	4,000	2,000	3,500	4,960	5,720	22,000	3,680	2,100	2,370
4	3,300	4,510	3,720	4,200	2,200	3,440	4,850	5,650	21,600	3,960	2,100	2,410
5	3,340	4,510	3,140	4,400	2,300	3,460	5,000	5,720	20,800	4,220	2,100	2,450
6	3,120	4,510	2,970	4,400	2,400	3,350	4,780	5,950	19,800	4,440	2,100	2,500
7	3,120	4,590	3,370	4,400	2,500	3,190	4,590	6,140	18,000	4,490	2,200	2,610
8	3,140	4,550	3,350	4,400	2,600	3,020	4,590	6,300	15,100	4,340	2,300	2,870
9	3,140	4,490	3,390	4,400	2,800	3,190	4,570	6,920	12,100	*4,070	2,400	2,900
10	3,090	4,570	3,410	4,400	2,940	3,010	4,720	7,820	11,100	3,800	2,500	2,890
11	3,140	4,720	3,550	4,300	3,040	2,730	4,930	8,400	10,800	3,500	2,500	*2,940
12	3,180	4,240	3,880	4,200	3,060	2,810	4,910	9,060	*10,100	3,200	2,500	2,990
13	3,180	3,140	4,000	4,100	3,110	2,870	5,220	9,060	9,620	3,000	*2,400	3,160
14	3,140	2,500	3,000	4,000	3,180	3,090	5,670	8,640	9,000	2,800	2,300	3,300
15	3,140	2,040	2,800	3,800	3,140	3,110	6,320	7,960	8,310	2,600	2,200	3,190
16	3,180	2,000	*2,640	3,700	2,710	3,090	7,200	7,400	8,070	2,500	2,020	3,040
17	3,190	2,410	2,400	3,700	2,310	3,520	7,760	7,400	7,790	2,500	2,020	2,920
18	3,180	2,550	2,200	3,700	2,290	4,180	8,220	8,040	7,930	2,400	2,000	2,890
19	3,180	3,340	2,250	3,700	2,290	4,510	8,190	9,180	7,260	2,400	1,960	2,840
20	3,160	4,220	2,820	3,700	2,390	4,800	7,960	10,600	6,660	2,300	1,980	2,770
21	3,020	4,570	3,480	3,700	2,790	5,220	7,980	12,300	5,720	2,200	1,990	2,820
22	3,160	4,800	4,530	3,700	*2,990	5,970	8,310	14,300	5,490	2,100	1,940	2,790
23	3,370	4,460	6,430	*3,740	3,210	8,000	*8,700	16,600	5,200	2,000	1,920	2,770
24	3,480	4,510	4,960	3,600	3,370	10,000	8,820	*18,000	5,150	1,900	1,860	2,770
25	3,520	4,630	5,070	3,400	3,250	*9,800	8,760	19,300	5,200	1,800	1,880	2,790
26	3,520	4,590	4,850	3,100	3,230	8,550	8,400	21,100	5,200	1,700	1,920	2,850
27	3,500	4,140	5,040	2,800	3,300	7,620	7,870	21,500	4,760	1,700	1,960	2,840
28	3,500	3,900	4,700	2,600	3,140	6,370	7,310	22,000	4,420	1,700	2,000	2,890
29	3,500	3,940	4,280	2,400	3,210	5,950	7,060	24,000	4,180	1,700	2,020	2,970
30	3,600	4,020	3,880	2,200	------	5,670	6,820	24,800	3,920	1,800	2,140	3,060
31	3,700	------	3,300	2,000	------	5,720	------	*23,700	------	1,900	2,230	------
Total	101,280	118,510	115,950	113,540	79,550	146,390	195,130	366,130	320,480	87,930	65,540	84,340
Mean	3,267	3,950	3,740	3,663	2,743	4,722	6,504	11,810	10,680	2,836	2,114	2,811
Ac-ft	200,900	235,100	230,000	225,200	157,800	290,400	387,000	726,200	635,700	174,400	130,000	167,300

Calendar year 1955: Max 13,800 Min 1,600 Mean 3,877 Ac-ft 2,807,000
Water year 1955-56: Max 24,800 Min 1,700 Mean 4,904 Ac-ft 3,560,000

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Dec. 14-18, Jan. 1 to Feb. 9. No gage-height record Oct. 27 to Nov. 1, Jan. 4 to Feb. 5, Mar. 23, 24, July 10 to Aug. 15; discharge estimated on basis of 3 discharge measurements, weather records, and records for stations upstream.

Canyon Ferry Reservoir near Helena, Mont.

Location.--Lat 46°39'00", long 111°43'40", in SE¼SE¼ sec. 4, T. 10 N., R. 1 W., in block 17 of Canyon Ferry Dam, 15 miles east of Helena.

Drainage area.--15,860 sq mi (approximately).

Records available.--April 1953 to September 1956. Records of month-end contents in Lake Sewell available September 1939 to March 1953. Old Canyon Ferry Dam was submerged by the present reservoir Apr. 8, 1953.

Gage.--Water-stage recorder in powerhouse control room. Datum of gage is at mean sea level (levels by Bureau of Reclamation).

Extremes.--Maximum daily contents during year, 2,043,000 acre-ft July 2, 5, 6, 8 (elevation, 3,800.00 ft); minimum daily, 1,474,000 acre-ft Mar. 17 (elevation, 3,782.37 ft).
1953-56: Maximum daily contents, 2,043,000 acre-ft July 15-29, 31, 1955, July 2, 5, 6, 8, 1956 (elevation, 3,800.00 ft); storage began March 1953.

Remarks.--Reservoir is formed by concrete dam; construction began in 1949, completed in 1953. Storage began in March 1953. Capacity, 2,043,000 acre-ft at controlled spillway elevation (3,800 ft) exclusive of dead storage (8,000 acre-ft) below elevation 3,650 ft. Minimum operating level, 3,728 ft for on-site power generation (contents, 428,000 acre-ft, exclusive of dead storage). Figures given herein represent usable contents above elevation 3,650 ft. Water is used for power production, flood control and irrigation.

Cooperation.--Month-end elevations and capacity table furnished by Bureau of Reclamation.

Month-end elevation and usable contents, water year October 1955 to September 1956

Date	Elevation (feet)†	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	3,794.79	1,867,000	-
Oct. 31	3,792.69	1,796,000	-71,000
Nov. 30	3,791.85	1,768,000	-28,000
Dec. 31	3,790.29	1,715,000	-53,000
Calendar year 1955	-	-	+328,000
Jan. 31	3,788.04	1,646,000	-69,000
Feb. 29	3,784.09	1,526,000	-120,000
Mar. 31	3,785.94	1,582,000	+56,000
Apr. 30	3,787.72	1,637,000	+55,000
May 31	3,796.03	1,909,000	+272,000
June 30	3,799.91	2,040,000	+131,000
July 31	3,797.95	1,974,000	-66,000
Aug. 31	3,794.15	1,846,000	-128,000
Sept. 30	3,791.91	1,770,000	-76,000
Water year 1955-56	-	-	-97,000

† Mean daily elevation based on readings made at 4-hour intervals.

Prickly Pear Creek near Clancy, Mont.

Location (revised).--Lat 46°31'05", long 111°56'45", in NE¼SW¼ sec. 23, T. 9 N., R. 3 W., on right bank 100 ft upstream from bridge on U. S. Highway 91, 3½ miles downstream from Lump Gulch Creek, 4 miles northeast of Clancy, and 7 miles southeast of Helena.

Records available.--July 1908 to January 1909 (gage heights only), January to April 1909, July 1910 to September 1916, July 1921 to August 1933, October 1945 to October 1953, October 1954 to September 1956. Few winter records in earlier years.

Gage.--Water-stage recorder. Datum of gage is 4,067.1 ft above mean sea level, datum of 1929. Prior to July 12, 1910, staff gage at site 1¼ miles upstream at different datum. July 12, 1910, to Sept. 30, 1916, and July 28, 1921, to Aug. 12, 1933, staff gage at site 2¼ miles upstream at different datum.

Average discharge.--10 years (1945-53, 1954-56), 46.8 cfs (33,880 acre-ft per year).

Extremes.--Maximum discharge during year, 180 cfs Mar. 23, May 22 (gage height, 3.05 ft); maximum gage height, 3.95 ft Feb. 23 (backwater from ice); minimum daily discharge, 8.8 cfs Aug. 25.

1908-9, 1910-16, 1921-33, 1945-53, 1954-56: Maximum discharge, 586 cfs June 5, 1948 (gage height, 6.35 ft); minimum, 2.3 cfs Feb. 4, 1955.

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of about 700 acres above station.

Revisions (water years).--WSP 1086: 1946(m).

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.9	8.5	1.8	56
1.0	12	2.0	72
1.2	20	2.5	120
1.4	30	3.0	174
1.6	42		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	22	20	17	21	14	30	40	48	101	30	*16	14
2	22	19	17	22	14	29	34	48	96	32	15	12
3	21	20	16	23	15	28	35	48	90	38	15	12
4	21	20	16	24	15	27	36	48	87	40	14	12
5	20	24	15	24	16	26	37	46	80	37	14	12
6	20	21	15	24	17	25	31	50	73	37	14	12
7	20	20	15	23	18	24	32	49	68	35	15	12
8	20	20	15	22	18	22	32	56	64	32	16	12
9	19	20	15	21	17	20	34	98	60	29	16	14
10	19	20	15	20	17	19	40	120	55	27	16	12
11	20	18	15	21	16	18	35	110	52	30	14	12
12	*19	16	16	22	15	17	35	90	49	34	14	12
13	19	14	16	22	15	16	40	84	48	30	13	12
14	18	13	16	21	15	16	45	79	48	24	12	11
15	18	12	16	20	15	17	49	79	50	24	12	10
16	18	14	16	20	16	18	57	93	78	22	11	10
17	18	15	16	20	16	21	62	112	76	22	11	10
18	18	16	18	21	17	24	57	*130	62	21	12	10
19	18	17	20	22	18	27	53	142	55	19	12	10
20	18	18	22	*23	20	31	56	154	50	18	12	10
21	18	20	*25	23	22	35	62	*164	51	17	11	11
22	18	*22	26	24	23	46	63	166	48	16	10	11
23	19	24	27	24	23	90	*59	164	44	16	9.4	11
24	20	22	26	23	*24	112	60	165	50	15	9.1	11
25	20	20	25	22	25	95	57	155	*50	14	8.8	11
26	20	18	24	21	26	71	58	141	43	14	9.1	11
27	20	18	23	20	27	49	53	145	40	15	*12	11
28	19	18	23	18	28	*42	50	141	37	17	13	12
29	19	18	22	17	29	40	48	*138	33	18	13	13
30	20	17	21	16	------	43	48	121	31	18	13	13
31	20	------	21	15	------	46	------	110	------	17	14	------
Total	601	554	590	659	551	1,124	1,398	3,294	1,769	758	396.4	346
Mean	19.4	18.5	19.0	21.3	19.0	36.3	46.6	106	59.0	24.5	12.8	11.5
Ac-ft	1,190	1,100	1,170	1,310	1,090	2,230	2,770	6,530	3,510	1,500	786	686

Calendar year 1955:	Max	198	Min	9	Mean	39.3	Ac-ft	28,480
Water year 1955-56:	Max	166	Min	8.8	Mean	32.9	Ac-ft	23,870

Peak discharge (base, 140 cfs).--Mar. 23 (7:30 a.m.) 180 cfs (3.05 ft); May 22 (4:30 a.m.) 180 cfs (3.05 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 10-24, Nov. 27 to Mar. 23.

Tenmile Creek near Rimini, Mont.

Location.--Lat 46°32', long 112°15', in NE¼ sec. 20, T. 9 N., R. 5 W., on left bank at Moose Creek ranger station, 500 ft upstream from Moose Creek and 3 miles north of Rimini.

Drainage area.--34 sq mi, approximately.

Records available.--March 1915 to September 1956 (few winter records prior to 1935).

Gage.--Water-stage recorder and Cippoletti weir. Altitude of gage is 4,870 ft (by barometer). Prior to Dec. 17, 1934, at site 40 ft downstream at different datum and different control.

Average discharge.--26 years (1916-18, 1920-21, 1923-24, 1934-56), 18.1 cfs (13,100 acre-ft per year).

Extremes.--Maximum discharge during year, 219 cfs May 20 (gage height, 2.73 ft); minimum, 0.2 cfs Nov. 12, Aug. 24, Sept. 14-20, 23-27.
1915-56: Maximum discharge, 948 cfs May 15, 1917 (gage height, 4.87 ft, site and datum then in use); no flow at times.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Flow regulated by Chessman Reservoir on tributary above station (capacity, 1,750 acre-ft). Small diversion above station for water supply for city of Helena.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.9	0.1	1.6	9.0
1.0	.4	1.7	14
1.1	.9	1.8	22
1.2	1.4	2.0	44
1.3	2.1	2.2	71
1.4	3.0	2.5	139
1.5	5.0	3.0	325

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.5	0.6	1.1	1.2	b0.6	0.7	3.3	16	67	5.0	*0.5	0.4
2	.5	.5	1.1	1.2	b.6	.7	2.4	16	63	5.8	.5	.4
3	.5	.6	1.1	1.1	b.7	.7	1.9	14	53	6.6	.5	.4
4	.5	.8	1.1	1.1	b.7	.7	1.7	13	*45	5.0	.5	.4
5	.5	1.0	1.1	1.0	b.7	.7	1.9	14	40	4.7	.5	.4
6	.5	.7	1.1	1.0	.8	.7	1.9	17	36	5.0	.5	.4
7	.4	.7	1.1	1.0	.8	.7	1.7	20	29	4.4	.5	.4
8	.4	.7	1.0	.9	.8	.7	1.8	34	24	4.0	.5	.3
9	.4	.7	1.1	.9	.8	.7	2.8	60	19	4.4	.5	.4
10	.5	b.7	1.0	.9	.8	.7	4.7	67	14	4.0	.5	.3
11	.5	a.3	1.0	.9	.8	.7	2.9	65	12	3.1	.5	.3
12	*.4	a.2	1.1	.8	.8	.8	2.6	56	10	1.3	.4	.4
13	.4	a.3	1.2	.8	.8	.7	6.6	53	8.6	1.1	.4	.4
14	.4	a.4	1.0	b.8	.8	.7	12	54	7.8	1.0	.4	.3
15	.4	a.5	.9	b.8	b.8	.7	19	61	9.0	1.0	.4	.3
16	.4	a.5	b.9	b.8	b.8	.7	25	85	25	.9	.4	.2
17	.5	a.7	b.9	b.8	b.8	.8	33	110	18	.9	.4	.3
18	.4	a.9	b.8	b.7	.8	.8	28	*149	14	.8	.4	.2
19	.4	a1.0	b.8	b.7	.8	.9	30	158	12	.8	.4	.2
20	.5	a1.0	b.7	*b.8	.8	1.1	37	171	11	.7	.4	.2
21	.4	a1.0	*b.7	b.8	.8	1.1	40	185	12	.7	.3	.3
22	.5	*1.2	b1.4	b.8	.8	1.3	37	174	10	.6	.3	.3
23	.5	1.1	2.3	b.8	.8	1.9	*30	158	9.0	.6	.3	.2
24	.7	1.1	2.4	b.8	*.7	2.8	28	155	14	.5	.3	.2
25	.5	1.0	2.0	b.7	.7	4.4	23	142	*10	.5	.4	.2
26	.5	1.3	1.6	b.7	.7	7.4	22	139	8.6	.5	.5	.2
27	.5	1.1	1.5	b.7	.7	4.4	20	136	7.8	.6	*.6	.2
28	.5	1.0	1.3	b.7	.7	*3.3	19	134	6.2	.6	.4	.4
29	.5	1.0	1.2	b.7	.7	3.1	18	*115	5.8	.7	.5	.4
30	.5	1.0	1.2	b.7	------	3.4	17	96	5.0	.6	.8	.3
31	.5	------	1.2	b.7	------	4.0	------	78	------	.5	.5	------
Total	14.6	23.6	36.9	26.3	21.9	52.0	474.2	2,745	605.8	63.9	14.0	9.3
Mean	0.47	0.79	1.19	0.85	0.76	1.68	15.8	88.5	20.2	2.16	0.45	0.31
Ac-ft	29	47	73	52	43	103	941	5,440	1,200	133	28	18

Calendar year 1955: Max 128 Min 0.2 Mean 15.3 Ac-ft 11,080
Water year 1955-56: Max 185 Min 0.2 Mean 11.2 Ac-ft 8,110

Peak discharge (base, 80 cfs).--May 20 (9 p.m.) 219 cfs (2.73 ft).

* Discharge measurement made on this day.

a No gage-height record (stage-discharge relation affected by ice during most of period); discharge estimated on basis of 1 discharge measurement, weather records, and records for nearby stations.

b Stage-discharge relation affected by ice.

Missouri River below Holter Dam, near Wolf Creek, Mont.

Location.--Lat 46°59'40", long 112°00'50", in S½ sec. 5, T. 14 N., R. 3 W., on left bank a quarter of a mile downstream from Holter Dam and 3 miles southeast of Wolf Creek.

Records available.--October 1945 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 3,470 ft (from topographic map).

Average discharge.--11 years, 5,212 cfs (3,773,000 acre-ft per year).

Extremes.--1953-54: Maximum daily discharge during water year, 5,500 cfs Jan. 2; minimum daily, 880 cfs July 2.

1954-55: Maximum daily discharge during water year, 6,720 cfs July 18; minimum daily, 830 cfs May 22.

1955-56: Maximum discharge during water year, 25,500 cfs June 2 (gage height, 9.48 ft); minimum daily, 2,790 cfs Apr. 6.

1946-56: Maximum discharge, 34,800 cfs June 8, 1948 (gage height, 11.70 ft); minimum daily, that of May 22, 1955.

Remarks.--Records good. Diversions for irrigation of about 574,000 acres above station. Flow regulated by nine smaller irrigation reservoirs and powerplants (see p. 238) and Canyon Ferry Reservoir (see p. 44).

Cooperation.--Records Jan. 1, 1954, to Sept. 30, 1955 furnished by The Montana Power Co.

Rating table, period Oct. 1, to Dec. 31, 1953 and water year 1955-56 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 2 to July 18, Aug. 17 to Sept. 30, 1956)

0.0	400	6.0	13,200
2.0	3,070	8.0	20,300
4.0	7,370	9.0	24,100

Discharge, in cubic feet per second, water year October 1953 to September 1954

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,240	3,500	4,410	2,650	4,800	4,400	4,200	3,000	2,000	1,800	2,400	2,000
2	1,580	3,660	4,840	5,500	4,790	4,400	4,190	3,000	2,000	880	2,400	1,000
3	2,530	3,690	4,800	4,850	4,800	4,400	4,500	3,000	1,500	1,000	2,400	1,000
4	2,530	3,680	3,670	4,800	4,400	4,000	4,200	3,000	1,000	1,000	2,500	1,000
5	2,500	3,480	3,800	4,570	3,800	3,200	4,200	3,000	1,000	1,060	2,100	2,000
6	2,510	2,480	4,690	4,800	4,200	3,800	4,200	2,770	1,000	2,000	1,700	2,000
7	2,550	3,300	4,310	4,800	4,000	3,800	4,200	2,000	2,000	2,200	2,500	2,400
8	2,460	3,630	4,340	4,000	4,000	3,800	3,200	3,000	2,000	2,200	2,500	2,500
9	2,180	3,580	4,400	4,800	4,000	3,800	1,800	3,000	2,000	1,500	2,500	2,500
10	2,550	3,720	4,390	4,800	4,590	3,800	3,400	3,000	1,790	1,500	2,500	1,200
11	2,800	3,760	3,380	5,000	4,600	3,600	3,400	2,800	1,000	2,300	2,520	3,000
12	2,740	3,640	4,380	4,800	4,200	3,000	3,400	2,800	1,000	2,800	2,100	3,000
13	2,720	2,550	4,580	4,800	4,600	3,800	3,400	2,400	1,000	3,000	1,800	3,000
14	2,710	3,600	4,650	5,000	4,600	3,850	3,400	1,500	1,700	3,000	2,400	3,000
15	2,520	3,830	4,660	4,600	4,400	4,400	3,400	2,500	2,000	2,500	2,400	3,200
16	1,950	3,850	4,620	4,800	4,200	4,400	2,000	2,490	2,000	2,000	2,500	2,800
17	2,750	3,900	4,640	4,800	4,400	4,200	3,200	2,400	2,000	3,500	2,500	1,600
18	2,700	3,860	3,650	4,800	4,200	3,800	3,200	2,300	1,030	3,800	2,500	3,000
19	2,960	3,680	4,700	4,800	3,800	3,000	3,000	2,000	1,000	3,600	1,800	3,000
20	3,300	2,550	4,720	4,800	4,400	4,200	3,000	1,300	1,200	3,600	1,200	3,000
21	3,270	3,840	4,760	4,800	4,400	4,200	3,000	1,000	2,500	3,600	1,000	3,000
22	3,090	3,870	4,720	4,400	4,400	4,400	2,800	1,000	2,500	3,000	1,410	3,200
23	2,370	3,810	3,720	4,800	4,190	4,400	1,600	1,000	2,020	2,020	2,000	2,800
24	3,320	3,840	4,030	4,800	4,000	4,400	2,800	1,910	1,020	3,600	2,000	1,400
25	3,280	3,880	3,690	4,800	3,980	4,000	3,000	2,000	1,020	3,600	1,600	3,000
26	3,300	3,890	4,660	4,800	3,200	3,400	3,000	2,000	1,030	3,600	1,200	3,000
27	2,920	3,330	4,610	4,720	3,800	4,500	3,000	1,070	1,000	3,000	1,000	3,200
28	2,880	4,110	4,720	4,600	3,800	4,500	3,000	1,000	1,940	2,500	1,000	3,200
29	3,050	4,830	4,760	4,000	-	4,690	2,800	1,000	2,000	2,000	1,000	3,200
30	2,300	4,980	3,730	4,800	------	4,640	2,000	1,000	2,070	1,500	1,600	2,800
31	3,460	------	4,120	4,800	------	4,500	------	2,000	------	2,400	2,000	------
Total	84,020	110,320	135,150	145,090	118,550	125,280	96,490	66,240	47,320	76,060	61,030	75,000
Mean	2,710	3,677	4,360	4,680	4,234	4,041	3,216	2,137	1,577	2,454	1,969	2,500
Ac-ft	166,700	218,800	268,100	287,800	235,100	248,500	191,400	131,400	93,860	150,900	121,100	148,800

Calendar year 1953:	Max	10,800	Min	1,540	Mean	3,881	Ac-ft	2,810,000
Water year 1953-54:	Max	5,500	Min	880	Mean	3,125	Ac-ft	2,262,000

Missouri River below Holter Dam, near Wolf Creek, Mont.--Continued

Discharge, in cubic feet per second, water year October 1954 to September 1955

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,200	4,000	4,860	4,600	4,300	4,200	2,000	3,400	1,500	2,130	4,000	3,400
2	3,000	4,000	4,000	4,600	4,400	4,200	3,500	3,400	1,000	2,020	4,250	2,400
3	3,000	4,270	2,600	4,600	4,000	4,000	3,500	3,400	1,060	3,010	4,400	2,400
4	3,300	3,800	4,370	4,800	3,600	4,400	3,500	3,200	1,380	3,010	4,200	4,000
5	3,300	2,500	4,400	4,830	4,400	4,400	3,200	2,800	1,410	2,600	3,400	4,000
6	3,300	4,200	4,500	4,700	4,400	4,200	3,200	1,600	1,340	2,600	4,400	4,000
7	3,000	4,200	4,500	3,600	4,400	4,200	2,800	3,200	1,480	2,600	4,400	4,000
8	2,000	4,300	4,500	4,600	4,400	4,200	2,500	3,200	1,480	1,500	4,400	4,000
9	3,300	4,100	4,200	4,600	4,800	3,800	3,000	3,200	1,000	2,010	4,400	3,600
10	3,300	4,100	3,030	4,600	4,000	3,500	3,000	3,200	1,000	2,600	4,400	4,400
11	3,300	3,800	4,500	4,600	4,000	3,200	3,000	3,200	1,000	2,800	3,800	4,400
12	3,300	2,700	4,500	4,600	4,600	3,600	3,000	2,600	1,000	3,350	3,000	4,400
13	3,300	4,300	4,500	3,600	4,400	4,000	3,500	1,600	970	3,000	4,350	4,400
14	3,000	4,300	4,600	3,600	4,030	4,000	2,800	2,800	1,500	3,320	4,400	4,400
15	2,000	4,300	4,600	4,500	4,000	4,000	2,300	2,500	1,500	4,960	4,400	4,400
16	3,490	4,300	4,000	4,400	4,000	3,980	3,500	2,000	1,000	5,850	4,400	3,800
17	3,500	4,300	3,400	4,400	3,600	3,800	3,500	2,000	1,250	6,270	4,400	4,500
18	3,500	3,600	4,700	4,400	3,600	3,200	3,500	1,700	1,000	6,720	3,600	4,500
19	3,500	2,400	4,700	4,400	4,200	4,000	3,500	1,600	940	6,060	2,800	4,500
20	3,500	4,300	4,700	4,000	4,200	4,000	3,500	1,600	1,750	5,220	4,000	4,500
21	3,000	4,300	4,700	3,600	4,200	4,000	3,000	1,030	1,500	4,340	4,000	4,500
22	2,400	4,300	4,700	4,500	4,400	4,200	2,200	830	2,000	4,270	4,000	4,500
23	3,500	3,600	3,800	4,500	4,390	4,530	3,270	1,000	1,620	3,500	4,000	4,500
24	3,500	4,300	3,600	4,500	4,400	4,800	3,500	900	2,000	4,000	4,000	3,700
25	3,700	3,800	4,700	4,400	4,000	4,400	3,500	1,000	2,000	4,000	3,400	4,700
26	3,800	2,470	4,740	4,400	4,400	4,150	3,500	1,070	2,140	4,000	2,400	4,700
27	3,800	4,300	5,000	4,000	4,400	3,800	3,500	1,500	2,810	4,000	4,000	4,600
28	3,200	4,400	5,070	3,500	4,400	3,800	3,500	1,070	2,830	3,600	3,790	4,600
29	2,400	4,400	5,600	4,400	-	3,800	2,000	930	2,500	2,760	4,000	4,650
30	4,020	4,690	4,000	4,380	------	3,400	3,400	930	2,040	4,740	4,000	4,600
31	4,000	------	4,000	4,400	------	2,600	------	1,500	------	3,880	4,000	------
Total	98,410	118,330	135,070	134,610	117,920	122,360	93,670	63,960	46,000	114,720	122,990	125,050
Mean	3,175	3,944	4,357	4,342	4,211	3,947	3,122	2,063	1,533	3,701	3,967	4,168
Ac-ft	195,200	234,700	267,900	267,000	233,900	242,700	185,800	126,900	91,240	227,500	243,900	248,000

Calendar year 1954: Max 5,600 Min 880 Mean 3,186 Ac-ft 2,307,000
Water year 1954-55: Max 6,720 Min 830 Mean 3,543 Ac-ft 2,565,000

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4,430	4,840	4,960	5,120	5,500	4,980	4,020	7,450	22,600	4,030	4,310	3,030
2	4,450	4,920	5,180	5,110	5,250	4,960	4,060	7,840	23,400	3,360	4,030	4,130
3	4,610	4,880	5,160	5,160	5,040	*5,270	3,960	7,240	17,200	4,330	3,460	4,270
4	4,630	4,880	5,180	5,190	5,310	5,310	4,090	6,660	*16,100	4,330	4,290	4,260
5	*4,600	4,810	5,190	5,250	5,320	5,460	3,390	6,580	13,900	*3,960	4,340	4,260
6	4,870	5,020	5,130	5,250	5,110	5,260	2,790	6,560	11,400	3,970	4,310	4,120
7	4,980	4,840	5,160	5,160	5,100	5,310	4,050	6,660	13,400	4,380	4,290	3,270
8	*4,950	4,900	4,930	5,240	5,320	5,130	3,930	6,730	*15,500	4,270	4,270	4,190
9	4,760	4,920	5,010	5,170	5,200	5,400	4,000	6,740	10,800	4,230	4,120	4,280
10	4,840	4,770	5,180	5,180	5,080	5,300	5,140	6,900	10,500	*4,230	3,470	*4,440
11	4,880	4,860	5,180	5,250	5,070	5,440	*6,090	*6,840	13,000	4,220	4,290	4,390
12	*4,830	4,790	5,130	5,250	5,320	5,330	5,350	6,900	10,300	3,780	4,280	4,400
13	4,750	5,090	5,220	5,250	5,510	5,380	4,970	6,100	6,450	3,800	4,290	4,170
14	4,910	5,990	5,120	5,300	5,540	5,240	5,200	6,900	4,700	4,490	4,280	3,560
15	5,060	6,050	5,150	5,480	5,650	5,190	5,380	6,840	4,910	4,580	4,270	4,270
16	4,860	5,150	5,120	5,480	5,530	4,700	5,090	6,740	3,820	4,230	4,070	4,330
17	4,820	5,100	5,150	5,180	5,290	4,880	5,040	7,050	3,760	4,180	3,380	4,480
18	4,890	4,810	5,240	5,080	5,300	4,950	5,020	7,010	4,960	4,230	3,860	4,390
19	4,870	5,170	5,200	5,080	5,310	4,860	6,720	7,040	4,810	3,040	4,140	4,420
20	4,880	5,110	5,140	5,260	5,260	4,870	7,800	6,320	5,800	3,100	4,190	4,370
21	4,920	4,850	4,910	5,260	5,300	4,800	7,860	7,200	5,040	4,010	*4,190	3,830
22	4,990	4,970	4,690	5,280	5,340	4,880	8,420	7,220	5,070	4,000	4,120	4,430
23	4,880	5,320	4,820	5,380	5,090	3,670	7,220	7,140	3,900	4,140	3,750	4,440
24	4,890	5,010	4,860	*5,240	5,130	3,980	7,320	7,240	4,170	4,280	3,470	4,450
25	4,900	4,730	5,160	5,220	5,360	4,030	7,400	7,020	5,840	4,340	4,030	4,460
26	4,960	5,320	4,900	5,520	5,280	3,960	7,380	6,790	5,470	*4,200	4,230	4,460
27	4,920	5,280	5,170	5,480	5,290	5,100	7,400	6,390	5,340	3,370	4,230	4,460
28	4,940	5,280	5,210	5,560	5,320	4,420	7,400	11,400	5,630	4,360	4,240	4,360
29	4,900	5,080	4,950	5,550	5,320	4,020	7,420	14,900	5,570	4,420	4,330	4,410
30	4,980	5,100	4,950	5,430	------	3,100	7,420	17,100	4,160	4,280	3,950	4,480
31	4,930	------	4,980	5,500	------	3,630	------	21,100	------	4,280	3,000	------
Total	150,080	151,840	157,330	163,860	153,440	148,810	171,330	250,600	267,500	126,420	125,480	126,810
Mean	4,841	5,061	5,075	5,286	5,291	4,800	5,711	8,084	8,917	4,078	4,048	4,227
Ac-ft	297,700	301,200	312,100	325,000	304,300	295,200	339,800	497,100	530,600	250,800	248,900	251,500

Calendar year 1955: Max 6,720 Min 830 Mean 3,837 Ac-ft 2,778,000
Water year 1955-56: Max 23,400 Min 2,790 Mean 5,447 Ac-ft 3,954,000

* Discharge measurement made on this day.

Dearborn River near Craig, Mont.

Location.--Lat 47°12', long 112°05', in SE¼ sec. 27, T. 17 N., R. 4 W., on right bank 20 ft upstream from bridge on State Highway 33, 5 miles downstream from South Fork, 10 miles northwest of Craig, and 12 miles upstream from mouth.

Records available.--October 1945 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 3,440 ft (by barometer). Prior to Oct. 1, 1946, wire-weight gage at present site and datum.

Average discharge.--11 years, 225 cfs (162,900 acre-ft per year).

Extremes.--Maximum discharge during year, 1,080 cfs May 22 (gage height, 4.75 ft); maximum gage height, 5.06 ft Dec. 22 (backwater from ice); minimum discharge observed, 12 cfs Aug. 2.

1945-56: Maximum discharge, 7,960 cfs June 4, 1953 (gage height, 9.58 ft); minimum observed, that of Aug. 2, 1956.

Remarks.--Records poor. Diversions for irrigation of about 9,000 acres, of which 6,600 acres lie below station.

Rating table, water year 1955-56, except periods of ice effect or backwater from beaver dams (gage height, in feet, and discharge, in cubic feet per second) (Shifting-control method used Oct. 1 to Nov. 1, Nov. 3-11, Aug. 3 to Sept. 15)

2.3	7	3.0	123
2.4	13	3.5	290
2.5	23	4.0	540
2.7	55	5.0	1,220

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	34	71	45	100	30	60	106	190	639	116	17	18
2	34	70	45	110	30	65	98	198	704	91	12	16
3	35	71	40	130	40	70	98	194	665	187	[illegible]	19
4	34	69	40	150	50	65	103	190	632	145	23	21
5	35	73	40	150	60	60	106	187	620	174	21	23
6	32	73	45	130	*50	55	100	194	522	147	23	23
7	34	69	50	110	45	50	103	226	425	134	24	21
8	*29	65	60	110	45	55	103	306	385	120	22	19
9	28	69	70	100	50	60	106	410	380	150	18	19
10	28	71	75	100	55	50	113	528	410	123	15	*19
11	28	61	80	110	60	50	113	600	425	123	15	18
12	26	30	90	100	60	50	116	594	380	100	16	20
13	24	25	70	90	50	55	118	534	*322	100	18	21
14	26	25	50	70	40	60	136	486	294	96	22	20
15	26	20	40	60	35	65	156	474	298	59	20	21
16	29	25	40	50	30	80	177	469	370	80	17	21
17	46	30	35	50	35	95	198	698	400	59	18	20
18	57	30	35	60	40	160	198	847	348	43	18	20
19	61	40	40	70	45	200	201	916	330	43	17	19
20	50	90	50	75	60	195	218	*951	294	61	19	19
21	41	*75	100	80	80	150	258	1,030	270	63	*20	18
22	41	60	300	80	75	115	298	1,030	246	63	14	17
23	40	50	*350	80	60	103	294	972	222	57	15	17
24	38	50	330	80	50	120	270	937	212	*59	17	16
25	36	60	300	70	45	126	243	888	201	50	19	16
26	40	60	250	60	45	126	*232	840	*177	48	24	16
27	53	50	200	50	*45	*110	*226	814	168	40	24	17
28	65	40	150	40	50	103	212	750	156	34	14	17
29	67	40	120	35	55	100	204	756	145	26	14	17
30	67	40	100	30	------	103	198	678	128	24	21	17
31	73	------	90	30	------	110	------	606	------	21	20	------
Total	1,257	1,602	3,330	2,560	1,415	2,866	5,102	18,493	10,768	2,636	595	565
Mean	40.5	53.4	107	82.6	48.8	92.5	170	597	359	85.0	19.2	18.8
Ac-ft	2,490	3,180	6,600	5,080	2,810	5,680	10,120	36,680	21,360	5,230	1,180	1,120

Calendar year 1955:	Max 1,760	Min 20	Mean 192	Ac-ft 138,800
Water year 1955-56:	Max 1,030	Min 12	Mean 140	Ac-ft 101,500

Peak discharge (base, 600 cfs).--May 22 (6 to 7 a.m.) 1,080 cfs (4.75 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 2, Nov. 12 to Mar. 22. Doubtful gage-height record Oct. 1 to Nov. 11, Mar. 23 to June 30; discharge computed on basis of 7 discharge measurements and reconstucted gage-height graph. Discharge computed from once-daily staff-gage readings July 1 to Aug. 29. Stage-discharge relation affected by backwater from beaver dams Sept. 16-30; discharge computed on basis of gage-height record and weather records.

Newland Creek near dam site, near White Sulphur Springs, Mont.

Location.--Lat 46°38', long 110°57', in NW¼ sec. 14, T. 10 N., R. 6 E., on right bank 50 ft upstream from farm bridge, 4 miles downstream from U. S. Highway 89, and 6 miles north of White Sulphur Springs.

Records available.--August 1950 to September 1956.

Gage.--Wire-weight gage read once daily. Altitude of gage is 5,100 ft (by barometer). Prior to June 14, 1951, staff gage at site 50 ft downstream at datum 0.52 ft lower.

Average discharge.--6 years, 9.79 cfs (7,090 acre-ft per year).

Extremes.--Maximum discharge observed during year, 43 cfs Mar. 25 (gage height, 1.33 ft); minimum daily, 1.0 cfs at times.

1950-56: Maximum discharge, 227 cfs June 5, 1953 (gage height, 3.83 ft, from graph based on gage readings); minimum daily, 0.6 cfs Mar. 7, 1953.

Remarks.--Records poor. Diversions for irrigation of about 200 acres above station. Flow may be supplemented by diversion from Sheep Creek, in sec. 26, T. 12 N., R. 7 E., which enters 8 miles upstream.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Feb. 23, Mar. 22 to Apr. 28, May 13-26)

0.6	4.4	1.0	18
.7	6.7	1.5	42
.8	10	2.0	71

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.3	7.4	3.5	2.5	1.0	1.6	15	20	22	17	13	12
2	9.3	6.2	3.2	2.5	1.0	1.7	8.0	19	22	17	12	11
3	*9.3	5.8	3.0	2.5	1.2	2.0	5.8	19	21	17	12	11
4	9.3	5.8	3.0	2.7	1.3	1.8	*12	18	21	17	12	11
5	9.3	5.8	3.0	2.9	1.5	1.6	11	19	21	18	12	11
6	10	4.9	3.3	3.0	1.5	1.5	9.7	19	22	15	12	10
7	10	4.9	3.3	3.0	1.5	1.5	6.5	19	22	15	16	10
8	10	5.0	3.2	3.0	1.5	1.5	12	*20	21	17	14	10
9	10	5.0	3.0	2.8	1.5	1.5	12	20	21	16	13	10
10	10	4.9	3.0	2.5	1.5	1.0	20	23	19	17	13	9.7
11	10	4.9	3.2	2.5	1.5	1.0	16	28	19	18	13	9.7
12	10	4.5	*3.4	2.7	1.5	1.2	16	28	20	18	12	9.7
13	10	3.5	3.5	2.9	1.4	1.5	20	30	20	17	12	9.7
14	10	3.0	3.0	2.7	1.2	1.5	21	30	20	15	11	9.7
15	10	3.0	2.5	2.0	1.0	1.5	24	30	20	14	11	9.0
16	9.3	3.5	2.5	1.7	1.0	1.6	25	30	20	14	11	8.7
17	9.3	4.0	2.2	1.5	1.1	1.7	23	30	19	14	11	8.7
18	9.3	4.5	2.0	1.5	1.2	1.8	22	*30	19	13	11	8.0
19	9.3	*5.0	2.0	1.5	1.3	2.5	22	31	19	13	11	8.7
20	8.7	4.5	2.0	1.5	1.5	2.8	24	29	19	13	11	8.7
21	8.7	4.0	2.5	1.5	2.5	3.0	24	28	18	11	11	*9.7
22	8.7	4.0	4.0	1.7	3.0	3.4	24	28	18	10	*11	8.7
23	8.7	3.5	5.0	1.9	*3.3	12	24	26	17	10	11	9.3
24	8.7	3.5	4.0	2.0	2.5	26	25	25	17	10	11	10
25	8.7	3.7	4.0	2.0	2.0	43	24	23	17	*11	10	10
26	8.7	4.0	4.5	1.8	1.5	39	23	22	17	10	10	10
27	8.7	3.5	4.5	1.5	1.5	25	21	20	*17	10	12	10
28	8.7	3.0	4.0	1.3	1.5	16	21	20	17	12	12	10
29	8.7	3.2	3.0	1.2	1.5	4.9	20	21	17	15	12	12
30	8.7	3.3	2.8	1.1	------	11	19	23	17	15	12	11
31	8.7	------	2.5	1.0	------	16	------	22	------	14	12	------
Total	288.1	131.8	98.6	64.9	45.5	232.1	550.0	750	579	443	367	297.0
Mean	9.29	4.39	3.18	2.09	1.57	7.49	18.3	24.2	19.3	14.3	11.8	9.90
Ac-ft	571	261	196	129	90	460	1,090	1,490	1,150	879	728	589

Calendar year 1955: Max 28 Min 0.8 Mean 8.80 Ac-ft 6,370
Water year 1955-56: Max 43 Min 1.0 Mean 10.5 Ac-ft 7,630

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 12 to Mar. 21 (no gage-height record Jan. 29 to Feb. 24; discharge estimated on basis of 1 discharge measurement and weather records).

Sheep Creek near White Sulphur Springs, Mont.

Location.--Lat 46°46', long 110°49' (revised), in SW¼SE¼ sec. 26, T. 12 N., R. 7 E., on right bank 7 miles upstream from Moose Creek and 16 miles north of White Sulphur Springs.

Drainage area.--35.5 sq mi.

Records available.--July 1941 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 5,820 ft (by barometer). Prior to Sept. 4, 1942, wire-weight gage at site 1,000 ft upstream at datum 7.03 ft higher and Sept. 4, 1942, to May 3, 1955, wire-weight gage at site 700 ft upstream at datum 5.33 ft higher.

Average discharge.--15 years, 29.9 cfs (21,650 acre-ft per year).

Extremes.--Maximum discharge during year, 163 cfs May 26 (gage height, 3.76 ft); minimum daily, 7 cfs Feb. 18, Mar. 10, 11.

1941-56: Maximum discharge observed, 420 cfs June 3, 4, 1953 (gage height, 5.58 ft, site and datum then in use); minimum daily, 3.5 cfs Jan. 18-20, 1943.

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of about 200 acres above station.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.8	8.6	2.5	34
1.9	11	3.0	78
2.0	14	3.5	132
2.1	18	4.0	192
2.3	25		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	18	11	11	8.5	9	8	9.5	18	103	29	15	14
2	18	12	11	8.5	9	8.5	9.5	17	104	29	15	13
3	*17	14	11	9	9	8.5	9.5	16	97	32	15	13
4	18	15	10	10	9.5	8.5	*9.5	16	92	30	15	13
5	18	13	11	10	9.5	8.5	9.5	17	83	28	15	13
6	17	12	11	10	9.5	8.5	9.5	17	79	27	16	13
7	17	16	11	10	9.5	8.5	9.5	20	72	27	18	13
8	16	14	11	10	9.5	8	9.4	24	66	26	16	13
9	16	14	11	10	9.5	7.5	10	30	61	25	16	13
10	16	16	11	10	9.5	7	11	46	57	25	15	13
11	16	15	11	9.5	9.5	7	13	40	53	25	15	13
12	16	11	*11	9.5	9.5	7.5	14	35	50	25	15	13
13	16	10	11	9.5	9.5	7.5	16	32	48	24	14	13
14	16	9.5	11	9.5	9.5	7.5	17	32	46	24	14	12
15	16	9.5	10	9	9.5	8	20	34	48	24	14	12
16	15	11	9.5	9	8	8	21	49	60	22	14	12
17	15	13	9.5	9	7.5	8	21	70	57	21	14	12
18	15	14	9.5	9	7	8	21	*91	43	21	14	12
19	15	*14	9	9	7.5	8	24	106	40	20	14	12
20	15	14	9	9	8.5	7.5	28	113	43	19	13	12
21	15	14	10	9.5	8.5	7.5	32	130	46	19	13	*15
22	15	13	10	9.5	8.5	7.5	29	133	41	18	*13	13
23	14	12	11	10	*8.5	7.5	25	138	38	18	13	13
24	14	13	10	11	8.5	8.5	23	144	39	17	13	12
25	14	13	10	11	8	9.5	21	142	37	*16	13	12
26	15	12	11	*11	8	12	20	144	34	16	15	12
27	14	12	11	11	8	17	19	149	*32	18	16	13
28	14	10	10	10	8	14	18	142	32	18	15	16
29	14	10	9	10	8	16	18	132	30	17	16	14
30	15	11	8.5	9.5	------	10	18	119	30	16	16	13
31	13	------	8.5	9	------	9.7	------	108	------	16	14	------
Total	483	378.0	318.5	299.5	253.5	277.7	514.9	2,304	1,661	692	454	387
Mean	15.6	12.6	10.3	9.66	8.74	8.96	17.2	74.3	55.4	22.3	14.6	12.9
Ac-ft	958	750	632	594	503	551	1,020	4,570	3,290	1,370	900	768

Calendar year 1955: Max 168 Min 4 Mean 29.6 Ac-ft 21,400
Water year 1955-56: Max 149 Min 7 Mean 21.9 Ac-ft 15,900

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* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 11 to Mar. 29, Apr. 1-7, 9, 12, 13 (no gage-height record Nov. 15 to Dec. 11; discharge estimated on basis of 2 discharge measurements and weather records).

Smith River near Eden, Mont.

Location.--Lat 47°12', long 111°23', in SW¼SW¼ sec. 29, T. 17 N., R. 3 E., on left bank a quarter of a mile upstream from Mullens Creek, 2 miles upstream from Hound Creek, and 7 miles southwest of Eden.

Drainage area.--1,601 sq mi.

Records available.--April 1951 to September 1956

Gage.--Water-stage recorder. Altitude of gage is 3,500 ft (by barometer).

Average discharge.--5 years, 297 cfs (215,000 acre-ft per year).

Extremes.--Maximum discharge during year, 1,020 cfs May 25 (gage height, 2.88 ft); maximum gage height, 4.12 ft Dec. 24 (backwater from ice); minimum daily discharge, 30 cfs Nov. 14, 15.

1951-56: Maximum discharge, 12,300 cfs June 4, 1953 (gage height, 10.46 ft), from rating curve extended above 3,800 cfs on basis of slope-area determination of peak flow; minimum daily, 26 cfs Jan. 18, 19, 1954.

Remarks.--Records good except those for period of ice effect, which are poor. Diversions for irrigation of about 24,500 acres above station. Flow affected by storage in Smith River Reservoir (usable contents, 10,700 acre-ft).

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.3	24	1.5	290
.5	47	2.0	500
.7	77	3.0	1,130
1.0	141		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	144	141	80	90	70	80	294	283	738	123	57	86
2	141	120	85	95	75	80	290	286	713	125	54	74
3	136	120	80	95	80	80	248	294	725	139	51	66
4	134	146	75	95	85	75	238	283	689	151	48	64
5	136	154	80	95	90	75	238	290	653	156	47	64
6	144	148	85	90	90	*75	222	318	605	146	45	66
7	*141	130	85	90	90	75	192	338	556	144	46	66
8	139	111	85	95	90	70	201	322	491	127	47	61
9	136	144	85	95	90	65	198	334	428	120	60	60
10	134	161	90	95	90	60	210	*419	390	111	66	58
11	132	100	90	95	90	60	*261	578	370	107	66	58
12	130	75	90	95	90	60	276	556	354	94	66	60
13	132	40	85.	95	80	70	286	486	330	90	64	61
14	132	30	80	90	75	70	334	437	302	90	60	60
15	134	30	80	85	65	75	354	398	306	83	55	57
16	134	40	75	75	60	75	386	386	338	79	54	55
17	132	60	70	75	65	75	390	432	446	74	53	51
18	130	90	70	80	75	75	366	510	398	69	53	50
19	134	115	*75	90	75	80	338	605	338	71	54	50
20	134	*120	80	95	80	85	334	677	294	67	54	*50
21	132	115	85	95	80	90	350	770	272	64	*51	57
22	134	105	90	95	75	100	382	888	283	61	54	63
23	132	95	90	95	75	110	386	941	258	55	51	67
24	130	90	95	*95	75	125	370	983	228	*53	47	66
25	130	90	95	95	75	135	374	*1,020	213	53	37	64
26	132	90	95	90	75	145	362	983	*192	48	33	63
27	134	85	95	85	75	160	342	962	179	47	56	63
28	134	75	90	75	75	180	310	983	161	51	118	63
29	134	75	85	75	75	225	294	955	146	57	94	66
30	136	75	85	75	------	265	286	914	130	57	88	74
31	139	------	85	75	------	318	------	816	------	58	90	------
Total	4,176	2,970	2,615	2,760	2,285	3,313	9,112	18,447	11,526	2,770	1,819	1,863
Mean	135	99.0	84.4	89.0	78.8	107	304	595	384	89.4	58.7	62.1
Ac-ft	8,280	5,890	5,190	5,470	4,530	6,570	18,070	36,590	22,860	5,490	.3,610	3,700

Calendar year 1955: Max 1,680 Min 30 Mean 277 Ac-ft 200,700
Water year 1955-56: Max 1,020 Min 30 Mean 174 Ac-ft 126,200

Peak discharge (base, 1,100 cfs).--No peak above base.
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 11 to Mar. 30.

North Fork of North Fork Sun River near Augusta, Mont.

Location.--Lat 47°38'30", long 112°51'40", near SE¼ sec. 22 (revised), T. 22 N., R. 10 W., on left bank 400 ft upstream from Medicine Creek, 1 mile upstream from confluence with South Fork of North Fork, and 25 miles northwest of Augusta.

Drainage area.--258 sq mi.

Records available.--May 1911 to September 1912 (no winter records), October 1945 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 4,785.72 ft above mean sea level (levels by Bureau of Reclamation). May 27, 1911, to Sept. 30, 1912, staff gage near present site at different datum. Oct. 1, 1945, to July 22, 1946, wire-weight gage at site three-quarters of a mile downstream at different datum.

Average discharge.--11 years (1945-56), 373 cfs (270,000 acre-ft per year).

Extremes.--Maximum discharge during year, 4,170 cfs June 2 (gage height, 6.73 ft); minimum daily, 45 cfs Dec. 18-20.

1911-12, 1945-56: Maximum discharge, 4,580 cfs May 20, 1954; maximum gage height, 7.03 ft June 3, 1948; minimum discharge, 27 cfs Nov. 21, 1949 (gage height, 0.79 ft).

Remarks.--Records good except those for period of ice effect, which are poor. No regulation or diversion above station.

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 22 to July 9)

1.1	78	3.0	650
1.2	80	4.0	1,350
1.3	94	5.0	2,300
1.5	128	6.0	3,430
2.0	240	6.5	4,070
2.5	410		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	102	83	62	70	70	64	90	*246	3,010	585	218	142
2	100	94	65	75	77	64	87	238	3,710	570	220	136
3	99	104	68	84	80	62	87	220	2,970	740	230	134
4	99	114	70	*87	80	*60	*88	218	2,910	698	207	136
5	100	134	75	87	*78	60	83	208	2,760	635	200	138
6	99	99	*80	86	75	62	78	218	1,990	605	198	132
7	97	94	82	86	71	63	87	252	1,540	570	200	128
8	97	105	84	86	69	62	83	358	1,460	535	200	121
9	*102	102	85	86	68	58	90	590	1,740	505	192	119
10	108	114	85	85	67	58	102	662	2,070	495	202	115
11	108	70	85	84	65	55	99	746	2,110	495	183	115
12	102	64	82	82	62	59	104	656	1,660	455	177	114
13	100	59	76	75	58	66	124	560	1,400	438	172	112
14	97	55	69	66	54	65	154	535	1,330	450	166	110
15	96	50	60	60	50	64	200	656	1,520	406	166	108
16	94	50	55	60	50	62	252	1,140	2,180	370	163	107
17	94	55	47	65	55	62	264	1,890	1,830	342	160	105
18	93	70	45	71	64	64	279	2,470	*1,450	324	156	105
19	93	85	45	72	65	63	342	2,800	1,360	312	152	104
20	96	85	45	73	65	62	480	3,180	1,410	300	*148	104
21	94	85	49	74	64	62	662	*3,600	1,180	297	144	105
22	99	80	55	74	62	65	710	*3,420	935	288	142	105
23	96	75	61	70	60	71	590	3,140	886	*279	133	104
24	96	70	66	66	58	82	510	3,050	914	264	140	102
25	100	78	71	62	58	89	418	2,870	865	255	146	*102
26	100	78	75	58	58	87	370	2,800	776	246	149	100
27	97	70	78	55	57	82	327	2,740	716	240	177	102
28	96	60	78	52	58	82	297	2,600	752	232	153	112
29	94	60	75	52	60	87	282	2,580	734	225	150	107
30	97	60	70	55	------	90	261	2,540	640	220	172	128
31	88	-----	68	62	-----	94	-----	2,580	------	218	154	------
Total	3,033	2,402	2,111	2,220	1,858	2,126	7,600	49,763	48,808	12,594	5,382	3,452
Mean	97.8	80.1	68.1	71.6	64.1	68.6	253	1,605	1,627	406	174	115
Cfsm	0.379	0.310	0.264	0.278	0.248	0.266	0.981	6.22	6.31	1.57	0.674	0.446
In.	0.44	0.35	0.30	0.32	0.27	0.31	1.10	7.17	7.04	1.82	0.78	0.50
Ac-ft	6,020	4,760	4,190	4,400	3,690	4,220	15,070	98,700	96,810	24,980	10,680	6,850

Calendar year 1955: Max 2,740 Min 40 Mean 324 Cfsm 1.26 In. 17.05 Ac-ft 234,800
Water year 1955-56: Max 3,710 Min 45 Mean 386 Cfsm 1.50 In. 20.40 Ac-ft 280,400

Peak discharge (base, 1,250 cfs).--May 21 (12 p.m.) 4,060 cfs (6.50 ft); June 2 (9:30 a.m.) 4,170 cfs (6.73 ft); June 11 (1 to 2 a.m.) 2,410 cfs (5.31 ft); June 16 (1 to 2 p.m.) 2,520 cfs (5.44 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 11 to Mar. 29 (no gage-height record Nov. 14-18).

Muddy Creek at Vaughn, Mont.

Location (revised).--Lat 47°33'40", long 111°32'30", near center of S½NE¼ sec. 24, T. 21 N., R. 1 E., near center of span on upstream side of old highway bridge at Vaughn and 1½ miles upstream from mouth.

Records available.--May 1925 to February 1926, April 1934 to September 1956.

Gage.--Wire-weight gage and crest-stage indicator; gage read once or twice daily. Altitude of gage is 3,350 ft (from topographic map). May 21, 1925, to Feb. 8, 1926, staff gage at site 500 ft downstream at different datum. Apr. 19, 1934, to Sept. 30, 1955, at present site at datum 1.00 ft higher.

Average discharge.--22 years (1934-56), 109 cfs (78,910 acre-ft per year).

Extremes.--Maximum discharge during year, 590 cfs June 16 (gage height, 3.28 ft, from graph based on gage readings); minimum daily, 20 cfs at times.

1925-26, 1934-56: Maximum discharge, 7,600 cfs June 4, 1953 (gage height, 16.7 ft from floodmarks), from rating curve extended above 3,000 cfs on basis of slope-area determination of peak flow; minimum observed, 4.9 cfs Jan. 24, 1936.

Flood in June 1908 reached a stage of about 24 ft (discharge not determined); flood in June 1932 reached a stage of about 19 ft (discharge not determined), from information by local residents.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. Natural flow increased by return flow from irrigation. Diversions for irrigation of about 500 acres above station.

Revisions (water years).--WSP 856: 1937.

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 12 to Aug. 2, Sept. 20-30)

1.1	23	2.0	120
1.2	31	2.2	154
1.4	50	2.5	236
1.6	70	3.0	430
1.8	94	3.5	640

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	196	67	50	50	20	30	43	30	115	117	402	236
2	174	47	50	50	20	35	36	31	133	120	426	226
3	*174	90	50	55	20	35	41	36	167	210	474	210
4	145	88	50	60	20	40	39	36	184	278	538	207
5	119	78	50	60	20	40	38	41	174	240	506	201
6	128	76	50	60	20	40	31	38	190	282	530	217
7	141	67	45	60	25	35	30	36	165	358	482	210
8	165	71	40	60	30	30	32	32	136	370	442	195
9	156	69	40	55	35	30	34	38	136	362	402	190
10	152	69	40	50	40	30	32	*35	167	308	402	185
11	116	76	40	45	40	25	32	31	198	293	462	180
12	103	45	40	40	40	20	30	30	255	240	398	170
13	98	25	40	30	40	25	31	33	207	174	414	175
14	98	20	40	30	35	40	29	34	190	179	339	175
15	95	20	35	25	25	70	30	60	278	207	301	170
16	93	35	30	20	20	130	29	58	510	220	327	165
17	90	50	30	20	20	165	29	53	346	190	259	165
18	116	60	30	20	20	190	29	65	226	161	293	160
19	122	65	30	20	20	200	29	128	179	149	342	160
20	119	*70	*25	20	30	200	29	156	174	156	304	*156
21	116	70	25	20	40	200	30	167	161	165	226	143
22	106	65	25	25	45	190	38	116	156	184	*240	143
23	114	60	25	25	50	170	38	111	156	184	184	136
24	114	55	25	30	50	120	38	*163	172	*187	158	143
25	114	50	25	*30	50	70	36	172	150	179	161	165
26	111	50	30	30	50	35	31	141	*149	161	230	152
27	108	50	30	30	40	*25	32	204	133	156	446	145
28	111	50	35	25	35	30	32	220	126	210	382	156
29	108	50	40	25	35	35	31	220	120	247	362	165
30	103	50	40	25	------	45	32	138	117	312	327	176
31	103	------	45	25	------	45	------	136	------	378	285	------
Total	3,808	1,738	1,150	1,120	935	2,375	991	2,789	5,570	6,977	11,044	5,277
Mean	123	57.9	37.1	36.1	32.2	76.6	33.0	90.0	186	225	356	176
Ac-ft	7,550	3,450	2,280	2,220	1,850	4,710	1,970	5,530	11,050	13,840	21,910	10,470

Calendar year 1955: **Max** 378 Min - Mean 112 Ac-ft 81,340
Water year 1955-56: **Max** 538 Min 20 Mean 120 Ac-ft 86,830

* Discharge measurement made on this day.

Note.--No gage-height record Sept. 7-19; discharge estimated on basis of 1 discharge measurement and records for Sun River near Vaughn. Stage-discharge relation affected by ice Nov. 11 to Mar. 31.

Sun River near Vaughn, Mont.

Location (revised).--Lat 47°31'35", long 111°29'05", in SE¼SW¼ sec. 33, T. 21 N., R. 2 E., on right bank 4 miles downstream from Muddy Creek, 4 miles southeast of Vaughn, and 13 miles upstream from mouth.

Records available.--July to September 1897 (gage heights and discharge measurements only, published as Sun River near Great Falls), April 1934 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 3,315 ft (from topographic map). July 11 to Oct. 30, 1897, staff gage at site three-quarters of a mile upstream at different datum. Apr. 19 to Aug. 3, 1934, staff gage at present site and datum.

Average discharge.--22 years, 713 cfs (516,200 acre-ft per year).

Extremes.--Maximum discharge during year, 7,660 cfs June 4 (gage height, 8.96 ft); minimum daily, 150 cfs Mar. 11.

1934-56: Maximum discharge, 17,900 cfs June 4, 1953 (gage height, 16.38 ft, from high-water mark on gage house); minimum, 21 cfs May 10, 1941.

Remarks.--Records good except those for period of ice effect, which are poor. Flow regulated by Gibson, Pishkun, Willow Creek, and Nilan Reservoirs (see p. 238). Diversions for irrigation of about 110,000 acres above station.

Revisions (water years).--WSP 786: 1934.

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 28 to May 28, June 24 to July 3)

1.2	260	4.0	2,750
1.5	500	8.0	6,700
2.0	950	8.5	7,200

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	386	362	220	230	180	200	309	1,300	4,280	788	518	536
2	386	394	220	230	190	200	295	1,310	5,280	680	563	500
3	378	386	210	240	210	200	288	1,300	6,910	725	779	509
4	354	394	210	240	210	190	288	1,260	7,080	914	815	518
5	330	362	200	240	210	190	323	1,230	5,950	1,170	743	536
6	338	354	210	240	210	180	330	1,210	5,700	1,180	734	545
7	*354	346	210	240	210	180	330	1,230	4,070	1,140	734	518
8	370	338	210	230	210	170	338	1,260	2,690	1,010	725	491
9	378	338	210	220	210	170	338	1,300	2,110	896	716	482
10	362	346	210	220	210	160	338	*1,480	1,720	824	698	473
11	330	338	220	230	200	150	346	1,600	1,920	797	689	437
12	309	290	230	230	190	170	338	1,570	3,840	752	626	419
13	302	250	230	240	190	200	338	1,430	3,210	626	599	446
14	316	240	210	220	180	250	338	1,370	2,610	554	572	428
15	338	250	190	200	180	*260	338	1,330	2,260	545	527	402
16	330	270	180	200	180	270	338	1,280	2,600	536	500	394
17	330	290	180	200	180	280	346	1,210	3,320	509	500	378
18	338	310	180	210	190	290	323	1,210	4,120	437	491	378
19	346	320	180	210	200	320	295	1,320	3,890	402	527	362
20	346	*330	*190	210	200	350	378	2,600	3,230	354	509	*338
21	346	330	220	210	210	390	482	4,740	3,000	323	446	354
22	346	300	240	220	210	430	509	6,230	2,990	323	*437	362
23	354	280	250	230	210	500	527	6,980	2,780	338	402	354
24	354	270	240	230	210	482	797	*6,740	2,290	330	378	354
25	362	280	230	*230	200	464	1,140	6,340	1,790	*330	378	370
26	346	290	240	220	200	428	1,210	5,970	*1,730	316	446	346
27	346	270	250	200	200	*346	1,230	5,650	1,470	323	653	330
28	346	240	240	180	200	316	1,250	5,410	1,310	378	680	338
29	338	230	230	180	200	316	1,250	4,740	1,150	402	644	354
30	330	220	220	180	------	323	1,270	4,520	959	518	626	402
31	323	------	220	180	------	323	------	4,270	------	536	563	------
Total	10,712	9,218	6,680	6,740	5,780	8,698	16,220	89,390	96,259	18,956	18,218	12,654
Mean	346	307	215	217	199	281	541	2,884	3,209	611	588	422
Ac-ft	21,250	18,280	13,250	13,370	11,460	17,250	32,170	177,300	190,900	37,600	36,130	25,100

Calendar year 1955:	Max	5,340	Min	160	Mean	713	Ac-ft	516,500
Water year 1955-56:	Max	7,080	Min	150	Mean	818	Ac-ft	594,100

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 12 to Mar. 22 (no gage-height record Nov. 16, 17).

Belt Creek near Monarch, Mont.

Location.--Lat 47°12', long 110°56', in SE¼NW¼ sec. 26, T. 17 N., R. 6 E., on left bank half a mile south of Riceville and 9 miles northwest of Monarch.

Records available.--April 1951 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 3,960 ft (by barometer).

Average discharge.--5 years, 161 cfs (116,600 acre-ft per year).

Extremes.--Maximum discharge during year, 565 cfs May 28 (gage height, 3.41 ft); minimum daily, 10 cfs Jan. 28-30.

1951-56: Maximum discharge, 11,000 cfs June 4, 1953 (gage height, 10.12 ft), from rating curve extended above 2,500 cfs on basis of slope-area determination of peak flow; minimum daily, 4 cfs Jan. 19, 1954.

Flood in 1908 was several feet lower than in 1953, according to local resident.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.0	17	2.0	129
1.1	22	2.5	250
1.3	35	3.0	400
1.5	52	3.5	615
1.7	76		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a58	43	24	20	12	33	30	49	407	76	38	48
2	a57	40	23	22	13	34	26	48	384	76	37	43
3	*55	42	23	25	15	33	26	48	359	84	37	41
4	55	52	25	30	17	31	27	47	337	79	35	41
5	59	48	25	25	20	29	27	48	310	71	34	41
6	60	42	27	23	21	25	22	47	290	71	33	40
7	59	40	29	25	20	23	22	48	267	67	37	38
8	58	46	30	23	21	22	28	*52	245	61	38	36
9	55	48	30	20	22	21	27	73	226	58	34	34
10	54	48	30	20	22	18	28	123	207	54	34	33
11	56	48	32	20	21	15	29	185	189	55	34	34
12	55	37	34	18	20	16	26	187	178	97	32	35
13	54	20	*25	15	18	18	29	171	166	75	30	36
14	53	15	20	13	16	19	35	162	159	67	28	36
15	53	15	20	13	15	20	41	148	155	66	27	33
16	52	20	19	15	15	25	50	178	185	60	27	32
17	52	26	18	17	16	30	58	242	164	55	27	32
18	52	35	17	20	17	40	56	325	137	53	27	30
19	51	*37	15	20	20	45	56	380	127	49	27	29
20	51	36	17	19	25	40	58	407	120	48	26	29
21	51	32	25	19	35	a30	70	467	144	45	25	*37
22	51	29	35	20	35	a30	82	498	140	43	*24	38
23	47	25	40	21	30	a40	81	516	118	41	23	35
24	48	25	30	20	25	a50	71	542	116	40	23	33
25	48	30	20	16	23	a50	66	*534	106	*39	23	33
26	48	32	25	*13	24	a40	60	516	*97	39	44	32
27	49	29	25	11	*25	a30	59	520	90	40	83	32
28	48	27	20	10	26	a25	55	552	86	45	54	36
29	49	27	15	10	28	*20	53	520	81	41	53	38
30	49	30	15	10	------	34	51	480	78	41	55	36
31	48	------	17	11	------	34	------	432	------	40	56	------
Total	1,635	1,024	750	564	617	920	1,349	8,545	5,668	1,776	1,105	1,071
Mean	52.7	34.1	24.2	18.2	21.3	29.7	45.0	276	189	57.3	35.6	35.7
Ac-ft	3,240	2,030	1,490	1,120	1,220	1,820	2,680	16,950	11,240	3,520	2,190	2,120

Calendar year 1955: Max 1,170 Min 11 Mean 169 Ac-ft 122,100
Water year 1955-56: Max 552 Min 10 Mean 68.4 Ac-ft 49,620

Peak discharge (base, 600 cfs).--No peak above base.

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of 2 discharge measurements, weather records, and records for nearby stations.

Note.--Stage-discharge relation affected by ice Nov. 1, 2, Nov. 13 to Mar. 20 (no gage-height record Nov. 16-18, Jan. 13-25, Feb. 15-26, Mar. 10-12, 15-17; discharge estimated on basis of 3 discharge measurements, weather records, and records for nearby stations).

Missouri River at Fort Benton, Mont.

Location (revised).--Lat 47°49'03", long 110°39'59", in SE¼SE¼ sec. 23, T. 24 N., R. 8 E., on left bank at downstream side of highway bridge at Fort Benton, 4 miles upstream from Shonkin Creek.

Drainage area.--24,600 sq mi, approximately.

Records available.--October 1890 to September 1956. Records for June 1881 to September 1890, published in WSP 546 and 761 have been found to be unreliable and should not be used.

Gage.--Water-stage recorder. Datum of gage is 2,614.05 ft above mean sea level, datum of 1929. Prior to Oct. 11, 1921, several types of manually operated gages and Oct. 11, 1921, to Apr. 25, 1924, water-stage recorder, all at present site and at datum 1.00 ft higher.

Average discharge.--66 years (1890-1956), 7,628 cfs (5,522,000 acre-ft per year).

Extremes.--Maximum discharge during year, 31,100 cfs June 4 (gage height, 7.86 ft); maximum gage height not determined; minimum daily discharge, 3,000 cfs Nov. 15.
1890-1956: Maximum discharge observed, about 140,000 cfs June 6, 1908 (gage height, 18.5 ft, present datum), from rating curve extended above 63,000 cfs; minimum, 320 cfs July 5, 1936 (gage height, -0.50 ft); minimum daily, 627 cfs July 5, 1936.

Remarks.--Records good except those for periods of ice effect or no gage height record, which are fair. Diversions for irrigation of about 730,000 acres above station. Flow regulated by 18 smaller irrigation reservoirs and powerplants (see p. 238) and Canyon Ferry Reservoir (see p. 44).

Revisions (water years).--WSP 746: 1932. WSP 1146: 1891-1918, 1908(M), 1937-38. WSP 1209: 1948(P). See also Records available.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Nov. 5-14)

1.5	2,600	6.0	20,000
2.0	4,000	8.0	32,000
4.0	10,600		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5,430	5,580	6,000	5,000	5,800	6,200	4,460	9,880	23,200	6,360	5,070	4,960
2	5,930	5,800	6,500	6,000	5,800	6,200	5,170	9,780	25,800	6,280	5,020	4,680
3	5,390	6,000	6,500	6,500	6,000	6,200	4,940	9,780	28,300	5,500	5,300	3,640
4	*5,170	6,100	6,000	7,000	6,300	6,400	5,490	9,820	29,700	4,220	5,270	5,210
5	5,530	5,500	6,200	7,300	6,000	6,500	5,190	9,430	25,800	6,150	3,870	5,260
6	5,510	5,250	6,300	7,700	7,000	6,500	5,020	9,040	24,000	6,600	6,130	4,960
7	5,800	*6,400	6,300	6,800	7,000	6,500	4,530	9,010	20,600	6,000	5,460	5,710
8	5,740	5,960	6,300	6,800	6,800	6,300	4,640	9,080	17,500	5,710	5,460	4,980
9	5,650	5,880	6,500	7,200	6,700	*6,200	4,710	9,150	18,100	6,450	5,280	4,460
10	6,030	5,930	6,500	6,500	6,500	6,200	5,260	9,500	17,900	6,320	5,500	5,220
11	6,010	5,710	6,000	6,300	6,500	5,200	5,100	9,850	13,400	5,880	5,070	4,870
12	5,800	5,610	7,000	6,300	6,500	4,500	5,740	10,200	16,000	5,990	4,880	5,140
13	5,910	5,310	7,000	6,300	6,500	6,000	7,270	10,300	17,400	6,140	5,660	5,220
14	6,090	3,210	6,500	6,200	6,500	6,700	6,180	10,200	13,400	5,350	5,350	5,340
15	5,740	3,000	4,800	4,700	6,200	6,890	5,980	9,360	10,200	4,160	5,460	5,100
16	5,680	5,000	5,000	4,500	5,700	7,000	*7,200	9,680	8,660	6,060	5,120	4,660
17	6,330	6,000	5,000	4,300	5,000	6,680	7,060	9,570	8,660	5,370	5,290	4,960
18	5,960	6,000	5,300	6,100	5,800	6,080	6,460	9,600	9,260	5,300	4,910	5,020
19	6,260	5,800	5,200	6,300	6,000	7,080	6,700	10,200	9,410	5,090	4,220	5,100
20	6,000	6,500	5,200	6,500	6,300	6,460	6,770	10,900	8,490	4,880	5,300	5,130
21	5,570	7,000	5,700	6,500	6,500	6,510	7,460	13,900	9,300	4,460	5,010	5,060
22	5,570	7,500	6,700	6,700	6,500	6,500	9,060	15,000	9,400	3,330	5,180	4,960
23	5,750	5,800	7,300	7,000	7,000	6,280	9,750	17,300	*8,900	4,260	5,060	4,740
24	6,290	4,800	7,500	7,300	7,200	6,540	9,760	17,000	8,530	4,610	*5,020	5,100
25	5,960	6,300	7,300	6,800	6,400	5,560	9,570	17,000	7,380	4,840	4,290	4,710
26	6,010	6,000	6,500	5,800	6,200	6,520	9,920	16,500	6,340	4,940	4,420	5,260
27	5,750	5,500	7,000	6,000	6,200	6,320	9,920	15,800	7,440	*4,520	5,360	4,780
28	5,650	5,000	7,400	5,600	6,200	6,090	9,640	*15,200	7,380	4,730	5,540	5,220
29	5,310	5,000	6,700	5,600	6,200	6,290	9,880	15,200	6,920	4,220	5,400	5,000
30	6,220	6,000	6,300	5,500	------	6,160	10,000	19,500	6,990	4,860	5,500	5,140
31	6,120	------	5,800	5,300	------	5,640	------	21,200	------	5,090	5,150	------
Total	180,160	169,440	194,300	192,400	183,300	194,200	208,830	377,930	424,360	163,670	159,550	149,590
Mean	5,812	5,648	6,268	6,206	6,321	6,265	6,961	12,190	14,150	5,280	5,147	4,986
Ac-ft	357,300	336,100	385,400	381,600	363,600	385,200	414,200	749,600	841,700	324,600	316,500	296,700

Calendar year 1955:	Max	12,900	Min	2,350	Mean	5,894	Ac-ft	4,267,000
Water year 1955-56:	Max	29,700	Min	3,000	Mean	7,098	Ac-ft	5,152,000

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 15 to Mar. 14 (no gage-height record Nov. 2-4, 16-20, Dec. 6-13; discharge estimated on basis of powerplant records).

Two Medicine River near Browning, Mont.

Location.--Lat 48°28'30", long 112°48'10", in SW¼ sec. 5, T. 31 N., R. 9 W., on right bank 800 ft upstream from new bridge on U. S. Highway 89, 15 miles (revised) upstream from Badger Creek, and 11 miles southeast of Browning.

Drainage area.--316 sq mi.

Records available.--April 1907 to October 1924, May 1951 to September 1956. Published as "at Family" 1907-24.

Gage.--Water-stage recorder. Altitude of gage is 3,930 ft (from topographic map). Prior to Nov. 1, 1924, chain gage at several sites within 3 miles of present site at various datums.

Average discharge.--17 years (1907-8, 1909-11, 1914-23, 1951-56), 400 cfs (289,600 acre-ft per year).

Extremes.--Maximum discharge during year, 5,020 cfs May 22 (gage height, 5.66 ft); minimum daily, 40 cfs Feb. 16.

1907-24, 1951-56: Maximum discharge observed, 7,600 cfs June 9, 1909 (gage height, 8.15 ft, site and datum then in use), but flood in June 1908, which destroyed gage, was larger; minimum observed, 4.4 cfs Sept. 6-8, 1919.

Remarks.--Records fair except those for period of ice effect, which are poor. Diversion above station into Two Medicine Canal for irrigation of about 10,000 acres below station. Flow affected by storage in Lower Two Medicine Lake (see p. 238). Records of chemical analyses and water temperatures for the water year 1956 are given in WSP 1451.

Rating tables, water year 1955-56, except for periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Nov. 8-12, May 11-24)

Oct. 1 to May 24				May 25 to Sept. 30			
1.2	85	3.0	850	0.9	57	3.0	1,140
1.5	141	4.0	1,800	1.2	135	3.5	1,690
2.0	294	5.0	3,170	1.5	240	4.0	2,570
2.5	504	6.0	5,000	2.0	450	5.0	4,500
				2.5	750		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	99	105	145	160	90	60	195	376	2,360	634	216	123
2	101	101	130	160	*90	60	166	368	2,820	615	212	117
3	99	143	110	165	95	60	168	349	2,630	1,160	230	117
4	99	168	115	170	100	55	184	349	2,380	1,560	205	117
5	99	283	120	175	100	55	173	341	2,280	1,200	184	117
6	*99	227	125	180	105	50	148	360	1,870	1,060	174	117
7	95	234	130	185	105	50	156	434	1,590	962	166	111
8	93	238	135	190	110	45	166	653	1,380	865	170	105
9	99	227	140	190	110	45	189	1,340	1,320	799	163	102
10	179	*231	150	185	110	50	286	1,450	1,370	736	177	97
11	227	159	155	180	110	50	294	1,590	1,460	694	174	92
12	168	101	150	170	105	50	306	1,250	1,380	667	166	89
13	141	90	140	165	95	55	384	1,060	1,250	628	163	87
14	135	90	125	160	80	*55	521	1,160	1,140	597	152	84
15	125	90	110	150	60	60	748	1,420	1,140	567	146	77
16	123	90	100	140	40	80	1,040	2,010	1,380	528	142	72
17	123	90	100	130	45	120	986	2,710	1,460	500	142	72
18	121	90	105	130	50	150	914	2,900	1,310	470	149	70
19	123	95	115	130	55	200	*1,020	2,890	*1,270	436	146	68
20	125	100	130	135	55	300	1,240	3,490	1,250	410	142	68
21	119	110	150	140	60	400	1,360	4,340	1,200	392	*129	66
22	115	120	*170	140	60	450	1,090	4,300	1,120	369	117	64
23	117	130	175	140	60	400	834	3,890	1,030	344	114	66
24	113	135	180	140	60	370	674	*3,620	940	*328	108	64
25	113	140	185	130	60	345	544	*3,540	872	312	108	64
26	117	145	185	120	60	321	527	3,410	799	284	126	66
27	113	150	180	110	60	256	466	3,080	729	260	191	*66
28	111	155	175	100	60	227	430	2,950	708	236	152	75
29	113	155	170	90	60	231	405	2,820	708	219	129	72
30	117	160	165	90	------	231	384	2,490	667	208	129	84
31	111	------	160	90	------	227	------	*2,300	------	226	129	------
Total	3,732	4,352	4,425	4,540	2,250	5,108	15,998	63,240	41,813	18,266	4,851	2,589
Mean	120	145	143	146	77.6	165	533	2,040	1,394	589	156	86.3
Ac-ft	7,400	8,630	8,780	9,000	4,460	10,130	31,730	125,400	82,930	36,230	9,620	5,140

Calendar year 1955: Max 2,310 Min 34 Mean 350 Ac-ft 253,400
Water year 1955-56: Max 4,340 Min 40 Mean 468 Ac-ft 339,400

* Discharge measurement made on this day.

Note.--*Stage-discharge relation affected by ice Nov. 13 to Mar. 24 (no gage-height record Dec. 3-19, Mar. 21-24; discharge estimated on basis of weather records and records for Marias River near Shelby).*

Badger Creek near Browning, Mont.

Location.--Lat 48°21'00", long 112°50'20", in NE¼ sec. 24, T. 30 N., R. 10 W., on right bank just upstream from point of diversion to Four Horns Canal, 15 miles upstream from mouth and 17 miles southeast of Browning.

Drainage area.--133 sq mi.

Records available.--May 1951 to September 1956.

Gage.--Water-stage recorder and control consisting of concrete diversion dam and two taintor gates (regularly closed). Datum of gage is 4,179.26 ft above mean sea level (Bureau of Reclamation benchmark).

Average discharge.--5 years, 244 cfs (176,600 acre-ft per year).

Extremes.--Maximum discharge during year, 2,150 cfs May 22 (gage height, 5.29 ft); minimum daily, 70 cfs at times.

1951-56: Maximum discharge, 4,220 cfs June 4, 1953 (gage height, 6.28 ft), from rating curve extended above 1,900 cfs; minimum daily, 40 cfs Jan. 23, 1952, Mar. 24-26, 1955.

Remarks.--Records fair except those for period of ice effect or no gage-height record, which are poor. Water diverted into Four Horns Canal at station for irrigation of about 6,000 acres below station. Figures of discharge given herein are sum of flow over diversion dam and that diverted by Four Horns Canal.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	116	116	90	130	75	95	110	195	1,320	332	215	151
2	116	120	90	130	80	95	100	188	1,610	332	227	151
3	115	123	90	135	80	100	100	179	1,240	611	232	155
4	115	130	90	140	80	100	100	176	1,140	658	220	151
5	118	149	90	140	85	100	100	169	1,050	560	209	151
6	*118	134	95	145	90	95	90	168	745	513	200	148
7	115	127	100	145	95	95	90	189	612	468	204	145
8	121	123	100	150	95	90	100	247	597	444	204	145
9	113	123	105	150	100	85	110	369	703	427	200	137
10	110	120	110	150	100	75	130	415	782	409	204	137
11	146	*110	115	150	100	70	140	463	780	406	204	137
12	128	80	120	145	95	75	150	432	634	375	190	137
13	123	70	120	140	90	75	160	385	571	369	190	131
14	120	70	110	135	80	80	170	372	550	358	184	128
15	120	70	100	130	70	85	186	406	606	341	178	128
16	117	70	90	120	70	100	274	598	706	324	171	127
17	117	70	80	120	70	120	290	963	655	317	170	124
18	114	75	80	120	75	140	274	1,180	571	300	169	124
19	114	80	80	120	75	175	*304	1,220	*542	276	164	124
20	114	90	100	125	80	200	334	1,380	542	271	163	124
21	112	95	120	130	85	250	377	1,750	502	266	*156	127
22	112	100	125	130	95	300	359	1,750	466	262	152	124
23	112	100	130	130	100	250	336	*1,450	442	258	152	124
24	109	100	135	130	100	225	306	1,350	436	*240	152	121
25	109	100	140	125	95	200	267	1,280	418	226	156	121
26	109	100	140	110	95	175	251	1,340	395	230	172	*121
27	109	90	140	100	90	150	*227	1,280	372	229	183	124
28	109	80	135	90	90	125	214	1,270	383	224	165	130
29	109	80	130	75	90	120	206	1,260	371	224	159	130
30	109	85	130	70	------	120	198	1,200	349	219	162	139
31	107	-----	130	70	------	120	-----	1,140	------	212	159	------
Total	3,576	2,980	3,410	3,880	2,525	4,085	6,053	24,764	20,090	10,681	5,666	4,016
Mean	115	99.3	110	125	87.1	132	202	799	670	345	183	134
Cfsm	0.865	0.747	0.827	0.940	0.655	0.992	1.52	6.01	5.04	2.59	1.38	1.01
In.	1.00	0.83	0.95	1.08	0.71	1.14	1.69	6.92	5.62	2.99	1.58	1.12
Ac-ft	7,090	5,910	6,760	7,700	5,010	8,100	12,010	49,120	39,850	21,190	11,240	7,970

Calendar year 1955: Max 1,230 Min 40 Mean 218 Cfsm 1.64 In. 22.25 Ac-ft 157,800
Water year 1955-56: Max 1,750 Min 70 Mean 251 Cfsm 1.89 In. 25.63 Ac-ft 182,000

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* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 10 to about Mar. 25 (no gage-height record Nov. 18 to Dec. 21, Jan. 9-25, Feb. 2 to Apr. 14; discharge estimated on basis of 3 discharge measurements, weather records, and records for Two Medicine River near Browning).

Cut Bank Creek at Cut Bank, Mont.

Location.--Lat 48°38'00", long 112°20'40", in NE¼ sec. 11, T. 33 N , R. 6 W., on right bank at highway bridge half a mile west of Cut Bank and 12 miles upstream from confluence with Two Medicine River.

Drainage area.--971 sq mi.

Records available.--August 1905 to September 1919 and May 1922 to October 1924 (no winter records), May 1951 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 3,550 ft (from topographic map). Prior to Oct. 31, 1924, staff or chain gages at several sites a quarter of a mile upstream in vicinity of Great Northern Railway bridge at various datums.

Average discharge.--5 years (1951-56), 245 cfs (177,400 acre-ft per year).

Extremes.--Maximum discharge during year, 1,720 cfs July 4 (gage height, 5.22 ft); maximum gage height, 6.05 ft Mar. 31 (backwater from ice); minimum daily discharge, 10 cfs Feb. 16-18.

1905-19, 1922-24, 1951-56: Maximum discharge observed, 8,810 cfs June 5, 1908 (gage height, 10.0 ft, site and datum then in use), from rating curve extended above 1,200 cfs; minimum, 5 cfs Nov. 29, 30, 1905, Dec. 28, 1954.

Remarks.--Records good except those for period of ice effect, which are poor. Few minor diversions for irrigation of hay meadows above station. Natural flow of stream affected by water from Two Medicine Canal which irrigates land above station.

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-30, Aug. 8 to Sept. 30)

1.9	38	3.0	348
2.0	52	4.0	830
2.2	90	5.0	1,540
2.5	165		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	45	139	55	50	*25	35	200	245	876	399	134	98
2	45	150	55	50	20	35	240	252	960	394	197	90
3	45	180	55	50	20	40	300	252	1,070	570	220	92
4	41	168	55	50	25	40	352	260	1,020	1,470	187	94
5	41	145	55	50	25	40	271	294	914	1,290	159	94
6	*42	187	55	55	30	35	283	314	954	1,000	142	92
7	45	177	60	55	30	35	234	331	800	782	136	86
8	46	159	60	55	35	35	184	352	624	610	145	82
9	48	126	60	55	35	35	184	512	538	498	139	74
10	52	*111	60	55	30	30	199	740	548	444	268	74
11	66	72	65	55	30	30	234	722	638	417	187	72
12	234	40	65	50	25	30	227	628	705	458	199	68
13	210	40	60	45	20	*35	223	525	633	430	153	66
14	177	45	55	40	15	35	252	458	556	394	128	66
15	153	50	45	35	15	40	294	440	592	365	126	63
16	148	55	*35	30	10	80	352	502	812	327	139	59
17	150	60	30	30	10	100	408	660	967	302	134	56
18	156	60	25	30	10	120	404	940	876	275	124	56
19	148	65	25	30	15	150	*382	1,080	740	263	114	54
20	145	65	25	35	15	200	399	1,260	*660	230	103	54
21	159	65	25	35	20	250	458	1,300	656	216	92	56
22	177	60	30	35	25	300	512	1,440	628	203	*84	56
23	174	60	35	40	30	350	462	1,460	548	196	78	57
24	162	60	40	40	30	400	412	*1,290	498	193	78	57
25	150	65	45	40	35	500	373	1,150	471	*187	80	57
26	145	65	45	40	35	480	327	1,090	458	180	76	59
27	148	60	45	35	30	460	310	1,090	422	174	127	*63
28	148	60	45	35	30	400	283	1,050	390	168	139	70
29	150	60	40	30	30	300	263	1,010	390	156	114	76
30	145	55	40	30	------	240	256	988	408	148	105	78
31	136	------	45	25	------	200	------	921	------	136	103	------
Total	3,731	2,704	1,435	1,290	705	5,060	9,278	23,556	20,352	12,875	4,210	2,119
Mean	120	90.1	46.3	41.6	24.3	163	309	760	678	415	136	70.6
Ac-ft	7,400	5,360	2,850	2,560	1,400	10,040	18,400	46,720	40,370	25,540	8,350	4,200

Calendar year 1955: Max 2,370 Min 10 Mean 209 Ac-ft 151,000
Water year 1955-56: Max 1,470 Min 10 Mean 239 Ac-ft 173,200

Peak discharge (base, 660 cfs).--May 10 (11 to 12 p.m.) 812 cfs (3.97 ft); May 23 (11 a.m.) 1,500 cfs (4.94 ft); June 3 (6 p.m.) 1,470 cfs (4.91 ft); June 12 (3:30 p.m.) 728 cfs (3.83 ft); June 17 (11 a.m. to 12 m.) 1,030 cfs (4.30 ft); July 4 (4:30 p.m.) 1,720 cfs (5.22 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 12 to Apr. 3.

Marias River near Shelby, Mont.

Location.--Lat 48°26', long 111°53', in SE¼ sec. 20, T. 31 N., R. 2 W., on left bank 200 ft downstream from bridge on U. S. Highway 91, 7 miles south of Shelby, and 24 miles downstream from Cut Bank Creek.

Drainage area.--2,610 sq mi, approximately.

Records available.--April 1902 to January 1908, April 1911 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 3,087.72 ft above mean sea level, datum of 1929. Prior to Dec. 23, 1947, chain or wire-weight gage or water-stage recorder at several sites within 1,000 ft of present site at approximately the same datum.

Average discharge.--25 years (1902-4, 1931-32, 1934-56), 952 cfs (689,200 acre-ft per year).

Extremes.--Maximum discharge during year, 8,660 cfs May 22 (gage height, 7.88 ft); minimum, 78 cfs Nov. 12.

1902-8, 1911-56: Maximum discharge, 40,000 cfs June 18, 1948 (gage height, 17.75 ft, from floodmark); minimum observed, 10 cfs Aug. 20, 1919.

Flood in June 1908 may have exceeded that of June 18, 1948.

Remarks.--Records good except those for period of ice effect, which are poor. Diversions for irrigation of about 50,000 acres above station and about 15,000 acres below station. Low flow regulated by Lake Frances (see p. 238) and three other reservoirs having a combined capacity of 176,000 acre-ft.

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 26 to Apr. 26, May 16 to June 17, Sept. 23-30)

1.7	154	5.0	3,000
2.0	250	6.0	4,500
2.5	525	7.0	6,170
3.0	875	8.0	8,420
4.0	1,820		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	306	183	230	260	120	180	1,020	1,110	4,920	1,600	613	579
2	322	170	240	270	140	190	915	1,110	5,330	1,550	704	543
3	316	231	240	280	160	200	835	1,100	5,760	1,920	1,200	525
4	311	567	230	300	180	210	835	1,090	5,280	3,880	883	543
5	*295	471	220	320	200	210	760	1,160	5,000	4,130	753	555
6	300	460	230	330	210	210	634	1,160	4,640	3,280	655	549
7	306	507	230	340	220	200	531	1,180	4,040	2,910	627	531
8	311	573	240	340	230	190	501	1,330	3,370	2,580	662	507
9	306	*531	250	320	240	170	501	2,030	3,010	2,260	676	489
10	306	519	260	310	250	160	525	3,190	2,990	2,060	851	465
11	377	350	270	300	260	180	627	3,440	3,190	1,930	859	460
12	549	145	280	290	260	200	697	3,350	3,310	2,070	803	448
13	704	140	290	290	240	*220	704	2,820	3,080	1,810	753	448
14	606	130	280	280	220	280	774	2,480	2,740	1,810	676	448
15	531	130	270	280	200	400	980	2,620	2,690	1,700	627	421
16	489	140	*260	270	180	500	1,280	3,000	3,500	1,560	585	404
17	460	160	240	260	160	600	1,700	4,150	3,890	1,440	549	394
18	454	180	220	260	140	700	*1,720	5,420	3,540	1,330	561	382
19	460	180	210	270	140	800	1,650	6,170	3,140	1,250	585	377
20	443	190	220	280	130	880	1,780	6,560	*3,000	1,140	573	372
21	416	200	230	280	130	960	2,130	7,510	2,910	1,030	543	377
22	421	200	240	270	130	980	2,280	8,320	2,820	964	*519	372
23	426	210	260	280	140	1,100	2,030	8,130	2,540	907	501	388
24	421	210	260	280	140	1,300	1,720	7,220	2,320	867	477	382
25	394	220	280	270	140	1,500	1,530	6,710	2,170	*803	477	382
26	372	230	300	260	150	1,380	1,350	*6,460	2,040	753	519	372
27	366	230	310	*250	150	1,430	1,290	6,130	1,880	732	732	*344
28	366	220	300	220	150	1,010	1,180	5,850	1,720	718	803	360
29	372	210	280	180	160	1,060	1,140	5,690	1,660	683	697	394
30	344	220	270	140	------	1,140	1,120	*5,420	1,630	655	620	404
31	306	------	260	120	------	1,140	------	5,160	------	627	599	------
Total	12,356	8,107	7,900	8,400	5,170	19,680	34,739	127,070	98,110	50,949	20,682	13,215
Mean	399	270	255	271	178	635	1,158	4,099	3,270	1,644	667	440
Ac-ft	24,510	16,080	15,670	16,660	10,250	39,030	68,900	252,000	194,600	101,100	41,020	26,210

Calendar year 1955:	Max 6,640	Min 130	Mean 993	Ac-ft 718,700
Water year 1955-56:	Max 8,320	Min 130	Mean 1,110	Ac-ft 806,000

Peak discharge (base, 2,900 cfs).--May 10 (7 to 8 p.m.) 3,770 cfs (5.48 ft); May 22 (10 to 11 p.m.) 8,660 cfs (7.88 ft); June 17 (2 to 3 p.m.) 4,050 cfs (5.62 ft); July 4 (7:30 p.m.) 4,760 cfs (6.10 ft); July 12 (1 a.m.) 2,960 cfs (4.92 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 13 to Mar. 25 (weekly wire-weight-gage readings only Jan. 8 to Feb. 29; discharge estimated on basis of 1 discharge measurement, weather records, and records for nearby stations).

Tiber Reservoir near Chester, Mont.

Location.--Lat 48°19', long 111°06', in NW¼ sec. 33, T. 30 N., R. 5 E., in control house of river outlet tunnel at Tiber Dam, 15 miles southwest of Chester.

Drainage area.--4,375 sq mi (determined by Bureau of Reclamation).

Records available.--October 1955 to September 1956.

Gage.--Water-stage recorder and staff gages. Datum of gage is at mean sea level (levels by Bureau of Reclamation).

Extremes.--Maximum daily contents during year, 637,100 acre-ft Sept. 12 (elevation, 2,974.13 ft); storage began Oct. 28, 1955.

Remarks.--Reservoir formed by rolled earth-fill dam with concrete spillway chute; construction began September 1952, completed March 1956. Storage began Oct. 28, 1955. Capacity, 1,313,000 acre-ft at controlled spillway elevation (3,012.5 ft) exclusive of dead storage below elevation 2,870 ft (24,000 acre-ft). Minimum operating level to enable canal to deliver a full head of water, 2,967 ft (contents, 551,000 acre-ft, exclusive of dead storage). Figures given herein represent usable contents above elevation 2,870 ft. Water is used for irrigation and flood control.

Cooperation.--Month-end elevations and capacity table furnished by Bureau of Reclamation.

Monthly elevations and contents, water year October 1955 to September 1956

Date	Elevation (feet)†	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	-	0	-
Oct. 31	2,849.5	0	0
Nov. 30	2,867.0	0	0
Dec. 31	2,877.0	12,640	+12,640
Jan. 31	*2,883.7	28,220	+15,580
Feb. 29	*2,887.0	37,300	+9,080
Mar. 31	*2,896.7	68,390	+31,090
Apr. 30	2,912.0	130,600	+62,210
May 31	*2,946.4	351,900	+221,300
June 30	*2,964.1	519,000	+167,100
July 31	2,971.3	601,700	+82,700
Aug. 31	2,973.8	632,900	+31,200
Sept. 30	*2,973.25	626,100	-6,800
Water year 1955-56	-	-	+626,100

* First day of following month.
† Gage read at 8:30 a.m.

Marias River near Chester, Mont.

Location.--Lat 48°18', long 111°05', in SW¼SW¼ sec. 34, T. 30 N., R. 5 E., on left bank 1 mile downstream from Tiber Dam, 4 miles upstream from Pondera Coulee, and 15 miles southwest of Chester.

Drainage area.--4,375 sq mi (determined by Bureau of Reclamation).

Records available.--April to September 1921, October 1945 to September 1946, October 1955 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 2,814.03 ft above mean sea level (Bureau of Reclamation benchmark). Prior to Oct. 1, 1921, wire-weight gage at bridge 2½ miles downstream at different datum. Oct. 4, 1945, to Sept. 30, 1946, wire-weight gage at site 3 miles downstream at different datum.

Extremes.--Maximum discharge during year, 2,080 cfs Oct. 27 (gage height, 5.36 ft); minimum not determined.

1921, 1945-46, 1955-56: Maximum discharge observed, 5,070 cfs May 27, 1921 (gage height, 6.19 ft, site and datum then in use); minimum not determined.

Flood in June 1948 reached a stage of 16 ft, present datum.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Flow completely regulated by Tiber Reservoir (see preceding page). Some regulation by Lake Francis (see p. 238) and three other reservoirs having a combined capacity of 177,870 acre-ft.

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.5	2.0	2.2	57
1.6	3.0	2.4	103
1.7	5.0	2.6	160
1.8	9.0	3.0	320
1.9	16	3.5	590
2.0	25	4.0	915
2.1	38		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	380	0.2	0.8	35	35	35	48	48	57	59	81	145
2				35	35	35	46	48	57	59	81	142
3				35	35	35	46	48	59	61	81	148
4				35	35	35	44	49	59	31	81	145
5				35	35	35	44	49	72	12	81	145
6	340			35	35	35	46	49	72	31	81	145
7				35	35	35	48	49	59	122	84	145
8				35	35	*35	48	51	64	68	84	145
9		(**)		35	35	35	48	51	66	59	84	145
10				35	35	40	48	51	57	55	81	145
11	380	4	1	35	35	45	48	51	55	39	81	145
12				35	35	45	48	49	55	10	81	145
13				35	35	50	46	49	55	12	81	198
14				35	35	50	46	49	57	11	62	395
15			**1	35	35	55	46	51	57	10	42	668
16	540		1	35	35	65	46	51	59	10	59	768
17	500		5	35	35	70	44	51	59	23	59	894
18	480		18	35	35	65	*44	51	59	53	64	866
19	470		30	35	35	61	44	49	59	77	66	756
20	*476		35	35	35	61	44	48	57	79	64	638
21	470	.6	35	35	35	57	44	48	59	79	68	506
22	450		35	35	35	55	46	49	*57	79	79	410
23	430		35	35	35	53	46	51	57	79	*81	380
24	440		35	35	35	55	44	53	57	79	81	380
25	435		35	35	35	51	46	53	57	81	81	380
26	260		35	*35	35	49	46	55	57	*81	81	380
27	334		35	35	35	46	46	55	57	86	79	450
28	1		35	35	35	46	48	55	57	84	61	*596
29	.2		35	35	35	48	48	55	57	84	84	674
30	.2		35	35	------	48	48	*55	57	84	268	674
31	.2	------	35	35	------	48	------	59	------	84	116	------
Total	10,786.6	12.0	487.0	1,085	1,015	1,478	1,384	1,580	1,766	1,781	2,557	11,753
Mean	348	0.40	15.7	35.0	35.0	47.7	46.1	51.0	58.9	57.5	82.5	392
Ac-ft	21,390	24	966	2,150	2,010	2,930	2,750	3,130	3,500	3,530	5,070	23,310

Calendar year 1955: Max -	Min -	Mean -	Ac-ft -
Water year 1955-56: Max 894	Min -	Mean 97.5	Ac-ft 70,760

* Discharge measurement made on this day.

** Field estimate made on this day.

Note.--No gage-height record Oct. 1-18, Oct. 28 to Dec. 14, Jan. 17-25; discharge estimated on basis of weather records and records for station near Brinkman. Stage-discharge relation affected by ice Dec. 15 to Mar. 18.

Marias River near Brinkman, Mont.

Location.--Lat 48°16', long 110°42', in SE¼SE¼ sec. 17, T. 29 N., R. 8 E., on left bank 4 miles southwest of Brinkman Post Office, 14 miles (revised) downstream from Cottonwood Creek, and 30 miles north of Fort Benton.

Drainage area.--6,400 sq mi, approximately.

Records available.--October 1921 to September 1956 (discontinued).

Gage (revised).--Water-stage recorder. Datum of gage is 2,677.25 ft above mean sea level, adjustment of 1912. Prior to Oct. 6, 1931, cantilever gage at site 2,800 ft downstream at datum 0.64 ft higher. Oct. 6, 1931, to July 1, 1939, water-stage recorder at site 1,600 ft downstream at present datum.

Average discharge.--24 years (1928-29, 1931-32, 1934-56), 885 cfs (640,700 acre-ft per year).

Extremes.--Maximum discharge during year, 874 cfs Sept. 18 (gage height, 5.28 ft); maximum gage height, 6.12 ft Feb. 29 (backwater from ice); minimum daily discharge, 1 cfs Dec. 17, 18.

1921-56: Maximum discharge, 50,700 cfs June 19, 1948 (gage height, 21.0 ft, from floodmark); minimum daily, that of Dec. 17, 18, 1955.

Maximum discharge known, about 70,000 cfs (gage height, about 24.0 ft, present datum), occurred during flood in 1908.

Remarks.--Records good except those for period of ice effect, which are poor. Diversions for irrigation of about 65,000 acres above station. Flow regulated by Tiber Reservoir (see p. 62). Some regulation by Lake Frances (see p. 238) and three other reservoirs having a combined capacity of 177,870 acre-ft.

Revisions (water years).--WSP 956: 1929.

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 31 to Nov. 9)

3.2	6.0	4.0	165
3.3	13	4.5	365
3.4	24	5.0	660
3.5	38	5.5	1,120
3.7	80		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	400	31	5	40	15	56	266	46	38	57	71	139
2	380	23	5	40	18	60	223	51	40	57	73	162
3	370	23	5	40	20	60	200	51	48	64	71	162
4	360	20	5	40	24	57	190	51	40	71	68	165
5	*356	17	5	40	28	56	152	57	35	71	68	165
6	352	16	5	40	32	54	165	55	34	40	73	165
7	347	13	5	40	40	52	162	49	59	20	73	165
8	342	*11	5	38	44	*50	122	59	55	69	90	162
9	347	14	5	36	46	46	90	80	53	75	108	162
10	356	12	5	34	48	42	75	66	62	53	122	162
11	356	8	5	32	48	40	66	53	57	62	105	162
12	352	5	5	30	48	40	59	48	51	64	95	162
13	356	3	4	30	46	40	57	46	49	42	90	165
14	420	3	*2	30	44	45	57	46	49	21	88	230
15	562	4	2	30	42	50	53	44	64	16	85	472
16	569	5	2	31	40	55	51	48	100	12	59	653
17	520	6	1	33	40	60	*49	51	85	9.5	51	756
18	490	7	1	34	40	65	48	48	71	7.4	68	856
19	460	8	2	35	40	70	46	44	64	6.0	66	756
20	460	8	4	37	40	80	44	40	53	34	68	660
21	466	6	10	38	40	90	48	37	115	59	64	576
22	466	6	20	36	40	110	48	35	*127	62	57	450
23	445	5	30	34	40	150	46	34	95	64	*66	392
24	435	5	38	30	40	240	40	38	92	66	78	378
25	430	5	40	27	40	340	42	48	80	68	80	378
26	425	5	40	*25	44	380	42	48	62	*68	82	374
27	386	5	40	22	47	400	35	46	62	71	90	374
28	276	5	40	20	50	380	35	46	68	73	88	*450
29	80	5	40	16	52	356	35	44	66	73	75	590
30	46	5	40	15	------	324	40	*42	59	73	75	670
31	34	------	40	15	------	307	------	42	------	75	270	------
Total	11,644	289	456	988	1,136	4,155	2,584	1,493	1,933	1,602.9	2,617	11,113
Mean	376	9.63	14.7	31.9	39.2	134	86.1	48.2	64.4	51.7	84.4	370
Ac-ft	23,100	573	904	1,960	2,250	8,240	5,130	2,960	3,830	3,180	5,190	22,040

Calendar year 1955:	Max 4,440	Min 1	Mean 965	Ac-ft 698,900
Water year 1955-56:	Max 856	Min 1	Mean 109	Ac-ft 79,360

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 10 to Mar. 28.

Teton River near Dutton, Mont.

Location.--Lat 47°55'55", long 111°33'05", in SE¼SW¼ sec. 12, T. 25 N., R. 1 E., on left bank 300 ft downstream from Kerr bridge, 1 mile downstream from Hunt Coulee, and 10 miles northeast of Dutton.

Records available.--August 1954 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 3,235 ft (from topographic map).

Extremes.--Maximum discharge during year, 875 cfs Aug. 4 (gage height, 5.12 ft); maximum gage height, 5.74 ft Mar. 21 (backwater from ice); minimum daily discharge, 25 cfs Nov. 13.

1954-56: Maximum discharge, 1,040 cfs July 17, 1955 (gage height, 5.41 ft); maximum gage height, that of Mar. 21, 1956; minimum daily discharge, 25 cfs Mar. 25, Nov. 13, 1955.

Remarks.--Records good except those for periods of ice effect, which are poor. Water is diverted on left bank in sec. 34, T. 25 N., R. 7 W., for storage in Bynum Reservoir (usable capacity, 75,000 acre-ft). Diversions for irrigation of about 35,000 acres. Records of water temperatures, chemical analyses, and suspended sediment loads for the water year 1956 are given in WSP 1451.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Sept. 12-30)

2.3	62	3.5	250
2.4	72	4.0	412
2.6	92	4.5	606
3.0	148	5.0	830

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	85	75	50	60	45	80	245	146	332	145	116	120
2	82	*80	50	60	*50	85	213	163	369	148	134	116
3	79	124	50	65	*55	85	192	169	482	179	440	107
4	76	134	50	*70	55	85	185	185	514	383	502	103
5	73	102	50	70	55	85	179	229	*444	558	275	107
6	71	84	55	75	60	80	176	270	412	452	213	109
7	*71	79	55	75	60	*80	165	335	362	352	189	107
8	68	85	55	75	60	75	151	380	302	290	179	102
9	67	84	60	75	60	75	143	467	264	242	192	96
10	68	83	60	75	60	75	142	668	240	222	178	94
11	68	*55	65	75	55	75	140	677	229	202	187	94
12	65	40	65	75	55	*75	135	534	232	200	196	94
13	68	25	60	75	50	75	129	444	215	209	187	95
14	75	30	55	70	40	75	128	398	200	183	174	93
15	78	35	45	65	35	75	124	342	206	176	170	98
16	77	40	40	60	30	80	123	284	332	179	155	87
17	82	45	35	60	30	85	120	256	423	176	148	81
18	83	50	30	60	30	90	*118	264	502	*178	145	77
19	82	55	30	65	35	105	118	296	*416	176	142	75
20	73	55	40	65	40	125	*117	332	362	165	143	72
21	74	55	50	65	50	140	116	356	339	150	*138	71
22	80	55	*55	65	60	165	117	434	366	140	118	69
23	81	50	60	65	65	185	129	*498	*342	130	114	67
24	80	45	60	60	65	210	142	*506	290	*124	107	66
25	78	45	60	55	65	240	146	478	267	122	99	68
26	77	45	60	45	60	280	153	452	242	113	102	*67
27	83	45	60	35	60	300	148	441	224	106	137	65
28	87	50	60	30	60	300	145	423	206	106	155	65
29	92	50	55	30	60	290	145	390	178	107	153	69
30	99	50	55	35	------	280	145	366	158	107	145	74
31	99	------	55	40	------	270	------	*335	------	110	123	------
Total	2,421	1,850	1,630	1,895	1,505	4,325	4,429	11,518	9,450	6,130	5,456	2,608
Mean	78.1	61.7	52.6	61.1	51.9	140	148	372	315	198	176	86.9
Ac-ft	4,800	3,670	3,230	3,760	2,990	8,580	8,780	22,850	18,740	12,160	10,820	5,170

Calendar year 1955: Max 890 Min 25 Mean 147 Ac-ft 106,600
Water year 1955-56: Max 677 Min 25 Mean 145 Ac-ft 105,600

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 1, 2, Nov. 11 to Mar. 30.

Missouri River at Virgelle, Mont.

Location.--Lat 48°00'14", long 110°15'19", in SW¼SE¼ sec. 13, T. 26 N., R. 11 E., on left bank a quarter of a mile upstream from Virgelle ferry, half a mile southwest of Virgelle, and 3 miles downstream from Spring Coulee.

Drainage area.--34,300 sq mi, approximately.

Records available.--February 1935 to September 1956. Published as "at Loma" February 1935 to September 1953.

Gage.--Water-stage recorder. Datum of gage is 2,507.50 ft above mean sea level, datum of 1929. Prior to Sept. 30, 1953, water-stage recorder at Loma (18 miles upstream) at datum 2,543.40 ft above mean sea level.

Average discharge.--21 years 7,780 cfs (5,632,000 acre-ft).

Extremes.--Maximum discharge during year, 31,600 cfs June 4 (gage height, 9.87 ft); minimum daily, 3,000 cfs Nov. 16.

1935-56: Maximum discharge, 122,000 cfs June 5, 1953 (gage height, 23.4 ft, from floodmark), from rating curve for former site at Loma extended above 66,000 cfs, adjusted to present site; minimum daily, 638 cfs July 5, 1936.

Flood in June 1908 reached a stage of about 2 ft higher than that of June 5, 1953, from information by local residents.

Remarks.--Records good except those for period of ice effect, which are fair. Diversions for irrigation of about 830,000 acres above station. Flow regulated by 23 smaller irrigation reservoirs and powerplants (see p. 238), Canyon Ferry Reservoir (see p. 44), and Tiber Reservoir (see p. 62).

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.7	3,830	6.0	13,600
3.0	4,460	8.0	22,000
4.0	6,950	10.0	32,000

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5,600	5,880	6,200	6,200	5,600	6,600	6,290	10,100	22,800	7,160	5,130	5,830
2	5,640	5,360	6,200	5,600	6,100	6,600	4,220	10,000	25,600	5,940	5,440	5,480
3	5,840	5,620	6,900	6,400	6,100	6,600	6,000	10,100	28,400	5,980	5,540	4,560
4	*6,000	5,720	6,900	6,900	6,200	6,700	5,600	9,730	30,500	5,900	5,260	4,700
5	5,850	6,000	6,200	7,400	6,600	6,900	5,780	10,100	28,500	4,380	6,070	5,500
6	5,580	5,560	6,400	7,700	6,400	6,900	5,620	9,250	25,400	6,890	5,360	5,550
7	5,620	5,520	6,400	8,000	7,400	6,900	5,430	9,180	22,900	6,790	6,460	5,430
8	6,210	*6,050	6,400	7,200	7,200	6,900	5,370	9,220	19,000	6,870	5,370	5,580
9	6,210	5,800	6,400	7,200	7,100	6,600	3,970	9,450	18,100	5,430	6,280	5,030
10	5,680	5,800	6,700	7,600	6,900	6,600	5,890	9,760	19,300	5,780	5,810	5,320
11	6,020	6,000	6,900	6,900	6,800	6,600	5,580	10,300	15,200	6,280	5,700	4,930
12	6,120	5,960	6,500	6,700	6,800	5,700	5,520	11,000	14,900	6,320	5,110	5,410
13	6,010	6,180	7,400	6,600	6,800	4,900	6,600	11,000	17,700	5,870	5,600	5,450
14	6,040	4,520	7,400	6,600	6,900	6,400	7,010	10,900	15,600	6,370	6,060	5,410
15	6,260	3,500	6,900	6,600	6,900	7,100	6,120	10,100	11,600	5,270	5,700	5,450
16	6,220	3,000	5,300	5,300	6,500	7,200	6,220	10,000	9,380	4,510	5,660	5,510
17	5,780	5,000	5,300	4,900	6,000	7,400	*7,280	10,100	8,750	6,280	5,580	5,050
18	6,730	6,000	5,300	4,800	5,400	7,100	6,850	9,960	9,180	5,690	5,380	6,140
19	6,430	6,200	5,600	6,400	6,100	6,700	6,960	10,400	9,900	5,580	5,090	5,750
20	6,410	6,000	5,400	6,600	6,400	7,400	6,860	11,100	8,940	4,920	4,800	5,840
21	6,340	6,800	5,400	6,800	6,600	6,900	7,220	13,400	*9,640	5,210	5,480	5,700
22	6,120	7,200	6,200	6,800	6,900	6,900	8,490	15,000	9,690	4,000	5,340	5,560
23	6,060	7,800	6,900	6,900	6,900	7,000	9,620	16,800	9,320	3,980	5,170	5,440
24	5,980	6,500	7,600	*7,200	7,300	6,400	10,000	17,700	8,980	5,000	*5,350	4,980
25	6,380	5,300	7,800	7,600	7,700	6,700	9,730	17,500	7,820	5,060	5,350	5,130
26	5,900	6,500	7,600	7,200	6,900	6,020	9,930	17,400	6,980	*5,250	4,310	5,720
27	6,240	6,300	6,900	6,300	6,600	7,010	10,000	16,900	7,120	5,120	5,270	5,150
28	5,760	5,900	7,400	6,600	6,600	6,850	9,790	16,300	7,700	4,750	5,930	5,100
29	6,550	5,200	7,700	5,900	6,600	6,610	9,930	*15,900	7,360	4,920	5,750	5,520
30	5,020	5,300	7,200	5,800	------	6,870	10,000	18,500	7,100	4,360	5,630	5,560
31	5,710	------	6,700	5,700	------	6,610	------	21,600	------	5,480	5,280	------
Total	186,310	172,470	204,100	204,400	192,300	207,670	213,880	388,750	443,360	171,340	170,320	161,780
Mean	6,010	5,749	6,584	6,594	6,631	6,699	7,129	12,540	14,780	5,527	5,494	5,393
Ac-ft	369,500	342,100	404,800	405,400	381,400	411,900	424,200	771,100	879,400	339,800	337,800	320,900

Calendar year 1955:	Max	17,500	Min	3,000	Mean	7,089	Ac-ft	5,133,000
Water year 1955-56:	Max	30,500	Min	3,000	Mean	7,423	Ac-ft	5,388,000

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 15 to Mar. 25 (no gage-height record Dec. 19 to Jan. 23; discharge estimated on basis of 1 discharge measurement, weather records, and records for nearby stations).

Judith River near Utica, Mont.

Location.--Lat 46°54', long 110°14', in NW¼ sec. 17, T. 13 N., R. 12 E., on left bank at Noel Ranch, 3½ miles downstream from confluence of South and Middle Forks and 10 miles upstream from Utica.

Drainage area.--331 sq mi.

Records available.--October 1919 to September 1956.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 4,790 ft (by barometer). Prior to June 6, 1937, wire-weight gage at present site and datum.

Average discharge.--34 years (1919-23, 1924-32, 1934-56), 53.1 cfs (38,440 acre-ft per year).

Extremes.--Maximum discharge during year, 363 cfs May 28 (gage height, 3.57 ft); minimum daily, 0.5 cfs Mar. 12-14.

1919-56: Maximum discharge, 1,100 cfs May 25, 1942 (gage height, 5.56 ft), from rating curve extended above 500 cfs; no flow Mar. 19-21, 1933.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Few minor diversions for irrigation of hay meadows above station.

Revisions (water years).--WSP 896: 1939.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.6	0	2.2	41
1.7	1.0	2.5	92
1.8	4.0	3.0	209
1.9	9.0	3.6	371
2.0	17		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.8	7.3	4.9	2.9	1.6	1.0	1.5	1.5	258	38	9.0	6.7
2	7.8	7.3	4.4	2.9		.8	1.5	1.5	251	41	9.0	6.7
3	7.8	7.3	4.4	2.9		.8	1.2	1.5	245	46	9.0	6.7
4	7.8	7.3	4.4	2.9		.8	1.2	1.5	230	38	9.0	6.7
5	7.8	7.3	4.4	2.9		.8	1.5	1.5	217	34	9.6	6.7
6	8.4	7.3	4.4	3.3		.6	1.5	1.5	199	33	9.6	6.2
7	8.4	7.8	4.4	3.3		.6	1.5	1.5	184	32	9.6	6.2
8	8.4	7.3	4.0	3.3		.6	1.5	1.5	164	29	9.0	6.2
9	8.4	7.3	4.0	2.3		.6	1.5	1.5	150	27	13	5.7
10	8.4	7.3	4.0	2.3		.6	1.5	2.0	136	25	10	5.7
11	9.0	7.3	4.0	2.3	1.4	.6	1.5	27	124	26	9.6	5.7
12	9.0	6.7	4.0	2.3		.5	1.5	52	118	28	9.6	5.7
13	9.0	6.0	4.0	2.3		.5	1.5	48	111	27	9.0	5.7
14	9.0	5.8	3.6	2.3		.5	1.5	50	*102	25	9.0	5.7
15	9.0	5.7	3.6	2.3		.6	1.5	54	102	21	9.0	5.7
16	9.6	5.7	3.6	2.0	1.0	.6	1.5	79	120	18	9.0	5.7
17	9.6	5.8	3.6	2.0		.6	1.5	134	102	16	9.0	5.7
18	9.6	6.0	3.6	*2.0		.6	1.5	189	90	16	9.0	5.2
19	9.6	6.1	3.6	2.0		.8	1.5	225	82	15	9.0	5.2
20	9.6	6.2	3.6	2.0		1.0	1.5	245	77	14	8.4	5.2
21	9.6	6.2	3.6	2.0	1.4	1.5	1.5	284	82	14	8.4	5.2
22	9.6	5.7	3.6	2.0		1.2	1.5	295	75	12	7.8	5.2
23	9.0	5.2	3.6	2.0		1.7	1.5	295	66	13	7.3	4.9
24	9.0	5.2	3.3	1.7		1.7	1.5	312	63	12	7.3	4.9
25	9.0	5.2	3.3	1.5		2.0	*1.5	309	*58	12	7.3	4.9
26	8.7	5.2	3.3	1.5		2.0	1.5	301	53	11	7.3	4.9
27	8.3	4.9	2.9	1.5	(*)	1.7	1.5	321	50	11	7.8	4.9
28	7.9	4.9	2.9	1.7		1.5	1.5	351	46	11	7.3	*4.4
29	7.5	4.9	2.9	2.0		*1.2	1.5	329	41	11	*7.3	4.0
30	7.1	*4.9	*2.9	*2.0	------	1.5	1.5	*307	40	11	7.3	4.0
31	*6.7	------	2.9	2.0	------	1.5	------	279	------	*10	7.3	------
Total	266.4	187.1	115.7	70.4	40.6	31.0	44.4	4,501.5	3,636	677	269.8	166.3
Mean	8.59	6.24	3.73	2.27	1.40	1.00	1.48	145	121	21.8	8.70	5.54
Ac-ft	528	371	229	140	81	61	88	8,930	7,210	1,340	535	330

Calendar year 1955: Max 397 Min 0.8 Mean 42.5 Ac-ft 30,790
Water year 1955-56: Max 351 Min 0.5 Mean 27.3 Ac-ft 19,840

Peak discharge (base, 120 cfs).--May 28 (4 p.m.) 363 cfs (3.57 ft); June 16 (11 a.m. to 1 p.m.) 131 cfs (2.68 ft).

* Discharge measurement made on this day.

Note.--No gage-height record Oct. 26-30, Nov. 13-19; discharge interpolated. Stage-discharge relation affected by ice Jan. 25 to Feb. 29, Mar. 11-13.

Ross Fork near Hobson, Mont.

Location.--Lat 46°59', long 109°48', in NW¼ sec. 11, T. 14 N., R. 15 E., on left bank 1 mile downstream from Hauck Coulee, 3½ miles east of Hobson, and 7 miles upstream from mouth.

Drainage area.--330 sq mi, approximately.

Records available.--June 1946 to December 1953, March 1955 to September 1956.

Gage.--Water-stage recorder.

Average discharge.--8 years, 15.9 cfs (11,510 acre-ft per year).

Extremes.--Maximum discharge during year, 389 cfs Mar. 21 (gage height, 5.27 ft), but may have been higher on Mar. 20; maximum gage height, 6.38 ft Mar. 20 (backwater from ice); no flow Oct. 1-12, July 26, 27, Aug. 1 to Sept. 30.

1946-53, 1955-56: Maximum discharge, 1,160 cfs Mar. 22, 1947 (gage height, 7.80 ft), from rating curve extended above 360 cfs by logarithmic plotting; no flow at times.

Remarks.--Records poor. Small diversions for irrigation of hay meadows above station. Flow may be augmented by operation of Ackley Lake (see p. 238), which receives water from Judith River.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	*1.5	*3	6	2.5	7	35	24	18	7.0	(*)	
2	0	1.5	3	6	3.5	7	33	29	17	7.2		
3	0	2.5	2.5	6.5	4.5	7.5	31	31	17	8.2		
4	0	2	2	7.5	5	7.5	30	31	15	8.0		
5	0	1.5	2.5	6.5	5.5	6.5	30	31	14	7.7		
6	0	1	3.5	6	5	6.5	28	30	15	7.2		
7	0	1	3.5	6	4.5	7	27	28	15	7.2		
8	0	1.5	3.5	6	3.5	7.5	28	*25	15	6.8		
9	0	2	3.5	6	4.5	6.5	26	*23	14	6.5		
10	0	1.5	4.5	6.5	4.5	5.5	26	23	14	5.4		
11	0	1	5	6.5	5	4	26	23	13	4.8		
12	0	1	6	6	6	5.5	25	22	12	5.6		
13	.5	1	5	6	5	6.5	24	20	12	6.4		
14	.6	1	4	5	4	6.5	23	19	11	5.3		
15	.6	1	3.5	4	3	6.5	21	18	15	5.2		
16	.6	1	4.5	3	2	8	21	17	51	5.6		
17	.8	1	4	4	3	12	20	17	124	4.7		
18	.8	2	2.5	4	3.5	20	19	17	18	3.2		
19	1.0	3	3.5	4	4	60	18	17	11	2.8		
20	1.0	3.5	5	3	5	200	18	18	7.9	2.4		
21	1.0	3	6	3.5	6	336	18	18	7.4	2.0		
22	1.0	2.5	8	4	7	210	18	18	6.6	1.7		
23	1.5	2.5	8	5	7.5	164	19	18	6.4	1.2		
24	2	3	5	4.5	6.5	182	20	19	6.8	.6		
25	2	2.5	4	3.5	6	186	21	19	*6.6	.2		
26	2	2	6	3	6	164	24	18	6.8	0		(*)
27	1.5	2	5	4	6.5	93	24	24	6.8	0		
28	1.5	2.5	4.5	4.5	*6.5	48	23	27	6.8	.4		
29	1.5	3	4	4	6.5	41	22	24	6.6	.6	(*)	
30	1.5	3	*4	*3.5	------	*36	23	*24	6.8	.6		
31	1.5	------	5	3	------	34	------	22	------	.2		------
Total	22.9	57.5	134.0	151.0	142.0	1,891.5	721	694	496.5	124.7	0	0
Mean	0.74	1.92	4.32	4.87	4.90	61.0	24.0	22.4	16.6	4.02	0	0
Ac-ft	45	114	266	300	282	3,750	1,430	1,380	98.5	247	0	0

Calendar year 1955: Max - Min - Mean - Ac-ft -
Water year 1955-56: Max 336 Min 0 Mean 12.1 Ac-ft 8,800

Peak discharge (base, 150 cfs).--Mar. 21 (11 p.m.) 389 cfs (5.27 ft); June 17 (3 a.m.) 293 cfs (5.19 ft).

* Discharge measurement or observation of no flow on this day.

Note.--Stage-discharge relation affected by ice Oct. 22 to Mar. 20.

Big Spring Creek near Lewistown, Mont.

Location.--Lat 47°01', long 109°21', in NW¼ sec. 5, T. 14 N., R. 19 E., on upstream side of left wing wall of old highway bridge, half a mile downstream from Big Springs and 5 miles southeast of Lewistown.

Records available.--June 1932 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 4,130 ft (by barometer). Prior to Apr. 27, 1955, staff gage on downstream left wing wall read 2 or 3 times weekly.

Average discharge.--24 years, 107 cfs (77,460 acre-ft per year).

Extremes.--Maximum discharge recorded during year, 117 cfs Oct. 4; maximum gage height recorded, 0.76 ct June 15; minimum daily discharge, 102 cfs May 17 to June 1.

1932-56: Maximum discharge, 250 cfs May 30, 1953 (gage height, 1.95 ft, from high-water mark), from rating curve extended above 120 cfs; minimum observed, 76 cfs Feb. 1-8, 1938.

Remarks.--Records poor. City of Lewistown diverts water above station for municipal supply.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	116	104	*104	105	a105	103	106	a106	102	108	*106	114
2	116	104	a104	106	a105	104	106	a105	103	108	106	113
3	116	104	g104	106	a105	104	106	a105	103	108	107	113
4	115	104	g104	106	g105	104	106	g104	104	109	108	113
5	114	104	a104	106	a105	103	106	a104	104	108	108	112
6	114	104	a105	106	a106	103	106	a104	104	108	108	112
7	114	104	g105	106	a106	103	106	a103	104	108	109	112
8	114	104	a105	106	a106	104	106	a103	104	108	110	112
9	113	104	a104	106	a107	104	106	*103	104	108	110	111
10	112	104	a104	106	g108	103	107	103	104	108	110	111
11	112	104	g104	106	a107	103	106	104	104	108	111	111
12	112	105	a104	105	a106	104	106	104	105	108	111	111
13	112	105	a104	105	a105	104	106	103	106	108	111	111
14	111	104	a104	105	a104	104	106	103	106	108	110	111
15	110	104	a104	105	g104	104	106	103	106	107	110	111
16	110	104	a104	105	a104	104	106	103	109	107	110	110
17	110	104	a104	105	g104	104	106	102	107	108	111	110
18	109	104	a104	*105	a104	105	106	102	108	108	111	110
19	109	104	a104	105	a104	106	106	102	108	108	112	110
20	108	104	a104	105	g104	105	106	102	108	107	111	110
21	108	104	g104	104	a104	104	106	102	108	107	111	110
22	108	104	a104	a104	a104	105	106	102	109	107	111	a110
23	108	104	a104	g105	a104	105	107	102	108	106	111	a109
24	107	103	g104	a105	g104	105	a107	102	109	106	111	a109
25	106	103	a104	a105	a104	104	a107	102	109	106	112	a109
26	106	103	a104	g105	a104	104	a107	102	*109	106	113	a108
27	106	103	g104	a105	g104	103	a107	102	108	107	114	*108
28	106	104	a104	a105	*103	104	a107	102	108	107	*114	108
29	105	104	*104	a105	103	104	a107	102	109	107	114	108
30	104	104	104	g105	------	*105	g107	102	109	106	114	107
31	*104	------	104	a105	------	106	------	*102	------	106	114	------
Total	3,415	3,118	3,227	3,263	3,038	3,227	3,188	3,190	3,189	3,329	3,429	3,314
Mean	110	104	104	105	105	104	106	103	106	107	111	110
Ac-ft	6,770	6,180	6,400	6,470	6,030	6,400	6,320	6,330	6,330	6,600	6,800	6,570

Calendar year 1955 :	Max	136	Min	95	Mean	112	Ac-ft	81,060
Water year 1955-56 :	Max	116	Min	102	Mean	106	Ac-ft	77,200

* Discharge measurement made on this day
a No gage-height record; discharge interpolated.
g Computed from staff-gage readings.

Wolf Creek near Stanford, Mont.

Location.--Lat 47°07', long 110°17', in NE¼SE¼ sec. 26, T. 16 N., R. 11 E., on right bank half a mile downstream from confluence of Dry Wolf and Running Wolf Creeks and 4 miles southwest of Stanford.

Drainage area.--118 sq mi.

Records available.--March 1950 to November 1953, March 1955 to September 1956. March 1920 to September 1926 (few winter records) at site a quarter of a mile upstream; records not equivalent due to diversions.

Gage.--Water-stage recorder. Altitude of gage is 4,490 ft (by barometer).

Extremes.--Maximum discharge during year, 9.0 cfs Aug. 26 (gage height, 1.95 ft); maximum gage height, 2.24 ft Feb. 1, 2 (backwater from ice); minimum discharge, 0.1 cfs Mar. 28 (gage height, 1.38 ft).

1950-53, 1955-56: Maximum discharge, 578 cfs (does not include an estimated 50 cfs in bypass channel on left bank) June 4, 1953 (gage height, 4.51 ft), from rating curve extended above 52 cfs on basis of velicity-area study; no flow Nov. 17, 1951 (result of ice jam upstream).

Remarks.--Records good except those for periods of ice effect, which are poor. Some regulation from a small dam a quarter of a mile upstream. Several diversions for irrigation of hay meadows above station.

Revisions.--WSP 1176: Drainage area.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.3	0	1.6	2.4
1.4	.4	1.7	4.1
1.5	1.2		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.1	1.3	1.8	2.2	1.6	1.8	1.3	1.8	1.9	1.6	1.5	0.9
2	2.0	1.5	1.8	2.0	1.6	1.8	1.3	1.9	1.6	1.6	1.4	.9
3	1.9	1.6	1.8	2.0	1.6	1.5	1.3	1.8	1.8	1.8	1.4	1.0
4	1.9	1.4	1.8	2.2	1.6	1.4	1.3	1.9	1.6	1.5	1.2	1.0
5	1.9	1.4	1.7	2.3	1.6	1.4	1.2	2.0	1.5	1.5	1.1	1.0
6	1.9	1.5	1.4	2.4	1.5	1.3	1.3	2.1	1.5	1.4	1.3	1.1
7	2.0	1.5	1.6	2.3	1.5	1.4	1.3	2.1	1.0	1.1	1.3	1.1
8	1.8	1.6	1.8	2.2	1.5	1.4	1.4	*2.1	.9	.9	1.5	1.2
9	1.8	1.6	1.8	2.1	1.5	1.4	1.3	2.2	.9	.9	1.5	1.3
10	1.8	1.5	1.8	2.0	1.4	1.3	1.3	2.5	.7	.8	1.4	1.4
11	1.6	1.4	1.8	2.0	1.3	1.2	1.3	3.0	.7	.9	1.3	1.4
12	1.6	1.2	2.0	2.0	1.2	1.2	1.3	2.7	1.4	1.0	1.2	1.4
13	1.8	1.0	2.0	1.9	1.2	1.4	1.3	2.1	1.4	1.1	1.2	1.4
14	1.8	.8	1.9	1.9	1.1	1.6	1.3	2.4	1.5	1.3	1.1	1.4
15	1.6	.6	1.8	1.8	1.0	1.6	1.3	2.5	1.6	1.6	1.0	1.4
16	1.5	.6	1.7	1.8	1.2	1.6	1.3	2.4	1.8	1.5	1.1	1.3
17	1.5	.8	1.6	1.8	1.3	1.3	1.3	2.2	1.8	1.6	1.1	1.4
18	1.5	1.2	1.4	1.8	1.4	1.2	1.2	2.1	1.8	1.6	1.2	1.2
19	1.5	1.6	1.8	1.8	1.5	1.0	1.2	1.8	1.6	1.5	1.3	1.2
20	1.4	2.0	2.0	1.8	1.6	.9	1.2	1.8	1.5	1.4	1.1	1.4
21	1.3	2.0	2.5	1.7	1.8	.8	1.2	1.8	1.9	1.2	1.2	1.5
22	1.4	1.9	2.8	1.7	2.0	.7	1.3	1.9	1.8	1.2	1.2	1.5
23	1.5	1.8	3.0	1.6	2.0	.7	1.4	2.1	1.6	1.2	1.1	1.5
24	1.4	1.7	3.0	1.6	1.9	.7	1.4	2.1	1.8	1.5	1.0	1.5
25	1.4	1.6	2.8	1.6	2.0	.8	1.4	1.9	*1.6	1.5	.9	1.6
26	1.4	1.5	2.6	1.6	2.1	.8	1.4	2.2	1.6	1.6	1.6	1.4
27	1.4	1.5	2.6	1.6	*2.1	.4	1.5	2.7	1.6	1.9	1.9	1.5
28	1.4	1.6	2.8	1.6	1.8	.6	1.5	2.7	1.6	1.5	1.2	*1.6
29	1.4	1.7	3.0	1.6	1.9	*1.3	1.8	2.4	1.6	1.4	*.9	1.6
30	1.4	*1.8	*3.3	*1.6	------	1.3	1.8	*2.1	1.6	1.3	1.0	1.6
31	*1.4	------	2.8	1.6	------	1.3	------	2.2	------	*1.4	.9	------
Total	50.3	43.2	66.5	58.1	45.8	37.1	40.4	67.5	45.2	42.3	38.1	39.7
Mean	1.62	1.44	2.15	1.87	1.58	1.20	1.35	2.18	1.51	1.36	1.23	1.32
Ac-ft	100	86	132	115	91	74	80	134	90	84	76	79

Calendar year 1955 : Max - Min - Mean - Ac-ft -

Water year 1955-56 : Max 3.3 Min 0.4 Mean 1.57 Ac-ft 1,140

Peak discharge (base, 22 cfs).--No peak above base.

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 9 to Feb. 22, Feb. 25, Mar. 4-13 (no gage-height record Nov. 14-29; discharge estimated on basis of 1 discharge measurement and weather records).

Missouri River at powerplant ferry, near Zortman, Mont.

Location.--Lat 47°44', long 108°56', in E½NE¼ sec. 30, T. 23 N., R. 22 E., on left bank at powerplant ferry, 5 miles downstream from Cow Creek and 22 miles southwest of Zortman.

Drainage area.--40,600 sq mi, approximately.

Records available.--February 1934 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 2,273.02 ft above mean sea level (levels by Corps of Engineers). Prior to Feb. 7, 1935, wire-weight gage at same site and datum.

Average discharge.--22 years 8,413 cfs (6,091,000 acre-ft per year).

Extremes.--Maximum discharge during year, 40,700 cfs June 16 (gage height, 10.64 ft); minimum daily, 3,800 cfs Nov. 17.

1934-56: Maximum discharge, 137,000 cfs June 6, 1953 (gage height, 22.20 ft, from graph based on gage readings); maximum gage height, 30.16 ft Mar. 19, 1947 (ice jam), from floodmark; minimum discharge, 1,120 cfs July 8, 1936 (gage height, 1.92 ft); minimum daily, 1,220 cfs Dec. 13, 1936.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of about 850,000 acres above station. Flow regulated by 24 smaller irrigation reservoirs and powerplants (see p. 238), Canyon Ferry Reservoir (see p. 44), and Tiber Reservoir (see p. 62).

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

3.8	3,780	6.0	11,200
4.0	4,240	8.0	22,200
5.0	7,320	10.0	35,900

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6,500	6,690	6,000	7,500	6,400	7,300	7,300	11,100	23,900	7,620	5,720	5,840
2	6,380	6,820	7,000	7,000	6,300	7,300	7,200	11,200	26,100	7,740	5,480	6,130
3	6,350	6,200	7,000	6,500	7,000	7,300	5,000	11,200	28,600	6,600	5,760	5,800
4	6,660	6,730	7,700	7,000	7,000	7,300	6,700	11,200	31,000	6,920	5,890	4,960
5	6,580	6,650	7,700	7,500	7,000	7,300	6,520	11,000	*32,200	6,350	5,590	4,820
6	6,560	6,920	*7,000	8,000	7,400	7,500	6,760	11,200	28,700	4,760	6,240	6,000
7	6,330	6,410	7,000	8,500	7,100	7,500	6,600	10,400	27,000	7,390	4,900	6,040
8	6,380	*6,120	7,000	8,700	8,200	7,500	6,350	*10,300	*24,000	7,350	7,180	5,760
9	6,970	6,880	7,000	8,000	8,000	7,500	*6,020	10,400	20,500	7,050	5,700	6,200
10	6,900	6,660	7,000	8,000	7,900	7,300	5,040	10,600	20,700	*5,990	*7,760	5,510
11	6,240	6,690	7,400	*8,200	7,800	7,300	6,680	10,800	20,800	7,460	6,480	5,300
12	6,520	6,920	7,500	7,500	7,700	7,300	6,510	11,300	15,900	6,800	6,000	5,540
13	6,620	6,720	7,200	7,400	7,700	6,200	6,180	11,900	17,100	6,660	5,600	*5,820
14	6,900	7,000	8,200	7,400	7,700	5,700	7,250	12,000	19,700	6,300	6,200	5,910
15	6,920	5,200	8,200	7,400	7,700	7,200	8,130	11,900	17,300	6,880	6,600	5,920
16	7,120	4,200	7,700	7,400	7,700	7,800	7,040	11,000	22,400	5,760	6,200	5,970
17	7,060	3,800	6,000	6,000	7,300	7,800	6,920	10,900	11,000	4,540	6,200	5,860
18	6,720	5,700	6,000	5,500	6,700	8,200	8,320	10,900	10,200	6,840	6,000	5,620
19	7,720	6,700	6,000	5,400	6,200	7,800	7,720	10,800	10,400	5,910	5,800	6,580
20	7,300	7,000	6,300	7,000	6,800	7,400	7,670	11,200	10,900	5,650	5,600	6,320
21	7,340	6,700	6,200	7,400	7,200	8,300	7,610	12,000	10,000	5,260	5,400	6,380
22	7,160	7,500	6,100	7,500	7,500	7,700	7,900	15,100	10,600	5,580	6,000	6,240
23	6,860	8,000	7,000	7,500	7,700	7,700	9,220	16,600	10,500	4,460	5,800	6,140
24	6,910	8,500	7,600	7,500	7,700	7,700	10,700	19,300	10,200	3,960	5,600	6,100
25	6,970	7,200	8,300	7,800	8,000	7,200	11,000	19,500	9,720	5,110	5,800	5,600
26	7,470	6,000	8,500	8,500	8,500	7,500	10,800	19,600	8,880	5,120	5,800	5,740
27	7,180	7,300	8,300	7,800	7,500	6,800	10,800	19,600	8,010	5,460	5,000	6,160
28	6,990	6,800	7,800	7,000	7,300	7,700	10,900	19,400	7,420	5,360	5,710	5,890
29	6,790	6,500	8,000	7,400	7,300	7,500	10,800	18,100	8,420	5,120	6,180	5,680
30	7,320	6,000	8,500	6,500	------	7,500	10,800	17,900	7,960	5,600	6,620	6,210
31	6,070	------	8,000	6,500	------	7,500	------	21,700	------	4,910	6,240	------
Total	211,790	196,510	225,200	227,300	214,300	229,600	236,440	420,100	510,110	186,510	185,050	176,040
Mean	6,832	6,550	7,265	7,332	7,390	7,406	7,881	13,550	17,000	6,016	5,969	5,868
Ac-ft	420,100	389,800	446,700	450,800	425,100	455,400	469,000	833,300	1,012,000	369,900	367,000	349,200

Calendar year 1955 : Max 20,200 Min 3,800 Mean 8,142 Ac-ft 5,895,000
Water year 1955-56 : Max 32,200 Min 3,800 Mean 8,248 Ac-ft 5,988,000

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 14 to Apr. 4. No gage-height record Aug. 12-27; discharge estimated on the basis of weather records and records for station at Virgelle.

North Fork Musselshell River near Delpine, Mont.

Location.--Lat 46°38', long 110°35', in SW$\frac{1}{4}$SE$\frac{1}{4}$ sec. 22, T. 10 N., R. 9 E., on right bank half a mile upstream from flow line of Durand Reservoir, 1 mile downstream from Lion Creek, and 4 miles northwest of Delpine.

Drainage area.--38.4 sq mi (revised).

Records available.--May 1940 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 5,380 ft (by barometer).

Average discharge.--16 years, 12.4 cfs (8,980 acre-ft per year).

Extremes.--Maximum discharge during year, 54 cfs Apr. 15 (gage height, 1.51 ft); maximum gage height, 2.03 ft Dec. 28 (backwater from ice); minimum discharge, 3.1 cfs Sept. 3.

1940-56: Maximum discharge, 423 cfs Apr. 1, 1950 (gage height, 4.63 ft), from rating curve extended above 60 cfs; minimum, 1.6 cfs Aug. 16, 1941 (gage height, 0.32 ft).

Remarks.--Records good except those for periods of ice effect, which are poor. Small diversions for irrigation of hay meadows above station.

Rating table, water year 1955-56, excpet periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.4	3.3	0.8	13
.5	4.6	1.0	21
.6	6.8	1.5	56

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.2	5.5	6.6	6.6	3.5	5.3	18	17	*31	8.6	4.6	7.7
2	4.2	*4.5	*6.4	6.4	4.0	5.3	15	17	29	8.9	*4.3	5.0
3	4.2	4.5	6.1	6.1	4.5	5.0	13	16	26	12	5.5	3.3
4	4.6	6.1	6.1	6.1	4.8	5.3	14	16	24	9.8	5.9	4.1
5	4.5	8.0	6.1	6.1	5.0	5.3	*18	20	23	9.5	5.7	4.3
6	4.3	8.3	6.6	5.9	5.0	5.3	15	20	24	9.2	6.1	4.5
7	4.3	8.9	6.4	5.9	5.0	5.3	12	19	23	8.9	6.4	4.0
8	4.2	7.4	6.1	5.7	4.8	5.5	12	20	21	8.3	5.9	3.7
9	4.2	7.7	6.4	5.5	4.8	5.3	17	21	20	8.3	5.7	3.8
10	4.1	8.6	6.1	5.7	4.8	4.8	33	*25	18	8.9	5.5	3.7
11	4.1	7.7	6.1	5.7	4.8	4.5	20	23	16	11	5.0	3.8
12	4.0	7.5	5.9	5.7	4.8	5.5	18	22	16	9.2	4.8	4.3
13	3.8	6.5	4.8	5.7	*4.8	5.5	27	21	15	8.6	4.5	4.0
14	3.8	6.1	4.6	5.5	4.6	5.5	30	21	15	8.3	4.2	3.8
15	4.0	5.9	4.6	4.6	4.5	5.5	26	21	16	7.7	4.3	3.6
16	4.1	6.1	5.0	5.0	4.2	5.5	28	22	19	7.1	4.5	4.0
17	4.0	6.6	6.0	5.0	4.8	5.3	21	22	15	7.1	9.2	3.6
18	4.0	7.4	5.0	5.0	5.0	5.3	20	23	15	7.1	9.5	3.7
19	4.1	8.6	5.5	5.0	5.0	5.3	21	24	13	6.8	9.2	3.6
20	4.1	8.9	6.0	4.5	5.0	5.5	22	22	12	6.4	8.3	4.2
21	4.1	8.6	6.0	5.0	5.3	5.5	23	24	14	5.9	8.0	4.5
22	4.2	8.3	7.0	5.0	5.0	6.4	21	25	13	5.7	7.7	3.7
23	4.6	8.3	8.0	4.5	5.0	8.6	20	26	12	5.7	7.4	3.6
24	4.6	7.4	6.5	4.5	5.0	16	20	29	13	5.5	7.4	4.1
25	4.6	7.1	6.0	4.0	5.0	17	19	31	12	5.3	7.4	3.7
26	4.6	6.6	5.5	4.0	5.3	28	18	32	*11	5.5	8.0	3.6
27	4.8	5.9	5.5	4.5	5.5	17	17	35	10	5.9	11	3.7
28	4.8	7.4	*5.5	4.0	5.3	16	17	34	9.8	6.1	8.3	4.5
29	5.0	6.8	5.5	4.0	*5.3	16	17	36	8.9	6.4	8.3	4.8
30	5.3	6.6	5.0	4.0	------	15	17	36	8.9	6.6	8.3	4.0
31	4.8	------	6.0	4.0	------	16	------	34	------	5.9	*7.7	------
Total	134.2	213.8	182.9	159.2	140.4	267.3	589	754	503.6	236.2	208.6	122.9
Mean	4.33	7.13	5.90	5.14	4.84	8.62	19.6	24.3	16.8	7.62	6.73	4.10
Ac-ft	266	424	363	316	278	530	1,170	1,500	999	468	414	244

Calendar year 1955: Max 29 Min 1.9 Mean 7.23 Ac-ft 5,230
Water year 1955-56: Max 36 Min 3.3 Mean 9.60 Ac-ft 6,970

Peak discharge (base, 50 cfs).--Apr. 15 (8 p.m.) 54 cfs (1.51 ft).
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 12, 13, Dec. 16-31, Jan. 17 to Feb. 3.

South Fork Musselshell River above Martinsdale, Mont.

Location.--Lat 46°27', long 110°23', in NW¼ sec. 17, T. 8 N., R. 11 E., on left bank 2 miles downstream from Cottonwood Creek, 3 miles west of Martinsdale, and 6 miles upstream from confluence with North Fork.

Records available.--October 1941 to September 1956 (no winter records 1941-42).

Gage.--Water-stage recorder. Altitude of gage is 4,900 ft (by barometer).

Average discharge.--14 years (1942-56), 84.9 cfs (61,470 acre-ft per year).

Extremes.--Maximum discharge during year, 916 cfs May 29 (gage height, 5.53 ft); minimum, 4.2 cfs Sept. 20.

1941-56: Maximum discharge, 1,240 cfs June 5, 1948 (gage height, 6.56 ft); minimum, 0.1 cfs Aug. 28-31, Sept. 2, 1949, Mar. 29, 1950.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of about 6,600 acres of which 250 acres lie below station.

Rating tables, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Sept. 22-30)

Oct. 1 to Mar. 23		Mar. 24 to Sept. 30			
2.1	5.1	2.0	2.0	3.0	132
2.2	10	2.1	5.1	3.5	261
2.3	18	2.2	10	4.0	412
		2.3	18	5.0	736
		2.5	43	5.5	906

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	10	13	18	29	13	18	65	89	594	49	10	8.3
2	9.3	*13	*18	28	15	18	54	98	611	52	*9.9	7.2
3	8.8	12	18	25	16	17	48	94	558	60	10	6.7
4	8.8	16	18	20	16	16	49	87	513	56	9.9	7.8
5	8.8	19	18	20	16	15	*46	98	462	54	9.3	8.3
6	8.8	20	19	19	16	14	39	162	403	55	8.8	8.3
7	8.8	22	18	18	16	16	39	122	335	46	9.3	7.8
8	8.8	20	18	17	15	16	42	128	267	40	9.3	7.2
9	8.8	21	18	19	15	14	44	*235	218	38	9.3	7.8
10	8.8	22	17	17	15	13	65	314	208	35	9.9	7.2
11	8.8	21	17	17	15	13	77	338	202	40	9.3	7.2
12	8.8	20	18	17	16	15	70	264	190	39	8.8	6.2
13	8.8	17	17	16	15	15	90	210	175	33	8.3	6.2
14	9.3	16	16	15	*14	15	119	190	155	32	7.8	6.2
15	9.9	15	16	14	13	15	162	188	*148	29	7.2	5.6
16	9.9	16	17	16	13	18	210	238	153	27	6.7	5.1
17	9.9	17	18	18	15	20	178	353	137	21	6.7	5.1
18	11	18	16	19	16	13	146	*453	126	17	7.2	4.5
19	11	20	17	19	17	15	141	507	109	16	7.8	4.5
20	11	21	18	18	18	20	162	588	100	14	7.2	4.5
21	11	20	18	18	20	25	195	680	122	13	6.7	5.1
22	12	19	30	17	21	30	205	720	103	12	6.2	5.1
23	12	19	50	15	21	40	160	743	89	10	5.1	5.1
24	12	18	35	14	20	80	130	763	82	10	5.1	4.8
25	11	17	30	14	20	102	117	763	85	9.9	5.1	5.1
26	11	16	30	13	19	105	107	736	75	8.8	5.1	4.8
27	11	15	32	13	18	89	105	733	61	9.9	7.2	5.1
28	12	17	*33	14	18	89	92	777	56	12	8.3	5.1
29	12	17	32	14	*18	80	89	865	52	11	8.3	5.6
30	13	18	25	14	------	77	92	756	49	10	8.3	6.2
31	13	------	27	13	------	73	------	*644	------	10	*9.3	------
Total	318.1	535	692	540	480	1,106	3,138	12,936	6,438	869.6	247.4	183.7
Mean	10.3	17.8	22.3	17.4	16.6	35.7	105	417	215	28.1	7.98	6.12
Ac-ft	631	1,060	1,370	1,070	952	2,190	6,220	25,660	12,770	1,720	491	364

Calendar year 1955: Max 312 Min 4.5 Mean 40.7 Ac-ft 29,470
Water year 1955-56: Max 865 Min 4.5 Mean 75.1 Ac-ft 54,500

Peak discharge (base, 480 cfs).--May 24 (9 a.m.) 784 cfs (5.14 ft); May 29 (8 a.m.) 916 cfs (5.53 ft).

* Discharge measurement made on this day.

Note.--No gage-height record Nov. 3 to Dec. 1; discharge estimated on basis of 2 discharge measurements and record for North Fork Musselshell River near Delpine. Stage-discharge relation affected by ice from about Nov. 12 to Mar. 23.

Big Elk Creek at Twodot, Mont.

Location.--Lat 46°25', long 110°04', in NE$\frac{1}{4}$NW$\frac{1}{4}$ sec. 35, T. 8 N., R. 13 E., on right bank on upstream pile bent of private bridge, three-quarters of a mile south of Twodot and 1 mile upstream from mouth.

Records available.--March 1953 to September 1956 (discontinued).

Gage.--Staff gage read once daily. Altitude of gage is 4,450 ft (by barometer).

Extremes.--Maximum discharge observed during year, 242 cfs May 27 (gage height, 3.20 ft); minimum observed, 0.9 cfs Aug. 24-26 (gage height, 1.50 ft).

1953-56: Maximum discharge observed, that of May 27, 1956; minimum, 0.3 cfs May 22, 1955 (gage height, 1.42 ft, from graph based on gage readings).

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of about 4,700 acres above station.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.4	0.3	2.0	22
1.5	1.0	2.2	43
1.6	2.0	2.5	102
1.7	4.6	3.0	202
1.8	8.4	3.5	302
1.9	14		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.4	*7.6	9.0	10	8	7	8.4	20	*146	3.6	2.8	1.3
2	5.7	5.7	*9.5	10	8	5	8.4	23	144	3.3	*2.5	1.3
3	6.1	5.7	8.5	10	8	7	10	23	144	5.7	1.9	1.4
4	7.3	5.7	8.5	10	8	8	13	23	146	6.9	1.8	1.5
5	7.6	6.5	10	10	8	7	*14	29	144	8.0	1.7	1.4
6	7.3	5.7	10	9	7	5	14	33	102	8.4	1.7	1.3
7	6.9	6.5	7.5	9	7	6	14	32	70	8.4	1.7	1.3
8	7.3	6.1	7	8	7	7	14	26	66	7.3	1.7	1.3
9	6.9	4.3	6.9	8	8	5	14	*30	51	6.1	1.7	1.3
10	6.5	5.4	7.3	8	8	6	14	41	47	5.7	1.7	1.3
11	6.9	6.9	6.9	10	8	7	14	45	39	5.7	1.6	1.3
12	7.3	7.3	11	10	9	10	14	43	28	5.7	1.6	1.3
13	7.3	6.5	9	10	*8	12	14	35	18	5.4	1.5	1.3
14	5.4	6.5	8.5	9	7	12	14	24	13	5.0	1.5	1.3
15	7.3	6	10	7	6	12	14	22	*12	3.3	1.5	1.3
16	7.3	5.5	9.5	6	7	15	14	23	33	2.3	1.5	1.2
17	6.9	6.5	8.5	5	8	15	14	29	16	2.3	1.5	1.2
18	6.9	7	8	4	8	14	14	*49	13	2.0	1.4	1.2
19	7.6	9.5	9	6	8	14	14	66	13	1.9	1.3	1.2
20	8.4	12	10	5	8	16	15	84	16	1.9	1.1	1.2
21	8.4	8	11	8	9	18	15	138	13	1.9	1.0	1.2
22	9.5	6.5	13	9	10	19	15	162	11	1.9	1.0	1.2
23	9.5	5.5	16	9	10	20	16	160	7.3	1.9	1.0	1.2
24	8.0	6.5	15	9	9	22	20	148	7.3	1.9	.9	1.2
25	8.0	8.4	14	8	8	21	17	142	7.3	1.8	.9	1.2
26	8.0	8.4	13	7	6	16	15	144	6.5	1.8	.9	1.2
27	9.0	7.5	12	7	6	14	15	208	6.1	1.8	1.0	1.2
28	8.4	8	*10	7	6.5	14	15	228	5.4	1.8	1.2	1.2
29	8.4	8	9	7	*6.5	13	15	222	5.0	1.8	1.3	1.2
30	8.4	9	9	6	------	9.5	16	220	4.1	1.8	1.3	1.2
31	8.0	------	10	7	------	8.4	------	178	------	2.0	*1.3	------
Total	231.9	208.7	306.6	248	225.0	364.9	423.8	2,650	1,334.0	119.3	45.5	37.9
Mean	7.48	6.96	9.89	8.00	7.76	11.8	14.1	85.5	44.5	3.85	1.47	1.26
Ac-ft	460	414	608	492	446	724	841	5,260	2,650	237	90	75

Calendar year 1955: Max 106 Min 0.5 Mean 12.3 Ac-ft 8,930
Water year 1955-56: Max 228 Min 0.9 Mean 16.9 Ac-ft 12,300

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 13-18, 22-24, 27-30, Dec. 2-4, 7, 8, 13-23, Dec. 25 to Mar. 23.

Musselshell River at Harlowton, Mont.

Location.--Lat 46°26', long 109°51', in NE¼ sec. 28, T. 8 N., R. 15 E., on left bank 300 ft downstream from bridge on State Highway 19, 1 mile southwest of Harlowton, and 6 miles upstream from American Fork.

Drainage area.--1,130 sq mi, approximately.

Records available.--July 1907 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 4,170 ft (by barometer). Prior to Dec. 8, 1937, chain gage at site 1¼ miles downstream at different datum. Dec. 8, 1937, to Aug. 26, 1955, wire-weight gage at bridge 300 ft upstream at datum 2.00 ft higher.

Average discharge.--32 years (1909-12, 1914-15, 1917-19, 1924-26, 1927-28, 1931-32, 1934-56), 148 cfs (107,100 acre-ft per year).

Extremes.--Maximum discharge during year, 1,150 cfs May 30 (gage height, 4.94 ft); maximum gage height, 5.62 ft Mar. 24 (ice jam); minimum daily discharge, 22 cfs Aug. 25, 26.

1907-56: Maximum discharge observed, 4,530 cfs June 24, 1938 (gage height, 8.72 ft, datum then in use), from rating curve extended above 2,100 cfs by logarithmic plotting; no flow at times.

Remarks.--Records good except those for periods of ice effect, which are poor. Some regulation by Durand and Martinsdale Reservoirs (see p. 238). Diversions for irrigation of about 37,000 acres above station, of which 2,300 acres are flood irrigated.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.8	22	3.0	265
2.1	58	4.0	640
2.5	142	5.0	1,190

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	58	*52	*66	70	46	62	187	158	765	48	*68	44
2	60	48	66	74	46	62	170	170	675	70	65	46
3	60	60	65	72	48	62	156	184	636	121	*63	56
4	46	73	65	66	50	61	154	179	586	94	52	61
5	37	68	64	60	50	60	*163	179	514	81	43	65
6	39	65	66	60	50	58	147	219	438	77	39	57
7	42	58	68	58	50	56	133	219	319	70	34	42
8	42	60	66	56	50	60	135	194	242	61	34	39
9	42	60	66	54	48	60	133	*196	175	56	35	32
10	48	61	66	58	48	56	137	274	126	50	36	33
11	47	59	64	54	48	54	149	360	98	50	36	47
12	39	56	64	54	48	54	151	423	70	53	35	44
13	36	50	66	54	50	58	149	378	60	65	36	42
14	36	48	64	52	*48	58	172	286	*60	54	33	42
15	39	46	62	50	48	58	175	232	81	49	33	40
16	40	44	62	48	46	58	204	214	234	46	35	36
17	40	46	64	52	46	60	236	247	187	42	36	39
18	39	48	66	54	50	62	204	350	128	41	46	41
19	39	50	62	56	52	66	170	*482	108	39	54	43
20	40	54	64	56	54	70	156	586	83	40	56	41
21	39	56	66	54	58	80	167	650	73	39	48	36
22	40	54	66	54	63	90	199	780	77	41	34	34
23	41	52	86	52	66	200	219	856	63	52	27	34
24	47	54	110	50	66	500	196	884	57	58	24	33
25	47	56	100	48	64	400	184	884	72	61	22	35
26	48	54	90	48	63	342	170	862	61	65	22	35
27	52	52	80	46	62	249	163	845	56	83	27	36
28	49	56	80	46	*62	209	158	900	52	77	*29	36
29	46	60	*79	48	62	202	151	*1,020	47	61	28	34
30	53	64	76	48	------	204	151	1,120	48	63	36	34
31	58	------	66	48	------	196	------	988	------	61	47	------
Total	1,389	1,664	2,195	1,700	1,542	3,867	5,039	15,319	6,191	1,868	1,213	1,237
Mean	44.8	55.5	70.8	54.8	53.2	125	168	494	206	60.3	39.1	41.2
Ac-ft	2,760	3,300	4,350	3,370	3,060	7,670	9,990	30,380	12,280	3,710	2,410	2,450

Calendar year 1955: Max 238 Min 26 Mean 55.1 Ac-ft 39,890
Water year 1955-56: Max 1,120 Min 22 Mean 118 Ac-ft 85,730

Peak discharge (base, 430 cfs).--Mar. 24 (10:40 a.m.) 5.62 ft (discharge unknown); May 12 (7 a.m.) 434 cfs (3.51 ft); May 30 (5 a.m.) 1,150 cfs (4.94 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 1-3, 7, 8, Nov. 11 to Mar. 25 (no gage-height records Nov. 13-30; discharge estimated on basis of 2 discharge measurements and records for South Fork Musselshell River above Martinsdale).

American Fork below Lebo Creek, near Harlowton, Mont.

Location.--Lat 46°24', long 109°46', in NE¼ sec. 6, T. 7 N., R. 16 E., on left bank 2 miles upstream from mouth, 2 miles downstream from Lebo Creek, and 5 miles southeast of Harlowton.

Records available.--July 1946 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 4,170 ft (by barometer).

Average discharge.--10 years, 34.3 cfs (24,830 acre-ft per year).

Extremes.--Maximum discharge during year, 506 cfs May 30 (gage height, 4.93 ft); minimum, 0.2 cfs July 25, 26 (gage height, 1.37 ft).

1946-56: Maximum discharge, 741 cfs July 11, 1948 (gage height, 5.67 ft); minimum, that of July 25, 26, 1956.

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of about 7,500 acres, of which 300 acres lie below station. During irrigation season, natural flow is supplemented by release from Lake Lebo (capacity, about 3,000 acre-ft).

Revisions (water years).--WSP 1116: 1947.

Rating tables, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 29		Mar. 30 to Sept. 30			
1.7	1.5	1.4	0.3	2.3	29
1.8	3.0	1.5	1.1	3.0	80
1.9	5.4	1.6	2.2	4.0	195
2.0	9.1	1.7	3.8	4.5	310
2.1	14	1.8	6.0	5.0	545
		2.0	13		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	10	*4.0	10	14	12	23	27	33	283	13	*4.4	6.9
2	8.6	5.0	*10	15	13	21	27	40	268	12	4.5	6.6
3	7.8	10	9	15	15	20	28	37	258	15	7.4	7.2
4	7.8	11	10	16	18	21	32	37	239	16	9.4	7.8
5	5.4	11	11	16	21	20	*33	43	210	15	9.0	7.4
6	4.3	9	10	14	20	18	27	58	175	16	9.4	8.1
7	4.3	9.5	9	12	19	21	27	42	128	17	9.0	7.2
8	4.6	10	10	10	18	20	28	37	84	15	8.4	7.4
9	5.1	10	10	8	20	18	29	*36	56	14	8.7	8.1
10	4.6	10	10	9	20	17	27	36	43	14	6.3	8.4
11	4.6	8.5	11	10	20	15	28	44	31	16	5.7	8.7
12	4.6	8	12	10	21	16	27	56	27	16	5.7	9.0
13	4.6	7	11	9	20	16	28	45	20	16	5.7	8.1
14	4.6	6	10	8	*17	18	27	34	12	13	5.7	8.1
15	4.8	5	9	7	12	20	27	22	16	7.4	5.7	7.2
16	4.3	7	10	9	10	22	27	18	42	12	5.7	4.4
17	3.8	8	10	11	12	25	26	25	26	11	6.3	3.1
18	3.6	9	8	11	14	30	25	53	30	9.4	8.4	5.2
19	3.0	11	9	12	16	90	25	*77	26	8.1	9.0	4.0
20	3.2	12	10	10	18	140	25	99	16	7.4	8.4	3.4
21	3.0	11	11	10	20	160	27	130	14	5.0	7.8	5.4
22	3.0	10	15	9	22	100	28	160	11	5.0	6.3	4.2
23	3.0	10	25	9	23	92	31	179	8.7	4.5	4.2	2.8
24	2.8	9	20	8	25	60	33	202	8.4	4.0	2.4	2.1
25	2.6	9	15	7	23	40	33	220	14	1.0	2.4	1.9
26	2.6	8	15	6	20	35	30	228	*14	.4	5.7	1.9
27	3.4	7	*16	8	21	30	28	228	13	1.9	7.2	1.9
28	4.0	9	14	9	*22	25	27	260	11	3.4	*7.4	2.3
29	4.6	9	10	8	22	30	28	400	11	3.8	5.7	.9
30	5.4	10	12	10	------	32	30	468	13	3.6	4.0	.4
31	5.4	------	14	12	------	28	------	*353	------	4.4	5.7	------
Total	143.4	263.0	366	322	534	1,223	845	3,700	2,108.1	300.3	201.6	160.1
Mean	4.63	8.77	11.8	10.4	18.4	39.5	28.2	119	70.3	9.69	6.50	5.34
Ac-ft	284	522	726	639	1,060	2,430	1,680	7,340	4,180	596	400	318

Calendar year 1955: Max 73 Min 0.6 Mean 12.3 Ac-ft 8,920
Water year 1955-56: Max 468 Min 0.4 Mean 27.8 Ac-ft 20,180

Peak discharge (base, 150 cfs).--May 30 (1 a.m.) 506 cfs (4.93 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 1, 2, 6, 7, Nov. 11 to Mar. 29 (no gage-height record Nov. 12-30, Jan. 31 to Feb. 13; discharge estimated on basis of 4 discharge measurements, weather records, and records for South Fork Musselshell River above Martinsdale).

Musselshell River near Ryegate, Mont.

Location.--Lat 46°18', long 109°12', in lot 6, NW¼ sec. 2, T. 6 N., R. 20 E., on left bank 1 mile upstream from Careless Creek and 3 miles east of Ryegate.

Records available.--July 1946 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 3,580 ft (by barometer).

Average discharge.--10 years, 185 cfs (133,900 acre-ft per year).

Extremes.--Maximum discharge during year, 1,400 cfs May 31 (gage height, 6.87 ft); minimum, 6.1 cfs Nov. 1 (gage height, 2.41 ft).
1946-56: Maximum discharge, 6,260 cfs June 17, 1948 (gage height, 10.92 ft); no flow Aug. 17-28, 1946.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Water is diverted on left bank in sec. 8, T. 7 N., R. 17 E., for storage in Deadmans Basin Reservoir (see p. 238) and can be returned to the stream by canal at a point about 10 miles above station or through Careless Creek 1 mile below. Some regulation by Durand and Martinsdale Reservoirs (see p. 238). Diversions for irrigation of about 45,200 acres above station, of which 2,700 acres are flood irrigated.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.6	8.0	4.0	230
2.8	17	5.0	573
3.0	34	6.0	1,000
3.2	55	7.0	1,470
3.5	110		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	10	10	40	46	20	32	45	193	1,180	44	139	14
2	9.6	10	40	46	24	32	43	216	866	41	130	14
3	9.2	11	42	44	26	36	43	244	*740	53	128	13
4	9.6	12	40	42	28	40	a40	167	668	104	117	12
5	10	12	38	40	28	44	a38	*134	736	92	106	22
6	11	11	40	40	26	40	a37	132	651	86	106	23
7	11	10	38	40	26	36	*37	162	529	102	108	21
8	11	11	38	40	26	32	36	119	373	104	102	21
9	10	12	*38	40	26	30	35	82	278	104	137	23
10	10	12	38	40	28	26	34	68	198	108	146	*27
11	10	13	36	38	30	28	48	114	148	106	155	25
12	11	14	34	36	30	28	165	364	102	*90	141	26
13	10	16	33	32	*25	28	174	463	68	57	137	42
14	8.0	18	22	30	20	28	179	421	48	a53	146	39
15	8.8	20	28	34	12	32	196	328	*38	a43	*146	34
16	9.6	22	28	38	16	54	198	278	312	a43	146	20
17	11	20	26	38	18	90	108	250	354	a47	146	15
18	10	18	24	38	16	300	96	283	255	a49	144	13
19	11	20	22	34	14	500	75	391	203	a60	193	12
20	12	22	21	32	22	600	42	545	155	a86	141	12
21	13	20	20	32	24	500	36	693	117	a104	33	12
22	15	22	30	30	24	440	35	822	100	a133	18	11
23	14	26	38	30	22	400	36	*964	90	a130	19	10
24	12	32	42	28	22	500	48	1,030	86	a126	11	9.2
25	12	36	46	24	24	300	53	874	86	121	8.4	8.8
26	*12	32	46	26	24	96	45	848	96	119	24	9.2
27	11	36	*45	22	26	86	39	857	79	123	25	8.8
28	11	38	40	24	28	64	36	879	68	128	14	10
29	14	38	42	20	32	55	66	1,040	55	130	9.6	10
30	15	41	44	16	------	45	172	1,210	50	128	12	10
31	15	------	46	18	------	45	------	1,370	------	184	14	------
Total	346.8	615	1,105	1,038	687	4,567	2,235	15,541	8,729	2,898	2,902.0	527.0
Mean	11.2	20.5	35.6	33.5	23.7	147	74.5	501	291	93.5	93.6	17.6
Ac-ft	688	1,220	2,190	2,060	1,360	9,060	4,430	30,830	17,310	5,750	5,760	1,050

Calendar year 1955:	Max	214	Min	4	Mean	35.5	Ac-ft	25,670
Water year 1955-56:	Max	1,370	Min	8.0	Mean	113	Ac-ft	81,710

Peak discharge (base, 1,000 cfs).--May 24 (9 p.m.) 1,060 cfs (6.12 ft); May 31 (1 p.m.) 1,400 cfs (6.87 ft).

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for station near Roundup.

Note.--Stage-discharge relation affected by ice Nov. 1 to Mar. 28 (no gage-height record Jan. 29 to Feb. 12; discharge estimated on basis of weather records and records for station near Roundup).

Musselshell River near Roundup, Mont.

Location.--Lat 46°26', long 108°34', in SE¼ sec. 22, T. 8 N., R. 25 E., on left bank at old highway bridge just downstream from Half Breed Creek, 2½ miles west of Roundup.

Records available.--May 1946 to September 1947, October 1949 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 3,188.22 ft, datum of 1929. May 22, 1946, to Sept. 30, 1947, wire-weight gage on bridge at same datum.

Average discharge.--8 years (1946-47, 1949-56), 178 cfs (128,900 acre-ft per year).

Extremes.--Maximum discharge during year, 2,520 cfs May 28; maximum gage-height, 7.29 ft Mar. 18 (backwater from ice); minimum daily discharge, 4 cfs Nov. 7.

1946-47, 1949-56: Maximum discharge, 3,840 cfs Aug. 30, 1951 (gage height, 7.20 ft); minimum, 2.0 cfs July 10, 1953.

Flood of June 18, 1948, reached a stage of 11.0 ft, from floodmarks (discharge, 7,460 cfs).

Remarks.--Records good except those for periods of ice effect, which are poor. Some regulation by Durand, Martinsdale, and Deadmans Basin Reservoirs (see p. 238). Diversions for irrigation of about 59,600 acres above station, of which about 11,000 acres are flood irrigated.

Revisions (water years).--WSP 1086: 1946.

Rating tables, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 20 to Nov. 5)

Oct. 1 to May 27				May 28 to Sept. 30			
0.9	6.0	1.8	123	1.1	19	2.5	415
1.0	9.0	2.0	178	1.2	27	3.0	700
1.1	13	2.2	237	1.4	51	4.0	1,300
1.2	20	2.5	375	1.7	111	5.0	1,960
1.4	41	3.0	670	2.1	236		
1.6	73	3.5	980				

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	32	5.4	44	48	20	34	142	192	1,270	86	218	74
2	26	5.4	42	48	22	34	134	222	*1,080	76	203	72
3	24	5.6	42	48	26	34	126	259	862	84	192	66
4	22	6.0	44	46	28	38	115	297	778	93	159	56
5	18	5.8	42	44	30	42	107	*237	730	136	136	54
6	15	5	40	42	30	46	104	210	760	116	118	58
7	14	4	42	42	28	42	*104	198	658	134	109	56
8	13	5	40	42	28	38	94	207	536	118	102	53
9	13	6	40	42	28	34	87	184	395	116	88	53
10	12	6	40	42	28	32	80	156	290	124	116	*53
11	13	6	40	42	30	28	78	142	185	126	131	54
12	11	7	38	40	32	30	80	150	116	*111	286	58
13	11	8	36	38	32	30	195	408	78	97	150	63
14	10	10	35	34	28	30	204	490	50	72	114	61
15	9.8	12	24	32	22	30	210	454	38	68	*136	76
16	9.0	14	30	36	14	34	222	392	30	58	148	63
17	8.7	16	30	40	18	60	225	320	389	58	153	60
18	8.1	14	28	40	20	100	158	283	604	61	162	46
19	7.8	12	26	40	18	500	131	320	380	63	159	39
20	7.2	16	24	36	*16	1,000	115	490	294	74	192	35
21	5.6	20	*23	34	24	790	75	664	221	100	142	27
22	5.4	24	22	34	26	610	64	790	168	128	104	25
23	5.6	22	32	32	26	532	64	856	142	148	104	25
24	6.0	26	40	32	24	466	62	*922	142	145	97	25
25	6.0	32	44	30	24	436	64	928	165	145	100	24
26	*5.6	36	48	26	26	652	78	814	156	145	93	25
27	5.2	32	48	28	26	616	73	814	156	148	82	24
28	4.8	38	46	24	28	386	68	1,720	142	162	102	25
29	5.6	*43	42	26	30	222	64	1,110	118	179	93	25
30	6.6	40	44	22	------	190	73	1,150	100	179	93	36
31	5.8	------	46	18	------	161	------	1,240	------	185	84	------
Total	346.8	482.2	1,162	1,128	732	7,277	3,396	16,619	11,033	3,535	4,166	1,411
Mean	11.2	16.1	37.5	36.4	25.2	235	113	536	368	114	134	47.0
Ac-ft	688	956	2,300	2,240	1,450	14,430	6,740	32,960	21,880	7,010	8,260	2,800

Calendar year 1955:	Max 306	Min 4	Mean 63.5	Ac-ft 45,960
Water year 1955-56:	Max 1,720	Min 4	Mean 140	Ac-ft 101,700

Peak discharge (base, 1,000 cfs).--Mar. 18 (7:20 p.m.) 7.29 ft (discharge unknown); May 28 (9:30 a.m.) 2,520 cfs (5.80 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 6 to Mar. 20 (no gage-height record Feb. 9-19; discharge estimated on basis of 2 discharge measurements, weather records, and records for nearby stations).

Musselshell River at Musselshell, Mont.

Location.--Lat 46°32', long 108°06', in S½SW¼ sec. 20, T. 9 N., R. 29 E., on left bank three-quarters of a mile upstream from Hawk Creek and 1 mile west of Musselshell.

Records available.--August 1928 to September 1932 (no winter records 1928-31), August 1945 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 2,980 ft (by barometer). Aug. 15, 1928, to Sept. 30, 1932, chain gage and Aug. 3, 1945, to Oct. 7, 1949, wire-weight gage, at site 1 mile downstream at different datum.

Average discharge.--12 years (1931-32, 1945-56), 184 cfs (133,200 acre-ft per year).

Extremes.--Maximum discharge during year, 2,210 cfs Mar. 21 (gage height, 6.12 ft); maximum gage height, 9.94 ft Mar. 20 (backwater from ice); minimum daily discharge, 4.9 cfs Oct. 21.

1928-32, 1945-56: Maximum discharge, 4,790 cfs June 19, 1948 (gage height, 8.5 ft, from graph based on gage readings, site and datum then in use), from rating curve extended above 2,300 cfs; no flow at times.

Maximum stage known, about 12 ft May 19, 1917, at former site at datum used August 1945 to September 1949, from information by local residents.

Remarks.--Records good except those for period of ice effect, which are poor. Some regulation by Durand, Martinsdale, and Deadmans Basin Reservoirs (see p. 238). Diversions for irrigation of about 63,300 acres above station, of which 12,500 acres are flood irrigated.

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Nov. 1)

1.5	3.5	2.5	125
1.6	7.0	3.0	257
1.7	12	3.5	445
1.8	20	4.0	705
2.0	40	5.0	1,360
2.2	68	6.0	2,120

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	31	6.6	40	47	21	33	201	101	1,230	111	136	92
2	33	6	44	49	24	35	198	195	*1,200	111	150	81
3	32	7	43	49	28	36	171	228	1,000	103	161	73
4	28	6.5	42	48	30	39	148	274	858	105	140	72
5	26	6	44	46	32	41	*136	*290	783	103	127	68
6	26	6	44	44	31	44	129	222	753	117	125	65
7	22	6	43	43	28	45	127	210	741	107	113	62
8	17	6	42	41	26	42	125	201	666	111	109	60
9	15	7	41	41	28	37	119	210	556	88	103	56
10	12	7	40	43	29	33	111	182	436	84	82	*50
11	10	7	42	43	32	29	103	159	325	96	79	48
12	10	7	43	42	33	32	99	144	251	*235	103	49
13	11	6	40	40	33	32	109	195	192	129	176	50
14	10	8	36	37	30	32	192	424	153	103	103	52
15	7.6	10	30	34	25	32	204	436	127	79	*90	53
16	5.6	12	31	35	20	40	210	390	99	66	107	62
17	5.6	14	30	39	20	80	222	325	81	58	121	59
18	5.6	16	26	42	21	150	219	290	419	54	129	53
19	6.3	15	28	42	24	400	155	274	411	49	133	49
20	5.6	18	28	38	*26	1,500	140	325	294	43	133	41
21	4.9	22	*26	36	28	1,840	125	441	254	44	138	37
22	6.3	23	24	35	28	694	99	578	201	64	117	32
23	7.0	24	28	35	28	590	88	661	155	84	84	28
24	6.3	22	36	34	29	510	86	*789	142	103	81	26
25	5.6	28	42	34	29	432	82	851	146	99	66	26
26	*5.2	34	47	30	28	490	82	795	159	92	73	26
27	5.6	35	48	26	28	622	96	747	142	92	77	25
28	6.6	32	47	28	29	472	90	1,310	150	105	92	25
29	7.0	*31	45	26	30	344	86	1,190	138	113	96	26
30	7.6	36	43	22	------	244	82	1,050	123	129	90	25
31	7.6	------	45	20	------	216	------	1,110	------	133	92	------
Total	389.0	464.1	1,188	1,169	798	9,166	4,034	14,597	12,185	3,010	3,426	1,471
Mean	12.5	15.5	38.3	37.7	27.5	296	134	471	406	97.1	111	49.0
Ac-ft	772	921	2,360	2,320	1,580	18,180	8,000	28,950	24,170	5,970	6,800	2,920

Calendar year 1955:	Max 270	Min 4.9	Mean 53.3	Ac-ft 38,600
Water year 1955-56:	Max 1,840	Min 4.9	Mean 142	Ac-ft 102,900

Peak discharge (base, 1,000 cfs).--Mar. 21 (2 a.m.) 2,210 cfs (6.12 ft); May 28 (9 p.m.) 2,110 cfs (5.99 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 2 to Mar. 20.

McDonald Creek at Winnett, Mont.

Location.--Lat 47°00', long 108°20', in NE¼ sec. 6, T. 14 N., R. 27 E., at Winnett, about 12 miles upstream from mouth.

Records available.--April 1930 to December 1932, February 1934 to September 1945, February 1953 to September 1956 (discontinued).

Gage.--Wire-weight gage and crest-stage indicator; gage read twice daily. Altitude of gage is 2,930 ft (by barometer). Apr. 18, 1930, to Dec. 5, 1932, and Feb. 4, 1934, to Sept. 30, 1945, at sites within 1 mile of present site at different datums.

Average discharge.--13 years (1930-31, 1934-36, 1938-45, 1953-56), 14.4 cfs (10,430 acre-ft per year).

Extremes.--Maximum discharge during year, 88 cfs Aug. 3 (gage height, 2.55 ft, from crest-stage indicator), but may have been higher in March; maximum gage height, 3.03 ft in March, from crest-stage indicator; no flow for many days.

1930-32, 1934-45, 1953-56: Maximum discharge, 900 cfs May 15 or 16, 1942 (gage height, 8.48 ft, from floodmark, present site and datum), from rating curve extended above 500 cfs; no flow at times.

Remarks.--Records poor. Small reservoirs in headwaters. Diversions for irrigation of several thousand acres above station.

Rating table, water year 1955-56, except periods of ice effect or backwater from beaver dam (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 21-27)

0.5	0	1.0	7.0
.6	.3	1.2	13
.7	1.0	1.5	24
.8	2.4	2.0	47
.9	4.5	2.5	83

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0.2	a0.2		0	1	a20	1.1	1.1	0	a0	
2	0	.2	.2		0	3	16	1.5	.9	0	0	
3	0	.3	.2		0	5	7.9	1.9	.5	0	58	
4	0	.3	.2		a0	1	7.0	1.3	.3	a0	1.2	
5	0	.2	.2		0	2	7.0	1.3	.2	.1	.1	
6	0	.2	.2		0	1	10	1.3	.2	.2	0	
7	0	.2	.2		0	.5	8.8	1.6	.2	.1	0	
8	0	.2	.2		0	.2	6.5	1.9	.2	.1	0	
9	0	.2	.1		0	0	6.2	1.6	.2	0	0	
10	0	.2	.1		0	a0	5.2	1.7	a.1	0	0	(*)
11	0	.1	0		0	a0	5.8	1.6	0	0	0	
12	0	0	0		0	0	4.5	1.7	0	.1	0	
13	0	0	0		0	0	3.4	1.7	0	*.1	0	
14	0	0	0		0	.1	2.6	2.0	0	.1	0	
15	0	0	0		a0	.2	a2.0	1.5	0	.1	0	
16	0	0	0		0	.6	a1.8	1.0	0	0	*0	
17	0	0	0		0	1	a1.6	.8	0	0	0	
18	0	0	0		0	2	a1.4	.6	.2	0	0	
19	0	0	0		0	4	a1.2	.4	.1	0	0	
20	0	.1	0		0	6	a1.1	.4	0	0	0	
21	0	.2	.1		0	7.9	a1.0	.3	.3	0	0	
22	0	.2	*.1		0	49	a.9	.3	*0	0	0	
23	0	.2	.1		0	57	*.8	.4	0	0	0	
24	0	.2	.1		0	52	.9	*.3	0	0	0	
25	*0	*.2	a.1		0	39	.9	.2	0	0	0	
26	0	.2	.1		0	*29	1.0	.2	0	0	a0	
27	0	.2	.1		*0	38	.9	7.0	0	0	0	
28	0	.2	.1		0	21	1.0	13	0	0	0	
29	.1	.2	.1		.1	33	.9	3.9	0	0	0	
30	.1	a.2	.1		------	34	.9	2.2	0	0	0	
31	.2	------	.1	(*)	------	26	------	1.7	------	0	0	------
Total	0.4	4.4	2.9	0	0.1	413.5	129.2	56.4	4.5	0.9	59.3	0
Mean	0.01	0.15	0.09	0	0.003	13.3	4.31	1.82	0.15	0.03	1.91	0
Ac-ft	0.8	8.7	5.8	0	0.2	820	256	112	8.9	1.8	118	0

Calendar year 1955: Max 217 Min 0 Mean 7.50 Ac-ft 5,430
Water year 1955-56: Max 58 Min 0 Mean 1.83 Ac-ft 1,330

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* Discharge measurement or observation of no flow made on this day.
a No gage-height record; discharge estimated.
Note.--Stage-discharge relation affected by ice Nov. 7 to Mar. 20. Backwater from beaver dams Oct. 1 to Nov. 6; discharge estimated on basis of 2 discharge measurements and weather records.

Flatwillow Creek near Flatwillow, Mont.

Location.--Lat 46°47', long 108°37', in NE¼ sec. 19, T. 12 N., R. 25 E., on left bank at Zimmerman Ranch, 12 miles upstream from Flatwillow and 14 miles upstream from Pike Creek.

Drainage area.--195 sq mi.

Records available.--May 1911 to September 1932, February 1934 to September 1956 (discontinued). No winter records for several years prior to 1935.

Gage.--Wire-weight gage and masonry control; gage read twice daily. Altitude of gage is 3,560 ft (by barometer). Prior to Apr. 17, 1918, staff gage at site 4 miles downstream at different datum. Apr. 17, 1918, to Sept. 30, 1938, chain gage at site 300 ft upstream at different datum.

Average discharge.--33 years (1913-16, 1918-19, 1920-21, 1922-23, 1924-26, 1927-28, 1930-32, 1934-56), 20.5 cfs (14,840 acre-ft per year).

Extremes.--Maximum daily discharge during year, 45 cfs Mar. 24, 25; maximum gage height, 2.00 ft Mar. 22 (backwater from ice); no flow for many days.

1911-32, 1934-56: Maximum discharge observed, 954 cfs June 4-10, 1917; no flow at times.

Remarks.--Records good except those for the period of ice effect, which are poor. Diversions for irrigation of about 9,000 acres above station when water is available.

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 23 to Apr. 3)

0.7	0	1.4	9.6
.8	.2	1.6	17
.9	.6	1.8	27
1.0	1.3	2.0	38
1.1	2.5	2.5	68
1.2	4.1		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0	3.5	3.0	2.9	4.0	17	2.3	4.8	0.1		
2		0	3.5	3.0	2.9	4.4	11	2.0	3.8	0		
3		0	3.0	3.2	3.0	4.4	9.0	2.0	4.4	0		
4		0	3.0	3.4	3.2	4.0	8.7	2.0	4.4	0		
5		0	3.0	3.6	3.4	3.8	6.9	2.0	4.4	0		
6		0	3.0	3.6	3.4	3.8	5.8	2.0	3.3	0		
7		0	3.0	3.6	3.2	3.8	5.6	2.0	3.3	0		
8		0	3.0	3.6	3.0	3.8	5.4	2.0	3.5	0		
9		0	3.0	3.0	3.0	3.8	4.6	2.0	3.5	0		
10		0	3.0	3.0	3.0	3.8	4.4	2.0	2.8	0		(*)
11		0	3.5	3.0	3.0	3.8	4.4	1.8	2.8	0		
12		0	3.5	3.0	3.0	4.4	3.5	1.8	2.8	0		
13		.2	3.0	3.0	2.8	5.0	3.5	1.8	2.3	*0		
14		.3	3.0	2.6	2.6	5.0	3.0	1.5	1.7	0		
15		0	3.0	2.6	2.6	5.0	2.5	1.4	1.4	0		
16		0	3.0	2.6	2.6	7.5	2.4	1.4	1.4	0	(*)	
17		0	3.0	2.6	2.6	10	2.3	1.4	1.4	0		
18		0	2.5	2.6	2.6	15	2.3	1.4	1.2	0		
19		0	2.5	3.0	2.6	20	2.3	1.4	1.2	0		
20		3.0	2.5	3.0	2.6	25	2.3	3.0	.8	0		
21		5.0	3.0	3.0	2.8	30	2.5	6.1	1.3	0		
22		4.6	*3.6	3.0	3.0	32	2.5	3.0	*1.2	0		
23		3.4	3.0	3.0	3.4	32	2.5	2.1	1.3	0		
24		3.2	3.0	2.8	3.4	45	2.5	*1.7	1.3	0		
25	(*)	*3.6	3.0	2.5	3.4	45	2.5	1.7	1.3	0		
26		3.0	3.0	2.7	3.6	*44	2.4	1.7	1.2	0		
27		2.5	3.0	2.9	*3.8	32	2.0	1.7	1.2	0		
28		3.0	2.5	2.9	3.7	21	2.0	2.7	1.0	0		
29		3.4	2.5	2.9	3.6	19	2.0	3.8	.6	0		
30		4.0	2.5	2.9	------	19	1.9	6.1	.2	0		
31		------	3.0	*2.9	------	18	------	5.8	------	0		------
Total	0	39.2	92.6	92.5	88.7	477.3	129.7	73.6	65.8	0.1	0	0
Mean	0	1.31	2.99	2.98	3.06	15.4	4.32	2.37	2.19	0.003	0	0
Ac-ft	0	78	184	183	176	947	257	146	131	0.2	0	0

Calendar year 1955: Max 94 Min 0 Mean 18.1 Ac-ft 13,120
Water year 1955-56: Max 45 Min 0 Mean 2.89 Ac-ft 2,100

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* Discharge measurement or observation of no flow made on this day.

Note.--Stage-discharge relation affected by ice Nov. 14 to Mar. 22.

Musselshell River at Mosby, Mont.

Location.--Lat 47°00', long 107°54', in NW¼ sec. 11, T. 14 N., R. 30 E., on downstream side of highway bridge, half a mile west of Mosby and 6 miles downstream from Box Elder Creek.

Drainage area.--8,010 sq mi, approximately.

Records available.--May 1929 to September 1932, February 1934 to September 1956.

Gage.--Wire-weight gage read twice daily. Altitude of gage is 2,500 ft (by barometer). Water-stage recorder at same site and datum used periodically during high stages in the years 1935-44.

Average discharge.--24 years (1930-32, 1934-56), 230 cfs (166,500 acre-ft per year).

Extremes.--Maximum discharge during year, 2,310 cfs Mar. 22 (gage height, 5.92 ft, from graph based on gage readings); maximum gage height, 7.25 ft Mar. 22 (backwater from ice); minimum daily discharge, 0.2 cfs Oct. 22, 23; minimum gage height, 1.40 ft Aug. 1.

1929-32, 1934-56: Maximum discharge, 18,000 cfs June 18, 1944 (gage height, 14.43 ft), from rating curve extended above 10,000 cfs; no flow at times.

Remarks.--Records good except those for period of ice effect, which are poor. Some regulation by Durand, Martinsdale, and Deadmans Basin Reservoirs (see p. 238). Diversions for irrigation of about 103,000 acres above station.

Rating tables, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 12-31, Sept. 25-30)

Oct. 1 to Mar. 22		Mar. 23 to Sept. 30			
1.3	0	1.4	0.5	2.5	145
1.4	.5	1.5	2	3.0	330
1.5	2	1.6	4	3.5	575
1.6	4	1.7	8	4.0	880
1.7	8	1.9	25	5.0	1,620
1.8	16	2.0	35	5.5	2,010
		2.2	70		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	10	0.3	40	46	20	30	285	104	1,140	66	3.0	54
2	11	.3	42	48	23	33	245	99	1,270	60	12	46
3	10	.4	44	49	26	36	220	110	*1,110	54	154	41
4	8.8	.5	43	49	29	38	203	203	834	50	189	42
5	8.8	.5	42	48	31	40	186	245	690	79	108	41
6	8.0	.8	45	46	33	42	166	269	666	874	90	41
7	11	.8	45	44	31	44	151	231	672	145	97	41
8	8.8	1.2	44	42	28	46	145	206	608	42	234	38
9	6.8	2.0	42	41	27	43	136	189	520	30	104	33
10	3.6	2.0	41	41	28	38	133	196	425	24	60	31
11	3.0	1.5	40	43	30	32	130	192	321	18	52	*31
12	2.4	1.2	42	43	33	30	115	163	231	52	38	33
13	1.2	1.0	44	42	34	33	108	151	175	*36	28	35
14	.8	1.0	40	40	33	33	99	163	124	83	25	32
15	.5	1.0	34	38	30	33	110	344	90	47	79	35
16	.4	1.0	30	36	26	33	186	402	64	29	*56	32
17	.6	1.0	29	36	22	50	200	370	58	20	47	33
18	.4	2.0	28	40	22	80	210	303	68	12	42	32
19	.4	3.0	26	43	23	300	220	261	79	3.8	52	31
20	.3	6.0	28	43	25	1,000	196	228	326	2.4	56	28
21	.3	14	26	39	27	1,700	154	253	308	2.2	58	26
22	.2	24	*19	37	29	2,000	145	362	*234	1.6	56	24
23	.2	24	26	36	29	1,540	*127	505	189	1.1	50	23
24	.3	20	30	36	29	776	110	602	166	1.2	30	15
25	*.4	*19	38	34	30	666	99	*738	169	1.0	25	15
26	.4	26	44	32	30	*553	94	789	118	.6	23	11
27	.4	30	48	30	*28	553	94	782	106	1.1	33	6.4
28	.4	31	48	27	29	602	94	828	113	5.6	60	5.2
29	.3	34	46	26	29	558	99	1,390	90	1.4	62	6.8
30	.4	34	44	23	------	430	99	1,210	68	1.0	62	7.2
31	.4	------	44	*15	------	330	------	1,060	------	.5	64	------
Total	100.5	283.5	1,182	1,193	814	11,722	4,559	12,948	11,032	1,744.5	2,049.0	869.6
Mean	3.24	9.45	38.1	38.5	28.1	378	152	418	368	56.3	66.1	29.0
Ac-ft	199	562	2,340	2,370	1,610	23,250	9,040	25,680	21,880	3,460	4,060	1,720

Calendar year 1955:	Max 976	Min	0.2	Mean	62.3	Ac-ft	45,080
Water year 1955-56:	Max 2,000	Min	0.2	Mean	133	Ac-ft	96,170

Peak discharge (base, 1,000 cfs).--Mar. 22 (4 p.m.) 2,310 cfs (5.92 ft); May 29 (4 p.m.) 2,050 cfs (5.55 ft); July 6 (8 a.m.) 1,250 cfs (4.50 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 1 to Mar. 22.

Dry Creek near Van Norman, Mont.

Location.--Lat 47°21', long 106°22', in NW¼ sec. 3, T. 18 N., R. 42 E., on left bank 500 ft downstream from Little Dry Creek, 1.2 miles southeast of Van Norman, and 26 miles east of Jordan.

Drainage area.--2,530 sq mi, approximately.

Records available.--October 1939 to September 1956 (discharge measurements only, October 1947 to March 1949).

Gage.--Water-stage recorder. Altitude of gage is 2,330 ft (by barometer).

Average discharge.--15 years, 57.1 cfs (41,340 acre-ft per year).

Extremes.--Maximum daily discharge during year, 960 cfs Mar. 19; no flow at times.
1939-56: Maximum discharge, 24,600 cfs Mar. 21, 1947 (gage height, 13.39 ft); maximum gage height, 15.26 ft Mar. 21, 1947 (ice jam); no flow at times each year.

Remarks.--Records poor. Few small diversions for irrigation of hay meadows above station.

Revisions (water years).--WSP 1209: 1947(M).

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 14-19)

1.4	0	1.8	6.3
1.5	.2	1.9	15
1.6	.8	2.0	29
1.7	2.1	2.5	140

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.4	0.4	b0.1			a50	16	2.7	1.4	0.2	0.4	2.7
2	.4	.4	b.1		(*)	*a450	16	3.0	1.0	.2	.3	1.0
3	.4	.4	b.1	(*)		a520	14	3.3	1.0	.6	.3	7.7
4	*.4	.4	0			a580	12	3.3	.9	4.1	.5	3.3
5	.4	.4	*0			*a540	10	3.3	.7	1.1	.3	2.1
6	.4	.3	0			a500	8.4	3.3	.8	62	.2	1.2
7	.4	.3	0			a350	9.2	2.7	.7	76	.1	.9
8	.4	.3	0			*a180	7.7	2.4	.7	78	.1	.8
9	.3	.3	0			a140	6.9	2.4	.6	80	.1	.6
10	.3	.4	0			a120	5.7	6.3	.5	25	12	.5
11	.3	b.2	0			a90	5.7	7.7	.4	10	14	.4
12	.3	b.1	0			a80	5.7	5.7	.3	4.6	.8	.4
13	.4	b.1	0			a70	5.1	19	.3	3.0	.9	.4
14	.4	b.2	0			a80	4.6	19	.3	1.8	.7	.3
15	.4	b.2	0			a80	4.6	13	**.4	1.2	.5	.3
16	.3	*b.3	0			a170	4.1	8.4	.3	1.1	.4	.3
17	.3	b.2	0			a450	4.1	*5.7	.2	*.9	.3	**.3
18	.3	b.1	0			a700	4.1	4.6	29	.9	.3	.3
19	.4	b.1	0			*a960	3.7	3.7	35	.8	.2	.3
20	.4	b.1	0			a720	3.3	3.0	1.1	.8	**.1	.2
21	.4	b.4	0			a460	3.0	2.1	.7	.8	.1	.1
22	.3	b.4	0			*a210	3.3	2.1	.9	.7	.1	.2
23	.3	b.3	0			a170	2.7	1.8	1.0	.6	0	.2
24	.3	b.2	0			a130	2.7	1.4	.8	.5	0	.2
25	.3	b.3	0			a95	2.7	1.1	.6	.4	0	.2
26	.3	b.3	0			a80	2.4	1.2	.5	.3	0	.1
27	.4	b.2	0			a60	*2.4	1.1	.4	.2	0	.1
28	.4	b.1	0		(*)	a40	2.4	.9	.4	10	16	.1
29	.4	b.1	0			*b20	2.4	1.4	.3	1.2	6.5	.1
30	.4	b.1	0		------	22	2.4	2.4	.2	.8	77	.1
31	.4	------	0		------	23	------	1.6	------	.6	31	------
Total	11.2	7.6	0.3	0	0	8,140	177.3	139.6	81.4	368.4	163.2	25.4
Mean	0.36	0.25	0.01	0	0	263	5.91	4.50	2.71	11.9	5.26	0.85
Ac-ft	22	15	0.6	0	0	16,150	352	277	161	731	324	50

Calendar year 1955: Max 916 Min 0 Mean 24.0 Ac-ft 17,420
Water year 1955-56: Max 960 Min 0 Mean 24.9 Ac-ft 18,080

Peak discharge (base, 400 cfs).--Mar. 4 (time and discharge unknown); Mar. 19 (time and discharge unknown).

* Discharge measurement or observation of no flow made on this day.

** Field estimate made on this day.

a No gage-height record; discharge estimated on basis of 6 discharge measurements and weather records.

b Stage-discharge relation affected by ice.

Fort Peck Reservoir at Fort Peck, Mont.

Location.--Lat 48°00'26", long 106°23'49", in sec. 14, T. 26 N., R. 41 E., in No. 4 emergency gate shaft of dam on Missouri River at Fort Peck, 2 miles dowrstream from Bear Creek, 9½ miles southwest of Nashua, and about 9½ miles upstream from Milk River.

Drainage area.--57,725 sq mi.

Records available.--October 1938 to September 1956. June 1937 to September 1938 in files of office of Missouri River Division, Corps of Engineers.

Gage.--Water-stage recorder. Datum of gage is at mean sea level, datum of 1929. Prior to May 1, 1941, tape gage at same site and datum.

Extremes.--Maximum contents during year, 6,312,000 acre-ft Oct. 1 (elevation, 2,181.58 ft); minimum, 4,665,000 acre-ft Jan. 25, 26 (elevation, 2,167.36 ft).

1937-56: Maximum contents, 17,550,000 acre-ft July 15, 1948 (elevation, 2,244.80 ft).

Remarks.--Reservoir is formed by earth-fill dam; storage began in 1937; dam completed in 1939. Usable capacity, 18,800,000 acre-ft between elevations 2,095 ft (lowest outlet) and 2,250 ft (top of 25-foot gates). Elevation of crest of spillway, 2,225 ft. Dead storage below elevation 2,095 ft, 617,000 acre-ft. Figures given herein represent contents above elevation 2,095 ft. Water is stored for navigation, flood control, and power generation. Elevations materially affected by wind.

Cooperation.--Elevations furnished by Corps of Engineers.

Month-end elevation and contents, water year October 1955 to September 1956

Date	Elevation (feet)†	Contents (acre-feet)	Change in contents (acre-feet)
Sept.30	2,181.94	6,358,000	-
Oct. 31	2,170.84	5,043,000	-1,315,000
Nov. 30	2,167.94	4,727,000	-316,000
Dec. 31	2,167.60	4,690,000	-37,000
Calendar year 1955	-	-	-4,694,000
Jan. 31	2,167.47	4,677,000	-13,000
Feb. 29	2,167.96	4,729,000	+52,000
Mar. 31	2,170.36	4,990,000	+261,000
Apr. 30	2,171.93	5,164,000	+174,000
May 31	2,175.69	5,596,000	+432,000
June 30	2,180.87	6,223,000	+627,000
July 31	2,179.04	5,997,000	-226,000
Aug. 31	2,176.94	5,744,000	-253,000
Sept.30	2,176.35	5,674,000	-70,000
Water year 1955-56	-	-	-684,000

† Elevations at 12 p.m.

Missouri River below Fort Peck Dam, Mont.

Location.--Lat 48°02'30", long 106°21'10", in NW¼ sec. 6, T. 26 N., R. 42 E., on right bank about 2 miles upstream from Milk River, 6 miles south of Nashua, and 8 miles downstream from Fort Peck Dam.

Drainage area.--57,800 sq mi, approximately.

Records available.--March 1934 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 2,020.00 ft above mean sea level, datum of 1929 (Corps of Engineers benchmark). Prior to Apr. 14, 1938, at site 0.7 mile upstream at different datum.

Average discharge.--5 years (1934-39, prior to Fort Peck Reservoir reaching operational level), 6,347 cfs (4,595,000 acre-ft per year); 13 years (1943-56, after operational level in Fort Peck Reservoir was reached), 10,120 cfs (7,327,000 acre-ft per year).

Extremes.--Maximum discharge during year, 31,500 cfs Oct. 21 (gage height, 8.01 ft); minimum daily, 3,530 cfs June 5.

1934-56: Maximum discharge, 51,000 cfs (includes 32,000 cfs inflow from spillway 1 mile downstream from station) Aug. 8, 1946; maximum gage height observed, 12.30 ft Mar. 10, 1936 (ice jam), site and datum then in use; maximum daily reverse flow, 400 cfs Mar. 29, 1943 (backwater from Milk River).

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Discharge measurements made at 5-day intervals during open water and twice a month during periods of ice effect. Diversions for irrigation of about 860,000 acres above station. Flow completely regulated by Fort Peck Reservoir (see preceding page).

Rating tables, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-4, 21-25, Mar. 1 to May 10, June 7-16, Sept. 12-16, 27-30)

Oct. 1 to Feb. 29

1.5	4,690	6.0	21,200
2.0	5,890	8.0	30,900
4.0	12,800	8.1	31,400

Mar. 1 to Sept. 30

0.0	2,900	3.0	10,000
1.0	4,630	3.1	10,400
2.0	6,940		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	29,600	20,800	6,800	6,900	6,500	5,570	4,330	5,980	6,250	8,360	10,100	7,450
2	29,800	19,800	6,700	6,800	6,500	5,300	4,780	5,820	6,300	10,400	10,100	6,370
3	30,000	19,000	6,700	6,900	5,500	5,350	4,740	5,840	6,270	10,200	10,000	6,180
4	30,100	17,700	6,500	6,900	5,500	4,650	3,890	5,870	5,320	10,100	9,830	6,300
5	30,000	16,600	6,700	6,900	4,500	4,800	4,740	6,200	3,530	6,890	10,000	6,340
6	29,800	15,700	6,700	7,000	5,120	5,620	4,230	5,780	4,040	5,500	10,200	6,420
7	29,800	14,900	6,700	7,100	6,430	6,080	3,930	5,960	5,060	5,350	10,300	6,460
8	29,800	13,800	6,600	7,000	5,760	5,710	5,800	5,780	5,240	5,300	10,100	6,520
9	29,600	12,700	6,800	7,000	5,430	5,680	5,890	6,100	5,280	8,620	10,000	6,540
10	30,000	11,500	6,700	6,900	5,360	5,680	5,890	6,370	5,300	10,200	10,000	6,620
11	30,000	10,600	6,500	7,000	5,190	5,820	5,800	6,200	5,350	10,100	9,970	6,690
12	29,800	9,530	6,600	7,000	4,760	5,820	4,860	6,320	5,410	10,200	9,900	6,590
13	29,500	8,500	6,800	7,000	5,000	5,780	4,630	6,370	5,300	10,100	9,830	6,620
14	30,000	7,500	6,900	7,000	5,500	5,280	4,470	6,270	6,560	10,100	9,930	6,620
15	29,900	6,500	6,900	7,000	6,000	5,320	4,330	6,590	6,010	10,100	10,000	6,660
16	30,000	6,500	6,800	7,100	5,800	5,370	4,410	6,180	6,010	10,100	9,950	6,560
17	30,400	6,500	6,800	7,100	5,700	5,170	4,650	6,270	5,890	10,100	9,970	6,620
18	30,500	6,500	6,900	7,100	5,500	4,000	4,450	6,320	6,030	10,100	10,300	6,540
19	30,600	6,500	6,900	7,100	5,000	4,370	4,370	5,680	6,080	10,100	9,760	6,540
20	30,900	6,400	6,800	7,100	5,500	5,170	4,490	5,820	6,010	10,000	9,970	6,540
21	31,100	6,300	6,800	7,200	5,700	5,390	5,550	6,080	5,940	10,100	10,000	6,420
22	31,000	6,400	6,700	7,200	5,600	5,410	5,410	6,270	5,910	10,000	10,200	6,420
23	30,400	6,500	6,600	7,100	5,500	5,460	5,570	6,250	5,620	10,100	10,300	6,460
24	29,200	6,800	6,800	7,000	5,200	5,410	5,890	6,100	6,390	9,760	10,200	5,620
25	28,000	6,600	6,800	7,000	5,500	4,550	6,010	6,180	5,960	10,200	10,100	4,450
26	26,800	6,600	6,700	7,000	5,000	4,760	5,890	6,100	6,060	10,100	10,000	5,730
27	24,700	6,800	6,700	7,000	5,500	5,370	6,010	6,320	6,460	10,300	10,100	6,720
28	24,100	6,800	6,800	6,500	5,500	4,880	6,180	6,490	6,690	10,200	9,970	6,740
29	23,300	6,800	7,000	6,000	5,500	4,670	6,200	6,180	6,270	10,100	9,860	6,740
30	22,700	6,800	7,000	6,000	------	4,690	6,300	6,250	6,150	10,100	10,000	6,720
31	21,500	------	6,900	6,000	------	4,610	------	6,490	------	10,100	9,860	------
Total	892,900	303,930	209,600	213,900	159,550	161,740	153,690	190,430	172,690	292,980	310,800	193,200
Mean	28,800	10,130	6,761	6,900	5,502	5,217	5,123	6,143	5,756	9,451	10,030	6,440
Ac-ft	‡1,771	602,800	415,700	424,300	316,500	320,800	304,800	377,700	342,500	581,100	616,500	383,200

Calendar year 1955: Max 31,100 Min 4,880 Mean 14,650 Ac-ft 10,610,000
Water year 1955-56: Max 31,100 Min 3,530 Mean 8,895 Ac-ft 6,457,000

‡ Expressed in thousands.

Note.--Stage-discharge relation affected by ice Nov. 22 to Feb. 5, Feb. 14-29 (no gage-height record Nov. 13-21).

South Fork Milk River near international boundary

(International gaging station)

Location.--Lat 49°00'50", long 112°32'20", in NW¼ sec. 6, T. 1, R. 19 W., fourth meridian, on left bank 1 mile north of international boundary, 19 miles upstream from mouth, and 20 miles west of Milk River, Alberta.

Drainage area.--433 sq mi.

Records available.--March 1931 to October 1956 (seasonal records only). April 1905 to October 1930 at site 27 miles upstream and 5 miles south of international boundary (published as "near Browning, Mont." April 1905 to September 1916); records not equivalent.

Gage.--Water-stage recorder. Altitude of gage is 3,810 ft (from topographic map). Mar. 1, 1931, to Aug. 8, 1948, at site 500 ft upstream. Prior to Mar. 5, 1954, at datum 1.0 ft higher.

Extremes.--Maximum discharge during season, 1,110 cfs July 4 (gage height, 3.84 ft); minimum daily, 4 cfs Mar. 8.

1931-56: Maximum discharge, 4,750 cfs June 18, 1948 (gage height, 6.83 ft, site and datum then in use), from rating curve extended above 1,300 cfs; no flow at times.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Several small diversions for irrigation above station.

Cooperation.--This is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. Records collected and compiled jointly with the Water Resources Branch, Department of Northern Affairs and National Resources, Canada.

Revisions (water years).--WSP 1389: 1934(M), 1935, 1936(M), 1937, 1942(M), 1947-48(M).

Rating table, Mar. 1 to Oct. 31, 1956, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.3	13.7	2.5	237
1.4	19.9	3.0	494
1.6	38.4	3.5	834
1.8	67	4.0	1,260
2.0	107		

Discharge, in cubic feet per second, March to October 1956

Day			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		
1			a12	a265	103	214	43.2	17.9	39.6	26.1		
2			*12	a271	107	214	47.1	23.6	35.0	24.4		
3			a8	277	103	205	187	54	29.8	24.4		
4			5	273	103	193	895	72	27.9	25.2		
5			a6	178	120	174	782	70	28.8	23.6		
6			8	a132	134	169	308	49.8	31.8	21.3		
7			a6	87	179	162	202	39.6	30.8	21.3		
8			4	a117	237	147	145	31.8	28.8	20.6		
9			a12	*147	266	136	*118	29.8	27.0	19.9		
10			21	213	564	122	100	36.1	24.4	19.9		
11			a17	a214	427	114	90	114	22.8	19.9		
12			a13	216	373	*107	114	143	*22.0	19.9		
13			9	a236	255	107	103	90	22.0	21.3		
14			a13	256	220	98	86	*58	22.8	22.0		
15			17	a298	230	118	74	44.5	22.0	22.0		
16			a23	339	295	299	69	36.1	22.8	22.8		
17			29	*373	*397	469	70	30.8	21.3	23.6		
18			a40	304	513	328	62	29.8	18.5	*23.6		
19			a51	244	507	187	54	29.8	16.7	24.4		
20			*62	255	445	145	51	35.0	15.5	25.2		
21			68	295	451	125	47.1	32.8	16.1	25.2		
22			76	318	513	127	43.2	27.9	16.7	23.6		
23			109	230	439	129	37.2	24.4	16.7	24.4		
24			127	184	385	103	32.8	22.8	17.3	24		
25			256	169	339	88	28.8	24.4	17.9	23		
26			*445	143	318	70	25.2	22.0	17.3	24		
27			514	154	304	53	21.3	28.8	17.3	29		
28			a350	125	282	42.0	19.2	49.8	17.9	21		
29			187	114	270	40.8	17.9	69	18.5	28		
30			277	114	251	39.6	17.9	54	20.6	*23		
31			259	-------	230	-------	17.9	445	------	23		
Total			3,036	6,541	9,360	4,525.4	3,908.8	1,436.0	686.6	719.6		
Mean			97.9	218	302	151	126	46.3	22.9	23.2		
Ac-ft			6,020	12,970	18,570	8,980	7,750	2,850	1,360	1,430		

Calendar year : Max Min Mean Ac-ft
The season: : Max - Min - Mean - Ac-ft 59,930

Peak discharge (base, 230 cfs).--Mar. 27 (time and discharge unknown); Apr. 17 (1 a.m.) 421 cfs (2.88 ft); Apr. 22 (7 to 9 a.m.) 355 cfs (2.77 ft); May 10 (1 p.m.) 636 cfs (3.22 ft); May 18 (10 to 11 a.m.) 570 cfs (3.12 ft); June 17 (1 to 3 p.m.) 500 cfs (3.01 ft); July 4 (11 p.m.) 1,110 cfs (3.84 ft).

* Discharge measurement made on this day.

a No gage-height record; discharge interpolated.

Note.--Stage-discharge relation affected by ice Mar. 1 to Apr. 15 and Oct. 24-31.

North Fork Milk River above St. Mary Canal, near Browning, Mont.

(International gaging station)

Location.--Lat 48°59', long 113°03', in NE¼ sec. 16, T. 37 N., R. 11 W., on left bank 1¼ miles upstream from outlet of canal, 2 miles south of international boundary, and 29 miles north of Browning.

Drainage area.--62 sq mi, approximately.

Records available.--May 1911 to July 1912, June to July 1918, June 1921 to October 1956. Published as "near Browning" 1911-12, 1918. Records usually obtained at this station only when St. Mary Canal is in operation.

Gage.--Water-stage recorder and concrete control. Altitude of gage 4,220 ft (from topographic map). May 8, 1911, to July 6, 1912, and June 18 to July 19, 1918, staff gages within 1 mile of present site at different datums.

Extremes.--Maximum discharge during season, 243 cfs July 3 (gage height, 3.16 ft), from rating curve extended above 110 cfs on basis of slope-area determination at gage height 7.55 ft; minimum recorded, 16.1 cfs Sept. 26 (gage height, 1.23 ft), but may have been less during periods of no gage-height record.

1911-12, 1918, 1921-56: Maximum discharge, 2,120 cfs Apr. 22, 1953 (gage height, 7.55 ft, from floodmarks in gage house), from rating curve extended above 110 cfs on basis of slope-area determination of peak flow; no flow Oct. 29, 1942.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Several small diversions for irrigation above station.

Cooperation.--This is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. Record collected and compiled jointly with the Water Resources Branch, Department of Northern Affairs and National Resources, Canada.

Rating table, Apr. 1 to Oct. 31, 1956 (gage height, in feet, and discharge, in cubic feet per second)

1.2	17.2
1.5	38.8
2.0	89
2.5	150

Discharge, in cubic feet per second, April to October 1956

Day				Apr.	May	June	July	Aug.	Sept.	Oct.		
1				a42	27.1	27.1	27.1	19.0	a19	17.8		
2					28.5	27.1	26.4	25.0		17.8		
3					27.8	26.4	133	36.4		18.4		
4					28.5	25.0	88	22.2		18.4		
5					31.6	25.0	42.2	20.2		18.4		
6					38.0	24.3	34.8	19.0		18.4		
7					46.7	22.9	27.8	19.6		18.4		
8					45.8	22.9	24.3	20.2		18.4		
9					77	22.2	22.9	24.3		18.4		
10					57	21.5	*21.5	66		19.0		
11				*38.0	49.4	22.2	22.2	31.6		19.0		
12				37.2	43.1	22.2	22.9	23.6		19.0		
13				44.0	40.4	*22.2	20.8	20.8	*18.4	19.0		
14				47.6	39.6	22.2	20.8	19.6	17.8	19.0		
15				51	39.6	29.2	20.8	*19.0	16.6	19.6		
16				49.4	*44.9	65	20.2	a19	17.8	19.6		
17				*43.1	47.6	46.7	22.2		17.8	*19.6		
18				37.2	44.9	28.5	20.8		17.2	a21		
19				38.8	41.3	24.3	19.6		17.2			
20				42.2	42.2	22.9	19.6		17.8			
21				41.3	42.2	27.8	18.4		17.8			
22				32.4	38.8	25.7	17.8		17.8			
23				30.0	37.2	22.2	17.8		17.2			
24				29.2	34.0	22.2	17.8		17.2			
25				29.2	34.0	21.5	18.4		17.2			
26				30.8	33.2	20.8	18.4		17.2			
27				27.1	32.4	21.5	20.2		18.4			
28				26.4	31.6	20.8	19.0		20.2			
29				26.4	30.0	20.2	19.0		19.0			
30				27.1	29.2	22.2	19.6		18.4			
31				-------	27.1	-------	18.4		------			
Total				1,148.4	1,210.7	774.7	862.7	690.5	549.0	612.2		
Mean				38.3	39.1	25.8	27.8	22.3	18.3	19.7		
Ac-ft				2,280	2,400	1,540	1,710	1,370	1,090	1,210		

Calendar year	: Max	Min	Mean	Ac-ft
The season:	: Max -	Min -	Mean -	Ac-ft 11,600

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* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of 3 discharge measurements and records for station near international boundary and St. Mary Canal at Hudson Bay Divide.

North Fork Milk River near international boundary

(International gaging station)

Location.--Lat 49°02', long 112°58', in NE¼ sec. 11, T. 1, R. 23 W., fourth meridian, on left bank 50 ft downstream from highway bridge, 2 miles north of international boundary, 2 miles east of Whiskey Gap, Alberta, and 11 miles southeast of Kimball, Alberta.

Drainage area.--101 sq mi.

Records available.--July 1909 to October 1956. Seasonal records only except for 1912-22.

Gage.--Water-stage recorder. Altitude of gage is 4,120 ft (from topographic map). Prior to May 1913, staff gage at site 2 miles downstream at different datum. May 1, 1913, to Apr. 11, 1930, water-stage recorder 800 ft upstream at different datum.

Extremes.--Maximum discharge during season, 1,020 cfs July 3 (gage height, 3.98 ft); minimum, 10 cfs Mar. 11 (gage height, 1.23 ft, backwater from ice).

1909-56: Maximum discharge, 2,170 cfs June 17, 1948 (gage height, 6.47 ft), from rating curve extended above 700 cfs; no flow Mar. 1, 2, 1940.

Remarks.--Records good except those for periods of ice effect, which are fair. Several small diversions for irrigation above station. Recorded diversions from St. Mary River into North Fork Milk River above station for 1956 are listed below:

Month	Mean (cfs)	Runoff in acre-feet
April..................	104	6,200
May....................	515	31,650
June...................	587	34,930
July...................	578	35,530
August.................	566	34,810
September..............	541	32,210
October................	263	16,160
The season............	-	191,500

For daily flow refer to records for St. Mary Canal at Hudson Bay Divide near Browning, Mont. (see WSP 1438).

Cooperation.--This is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. Records collected and compiled jointly with the Water Resources Branch, Department of Northern Affairs and National Resources, Canada.

Rating table, Mar. 1 to Oct. 31, 1956, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 16-22)

1.0	24.0	2.5	295
1.2	41.0	3.0	481
1.5	78	3.5	736
2.0	169	4.0	1,020

Discharge, in cubic feet per second, March to October 1956

Day			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		
1			*29	52	418	618	602	577	567	557		
2			45	46	426	618	602	582	567	552		
3			47	47	418	618	819	597	577	543		
4			36	58	418	618	786	587	572	548		
5			23	46	426	628	665	572	572	528		
6			17	45	430	623	649	567	567	523		
7			14	47	451	618	628	562	562	523		
8			16	49	481	608	618	562	562	523		
9			18	*65	582	613	613	562	552	528		
10			16	64	562	618	*608	628	552	528		
11			12	47	543	633	608	602	552	519		
12			12	44	538	*613	608	592	548	509		
13			14	51	548	618	608	587	*552	477		
14			15	59	538	618	608	*587	552	447		
15			26	64	538	639	602	587	548	361		
16			65	67	562	714	597	587	548	272		
17			167	*59	*582	681	602	582	548	182		
18			176	51	602	618	602	587	548	*111		
19			144	52	623	613	597	582	552	43.0		
20			*111	52	644	608	592	582	552	33.3		
21			83	54	649	613	592	582	552	33.3		
22			89	104	644	613	587	577	548	33.3		
23			146	337	639	597	582	572	552	28.4		
24			189	380	628	592	582	572	548	26.2		
25			184	422	613	533	582	567	552	25		
26			*127	*422	613	587	582	567	552	24		
27			52	418	613	592	582	572	552	20		
28			51	422	602	582	587	572	562	26		
29			*43	418	597	582	582	572	557	28		
30			59	418	597	587	582	582	557	*23		
31			71	-------	608	-------	582	572	------	23		
Total			2,097	4,460	17,133	18,413	19,036	17,978	16,682	8,597.5		
Mean			67.6	149	553	614	614	580	556	277		
Ac-ft			4,160	8,850	33,980	36,520	37,760	35,660	33,090	17,050		

Calendar year : Max Min Mean Ac-ft
The season : Max - Min - Mean - Ac-ft 207,100

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Mar. 1 to Apr. 15, Oct. 25-31.

Milk River at Milk River, Alberta

(International gaging station)

Location.--Lat 49°09', long 112°05', in SE¼ sec. 28, T. 2, R. 16 W., fourth meridian, on left bank 700 ft downstream from highway bridge at village of Milk River, Alberta, and 20 miles downstream from confluence of North and South Forks.

Drainage area.--1,104 sq mi.

Records available.--July 1909 to December 1917 and October 1920 to September 1956 in reports of Geological Survey. July 1909 to September 1956 in reports of Department of Northern Affairs and National Resources, Canada.

Gage.--Water-stage recorder. Datum of gage is 3,402.78 ft above mean sea level (Geodetic Surveys of Canada datum). Prior to June 17, 1919, staff or chain gages at several sites about 1,000 ft upstream from present site at datum 0.61 ft higher. June 17, 1919, to Nov. 2, 1921, water-stage recorder at site 1,000 ft upstream at datum 0.61 ft higher. Nov. 3, 1921, to Aug. 28, 1947, water-stage recorder at site 60 ft upstream at present datum.

Average discharge.--40 years (1916-56), 302 cfs (218,600 acre-ft per year).

Extremes.--Maximum discharge during year, 2,080 cfs July 4 (gage height, 4.7 ft, from partly estimated gage-height record); maximum gage height, 6.86 ft Mar. 27 (ice jam); minimum discharge, 10 cfs Nov. 27 (gage height, 1.92 ft, backwater from ice).
1909-56: Maximum discharge, 7,460 cfs May 22, 1927 (gage height, 11.41 ft), by slope-area determination; no flow at times.

Remarks.--Records good except those for period of ice effect, which are fair. Since 1917, flow increased during irrigation season by water from St. Mary Canal (see preceding page). Several small diversions for irrigation above station.

Cooperation.--This is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. Records collected and compiled jointly with the Water Resources Branch, Department of Northern Affairs and National Resources, Canada.

Rating tables, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 12		Apr. 13 to Sept. 30			
1.6	60	2.3	376	4.0	1,470
1.7	90	2.5	491	4.5	1,900
		3.0	792		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	71	*25	46	27	46	33	624	616	835	688	628	634
2	68	36	48	26	45	43	480	616	848	719	652	622
3	65	24	*39	25	*41	50	386	622	835	829	682	610
4	62	29	38	24	46	45	359	610	811	1,540	676	610
5	62	32	41	27	46	43	343	634	798	1,840	676	610
6	62	29	58	24	48	36	327	652	780	1,210	652	604
7	65	29	50	27	46	36	316	670	774	949	628	604
8	68	52	34	25	62	27	386	768	762	823	616	598
9	62	45	32	28	58	33	381	811	743	*755	616	598
10	62	36	45	26	68	33	*402	1,000	737	725	646	592
11	62	30	52	21	46	32	463	1,110	725	707	707	592
12	62	29	52	20	56	30	430	981	*719	700	755	*586
13	62	30	*54	20	46	27	393	936	707	725	719	598
14	77	28	52	29	45	43	393	854	707	713	*676	592
15	74	24	29	29	36	52	450	817	749	688	658	586
16	71	19	39	29	33	94	509	835	917	676	640	586
17	68	*17	38	*29	*30	90	580	*911	1,120	688	628	580
18	65	25	33	30	30	102	550	1,050	1,110	676	622	580
19	65	29	46	24	29	*548	474	1,110	898	664	616	580
20	68	29	60	33	30	762	422	1,100	811	658	604	580
21	68	32	65	32	29	671	456	1,090	755	646	610	586
22	68	34	68	43	26	458	503	1,150	743	634	598	574
23	80	39	28	56	22	397	491	1,130	743	622	598	568
24	68	30	27	54	23	408	628	1,070	725	616	598	574
25	71	32	45	38	27	419	664	1,010	694	610	610	574
26	65	22	38	28	29	486	676	975	628	610	610	574
27	65	16	33	46	29	518	670	949	670	610	634	574
28	65	30	27	43	30	930	670	923	670	622	616	586
29	65	36	24	43	32	994	634	898	664	622	646	586
30	68	46	29	36	------	856	622	879	664	628	713	592
31	60	------	27	36	------	835	------	854	------	622	658	------
Total	2,064	914	1,297	978	1,134	9,131	14,682	27,631	23,342	23,815	19,988	17,730
Mean	66.6	30.5	41.8	31.5	39.1	295	489	891	778	768	645	591
Ac-ft	4,090	1,810	2,570	1,940	2,250	18,110	29,120	54,810	46,300	47,240	39,650	35,170

Calendar year 1955:	Max	2,730	Min	11	Mean	327	Ac-ft	236,700
Water year 1955-56:	Max	1,840	Min	16	Mean	390	Ac-ft	283,100

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* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 31 to Apr. 12.

Milk River at eastern crossing of international boundary

(International gaging station)

Location.--Lat 49°00'00", long 110°35'30", in NE¼ sec. 6, T. 37 N., R. 9 E., on right bank 400 ft south of international boundary, 500 ft downstream from Canada Coulee, 30 miles north of Rudyard, Mont., and 37 miles south of Many Berries, Alberta.

Drainage area.--2,514 sq mi.

Records available.--August 1909 to September 1956 (few winter records).

Gage.--Water-stage recorder and rock control. Datum of gage is 2,698.4 ft above mean sea level (International Boundary Survey datum). Prior to Aug. 13, 1913, staff gages at several sites within a quarter of a mile of present site at various datums. Aug. 13, 1913, to June 13, 1917, water-stage recorder and staff gages at site 200 ft downstream at datum 2.34 ft lower.

Extremes.--Maximum discharge during year, 2,230 cfs July 6 (gage height, 3.68 ft); no flow Mar. 1-13.

1909-56: Maximum discharge, 9,530 cfs Mar. 31, 1952 (gage height, 9.34 ft), from rating curve extended above 2,600 cfs, but may have been higher Mar. 28, 1952; maximum gage height, 13.65 ft Mar. 28, 1952 (backwater from ice); no flow at times.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Since 1917, flow increased during irrigation season by discharge of St. Mary Canal (see p. 88). Small diversions for irrigation above station.

Cooperation.--This is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. Records collected and compiled jointly with the Water Resources Branch, Department of Northern Affairs and National Resources, Canada.

Revisions (water years).--WSP 1086: 1927, 1935.

Rating tables, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1-31		Nov. 7 to Sept. 30			
-0.2	65	-0.2	53	1.5	570
0.0	87	0.0	84	2.0	890
.2	116	.2	116	3.0	1,650
.3	136	.5	188	3.5	2,070
		1.0	346		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	118					0	b1,020	585	897	715	615	694
2	111						a870	580	876	650	722	650
3	106						*b720	590	848	855	855	610
4	100						b835	575	827	855	968	a604
5	95						b640	610	806	1,050	a870	a597
6	90						*590	620	785	1,980	a775	a591
7	87	†59					546	605	743	1,410	a680	585
8	83						a507	632	736	1,140	a650	580
9	80						a468	656	736	960	620	570
10	76						428	750	715	*869	a620	580
11	*77						a431	834	694	820	620	580
12	79					(*)	a434	1,090	674	764	632	570
13	75						437	1,020	662	785	*674	575
14	75					b60	450	939	656	778	694	575
15	74					a140	378	855	697	750	715	555
16	73					a220	339	799	1,050	785	662	565
17	72					b300	339	757	799	743	632	*550
18	79					a390	*386	813	904	694	632	536
19	80					a480	455	904	1,120	674	615	541
20	81					a560	492	1,070	*1,020	674	615	555
21	80					*b650	450	1,060	946	662	605	555
22	76					a745	394	1,040	a813	656	590	570
23	74					*b840	394	*1,060	680	644	590	560
24	72					b790	424	1,140	743	639	600	565
25	74					a770	450	1,100	743	615	605	546
26	73					b745	464	1,060	715	610	632	541
27	72					a610	590	1,000	662	600	615	541
28	72					a480	615	990	600	595	626	550
29	74					*b350	620	932	620	610	656	565
30	75				------	a560	620	897	680	610	778	570
31	73	------			------	b770	------	869	------	615	785	------
Total	2,526	-	-	-	-	9,460	15,786	26,432	23,447	24,806	20,948	17,226
Mean	81.5	-	-	-	-	305	526	853	782	800	676	574
Ac-ft	5,010	-	-	-	-	18,760	31,310	52,430	46,510	49,200	41,550	34,170

Calendar year : Max Min Mean Ac-ft
Water year : Max Min Mean Ac-ft

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* Discharge measurement or observation of no flow made on this day.

† Result of discharge measurement.

a No gage-height record; discharge interpolated or estimated on basis of 7 discharge measurements, weather records, and records for station at Milk River, Alberta.

b Stage-discharge relation affected by ice.

Wild Horse Lake closed basin

Sage Creek at "Q" Ranch, near Wildhorse, Alberta

(International gaging station)

Location.--Lat 49°07', long 110°13', in NW¼ sec. 9, T. 2, R. 2 W., fourth meridian, in Alberta, on right bank at "Q" Ranch, 3½ miles north of ranchhouse, 7½ miles north of Wildhorse customs post at international boundary, and 12½ miles (revised) rorth of Simpson, Mont.

Drainage area.--164 sq mi.

Records available.--March 1952 to October 1956 in reports of Geological Survey. March 1935 to October 1944 and March 1946 to October 1956 in reports of Department of Northern Affairs and National Resources, Canada. Seasonal records only.

Gage.--Water-stage recorder. Altitude of gage 2,900 ft (from topographic map). Mar. 1 to July 31, 1935, staff gage at same site and datum.

Extremes.--Maximum discharge during season, 352 cfs July 7 (gage height, 7.81 ft); no flow at times.
1935-56: Maximum discharge, 3,510 cfs Mar. 29, 1943 (gage height, 15.0C ft); no flow most of each year.

Remarks.--Records good except those for periods of ice effect or no gage-heigrt record, which are poor. Many diversions above station for irrigation.

Cooperation.--This is one of the international gaging stations maintained joirtly by the United States and Canada under the Boundary Waters Treaty. The records have been collected and compiled jointly with the Water Resources Branch, Department of Northern Affairs and National Resources, Canada.

Rating table, Mar. 1 to Oct. 31, 1956, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 6-8, 11, 12)

1.7	0	3.0	20.0
1.8	.1	3.5	35.0
1.9	.4	4.0	54
2.0	.8	5.0	109
2.2	2.7	6.0	174
2.4	5.6	7.0	259
2.6	9.6		

Discharge, in cubic feet per second, March to October 1956

Day			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		
1			0	a70	0.7	0	0.3	0				
2			0	a80	.6	0	.3	0				
3			0	a140	.5	0	4.8	0				
4			0	*168	.4	0	132	0				
5			0	203	.4	0	127	2.2				
6			0	*121	.4	0	158	1.9				
7			0	49.4	.3	0	254	.4				
8			0	*35.3	.3	0	52	.1				
9			0	36.8	.3	0	16.8	0		(*)		
10			*0	58	**.3	0	7.8	*0				
11			0	*82	4.5	0	*4.0	10.6				
12			0	43.6	2.7	0	2.1	4.0	(*)			
13			0	34.1	1.8	0	1.1	.5				
14			0	42.6	1.0	0	12.3	1.4				
15			0	49.5	.6	0	57	.9				
16			0	*32.0	.3	.2	16.0	.3				
17			0	24.8	.2	85	5.1	.1				
18			0	15.7	.1	20.8	2.1	.1				
19			0	*10.6	0	5.8	.8	0				
20			0	8.0	0	2.4	.4	0				
21			0	8.4	0	0.9	.4	0				
22			0	*8.7	0	0.6	.3	0				
23			0	7.2	*0	0.4	.3	0				
24			*0	4.2	0	0.3	.3	0				
25			0	2.5	0	0.3	.1	0				
26			b5	1.7	0	19.7	0	0				
27			b61	1.1	0	6.6	0	0				
28			*b45	*.9	0	2.3	0	0				
29			a40	.8	0	.8	0	0				
30			a50	.9	0	.5	0	0		(*)		
31			a60	-------	0	-------	0	0	------			
Total			261	1,340.8	15.4	146.6	855.3	22.5	0	0		
Mean			8.42	44.7	0.50	4.89	27.6	0.73	0	0		
Ac-ft			518	2,660	31	291	1,700	45	0	0		

Calendar year : Max Min Mean Ac-ft
The season : Max - Min - Mean - Ac-ft 5,240

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* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
a No gage-height record; discharge estimated on basis of 1 discharge measurement and weather records.
b Stage-discharge relation affected by ice.

Wild Horse Lake closed basin

Sage Creek at international boundary

(International gaging station)

Location.--Lat 49°00'10", long 110°11'30", in SE¼ sec. 3, T. 1, R. 2 W., fourth meridian, in Alberta, on right bank a quarter of a mile north of international boundary, 1 mile east of Wild Horse customs post, and 5 miles (revised) north of Simpson, Mont.

Records available.--March 1947 to October 1956 in reports of Geological Survey. March 1946 to October 1956 in reports of Department of Northern Affairs and National Resources, Canada. Seasonal records only.

Gage.--Water-stage recorder and concrete low-water control. Altitude of gage is 2,800 ft (from international boundary map). Prior to Sept. 22, 1950, at site half a mile downstream at different datum.

Extremes.--Maximum daily discharge during season, 35 cfs Apr. 11, 12; maximum gage height, 4.65 ft July 9 (backwater from irrigation checks); no flow at times.

1947-56: Maximum discharge, 52 cfs Sept. 6, 1951 (gage height, 4.72 ft); no flow most of each year.

Remarks.--Records poor. Many diversions for irrigation above station. All of the flow may be diverted at times. During the spring, high-water natural overflow occurs at many points along channel above and below gage.

Cooperation.--This is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. The records have been collected and compiled jointly with the Water Resources Branch, Department of Northern Affairs and National Resources, Canada.

Discharge, in cubic feet per second, March to October 1956

Day			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		
1				0	0.2	0	1	0				
2				0	.2	0	1	0				
3				0	.1	0	.7	0				
4				*0	0	0	.8	0				
5				0	0	0	20	0				
6				*0	0	0	34	0				
7				0	0	0	34	0				
8				0	0	0	34	0				
9				0	0	0	34	0		(*)		
10				**4	0	0	31	*.1				
11				*35	0	0	*18	.3				
12				35	0	0	10	.2	(*)			
13				30	2	0	6	.7				
14				26	.8	0	3	3				
15				26	.5	0	2	1				
16				*27	.4	0	24	.7				
17				*27	.3	0	22	.4				
18				20	.2	0	9	.5				
19				*13	.3	0	4	.5				
20				9	.3	*3	2	.3				
21				7	.2	4	1	.1				
22				*5	.2	.5	.9	0				
23				7	.1	.3	.8	0				
24			(*)	7	.1	.2	.8	0				
25				4	**.1	.1	.4	0				
26				2	0	.1	.2	0				
27				1	0	2	.1	0				
28				**.7	0	10	.1	0				
29				.4	0	4	0	0				
30				.2	0	1	0	0		(*)		
31				-------	0	-------	0	0	------			
Total			0	286.3	6.0	25.2	294.8	7.8	0	0		
Mean			0	9.54	0.19	0.84	9.51	0.25	0	0		
Ac-ft			0	568	12	50	585	15	0	0		

Calendar year : Max Min Mean Ac-ft
The season : Max - Min - Mean - Ac-ft 1,230

* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.

Note.--Stage-discharge relation affected at all times by varying amounts of backwater from irrigation checks, weeds, brush and debris in the channel.

Milk River at Havre, Mont.

Location.--Lat 48°33'30", long 109°40'10", in SE¼SE¼ sec. 5, T. 32 N., R. 16 E., on upstream side of highway bridge on 7th Avenue East in Havre, 30 ft downstream from Bull Hook Creek, 9 miles downstream from Big Sandy Creek, and 17 miles downstream from Fresno Dam.

Records available.--May 1898 to September 1922 (no winter records), August 1954 to September 1956.

Gage.--Wire-weight gage. Datum of gage is 2,461.11 ft (revised) above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Nov. 2, 1902, wire-weight gage at site half a mile upstream at different datum. Nov. 4, 1902, to Nov. 25, 1910, chain gage at datum 0.47 ft higher, Mar. 9, 1911, to July 13, 1920, chain gage at present datum, and July 14, 1920, to Sept. 30, 1922, chain gage at datum 4.00 ft higher, all at site 30 ft downstream.

Average discharge.--17 years (1899-1916), prior to operation of St. Mary Canal, 273 cfs (197,600 acre-ft per year); 6 years (1916-22), 336 cfs (243,300 acre-ft per year).

Extremes.--Maximum discharge observed during year, 1,280 cfs July 19 (gage height, 9.56 ft); minimum daily, 20 cfs Dec. 18, 19.

1898-1922, 1954-56: Maximum discharge, about 20,000 cfs Apr. 12, 1899 (gage height, 19.3 ft, present datum, from floodmarks), from rating curve extended above 5,200 cfs by logarithmic plotting; no flow at times in several years.

Flood of Apr. 3, 1952, reached a stage of 18.6 ft (discharge, about 11,400 cfs).

Remarks.--Records fair except those for period of ice effect, which are poor. Bull Hook Creek flood-control project is designed to bypass damaging floods to Milk River channel several miles downstream. Diversions for irrigation of about 6,000 acres above station. Since 1917, flow increased during irrigation season by water from St. Mary Canal, which diverts from St. Mary River near Babb (see p. 88). Flow regulated by Fresno Reservoir which was completed in 1939 (see p. 238).

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	556	110	30	45	30	60	126	704	950	875	1,170	682
2	560	77	30	45	30	75	124	616	905	844	1,160	679
3	564	78	35	50	35	75	108	578	905	866	1,120	693
4	567	124	35	50	45	75	*142	129	890	895	997	693
5	427	108	35	50	45	70	120	438	*900	920	986	693
6	424	122	35	50	50	70	104	588	816	910	970	690
7	405	126	40	45	50	*70	120	588	808	826	940	690
8	399	*80	40	45	50	70	118	532	890	794	945	690
9	396	68	40	40	50	65	98	511	940	790	935	693
10	369	65	45	40	50	60	95	525	920	862	925	690
11	336	60	50	40	50	60	91	536	1,160	905	920	693
12	315	45	50	35	50	65	92	522	1,140	*1,010	925	686
13	330	40	50	35	45	65	91	542	1,140	1,050	*895	712
14	327	35	*45	35	40	65	300	539	1,140	1,050	940	690
15	327	30	35	35	35	65	354	500	1,180	1,200	960	644
16	348	30	30	35	35	65	384	525	1,210	1,220	895	634
17	351	35	25	35	35	70	384	532	1,260	1,250	895	644
18	330	40	20	35	35	80	381	522	1,210	1,260	895	637
19	26	45	20	40	35	85	387	508	1,190	1,280	895	630
20	45	45	25	40	35	90	381	514	1,220	1,220	905	630
21	38	45	35	45	35	90	384	539	1,200	1,200	935	637
22	35	40	40	45	35	90	393	588	*1,010	1,190	955	630
23	96	40	40	45	35	90	*387	700	1,010	1,190	*945	630
24	58	35	40	45	35	95	402	848	1,040	1,190	960	630
25	72	35	35	*45	35	100	693	885	1,030	1,180	950	644
26	85	30	35	45	40	105	720	875	1,020	*1,180	950	626
27	108	30	35	40	40	110	732	940	997	1,140	935	542
28	107	30	35	40	45	110	736	945	975	1,160	905	553
29	106	30	35	35	45	115	728	955	915	1,200	812	536
30	107	30	40	35	------	115	716	970	895	1,210	821	539
31	106	------	40	30	------	120	------	950	------	1,190	803	------
Total	8,320	1,708	1,125	1,275	1,175	2,540	9,891	19,644	30,866	33,057	29,244	19,460
Mean	268	56.9	36.3	41.1	40.5	81.9	330	634	1,029	1,066	943	649
Ac-ft	16,500	3,390	2,230	2,530	2,330	5,040	19,620	38,960	61,220	65,570	58,000	38,600

Calendar year 1955: Max 2,550 Min 20 Mean 486 Ac-ft 351,800
Water year 1955-56: Max 1,280 Min 20 Mean 433 Ac-ft 314,000

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 11 to Mar. 31.

Lodge Creek below McRae Coulee at international boundary

(International gaging station)

Location.--Lat 49°00'20", long 109°43'05", in SW¼ sec. 5, T. 1, R. 28 W., third meridian, in Saskatchewan, on right bank a quarter of a mile downstream from McRae Coulee, 0.4 mile north of international boundary, three-quarters of a mile northeast of Willow Creek customs post, and 31 miles north of Havre, Mont.

Drainage area.--850 sq mi, approximately.

Records available.--October 1951 to October 1956 (seasonal records only). Prior to October 1951, records were collected on both McRae Coulee and Lodge Creek above McRae Coulee. Summations are equivalent to records at this site.

Gage.--Water-stage recorder. Datum of gage is 2,731.0 ft above mean sea level (International Boundary Survey datum).

Extremes.--Maximum discharge during season, 577 cfs July 4 (gage height, 5.23 ft); no flow at times.

1951-56: Maximum discharge, 5,570 cfs (includes inflow from Battle Creek drainage) Apr. 13, 1952 (gage height, 12.50 ft); maximum gage height, 12.73 ft Apr. 7, 1952 (backwater from ice); no flow at times in each year.

Maximum discharge determined at this site, about 5,700 cfs Mar. 30, 1943, on basis of records for Lodge Creek at international boundary and McRae Coulee at international boundary.

Remarks.--Records good. Natural flow affected by storage reservoirs, diversions for irrigation and return flow from irrigated areas.

Cooperation.--This is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. Records collected and compiled jointly with the Water Resources Branch, Department of Northern Affairs and National Resources, Canada.

Rating table, Mar. 1 to Oct. 31, 1956, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.8	0	1.8	39.4
.9	.2	2.0	55
1.0	.6	2.5	101
1.1	1.2	3.0	162
1.2	3.0	4.0	322
1.4	11.1	5.0	531
1.6	24.5		

Discharge, in cubic feet per second, March to October 1956

Day			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		
1			0	60	21.0	3.2	1.4	0.5	1.6	0		
2			0	*70	18.9	2.6	1.4	.4	2.8	0		
3			0	60	16.2	2.6	23.8	.4	1.0	0		
4			0	*72	16.2	*2.1	417	.3	.7	0		
5			0	*170	18.2	1.6	300	.2	.6	0		
6			0	*245	20.3	1.8	148	5.3	.4	0		
7			0	240	20.3	3.0	60	15.6	.3	0		
8			0	130	26.0	2.4	195	8.8	.2	0		
9			0	*105	36.4	1.8	82	7.3	.2	0		
10			0	100	53	1.5	41.7	5.2	.1	*0		
11			0	*185	*97	1.2	*21.7	*4.5	*0	0		
12			0	185	95	.9	11.1	2.1	0	0		
13			0	*125	81	.8	6.0	1.8	0	0		
14			0	260	61	.6	3.2	2.4	0	0		
15			*0	265	48.8	.6	2.1	1.3	0	0		
16			0	*235	43.3	.8	4.3	.8	0	0		
17			0	195	37.9	.7	5.5	.6	0	0		
18			0	*150	32.6	.7	5.2	.6	0	0		
19			0	113	28.9	.6	6.8	.5	0	0		
20			0	*102	26.7	.5	4.3	.4	0	0		
21			0	89	23.8	.6	2.8	.4	0	0		
22			0	87	20.3	.6	1.5	.4	0	0		
23			.6	81	16.9	.4	1.2	3.9	0	0		
24			3	*65	15.6	22.9	.9	2.1	0	0		
25			*20	57	15.6	18.2	.7	1.2	0	0		
26			46	41.7	11.1	10.6	.7	.8	0	0		
27			70	34.8	7.3	6.4	.6	.6	0	0		
28			60	29.6	6.0	3.9	.5	.5	0	0		
29			*55	31.8	4.8	2.4	.6	.4	0	.4		
30			60	*26.0	3.9	1.5	.5	.4	0	.9		
31			*46	-------	3.5	-------	.5	.3	------	*.9		
Total			360.6	3,609.9	927.5	97.5	1,351.0	70.0	7.9	2.2		
Mean			11.6	120	29.9	3.25	43.6	2.26	0.26	0.07		
Ac-ft			715	7,160	1,840	193	2,680	139	16	4.4		

Calendar year : Max Min Mean Ac-ft
The season : Max - Min - Mean - Ac-ft 12,750

* Discharge measurement or observation of no flow made on this day.
Note.--Stage-discharge relation affected by ice Mar. 23 to Apr. 19.

North Chinook Canal near Havre, Mont.

Location.--Lat 48°49', long 109°28', in SE¼ sec. 2, T. 35 N., R. 17 E., on right bank 1 mile downstream from headworks of canal, 4 miles upstream from North Chinook Reservoir, and 20 miles northeast of Havre.

Records available.--May 1928 to October 1956 (seasonal records only).

Gage.--Water-stage recorder. Prior to September 1929, staff gage at same site and datum.

Extremes.--1928-56: Maximum daily discharge, 148 cfs Apr. 14, 15, 1952; no flow at times each season.

Remarks.--Records good except those for period of ice effect or no gage-height record, which are poor. Canal diverts water from left bank of Lodge Creek in sec. 3, T. 35 N., R. 17 E.; this water is then stored in North Chinook Reservoir for irrigation of lands north of Chinook between Lodge Creek and Battle Creek.

Discharge, in cubic feet per second, March to October 1956

Day			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		
1			0	b56	0	2.8	1.9					
2			0	b44	0	2.0	1.8					
3			0	*b53	13	.8	2.8					
4			0	53	20	*.2	6.5					
5			0	*53	16	0	82					
6			0	92	14	0	92					
7			0	106	15	0	83					
8			0	101	17	2.2	68					
9			0	*88	18	1.4	91					
10			0	84	21	0	80			(*)		
11			0	76	*32	0	49	(*)				
12			0	100	43	0	*30					
13			0	100	43	0	20					
14			0	92	42	0	15					
15			0	58	41	0	12					
16			0	94	40	0	10					
17			0	91	26	0	6.0					
18			0	*88	5.3	0	3.3		(*)			
19			0	83	3.3	0	1.5					
20			0	80	2.6	0	3.3					
21			0	61	2.0	0	4.6					
22			0	48	1.4	0	4.6					
23			0	31	1.2	0	2.5					
24			a10	.6	.7	0	.6					
25			b20	.3	14	0	.1					
26			**22	0	14	0	0					
27			*b28	0	12	0	0					
28			b63	0	12	0	0					
29			a48	0	9.2	3.1	0					
30			a30	0	6.3	5.0	0					
31			b46	-------	5.3	-------	0		------	(*)		
Total			267	1,732.9	490.3	17.5	671.5	0	0	0		
Mean			8.6	57.8	15.8	0.58	21.7	0	0	0		
Ac-ft			530	3,440	972	35	1,330	0	0	0		

Calendar year : Max Min Mean Ac-ft
The season : Max - Min - Mean - Ac-ft 6,310

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* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
a No gage-height record; discharge interpolated or estimated.
b Stage-discharge relation affected by ice.

Battle Creek above Cypress Lake west inflow canal, near West Plains, Saskatchewan

(International gaging station)

Location.--Lat 49°26', long 109°41', in NE¼ sec. 34, T. 5, R. 28 W., third meridian, on right bank 1½ miles north of West Plains and 10 miles north of Senate.

Drainage area.--240 sq mi.

Records available.--March 1947 to October 1956 in reports of Geological Survey. March 1939 to October 1956 in report of Department of Northern Affairs and National Resources, Canada. Seasonal records only.

Gage.--Water-stage recorder. Altitude of gage is 3,230 ft (information furnished by Department of Northern Affairs and National Resources, Canada). Prior ot Oct. 13, 1939, at site 1½ miles downstream at different datum.

Extremes.--Maximum discharge during season, 199 cfs Apr. 16 (gage height, 4.06 ft, backwater from ice); minimum, 6.4 cfs Sept. 18 (gage height, 1.95 ft).

1939-56: Maximum discharge, 3,020 cfs (reduced by overflow into Lodge Creek basin by about 700 to 1,000 cfs) Apr. 14, 1952 (gage height, 10.00 ft, from floodmark), from rating curve extended above 1,500 cfs on basis of slope-area determination of peak flow; no flow at times in most years.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Several small diversions for irrigation above station.

Cooperation.--This is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. The records have been collected and compiled jointly with the Water Resources Branch, Department of Northern Affairs and National Resources, Canada.

Rating table, Mar. 1 to Oct. 31, 1956, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 20-22, Aug. 10 to Oct. 27)

1.4	6.4	2.0	38.3
1.5	9.6	2.5	78
1.6	13.8	3.0	124
1.8	25.1	3.5	174

Discharge, in cubic feet per second, March to October 1956

Day			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	
1			18	78	45.7	34.2	32.8	10.0	21.6	16.6		
2			18	75	45.7	32.1	36.2	10.9	21.6	16.0		
3			18	102	*44.2	32.8	39.0	17.6	19.3	16.6	†23	
4			18	**100	45.0	28.2	45.7	18.2	17.1	15.4		
5			18	94	47.2	*25.1	69	19.9	16.0	16.0		
6			18	*76	51	23.9	*56	14.9	16.6	15.4		
7			18	87	53	22.8	53	12.5	14.9	14.9		
8			*18	*83	58	22.2	50	*14.4	12.5	14.4		
9			18	79	75	21.6	40.5	15.4	10.9	14.9		
10			18	*91	93	20.5	34.2	13.4	9.6	15.4		
11			18	85	133	18.8	29.5	17.1	9.6	15.4		
12			18	*83	*125	17.1	27.0	17.1	*10.9	*14.4		
13			18	110	100	14.4	25.1	19.3	14.9	15.4		
14			17	**146	91	12.5	23.9	14.4	12.5	16.0		
15			17	153	82	13.0	27.0	10.4	10.9	16.0		
16			17	*149	76	16.0	32.8	8.6	9.0	16.6		
17			17	136	75	26.4	33.5	10.4	8.3	17.1		
18			17	*118	73	36.2	*36.2	13.0	8.3	17.6		
19			17	113	67	30.1	32.8	12.1	9.0	19.3		
20			17	*113	64	25.7	27.6	12.5	9.6	19.3		
21			*17	103	60	25.7	22.8	17.6	10.9	19.9		
22			17	90	56	26.4	19.9	17.6	11.7	20.5		
23			20	78	53	45.0	18.2	17.1	17.6	22.8		
24			30	68	51	45.7	16.0	15.4	22.2	26.4		
25			46	*63	55	*39.8	13.0	17.6	19.3	25.1		
26			66	56	58	35.5	10.9	19.9	*16.6	25.1		
27			48	53	53	31.4	10.0	22.8	14.9	26.4		
28			**51	50	50	28.2	11.3	21.0	14.9	25		
29			68	47.2	48.0	28.2	10.4	19.3	15.4	25		
30			62	47.2	39.8	31.4	10.4	18.8	16.0	24		
31			**73	-------	36.9	-------	9.6	18.2	------	24		
Total			851	2,726.4	2,004.5	810.9	904.3	487.4	422.6	586.9		
Mean			27.5	90.9	64.7	27.0	29.2	15.7	14.1	18.9		
Ac-ft			1,690	5,410	3,980	1,610	1,790	967	838	1,160		

Calendar year : Max Min Mean Ac-ft
The season : Max - Min - Mean - Ac-ft 17,440

* Discharge measurement made on this day.
† Result of discharge measurement.
** Field estimate made on this day.
Note.--Stage-discharge relation affected by ice Mar. 1 to Apr. 19, Oct. 28-31 (no gage-height record Mar. 1-7, 9-20, 22-24, Oct. 29-31; discharge estimated on basis of 2 discharge measurements, engineer's notes, and weather records).

Cypress Lake west inflow canal near West Plains, Saskatchewan

(International gaging station)

Location.--Lat 49°28', long 109°37', in SE¼ sec. 18, T. 6, R. 27 W., third meridian, on left bank 2 miles downstream from canal headgates, 4½ miles northeast of West Plains, and 13 miles northwest of Consul. Prior to Oct. 16, 1956, at site 2 miles upstream.

Records available.--March 1947 to October 1956 in reports of the Geological Survey. March 1939 to October 1956 in reports of Department of Northern Affairs and National Resources, Canada. Irrigation seasons only.

Gage.--Water-stage recorder. Prior to Oct. 16, 1956, at site 2 miles upstream at different datum.

Extremes.--1939-56: Maximum daily discharge, 663 cfs June 27, 1942; no flow at times each year.

Remarks.--Records poor. Canal diverts water from Battle Creek for storage in Cypress Lake. Part or all of flow may be returned to Battle Creek at wasteway 2 miles downstream.

Cooperation.--This is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. The records have been collected and compiled jointly with the Water Resources Branch, Department of Northern Affairs and National Resources, Canada.

Discharge, in cubic feet per second, March to October 1956

Day			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	
1			0	1	34	0.3	0.3	0.3	0.3	0.3		
2			0	**3	33							
3			0	**20	*33						†1.5	
4			0	30	33				(**)			
5			0	**40	33							
6			0	45	33	(**)	(**)					
7			0	45	21							
8			0	**50	.4							
9			0	60								
10			0	**65								
11			0	65								
12			0	**65								
13			0	85								
14			0	**100	(**)		(**)	(**)				
15			0	125						5		
16			0	*149						34		
17			0	121						15		
18			0	*93						*14		
19			0	76						15		
20			0	*59						15		
21			0	59						15		
22			*0	59						15		
23			0	55						16		
24			0	49						20		
25			0	*42	.3				(**)	19		
26			**.5	42			(**)			*19		
27			**1	38						19		
28			**1	35						19		
29			1	35						16		
30			1	34						17		
31			1	-------		-------			------	16		
Total			5.5	1,745	228.9	9.0	9.3	9.3	9.0	293.2		
Mean			0.18	58.2	7.38	0.30	0.30	0.30	0.30	9.46		
Ac-ft			11	3,460	454	18	18	18	18	582		

Calendar year : Max Min Mean Ac-ft
The season : Max - Min - Mean - Ac-ft 4,580

* Discharge measurement or observation of no flow made on this day.
† Result of field estimate.
** Field estimate made on this day.
Note.--No gage-height record Mar. 1 to Oct. 31; discharge estimated on the basis of 7 discharge measurements, 19 field estimates of flow, 1 observation of no flow, and observer's notes.

Cypress Lake west outflow canal near West Plains, Saskatchewan

(International gaging station)

Location.--Lat 49°28', long 109°35', in SW¼ sec. 16, T. 6, R. 27 W., third meridian, on right bank 1 mile downstream from Cypress Lake West Dam, 7 miles northeast of West Plains, and 12 miles north of Consul.

Records available.--March 1947 to October 1956 in reports of Geological Survey. July 1940 to October 1956 in reports of Department of Northern Affairs and National Resources, Canada. Irrigation seasons only.

Gage.--Water-stage recorder. Prior to Sept. 18, 1952, at site 1 mile upstream and 300 ft below Cypress Lake West Dam at different datum.

Extremes.--1940-56: Maximum daily discharge, 304 cfs May 4, 1951; no flow at times each year.

Remarks.--Records good except those for period of no gage-height record, which are poor. Canal diverts water from Cypress Lake for irrigation of lands in Battle Creek basin in Saskatchewan.

Cooperation.--This is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. The records have been collected and compiled jointly with the Water Resources Branch, Department of Northern Affairs and National Resources, Canada.

Discharge, in cubic feet per second, March to October 1956

Day			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	
1				0	12.8	16.0	2.2	41.7	1.8	5.5		
2				0	32.6	16.3	2.4	41.7	1.7	5.0		
3				0	*31.0	16.3	3.1	40.8	1.5	4.8	(*)	
4				0	29.1	16.6	*3.6	41.3	*1.7	*4.8		
5				0	26.8	32.8	2.9	39.6	1.5	4.8		
6				0	21.1	*64	3.2	28.3	1.4	4.7		
7				0	19.0	73	2.8	27.9	1.3	4.7		
8				0	3.6	72	2.8	28.7	1.2	4.7		
9				0	*9.2	71	2.9	29.1	1.1	2.2		
10				0	13.3	70	4.3	23.6	1.1	.7		
11				0	22.2	70	5.7	13.0	1.1	.7		
12				0	13.3	69	5.0	12.8	1.1	**.7		
13				.5	5.3	70	4.0	12.8	16.0	.6		
14				**1.0	*4.2	75	*7.4	*13.0	*26.8	.6		
15				.7	2.2	70	11.4	16.3	25.7	.3		
16				**.5	2.5	70	18.8	25.0	24.6	.2		
17				.4	7.8	72	32.2	24.3	24.6	.1		
18				**.3	7.2	65	29.1	22.2	21.1	**.1		
19				.4	6.6	*61	28.3	21.8	17.7	.1		
20				(**)	6.0	56	29.5	21.4	18.3	0		
21					5.5	44.0	40.1	21.1	18.7	0		
22			(*)		3.8	34.2	48.8	21.4	18.0	0		
23					2.9	47.4	51	21.1	17.7	0		
24					3.1	57	59	21.4	10.9	0		
25				(**) .5	*3.4	57	59	12.3	*6.4	0		
26					2.4	47.8	*59	2.8	6.4	*0		
27					2.3	36.2	59	2.9	5.7	0		
28					2.0	23.2	59	2.3	5.7	0		
29					2.0	11.6	59	2.2	5.7	0		
30					9.3	2.2	52	2.2	5.7	0		
31				-------	16.0	-------	41.3	1.9	------	0		
Total			0	9.3	328.5	1,486.6	778.8	636.9	292.2	45.3		
Mean			0	0.31	10.6	49.6	25.4	20.5	9.74	1.46		
Ac-ft			0	18	652	2,950	1,560	1,260	580	90		

Calendar year : Max Min Mean Ac-ft
The season : Max - Min - Mean - Ac-ft 7,110

* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
Note.--No gage-height record Apr. 13-30; discharge estimated on basis of 5 field estimates, 1 observation of no flow, engineers' notes, and weather records.

Battle Creek at international boundary

(International gaging station)

Location.--Lat 49°00'10", long 109°25'20", in SE¼ sec. 4, T. 1, R. 26 W., third meridian, on left bank 600 ft north of international boundary in Saskatchewan, 8 miles upstream from Woodpile Coulee, and 30 miles north of Chinook, Mont.

Drainage area.--726 sq mi.

Records available.--April 1917 to October 1956 (seasonal records only most years).

Gage.--Water-stage recorder. Datum of gage is 2,729.8 ft above mean sea level (International Boundary Survey datum).

Extremes.--Maximum daily discharge during season, 200 cfs Mar. 27; maximum gage height, 5.14 ft Mar. 28 (backwater from ice); minimum daily discharge, 5 cfs Mar. 10.
1917-56: Maximum discharge, 5,820 cfs Apr. 15, 1952 (gage height, 10.56 ft); no flow at times during most years.

Remarks.--Records excellent except those for periods of ice effect or no gage-height record, which are poor. Natural flow of stream affected by storage reservoirs, diversions for irrigation and return flow from irrigated areas. Water may be diverted into or from Frenchman River basin through Cypress Lake. Peak discharge for 1952 affected by loss to Lodge Creek basin (see records for Battle Creek above Cypress Lake west inflow canal, near West Plains, Saskatchewan).

Cooperation.--This is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. Records collected and compiled jointly with the Water Resources Branch, Department of Northern Affairs and National Resources, Canada.

Revisions (water years).--WSP 1389: 1935(M), 1936, 1937(M), 1938(M).

Rating table, Mar. 1 to Oct. 31, 1956, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.3	4.1	2.6	25.2
2.4	9.3	3.0	71
2.5	16.2	3.5	163

Discharge, in cubic feet per second, March to October 1956

Day			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	
1			7	90	26.2	39.7	39.7	29.3	14.6	18.6	†14.4	
2				100	25.2	32.3	38.6	30.3	14.0	17.0		
3				115	21.3	26.2	40.8	31.3	13.4	16.2		
4				130	25.2	19.5	45.0	29.3	12.6	15.4		
5				**155	42.8	14.0	*42.8	24.2	*12.6	16.2		
6				165	41.8	10.6	46.0	21.3	14.6	15.4		
7				135	40.8	8.0	43.9	29.3	16.2	14.6		
8			*6	135	46.0	8.6	57	31.3	14.6	15.4		
9			6	*105	*42.8	6.8	52	30.3	14.0	14.6		
10			5	95	58.0	22.2	47.2	29.3	14.0	14.0		
11			9	75	88	24.2	47.2	34.4	13.4	14.6		
12			10	*85	90	24.2	40.8	29.3	12.6	*12.6		
13			10	125	111	22.2	35.5	27.3	11.8	10.0		
14			30	135	122	19.5	*33.3	*25.2	*10.6	8.6		
15			45	140	97	17.8	33.3	22.2	9.3	12.6		
16			70	126	82	17.8	23.2	17.8	8.6	14.6		
17			90	*136	77	24.2	19.5	17.0	10.6	14.6		
18			100	134	70	24.2	17.0	14.6	17.8	15.4		
19			120	*80	77	19.5	22.2	13.4	17.0	17.0		
20			150	57	77	18.6	34.4	17.0	18.6	26.2		
21			175	56	74	*24.2	32.3	18.6	21.3	19.5		
22			150	48.4	67	23.2	28.3	18.6	17.8	17.0		
23			145	*52	61	52	24.2	17.0	15.4	14.6		
24			125	46.0	*59	48.4	20.4	16.2	16.2	14.0		
25			120	*45.0	54	48.4	24.2	15.4	*17.0	15.4		
26			**130	37.6	46.0	49.6	24.2	18.6	17.8	15.4		
27			200	*32.3	49.6	52	*28.3	19.5	19.5	16.2		
28			105	31.3	53	45.0	28.3	22.2	26.2	16.2		
29			**55	29.3	49.6	40.8	29.3	18.6	24.2	13.4		
30			70	27.3	43.9	43.9	34.4	20.4	21.3	11.2		
31			80	-------	39.7	-------	29.3	14.6	------	16.2		
Total			2,055	2,723.2	1,857.9	827.6	1,062.6	703.8	467.6	472.7		
Mean			66.3	90.8	59.9	27.6	34.3	22.7	15.6	15.2		
Ac-ft			4,080	5,400	3,690	1,640	2,110	1,400	927	938		

Calendar year	: Max	Min	Mean	Ac-ft
The season	: Max -	Min -	Mean -	Ac-ft 20,180

* Discharge measurement made on this day.
† Result of discharge measurement.
** Field estimate made on this day.

Note.--No gage-height record Mar. 1-7; discharge estimated on basis of 1 discharge measurement and weather records. Stage-discharge relation affected by ice Mar. 1 to Apr. 15.

Woodpile Coulee near international boundary

(International gaging station)

Location.--Lat 48°59'00", long 109°31'50", in NW¼ sec. 8, T. 37 N., R. 17 E., on right bank 600 ft downstream from Antelope Coulee, 1¼ miles south international boundary, 7 miles upstream from mouth, and 30 miles north of Havre, Mont.

Drainage area.--70 sq mi, approximately.

Records available.--March 1927 to October 1956 (seasonal records only most years).

Gage.--Water-stage recorder and concrete control. Altitude of gage is 2,740 ft (from topographic map). Prior to Aug. 27, 1927, staff gage at site 4 miles downstream at different datum.

Extremes.--Maximum discharge during season, 24.4 cfs May 11 (gage height, 2.66 ft); no flow most of period.

1927-56: Maximum discharge, 3,090 cfs Mar. 30, 1943 (gage height, 8.6 ft, from floodmark), from rating curve extended above 330 cfs on basis of slope-area determination at gage height 8.50 ft; no flow most of each year.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. Stock-water reservoir constructed in summer of 1947 a quarter of a mile upstream; capacity not more than 30 acre-ft. Seepage from reservoir produces long periods of flow under 0.05 cfs.

Cooperation.--This is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. Records collected and compiled jointly with the Water Resources Branch, Department of Northern Affairs and National Resources, Canada.

Revisions (water years).--WSP 1209: 1943(M). WSP 1389: 1935(M), 1936, 1937(M), 1939, 1940-41(M), 1943-44, 1947, 1950(M).

Rating table, Mar. 1 to Oct. 31, 1956, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.7	0	2.2	3.0
1.8	.1	2.3	4.9
1.9	.5	2.4	8.5
2.0	1.0	2.6	20.0
2.1	1.8		

Discharge, in cubic feet per second, March to October 1956

Day			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		
1			0	a6	**0.1	0.2	0.1					
2			0	a6	.1	.2	.2					
3			0	a5	.1	.2	.4					
4			0	*b6	.2	**.2	.3					
5			0	*6.5	.2	.2	.1					
6			0	4.2	.2	.2	.1					
7			0	3.8	.2	.2	.1					
8			0	1.9	.2	.2	.1					
9			0	1.0	.1	.2	.1					
10			0	.8	4.8	.2	0			(*)		
11			0	.6	*16.8	.1	0	(*)	(*)			
12			0	.4	6.9	.1	*0					
13			0	**.3	3.3	.2	0					
14			0	.3	2.1	.2	0					
15			0	.2	1.4	.2	0					
16			0	.2	1.0	.2	0					
17			0	.1	.8	.1	0					
18			0	**.1	.6	.1	0					
19			0	.1	.5	.1	0					
20			0	.1	.4	.1	0					
21			0	.1	.4	.3	0					
22			0	.1	.3	.2	0					
23			0	.1	.3	.1	0					
24			0	a.1	.3	.1	0					
25			*a0		.3	.1	0					
26			a3		.3	.1	0					
27			a10		.4	.1	0					
28			a8		.6	.1	0					
29			*b5		.5	.1	.1					
30			a5		.3	.1	.1					
31			*b5	-------	.3	-------	0		------	(*)		
Total			36	44.6	44.0	4.7	1.7	0	0	0		
Mean			1.16	1.49	1.42	0.16	0.05	0	0	0		
Ac-ft			71	88	87	9.3	3.4	0	0	0		

Calendar year : Max Min Mean Ac-ft
The season : Max - Min - Mean - Ac-ft 259

* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
a No gage-height record; discharge interpolated.
b Stage-discharge relation affected by ice.

East Fork Battle Creek near international boundary

(International gaging station)

Location.--Lat 48°58', long 109°08', in NW¼ sec. 17, T. 37 N., R. 20 E., on right bank 2 miles south of international boundary, 5½ miles upstream from Lyons Coulee, and 26 miles north of Chinook, Mont.

Drainage area.--95 sq mi, approximately.

Records available.--March 1927 to October 1956 (seasonal records only most years).

Gage.--Water-stage recorder. Altitude of gage is 2,760 ft (from topographic map). Prior to Sept. 3, 1927, chain or staff gage at site half a mile downstream at different datum. Sept. 3, 1927, to Oct. 18, 1952, water-stage recorder at site 300 ft downstream from former gage at different datum.

Extremes.--Maximum discharge during season, 50 cfs Mar. 27 (gage height, 4.00 ft, backwater from ice); no flow most of period.

1927-56: Maximum discharge, 2,300 cfs July 12, 1955 (gage height, 11.24 ft), from rating curve extended above 230 cfs on basis of slope-area determination made in 1952 at former site converted to present site and datum; no flow most of each year.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor.

Cooperation.--This is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. Records collected and compiled jointly with the Water Resources Branch, Department of Northern Affairs and National Resources, Canada.

Revisions (water years).--WSP 1176: 1939-40. WSP 1389: 1927, 1937(M), 1941(M), 1943-44.

Rating table, Mar. 1 to Oct. 31, 1956, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.3	0	2.8	1.7
2.4	.2	3.0	6.3
2.5	.4	3.2	12.3
2.6	.6	3.4	20.9
2.7	.9		

Discharge, in cubic feet per second, March to October 1956

Day			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	
1			0	9.4	0.1	0					(*)	
2			0	11.3	.2	0						
3			0	a12.7	.1	0						
4			0	*14.2	.1	0						
5			0	15.0	.2	*0						
6			0	9.7	.1	0						
7			0	*6.0	.1	0						
8			*0	3.0	.2	0						
9			0	*1.6	.2	0						
10			0	1.7	.3	0						
11			0	1.9	.2	0				(*)		
12			0	1.9	.2	0		(*)				
13			0	a1.7	.2	0	(*)					
14			0	a1.4	.1	0						
15			0	a1.2	.1	0						
16			0	a.9	.1	0			(*)			
17			0	.7	.1	0						
18			0	**.5	0	0						
19			0	.4	0	0						
20			0	.4	0	0						
21			0	.3	0	*0						
22			0	.3	0	0						
23			0	.2	0	0						
24			0	.2	0	0						
25			1	.2	0	0						
26			*b6	.2	0	0						
27			b18	**.1	0	0						
28			a12	.1	.1	0						
29			*b6	.1	.1	0						
30			b3	.1	0	0						
31			b5	-------	0	-------			------			
Total			51	97.4	2.8	0	0	0	0	0		
Mean			1.65	3.25	0.09	0	0	0	0	0		
Ac-ft			101	193	5.6	0	0	0	0	0		

Calendar year : Max Min Mean Ac-ft
The season : Max - Min - Mean - Ac-ft 300

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* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
a No gage-height record; discharge interpolated.
b Stage-discharge relation affected by ice.

Lyons Coulee at international boundary

(International gaging station)

Location.--Lat 49°00', long 109°14', in NW¼ sec. 1, T. 1, R. 25 W., third meridian, on right bank half a mile north of international boundary, 8 miles south of Arena, Saskatchewan, and 28 miles north of Chinook, Mont. Prior to Nov. 3, 1955, at site 300 ft upstream.

Records available.--March 1927 to October 1956 (seasonal records only most years).

Gage.--Staff gage. Altitude of gage is 2,800 ft (from international boundary map). Prior to Oct. 19, 1935, chain and staff gages at site half a mile south of international boundary at different datum. Oct. 19, 1935, to Oct. 31, 1940, staff gage at site 1¼ miles north of international boundary at different datum. Nov. 1, 1940, to Nov. 2, 1955, staff gage at site 300 ft upstream at same datum.

Extremes.--Maximum discharge observed during season, 19.1 cfs Apr. 4 (gage height, 2.94 ft); no flow most of year.

1927-56: Maximum discharge, 1,220 cfs July 6, 1955 (gage height, 8.38 ft, from floodmark), from rating curve extended above 600 cfs; no flow most of each year.

Remarks.--Records poor. Natural flow of stream affected by small stock-water dams above station.

Cooperation.--This is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. Records collected and compiled jointly with the Water Resources Branch, Department of Northern Affairs and National Resources, Canada.

Revisions (water years).--WSP 1389: 1929(M), 1936, 1937(M), 1939, 1940-41(M), 1946(M).

Rating table, Mar. 1 to Oct. 31, 1956 (gage height, in feet, and discharge, in cubic feet per second)

2.2	0	2.6	3.8
2.3	.2	2.7	6.8
2.4	.7	2.8	11.1
2.5	1.8	3.0	23.1

Discharge, in cubic feet per second, March to October 1956

Day			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		
1			0	3.8	0							
2			0	7.5	0							
3			0	14.3	0							
4			0	17.2	0							
5			0	*10.0	0							
6			0	10.0	0							
7			0	5.5	0							
8			0	3.3	.1							
9			0	*2.6	.1							
10			0	4.6	2.1							
11			0	3.3	1.2					(*)		
12			0	2.1	.4			(*)				
13			0	2.0	.3		(*)					
14			0	1.8	.2							
15			0	1.3	.1							
16			0	1.0	.1							
17			0	.7	0							
18			0	*.6	0							
19			0	.5	0							
20			0	.4	0							
21			0	.2	0	(*)						
22			0	.2	0							
23			0	.2	0							
24			0	.1	0							
25			0	**.1	0							
26			*0	0	0							
27			11	0	0							
28			7	0	0							
29			*3	0	0							
30			2	0	0							
31			12.2	-------	0	-------			------			
Total			35.2	93.3	4.6	0	0	0	0	0		
Mean			1.14	3.11	0.15	0	0	0	0	0		
Ac-ft			70	185	9.1	0	0	0	0	0		

Calendar year : Max Min Mean Ac-ft
The season : Max - Min - Mean - Ac-ft 264

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* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.

Matheson Canal near Chinook, Mont.

Location.--Lat 48°35'40", long 109°08'25", in SE$\frac{1}{4}$NW$\frac{1}{4}$ sec. 29, T. 33 N., R. 20 E., on right bank 75 ft downstream from headworks of canal and 3.9 miles east of Chinook.

Records available.--April 1905 to October 1921, May 1928 to September 1949, October 1950 to October 1956.

Gage.--Water-stage recorder. Prior to Apr. 12, 1930, staff gage at site 65 ft upstream at same datum.

Extremes.--1905-21, 1928-49, 1950-56: Maximum daily discharge, 30 cfs Apr. 1, 1915, caused by washing out of canal headgates; no flow at times each year.

Remarks.--Daily discharge not computed because of indeterminate stage-discharge relationship. Canal diverts water from right bank of Battle Creek for irrigation of lands between Battle Creek and Milk River. Estimated total diversion 340 acre-ft. Discharge measurements, in cubic feet per second, obtained during season are listed below.

May 9	0	July 26	0
24	9.7	Aug. 1	5.7
June 5	4.7	16	0
21	5.0	Sept. 16	0
July 13	.1	Oct. 14	.8
17	0	Nov. 2	2

Peoples Creek near Dodson, Mont.

Location.--Lat 48°21', long 108°21', in N$\frac{1}{2}$ sec. 21, T. 30 N., R. 26 E., on right bank a quarter of a mile upstream from Indian Service diversion, 6$\frac{1}{2}$ miles southwest of Dodson, and 7 miles upstream from mouth. Prior to Aug. 12, 1956, at site 300 ft downstream.

Records available.--April 1918 to July 1919, May to September 1921, June 1951 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 2,310 ft (by barometer). Prior to June 1951, chain gage at site 2 miles downstream at different datum. June 1, 1951, to Aug. 11, 1956, water-stage recorder at site 300 ft downstream at present datum.

Average discharge.--5 years (1951-56), 44.2 cfs (32,000 acre-ft per year).

Extremes.--Maximum daily discharge during year, 100 cfs Mar. 25; no flow at times. 1918-19, 1921, 1951-56: Maximum daily discharge, 3,500 cfs Mar. 30, 1952; maximum gage height, 17.05 ft Mar. 29, 1952 (ice jam), from floodmark in gage house; no flow at times.

Remarks.--Records good except those for periods of ice effect or no gage-height record and those after July 24, which are poor. Diversions for irrigation of about 700 acres above station.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.1	2.1				*0	45	11	3.0	0	0	0
2	.1	2.1				0	35	11	2.6	0	0	0
3	.1	2.1				0	30	11	1.9	.3	0	0
4	.1	2.4				0	40	11	*1.4	36	0	0
5	.1	2.8				0	*35	15	1.0	12	0	0
6	.1	5.0	(*)			0	32	15	.7	5.5	0	0
7	.2	5.5				0	29	14	.6	2.6	0	0
8	1.0	7.5				0	39	*13	.4	1.2	0	0
9	.4	9.0				0	38	12	.2	*.7	*0	0
10	.6	7.8				0	42	11	.2	.4	0	0
11	.9	4		(*)		0	31	11	.1	.2	**4	0
12	.9	2				0	30	9.7	.2	.2	.3	*0
13	1.0	1				0	31	9.0	1.3	.1	.2	0
14	1.2	*.6				0	32	8.2	.6	0	.2	0
15	1.2	.5				0	28	7.5	.2	0	.2	.9
16	3.8	.5				5	26	6.4	.1	0	.1	1.0
17	1.9	.4				15	23	5.8	3.9	3.0	.1	.3
18	1.9	.4				50	20	5.0	9.7	.9	.1	.1
19	2.2	.3				*60	19	4.2	5.2	.4	0	.1
20	*2.6	.3				50	17	4.2	8.8	.2	0	0
21	3.1	.2				45	16	4.8	10	.1	0	0
22	2.2	.2				50	15	3.5	3.8	0	0	0
23	2.1	.2				70	14	3.0	3.0	0	0	0
24	1.7	.1				90	13	2.4	1.9	*0	0	0
25	1.4	.1				100	13	2.4	1.0	0	0	0
26	1.7	.2				*85	12	2.8	.5	0	0	0
27	1.9	.1				75	11	4.0	.3	0	0	0
28	1.9	.1				50	12	5.2	.2	0	0	0
29	1.9	0				30	12	4.8	.1	0	0	0
30	2.1	0			------	40	12	3.8	0	0	.1	0
31	2.4	------			------	50	------	3.3	------	0	0	------
Total	42.8	57.5	0	0	0	865	752	235.0	62.9	63.8	5.3	2.4
Mean	1.38	1.92	0	0	0	27.9	25.1	7.58	2.10	2.06	0.17	0.08
Ac-ft	85	114	0	0	0	1,720	1,490	466	125	127	11	4.8

Calendar year 1955:	Max	1,280	Min	0	Mean	63.8	Ac-ft	46,200
Water year 1955-56:	Max	100	Min	0	Mean	5.70	Ac-ft	4,140

Peak discharge (base, 500 cfs).--No peak above base.

* Discharge measurement or observation of no flow made on this day.

** Field estimate made on this day.

Note.--Stage-discharge relation affected by ice Nov. 11-30. No gage-height record Dec. 1 to Apr. 4, July 25 to Aug. 11; discharge estimated on basis of 5 observations of no flow, 3 discharge measurements, 1 field estimate of flow, and weather records.

Whitewater Creek near international boundary

(International gaging station)

Location.--Lat 48°57', long 107°51', in NW¼ sec. 24, T. 37 N., R. 29 E., on left bank 500 ft downstream from North Fork, 3½ miles south of international boundary, 11 miles north of Loring, Mont., and 14 miles south of Orkney, Saskatchewan.

Records available.--March 1927 to October 1956 (seasonal records only most years).

Gage.--Water-stage recorder and V-notch weir in concrete control. Altitude of gage is 2,500 ft (from international boundary map). Prior to Aug. 31, 1927, staff gage and Aug. 31, 1927, to Oct. 31, 1948, water-stage recorder, at site 300 ft upstream at present datum.

Extremes.--Maximum discharge during season, 2.5 cfs Mar. 24 (gage height, 1.96 ft, backwater from ice); no flow at times.

1927-56: Maximum discharge, 3,500 cfs Apr. 14, 1952 (gage height, 6.15 ft), from rating curve extended above 2,100 cfs on basis of conveyance study; no flow at times during most years.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor.

Cooperation.--This is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. Records collected and compiled jointly with the Water Resources Branch, Department of Northern Affairs and National Resources , Canada.

Revisions (water years).--WSP 1389: 1928, 1931(M), 1936, 1939-41(M), 1943, 1950(M).

Rating table, Mar. 1 to Oct. 31, 1956, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 13-21)

1.0	0	1.6	1.0
1.2	.1	1.8	1.9
1.4	.5		

Discharge, in cubic feet per second, March to October 1956

Day			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		
1			0	a0.8	0.8	0.3	0	0	0.1	*0		
2			0	a.8	.7	.2	0	0	.1	0		
3			0	a1.0	.7	.2	.1	0	0	0		
4			0	a1.0	.6	.2	.1	0	0	0		
5			0	a.9	.9	.1	.1	0	.1	0		
6			0	a.8	1.3	.1	.1	0	.1	0		
7			*0	a.7	1.2	.1	.1	0	*.1	0		
8			0	a.8	1.5	.1	0	0	0	0		
9			0	a.9	1.9	.1	0	0	0	0		
10			0	*b1.0	1.8	.1	0	0	0	0		
11			0	b1.0	1.7	.1	0	0	0	0		
12			0	b1.0	1.4	0	0	0	0	0		
13			0	b.9	1.2	0	0	0	0	0		
14			0	b.8	1.1	0	0	0	0	0		
15			0	b.8	.9	0	0	0	0	0		
16			0	b.7	.8	0	0	0	0	0		
17			0	.6	*.7	0	0	0	0	0		
18			b0	.6	.7	0	0	0	0	0		
19			b.1	.5	.6	0	0	0	0	0		
20			b.3	*.6	.5	*0	0	0	0	0		
21			b.5	.5	.5	.1	0	0	0	0		
22			b.5	.5	.4	.1	0	0	0	0		
23			b.6	.5	.4	.1	0	0	0	0		
24			b2.2	.5	.3	.1	0	0	0	0		
25			b1.4	.5	.3	.1	0	0	0	0		
26			b.9	*.5	.3	.1	0	0	0	0		
27			b.8	.5	.6	.1	0	0	0	0		
28			*b.8	.5	.7	.1	0	0	0	.1		
29			a.9	.7	.6	0	0	0	0	0		
30			*b1.0	.7	.5	0	0	.1	0	0		
31			a.9	-------	.4	-------	*0	.1	------	*.1		
Total			10.9	21.6	26.0	2.4	0.5	0.2	0.5	0.2		
Mean			0.35	0.72	0.84	0.08	0.02	0.01	0.02	0.01		
Ac-ft			22	43	52	4.8	1.0	0.4	1.0	0.4		

Calendar year : Max Min Mean Ac-ft
The season : Max - Min - Mean - Ac-ft 125

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* Discharge measurement or observation of no flow made on this day.

a No gage-height record; discharge interpolated or estimated on basis of 3 weir readings, records for nearby stations, and weather records.

b Stage-discharge relation affected by ice.

Belanger Creek diversion canal near Vidora, Saskatchewan

(International gaging station)

Location.--Lat 49°30', long 109°22', in SW¼ sec. 30, T. 6, R. 25 W., third meridian, on left bank 1,000 ft downstream from diversion weir and 12 miles north of Vidora.

Records available.--March 1947 to October 1956 in reports of Geological Survey. March 1946 to October 1956 (published as "diversion to Cypress Lake") in reports of Department of Northern Affairs and National Resources, Canada. Irrigation seasons only.

Gage.--Water-stage recorder.

Extremes.--1946-56: Maximum daily discharge, 555 cfs Apr. 29, 1951; no flow at times in each year.

Remarks.--Records fair. Canal diverts water from right bank of Belanger Creek for storage in Cypress Lake Reservoir.

Cooperation.--This is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. The records have been collected and compiled jointly with the Water Resources Branch, Department of Northern Affairs and National Resources, Canada.

Discharge, in cubic feet per second, March to October 1956

Day			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Ncv.	
1			0	*0	14.5	1.4					(*)	
2			0	0	14.5	**2.3						
3			*0	0	13.7	5.0						
4			0	*0	13.4	5.3				(*)		
5			0	0	15.6	7.0						
6			0	0	17.8	6.2						
7			0	2	17.8	5.9						
8			0	7	25.2	1.3						
9			0	**13	56	1.3						
10			0	*39	41.1	1.4						
11			0	*13.4	42.9	*1.5						
12			0	7.1	32.1	0.8	(*)					
13			0	15.6	28.0	0						
14			0	*10.4	*26.8	0		(*)				
15			0	0	24.1	0						
16			0	39.0	23.3	0						
17			0	*62	22.9	0						
18			0	45.5	19.8	0						
19			0	*39.7	18.4	0						
20			0	41.1	17.5	0						
21			0	42.9	17.2	0						
22			0	28.8	15.6	0		(*)				
23			0	*23.3	*15.0	0						
24			0	21.1	15.6	0						
25			1	18.1	20.1	*0						
26			*7	16.8	18.7	0						
27			**3	15.0	16.5	0						
28			1	15.0	8.4	0						
29			*0	14.8	3.4	0						
30			*0	*14.5	2.2	0						
31			0	-------	1.8	-------			------			
Total			12	545.1	619.9	39.4	0	0	0	0		
Mean			0.39	18.2	20.0	1.31	0	0	0	0		
Ac-ft			24	1,080	1,230	78	0	0	0	0		

Calendar year : Max Min Mean Ac-ft
The season : Max - Min - Mean - Ac-ft 2,410

* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
Note.--Stage-discharge relation affected by ice Mar. 24 to Apr. 10 (no gage-height record Mar. 27 to Apr. 6; discharge estimated on the basis of 1 field estimate, 4 observations of no flow, and weather records).

Cypress Lake east outflow canal near Vidora, Saskatchewan

(International gaging station)

Location.--Lat 49°29', long 109°21', in sec. 19, T. 6, R. 25 W., third meridian, on right bank 500 ft upstream from Belanger Creek and 11 miles north of Vidora.

Records available.--May 1947 to October 1956 in reports of Geological Survey. July 1940 to October 1956 in reports of Department of Northern Affairs and National Resources, Canada. Irrigation seasons only.

Gage.--Water-stage recorder.

Extremes.--1940-56: Maximum daily discharge, 202 cfs Apr. 19, 1952; no flow at times each year.

Remarks.--Records fair except those for periods of no gage-height record, which are poor. Canal diverts water from Cypress Lake for irrigation of lands in Frenchman River basin in Saskatchewan.

Cooperation.--This is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. The records have been collected and compiled jointly with the Water Resources Branch, Department of Northern Affairs and National Resources, Canada.

Discharge, in cubic feet per second, March to October 1956

Day			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	
1			3	**1	3.3	35.4	3.2	1.1	1.2	1.7	†3.6	
2			3	1	3.6	*132	*2.9	**1.2	1.2	1.6		
3			**3	1	4.0	142	3.6	1.1	1.4	1.6		
4			3	1	3.5	55	5.1	1.0	*1.7	*1.6		
5			3	1	3.5	11.0	4.1	.9	1.6	1.6		
6			3	2	4.1	5.8	3.3	.9	1.5	1.6		
7			3	2	4.4	5.8	2.8	.9	1.5	1.6		
8			3	2	5.3	15.3	2.6	.9	1.4	1.7		
9			2	**2	10.3	7.4	2.5	.9	1.2	2.0		
10			2	2	4.3	5.4	2.2	1.0	1.4	2.0		
11			2	2	3.3	*6.1	2.0	1.1	1.3	2.0		
12			2	2	3.0	19.9	*2.0	1.1	1.4	2.1		
13			2	38	2.9	32.5	1.7	1.1	1.4	2.2		
14			**2	*76	*2.8	47.2	1.7	**1.0	**1.5	2.2		
15			2	*82	2.9	165	1.6	.9	1.5	2.2		
16			2	86	2.8	122	1.6	.8	1.4	2.2		
17			2	*79	2.7	34.7	1.6	.8	1.4	2.4		
18			2	68	2.6	3.5	1.5	.9	1.4	2.4		
19			2	*55	2.6	2.6	1.2	.8	1.4	2.7		
20			*2	19.6	2.7	2.4	1.1	.7	1.5	2.8		
21			2	6.7	2.8	2.7	.9	.6	1.7	2.8		
22			2	3.1	2.6	2.9	.8	**.5	1.8	3.0		
23			2	*2.2	*2.8	2.9	**.7	.5	1.7	3.2		
24			**2	2.2	2.9	2.9	.7	.6	*1.6	*2.9		
25			2	2.5	3.9	*2.8	.7	.6	1.6	2.9		
26			**1	2.6	3.9	3.2	.7	1.1	1.6	3.1		
27			**1	2.4	3.8	3.0	.7	1.8	1.7	3.5		
28			1	2.3	5.0	2.7	.7	1.1	1.9	3.4		
29			**1	2.6	16.4	3.0	.8	1.1	2.0	3		
30			**1	*2.8	20.3	3.1	1.0	1.3	1.8	3		
31			1	------	25.1	------	1.0	1.3	------	4		
Total			64	552.0	164.1	880.2	57.0	29.6	45.7	75.0		
Mean			2.06	18.4	5.29	29.3	1.84	0.95	1.52	2.42		
Ac-ft			127	1,090	325	1,750	113	59	91	149		

Calendar year : Max Min Mean Ac-ft
The season : Max - Min - Mean - Ac-ft 3,700

* Discharge measurement made on this day.
† Result of discharge measurement.
** Field estimate made on this day.
Note.--No gage-height record Mar. 1 to Apr. 13, Oct. 29; discharge estimated on basis of 1 discharge measurement, 9 field estimates, and weather records.

Frenchman River above East End Reservoir, near Ravenscrag, Saskatchewan

(International gaging station)

Location.--Lat 49°29', long 109°00', in NW¼ sec. 23, T. 6, R. 23 W., third meridian, on right bank 2 miles downstream from North Fork, 4 miles east of Ravenscrag, and 8 miles west of East End, Saskatchewan.

Drainage area.--598 sq mi.

Records available.--July 1912 to October 1917 and March 1947 to October 1956 in reports of Geological Survey. July 1912 to October 1917 and March 1937 to October 1956 in reports of Department of Northern Affairs and National Resources, Canada. Published as "at Phillips Ranch" 1912-17. Seasonal records only.

Gage.--Water-stage recorder. Altitude of gage is 3,040 ft (from topographic map). Prior to Nov. 1, 1917, staff gage at site about half a mile downstream at different datum. Mar. 1, 1937, to Aug. 11, 1938, staff or chain gages at several sites within 5 miles of present site at various datums.

Extremes.--Maximum discharge during season, 1,260 cfs Apr. 15 (gage height, 4.43 ft); minimum, 11.7 cfs Sept. 20.

1912-17, 1937-56: Maximum discharge, 12,600 cfs Apr. 16, 1952 (gage height, 12.25 ft, from floodmark), from rating curve extended above 3,200 cfs on basis of slope-area determination of peak flow; minimum recorded, 0.3 cfs (revised) Aug. 27, 1937.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Natural flow of stream affected by diversion in Belanger Creek diversion canal near Vidora, Saskatchewan (see p. 105), return in Cypress Lake east outflow canal near Vidora, Saskatchewan (see preceding page), diversions for irrigation at many other points along the stream, and return flow from irrigated areas. Water may be diverted into or from Battle Creek basin through Cypress Lake.

Cooperation.--This is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. Records collected and compiled jointly with the Water Resources Branch, Department of Northern Affairs and National Resources, Canada.

Rating table, Mar. 1 to Oct. 31, 1956, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.2	13.2	2.5	255
1.3	19.3	3.0	455
1.5	38.5	4.0	995
1.7	66	5.0	1,660
2.0	119		

Discharge, in cubic feet per second, March to October 1956

Day			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		
1			23	41	62	58	38.5	30.9	*17.9	16.5		
2			23	42	62	68	37.4	29.9	17.2	15.9		
3			23	44	58	130	39.7	33.0	15.3	14.7		
4			23	*45	*60	174	43.3	29.9	15.3	14.7		
5			23	34	68	94	47.2	26.0	15.9	13.7		
6			23	23	81	51	*44.6	21.6	16.5	13.2		
7			23	22	88	36.3	38.5	19.3	15.9	13.2		
8			23	29	103	35.2	34.1	17.9	15.9	13.7		
9			*23	*74	171	38.5	31.9	*17.9	15.3	*13.7		
10			23	123	219	38.5	29.9	17.9	14.2	14.2		
11			22	220	225	29.9	28.9	20.8	13.7	14.7		
12			22	**300	177	26.9	27.9	23.3	13.2	14.7		
13			21	*639	145	*31.9	26.9	24.2	12.7	16.5		
14			21	1,020	134	47.2	27.9	20.8	13.2	17.2		
15			*20	*1,140	119	62	26.9	17.9	13.2	17.9		
16			20	810	114	122	27.9	16.5	13.2	17.9		
17			21	*563	108	136	29.9	15.9	13.2	17.2		
18			21	363	104	74	29.9	16.5	12.7	17.9		
19			21	300	94	38.5	27.9	17.9	12.2	18.6		
20			22	*266	83	30.9	26.0	19.3	12.2	19.3		
21			*22	242	73	39.7	23.3	17.2	12.7	21.6		
22			24	185	63	36.2	21.6	15.9	13.2	20.8		
23			27	*136	*54	45.9	*19.3	14.2	15.3	22.4		
24			30	116	53	48.5	18.6	13.2	*15.9	21.6		
25			32	104	58	49.8	17.2	13.2	15.9	21.6		
26			*34	94	74	45.9	16.5	14.2	14.7	20.8		
27			35	83	73	42.1	16.5	14.2	13.7	21.6		
28			36	71	69	40.9	17.2	17.2	14.7	22		
29			38	*65	62	39.7	19.3	21.6	14.7	20		
30			39	63	54	37.4	26.0	20.0	16.5	24		
31			40	-------	57	-------	30.9	17.9	------	21		
Total			798	7,257	2,965	1,749.0	891.6	616.2	436.2	552.8		
Mean			25.7	242	95.6	58.3	28.8	19.9	14.5	17.8		
Ac-ft			1,580	14,390	5,880	3,470	1,770	1,220	865	1,100		

Calendar year : Max Min Mean Ac-ft
The season : Max - Min - Mean - Ac-ft 30,280

* Discharge measurement made on this day.
** Field estimate made on this day.

Note.--Stage-discharge relation affected by ice Mar. 1 to Apr. 13, Oct. 28-31 (no gage-height record Mar. 1 to Apr. 3, Apr. 5; discharge estimated on basis of 5 discharge measurements, engineers notes, and weather records).

East End Canal at East End, Saskatchewan

(International gaging station)

Location.--Lat 49°30', long 108°51', in NW¼ sec. 25, T. 6, R. 22 W., third meridian, on left bank 100 ft downstream from headgates and 2 miles west of East End.

Records available.--March 1947 to October 1956 in reports of Geological Survey. April 1937 to October 1956 in reports of Department of Northern Affairs and National Resources, Canada. Published as "Eastend Irrigation District main canal" April to September 1937. Seasonal records only.

Gage.--Water-stage recorder. Prior to Sept. 19, 1949, at site a quarter of a mile downstream at different datum.

Extremes.--1937-56: Maximum daily discharge, 62 cfs May 11, 12, 1949; no flow at times in each year.

Remarks.--Records fair. Canal diverts water from East End Reservoir on right bank for irrigation in Frenchman River basin in Saskatchewan.

Cooperation.--This is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. The records have been collected and compiled jointly with the Water Resources Branch, Department of Northern Affairs and National Resources, Canada.

Discharge, in cubic feet per second, March to October 1956

Day			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	
1					0	41.3	11.2	15.5	*0		(*)	
2					0	42.2	3.0	15.9	0			
3					0	42.6	*0	*15.5	0			
4					0	*42.6	0	18.0	0	(*)		
5					0	40.1	0	19.9	1.1			
6					0	40.9	0	19.5	16.8			
7					0	39.7	0	19.2	7.7			
8					0	35.9	0	19.9	0			
9					0	34.3	0	21.4	0			
10					0	35.5	0	21.8	0			
11					0	39.7	0	21.8	0			
12					*0	44.7	0	21.8	2.6			
13					0	*46.4	0	23.0	7.9			
14					0	46.4	0	*24.2	*9.3			
15					0	47.7	0	24.2	10.6			
16					0	48.1	3.6	23.8	10.6			
17					0	46.8	6.4	21.1	10.3			
18				(*)	0	45.5	6.7	20.3	10.3			
19					0	45.5	*11.5	19.9	9.2			
20					0	43.9	17.7	18.8	0			
21					5.5	21.4	19.9	17.7	0			
22					10.0	21.4	19.5	*17.7	0			
23					*17.8	20.7	*20.7	17.3	0			
24					25.8	19.5	23.8	16.2	*0			
25					26.2	*19.5	27.0	16.2	0			
26					30.2	19.5	31.4	12.2	0			
27					31.8	19.2	31.8	0	0			
28					31.4	19.2	29.8	0	0			
29					29.0	19.5	28.2	0	0			
30					29.8	16.2	23.0	0	0			
31				-------	32.2	-------	15.2	0	------			
Total			0	0	269.7	1,045.9	330.4	502.8	96.4	0		
Mean			0	0	8.70	34.9	10.7	16.2	3.21	0		
Ac-ft			0	0	535	2,070	655	997	191	0		

Calendar year : Max Min Mean Ac-ft

The season : Max - Min - Mean - Ac-ft 4,450

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* Discharge measurement or observation of no flow made on this day.

Frenchman River below East End Reservoir, near East End, Saskatchewan

(International gaging station)

Location.--Lat 49°31', long 108°50', in SE¼ sec. 36, T. 6, R. 22 W., third meridian, on left bank three-quarters of a mile west of East End, 1 mile downstream from East End Reservoir, and 100 miles upstream from international boundary.

Drainage area.--648 sq mi.

Records available.--April 1909 to October 1916, March 1947 to October 1956 in reports of Geological Survey. April 1909 to October 1916, April 1918 to May 1931, September 1935 to July 1936, and April 1939 to October 1956 in reports of Department of Northern Affairs and National Resources, Canada. Seasonal records only. Published as "at East End" 1909-16 in reports of Geological Survey and published as "near East End" 1909-10, as "at Engright and Strong's Ranch" 1911, as "at Strong and Day's Ranch" 1912-13, and as "at East End" 1914-16, 1918-36 in reports of Department of Northern Affairs and National Resources, Canada; records prior to April 1939 not equivalent owing to diversion in East End Canal since 1937.

Gage.--Water-stage recorder. Altitude of gage is 2,960 ft (from topographic map). Prior to July 1941, staff or chain gages at several sites within 1½ miles of present site at various datums.

Extremes.--Maximum discharge during season, 1,200 cfs Apr. 15 (gage height, 8.14 ft); minimum, 3.2 cfs Aug. 20 (gage height, 1.00 ft).

1939-56: Maximum discharge, 11,500 cfs Apr. 16, 1952 (gage height, 19.10 ft, from floodmark in gage house); no flow Aug. 14, 1943.

Remarks.--Records good except those for period of no gage-height record, which are fair. Natural flow of stream affected by storage reservoirs, diversions for irrigation and return flow from irrigated areas. Water may be diverted into or from Battle Creek basin through Cypress Lake.

Cooperation.--This is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. The records have been collected and compiled jointly with the Water Resources Branch, Department of Northern Affairs and National Resources, Canada.

Rating table, Mar. 1 to Oct. 31, 1956, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.0	2.9	1.7	80
1.1	6.9	2.0	139
1.2	12.8	3.0	291
1.3	20.9	5.0	594
1.5	44.6	8.0	1,170

Discharge, in cubic feet per second, March to October 1956

Day		Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	
1			18	39	67	20.9	35.0	8.4	*25.9	21.8	†14.2	
2			18	38	56	20.0	35.0	3.8	24.8	21.8		
3			17	26	51	20.9	35.0	*4.1	21.8	19.1		
4			17	*49	*54	56	40.3	3.8	21.8	19.1		
5			17	61	58	105	43.1	3.8	20.0	20.9		
6			16	59	69	82	*43.1	6.4	13.5	17.4		
7			16	54	69	32.6	44.6	4.9	12.8	17.4		
8			16	54	84	16.6	41.7	4.9	13.5	17.4		
9			17	*70	109	14.2	40.3	4.9	13.5	18.2		
10			*17	145	176	12.8	40.3	4.9	13.5	18.2		
11			17	*220	213	11.4	38.9	5.4	13.5	19.1		
12			17	*358	217	9.0	37.6	5.4	13.5	20.0		
13			17	608	174	*9.0	27.0	4.1	14.2	20.0		
14			18	*866	117	7.4	24.8	4.1	13.5	21.8		
15			*18	1,130	115	7.4	22.8	4.1	13.5	*20.0		
16			19	*834	103	7.4	24.8	3.8	13.5	20.0		
17			20	504	99	10.8	24.8	3.8	13.5	18.2		
18			*36	*149	87	20.9	24.8	3.8	13.5	19.1		
19			36	232	84	28.1	*25.9	3.8	13.5	20.9		
20			12	216	76	14.2	25.9	3.5	18.2	20.9		
21			*36	201	61	29.2	24.8	3.5	28.1	21.8		
22			57	190	36.3	36.3	22.8	3.5	24.8	20.9		
23			30	104	*17.4	20.0	21.8	3.5	25.9	21.8		
24			*38	56	18.2	14.2	20.9	3.8	*27.0	22.8		
25			42	53	20.9	17.4	13.5	4.9	27.0	21.8		
26			*39	*53	24.8	18.2	12.8	4.5	28.1	20.0		
27			32	56	46.1	21.8	12.1	26.2	28.1	22.8		
28			59	82	40.3	25.9	11.4	35.0	51	22.8		
29		†17.8	33	72	33.8	27.0	12.1	32.6	65	19.1		
30		-------	*46	70	32.6	30.3	11.4	27.0	23.8	16.6		
31		-------	*44	-------	28.1	-------	10.8	25.9	------	20.9	-------	
Total			835	6,649	2,437.5	746.9	850.1	262.1	650.3	622.6		
Mean			26.9	222	78.6	24.9	27.4	8.45	21.7	20.1		
Ac-ft			1,660	13,190	4,830	1,480	1,690	520	1,290	1,230		

Calendar year : Max Min Mean Ac-ft
The season : Max - Min - Mean - Ac-ft 25,890

* Discharge measurement made on this day.
† Result of discharge measurement.
Note.--Stage-discharge relation affected by ice Mar. 1 to Apr. 11 (no gage-height record Mar. 1-16; discharge estimated on basis of 3 discharge measurements and weather records).

Val Marie west gravity canal near Val Marie, Saskatchewan

(International gaging station)

Location.--Lat 49°22', long 107°53', in SW¼ sec. 7, T. 5, R. 14 W., third meridian, on right bank at outlet of Val Marie West Reservoir, 11 miles northwest of Val Marie.

Records available.--March 1947 to October 1956 in reports of Geological Survey. March 1946 to October 1956 in reports of Department of Northern Affairs and National Resources, Canada. Seasonal records only.

Gage.--Water-stage recorder. Prior to Sept. 27, 1949, at site half a mile downstream at different datum.

Extremes.--1946-56: Maximum daily discharge, 28.9 cfs June 21, 1952; no flow at times each year.

Remarks.--Records poor. Canal diverts water from Val Marie West Reservoir on left bank for irrigation in the Frenchman River basin in Saskatchewan.

Cooperation.--This is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. The records have been collected and compiled jointly with the Water Resources Branch, Department of Northern Affairs and National Resources, Canada.

Discharge, in cubic feet per second, March to October 1956

Day			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		
1					0	26.0	6.7	17.9	7.8	1.8		
2					0	25.3	7.5	21.5	8.6	0		
3					0	15.5	8.5	22.0	8.8	0		
4					0	14.2	4.1	22.7	8.9	0		
5					0	8.9	0	22.0	9.0	0		
6					0	9.6	0	19.6	9.0	0		
7					0	*12.5	*3.7	*16.5	*5.2	0		
8					0	17.6	5.2	13.3	0	*0		
9					0	18.4	5.6	11.2	0	0		
10					0	7.6	6.5	11.0	0	0		
11					0	23.3	8.9	11.3	14.7	0		
12					0	21.7	8.0	11.0	17.5	0		
13					0	15.9	3.3	10.0	16.9	0		
14					0	12.1	10.4	10.2	16.5	0		
15					0	17.3	10.0	9.8	11.6	0		
16					0	16.1	10.6	9.8	7.8	0		
17					*0	16.5	10.4	*9.8	*7.5	0		
18					0	*9.5	10.4	8.9	7.5	0		
19					8.5	11.0	10.4	8.9	7.5	0		
20					17.5	13.7	*10.4	7.4	7.4	0		
21					21.0	13.3	10.6	6.5	5.3	0		
22					17.3	10.7	10.7	9.2	0	0		
23					14.2	4.2	10.7	14.8	0	0		
24					14.6	2.9	10.6	14.4	0	0		
25					14.9	6.8	10.4	14.8	8.7	0		
26					12.4	8.5	10.4	14.6	5.5	0		
27				(*)	11.2	*8.6	10.2	13.3	*5.9	0		
28					*10.4	8.9	*10.8	13.0	5.6	0		
29					17.0	8.6	11.9	*12.4	5.5	0		
30					21.5	7.5	11.2	10.0	5.5	0		
31				-------	23.3	-------	12.2	7.5	------	*0		
Total			0	0	204.2	392.7	260.3	405.3	214.2	1.8		
Mean			0	0	6.59	13.1	8.40	13.1	7.14	0.06		
Ac-ft			0	0	405	779	516	804	425	3.6		

Calendar year : Max Min Mean Ac-ft
The season : Max - Min - Mean - Ac-ft 2,930

* Discharge measurement or observation of no flow made on this day.

Val Marie Canal near Val Marie, Saskatchewan

(International gaging station)

Location.--Lat 49°18', long 107°47', in NE¼ sec. 13, T. 4, R. 14 W., third meridian, on left bank 2 miles downstream from Val Marie Reservoir and 4½ miles northwest of Val Marie.

Records available.--April 1947 to October 1956 in reports of Geological Survey. April 1937 to October 1956 in reports of Department of Northern Affairs and National Resources, Canada. Published in Canadian reports as "Val Marie Irrigation District Canal" April to July 1937, as "Val Marie Main Canal" April 1946 to October 1956. Seasonal records only.

Gage.--Water-stage recorder.

Extremes.--1937-56: Maximum daily discharge, 90 cfs June 2, 3, 1951; no flow at times each year.

Remarks.--Records good. Canal diverts water from Val Marie Reservoir on left bank for irrigation in the Frenchman River basin in Saskatchewan. Approximately 280 acre-ft were diverted from canal during the season for use above station.

Cooperation.--This is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. The records have been collected and compiled jointly with the Water Resources Branch, Department of Northern Affairs and National Resources, Canada.

Discharge, in cubic feet per second, March to October 1956

Day			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		
1					0	51	6.5	32.9	1.3	3.4		
2					0	52	6.5	37.6	.6	3.4		
3					0	52	4.3	41.5	.2	2.8		
4					0	55	1.3	41.5	.2	2.9		
5					0	54	1.1	38.8	.1	2.9		
6					0	47.8	.6	38.0	.1	2.3		
7					0	*47.8	**.1	*37.6	*0	2.1		
8					.1	51	.1	34.8	0	*2.1		
9					0	56	.1	29.4	0	2.1		
10					0	59	.1	24.6	0	2.3		
11					0	59	.3	13.4	0	2.6		
12					0	58	9.9	10.1	0	2.5		
13					0	58	16.6	11.4	0	3.6		
14					0	58	25.3	10.8	1.7	4.8		
15					0	57	30.9	11.6	1.4	4.8		
16					0	56	31.3	11.6	1.4	4.7		
17					*.1	53	31.3	12.9	*1.4	*4.3		
18					2.6	*46.6	31.7	11.8	1.6	1.4		
19					2.8	46.2	31.3	11.6	1.6	.3		
20					4.7	46.2	*31.7	*11.6	1.6	.2		
21					*7.8	39.1	31.3	11.6	.7	.2		
22					15.5	26.0	33.7	11.6	.3	.2		
23					23.9	19.5	35.2	11.8	.2	.2		
24					27.9	19.5	36.4	11.8	2.3	.2		
25					30.6	19.5	41.1	6.5	7.6	3.0		
26				(*)	36.8	19.2	43.8	2.3	7.4	5.9		
27					45.4	*11.4	41.9	2.2	*5.0	*2.3		
28					*52	6.5	*37.2	2.2	3.6	.2		
29					43.4	6.5	34.5	*2.2	3.4	.2		
30			(*)		45.4	6.5	33.7	2.1	3.3	.1		
31				-------	49.8	-------	31.7	2.0	------	*0		
Total			0	0	388.8	1,237.3	661.5	539.8	47.0	68.0		
Mean			0	0	12.5	41.2	21.3	17.4	1.57	2.19		
Ac-ft			0	0	771	2,450	1,310	1,070	93	135		

Calendar year	: Max	Min	Mean	Ac-ft
The season	: Max -	Min -	Mean -	Ac-ft 5,830

* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.

Frenchman River at international boundary

(International gaging station)

Location.--Lat 49°00'00", long 107°18'10", in SE¼ sec. 5, T. 1 R. 10 W., third meridian, on left bank 50 ft upstream from international boundary and 22 miles northeast of Whitewater, Mont.

Drainage area.--2,020 sq mi, approximately.

Records available.--April 1917 to October 1956 (seasonal records only most years).

Gage.--Water-stage recorder and concrete control. Altitude of gage is 2,420 ft (from topographic map). Prior to June 23, 1937, at site about half a mile upstream at different datum and June 23, 1937, to October 1952, at site 100 ft downstream at present datum.

Extremes.--Maximum discharge during season, 788 cfs Apr. 23 (gage height, 7.08 ft), minimum daily, 1.2 cfs Oct. 23.

1917-56: Maximum discharge, 22,700 cfs Apr. 15, 1952 (gage height, 19.90 ft, from floodmark), from rating curve extended above 2,300 cfs on basis of slope-area determination of peak flow; no flow at times during most years.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Natural flow of stream affected by storage reservoirs, diversions for irrigation, and return flow from irrigated areas. Water may be diverted into or from Battle Creek basin through Cypress Lake.

Cooperation.--This is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. The records have been collected and compiled jointly with the Water Resources Branch, Department of Northern Affairs and National Resources, Canada.

Revisions (water years).--WSP 1389: 1938(M), 1939-41, 1942(M), 1943, 1950(M).

Rating table, Mar. 1 to Oct. 31, 1956, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

3.1	0.6	4.0	64
3.2	2.3	4.5	151
3.3	5.0	5.0	273
3.4	8.8	6.0	531
3.5	14.2	7.0	770
3.7	29.5		

Discharge, in cubic feet per second, March to October 1956

Day			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		
1			10	210	92	30.4	48.8	44.0	6.7	17.6		
2			10	240	94	30.4	32.3	36.3	5.3	10.7		
3			10	190	92	30.4	23.5	36.3	5.3	7.1		
4			10	135	91	29.5	21.1	36.3	5.3	5.7		
5			10	235	92	25.9	20.4	31.3	4.7	7.1		
6			10	*250	91	24.3	19.7	28.6	3.8	8.8		
7			*10	220	69	27.7	18.3	30.4	3.3	8.8		
8			10	190	70	26.8	15.5	25.9	2.3	7.9		
9			10	155	94	22.7	13.6	25.9	2.3	9.7		
10			10	*105	114	24.3	*11.2	*29.5	*1.9	*8.4		
11			10	137	*104	25.1	10.7	24.3	1.7	8.4		
12			11	179	97	29.5	11.2	19.0	1.9	7.5		
13			11	184	94	33.3	10.7	19.0	2.1	6.7		
14			*12	164	112	32.3	10.7	16.9	1.9	6.3		
15			13	220	166	37.4	10.2	13.0	1.7	4.1		
16			16	218	166	29.5	10.7	10.2	1.6	3.3		
17			19	220	166	34.3	12.4	8.4	2.6	2.6		
18			19	250	164	58	25.9	7.5	22.7	1.9		
19			120	411	164	59	24.3	7.1	22.7	1.6		
20			120	*514	166	*59	*26.8	*7.1	*21.1	*1.6		
21			95	614	*166	72	34.3	6.7	21.1	1.4		
22			*65	742	114	204	41.8	6.7	20.4	1.4		
23			65	732	40.7	270	41.8	8.4	21.1	1.2		
24			135	387	32.3	213	34.3	7.1	22.7	3.8		
25			145	205	34.3	102	34.3	6.4	21.9	5.7		
26			325	*112	37.4	75	31.3	7.1	21.9	5.7		
27			515	102	35.3	66	28.6	8.8	21.9	6.0		
28			*460	99	33.3	60	36.3	9.3	22.7	6.7		
29			280	97	32.3	83	40.7	9.7	24.3	7.1		
30			*175	*94	39.6	66	40.7	10.7	23.5	7.9		
31			185	-------	*32.3	-------	39.6	8.8	------	*10.7		
Total			2,896	7,611	2,895.5	1,880.8	781.7	546.7	342.4	193.4		
Mean			93.4	254	93.4	62.7	25.2	17.6	11.4	6.24		
Ac-ft			5,740	15,100	5,740	3,730	1,550	1,080	679	384		

Calendar year : Max Min Mean Ac-ft
The season : Max - Min - Mean - Ac-ft 34,000

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Mar. 1 to Apr. 9 (no gage-height record Mar. 1-13, 16, 21, 29, Apr. 7, 8; discharge estimated on basis of 6 discharge measurements and weather records).

Frenchman Canal near Saco, Mont.

Location.--Lat 48°36', long 107°15', near southwest corner of NW¼ sec. 26, T. 33 N., R. 34 E., on left bank two-thirds of a mile downstream from point of diversion and 10¼ miles northeast of Saco.

Records available.--May 1928 to October 1956. Seasonal records only most years.

Gage.--Water-stage recorder. Prior to Mar. 1, 1953, at site about 800 ft downstream at different datum.

Extremes.--1928-56: Maximum daily discharge, 132 cfs Apr. 11, 1954; no flow at times each year.

Remarks.--Records good except those for periods of no gage-height record and those after June 4, which are poor. Canal diverts water from left bank of Frenchman River for irrigation in the Frenchman Valley.

Discharge, in cubic feet per second, March to October 1956

Day			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		
1				0	*4.6	30	19	*26	5.9	0.9		
2				0	4.7	31	19	25	0	1.2		
3				0	4.6	30	14	25	0	.4		
4				0	4.6	*32	13	23	0	0		
5				0	5.0	33	13	23	0	0		
6				0	5.0	34	7.7	22	0	0		
7				0	5.0	34	1.8	24	0	*0		
8				0	4.8	36	.7	23	0	0		
9				*3.9	3.6	27	*1.9	*23	0	0		
10				8.2	2.4	22	7.6	22	0	0		
11				8.5	2.7	20	4.2	22	0	0		
12				8.5	3.3	17	2.8	22	*0	0		
13				8.5	3.5	14	2.3	22	0	0		
14				8.6	3.1	15	.9	21	0	.2		
15				8.6	3.1	15	.3	18	0	1.1		
16				8.6	3.8	16	1.4	18	0	1.1		
17				8.7	5.7	16	1.5	9.9	.1	1.0		
18				8.9	12	17	c17	3.5	.3	.7		
19				8.9	16	17	c19	3.5	.2	0		
20				8.6	16	c19	c18	3.5	.1	0		
21				6.7	16	19	c18	3.4	.1	0		
22				a7.4	16	20	17	3.1	.1	0		
23				8.2	15	22	c19	2.3	0	0		
24				12	13	28	c21	1.1	0	0		
25					16	29	26	.6	0	.1		
26			(*)		26	26	26	0	1.1	1.2		
27				a8.5	28	24	26	0	4.2	1.4		
28					30	22	26	0	5.4	1.3		
29					24	21	26	4.5	5.9	1.5		
30					23	22	26	9.1	3.7	1.5		
31				-------	30	-------	26	9.0	------	1.4		
Total			0	183.8	350.5	708	422.1	412.5	27.1	15.0		
Mean			0	6.13	11.3	23.6	13.6	13.3	0.90	0.48		
Ac-ft			0	365	695	1,400	837	818	54	30		

Calendar year : Max Min Mean Ac-ft
The season : Max - Min - Mean - Ac-ft 4,200

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* Discharge measurement or observation of no flow made on this day.
a No gage-height record; discharge interpolated.
c Stage-discharge relation affected by pumping for irrigation; discharge estimated on basis of records for previous years.

Reservoirs in Frenchman River basin in Saskatchewan

(International gaging stations)

Cypress Lake water diverted from Belanger Creek and Battle Creek at points 12 miles northwest of Consul and 12 miles northeast of Vidora, completed in 1938 for irrigation, has usable capacity of 79,750 acre-ft. Records partly furnished by Prairie Farms Rehabilitation Administration, Canada.

East End Reservoir on Frenchman River, 2 miles west of East End, completed in 1939 for irrigation, has usable capacity of 1,460 acre-ft. Records partly furnished by Prairie Farms Rehabilitation Administration, Canada.

Val Marie West Reservoir on Frenchman River, 12 miles northwest of Val Marie, completed in 1939 for irrigation, has usable capacity of 2,130 acre-ft. Records partly furnished by Prairie Farms Rehabilitation Administration, Canada.

Val Marie Reservoir on Frenchman River, 5½ miles northwest of Val Marie, completed in 1938 for irrigation, has usable capacity of 8,430 acre-ft. Records partly furnished by Prairie Farms Rehabilitation Administration, Canada.

These are international stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. The records have been collected and compiled jointly with the Water Resources Branch, Department of Northern Affairs and National Resources, Canada.

Month-end contents, in acre-feet, October 1955 to October 1956

Date	Cypress Lake	East End Reservoir	Val Marie West Reservoir	Val Marie Reservoir
Oct. 31, 1955	103,700	516	1,120	9,390
Nov. 30	-	-	-	-
Dec. 31	-	-	-	-
Jan. 31, 1956	-	-	-	-
Feb. 29	103,700	536	855	3,280
Mar. 31	104,100	528	956	5,720
Apr. 30	108,900	1,950	1,560	9,800
May 31	111,900	2,100	2,130	9,560
June 30	106,300	2,060	2,180	6,940
July 31	103,100	1,440	1,870	5,830
Aug. 31	99,680	1,090	1,090	4,480
Sept. 30	97,670	520	1,550	3,810
Oct. 31	96,060	506	889	4,820

Note.--Contents for Cypress Lake computed from graph based on gage readings made several times weekly prior to May 14, from water-stage recorder thereafter. Contents for other reservoirs computed from daily gage readings or graphs based on gage readings made several times weekly.

Rock Creek at international boundary

(International gaging station)

Location.--Lat 48°59'20", long 106°47'30", in SE¼ sec. 1, T. 37 N., R. 37 E., on right bank three-quarters of a mile south of international boundary, 2 miles upstream from Horse Creek, and 9 miles northeast of Thoeny, Mont.

Drainage area.--242 sq mi.

Records available.--May 1914 to October 1915, March 1927 to October 1956. Seasonal records only most years. March 1916 to October 1917 in reports of Geological Survey and March 1916 to October 1926 in reports of Department of Northern Affairs and National Resources, Canada, at site 3 miles downstream; records not equivalent owing to inflow from Horse Creek. Published as "near Barnard, Mont.", 1914-26.

Gage.--Water-stage recorder. Timber control since Sept. 10, 1937. Altitude of gage is 2,550 ft (from topographic map). Prior to Oct. 31, 1915, staff gage near present site at different datum. Mar. 18, 1927, to Sept. 9, 1937, staff or chain gage at site 200 ft downstream at present datum.

Extremes.--Maximum discharge during season, 604 cfs Mar. 27 (gage height, 7.90 ft, backwater from ice); no flow at times.

1914-15, 1927-56: Maximum discharge, 3,310 cfs Apr. 15, 1952 (gage height, 11.91 ft), from rating curve extended above 1,400 cfs on basis of slope-area determination of peak flow; no flow at times.

Remarks.--Records fair. Several small diversions for irrigation above station.

Cooperation.--This is one of the international gaging stations maintained jointly by United States and Canada under the Boundary Waters Treaty. The records have been collected and compiled jointly with the Water Resources Branch, Department of Northern Affairs and National Resources, Canada.

Revisions (water years).--WSP 1209: 1939(M).

Rating table, Mar.1 to Oct. 31, 1956, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.2	0.2	2.8	13.2
2.3	.5	3.0	25.5
2.4	1.1	3.2	41.0
2.5	2.1	3.5	73
2.6	4.4	4.0	130
2.7	8.0	5.0	254

Discharge, in cubic feet per second, March to October 1956

Day			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		
1			0	75	10.4	12.7	20.3	0.9	3.6	1.6		
2			0	55	11.0	11.0	11.6	.9	2.3	1.6		
3			0	*55	11.6	8.5	8.5	.9	1.6	1.8		
4			0	65	11.6	8.0	7.6	.7	1.4	2.0		
5			0	75	12.1	7.6	6.4	.7	1.3	2.0		
6			0	70	14.9	*6.4	6.0	.6	1.2	2.0		
7			*0	60	19.6	5.7	5.4	.7	1.2	2.0		
8			0	50	17.8	5.1	4.8	.9	1.2	2.3		
9			0	50	17.8	4.8	4.4	.8	1.3	2.1		
10			0	54	20.3	4.4	3.9	.7	1.2	2.1		
11			0	*47.0	22.2	4.2	3.3	.6	1.3	2.3		
12			0	43.0	24.8	3.6	3.1	.8	1.2	2.3		
13			0	41.0	19.6	3.3	2.3	.7	1.2	2.4		
14			0	40.2	17.3	2.8	2.0	.7	1.1	2.4		
15			0	34.6	16.1	2.8	1.8	.5	1.2	2.8		
16			0	29.2	*14.9	2.4	2.1	.5	1.2	2.8		
17			0	24.8	13.2	2.4	2.1	.5	1.0	3.1		
18			0	21.0	12.1	2.8	1.8	.6	1.2	3.3		
19			0	19.0	10.4	2.6	1.5	.5	1.2	3.6		
20			0	17.8	10.0	2.6	1.4	.5	1.2	3.6		
21			20	17.3	9.0	3.6	1.3	.5	1.0	3.6		
22			70	16.1	8.5	9.0	1.2	.3	.9	3.6		
23			*65	15.5	8.0	194	1.1	.4	1.1	3.9		
24			250	13.8	8.0	60	1.0	.4	1.2	3.9		
25			*310	12.7	8.0	28.5	.9	.4	1.1	3.9		
26			500	12.1	8.5	17.8	1.1	.3	1.2	4.2		
27			*400	11.6	9.0	12.7	1.0	.2	1.2	4.4		
28			220	11.0	12.1	*10.0	1.2	.5	1.3	4.4		
29			150	9.4	30.8	33.2	1.2	.7	1.3	4.2		
30			120	9.4	27.0	41.4	1.1	2.2	1.4	4.2		
31			85	-------	17.3	-------	.9	2.3	------	*4.4		
Total			2,190	1,055.5	453.9	513.9	112.3	21.9	39.8	92.8		
Mean			70.6	35.2	14.6	17.1	3.62	0.71	1.33	2.99		
Ac-ft			4,340	2,090	900	1,020	223	43	79	184		

Calendar year : Max Min Mean Ac-ft

The season : Max - Min - Mean - Ac-ft 8,880

* Discharge measurement or observation of no flow made on this day.

Note.--Stage-discharge relation affected by ice Mar. 22 to Apr. 5.

Horse Creek at international boundary

(International gaging station)

Location.--Lat 48°59'20", long 106°50'10", in SE¼ sec. 3, T. 37 N., R. 37 E., on right bank three-quarters of a mile south of international boundary, 1½ miles upstream from mouth, and 8 miles northeast of Thoeny, Mont.

Drainage area.--71 sq mi, approximately.

Records available.--May 1914 to October 1917 and March 1927 to October 1956 in reports of Geological Survey. May 1914 to October 1956 in reports of Department of Northern Affairs and National Resources, Canada. Seasonal records only most years. Published as "near Barnard, Mont." May 1914 to October 1926.

Gage.--Water-stage recorder and concrete control. Altitude of gage 2,540 ft (from topographic map). Prior to Sept. 9, 1937, staff gage and natural control at same site and datum.

Extremes.--Maximum daily discharge during season, 90 cfs Mar. 27; no flow part of season. 1914-56: Maximum discharge, 1,800 cfs Apr. 15, 1952 (gage height, 11.79 ft), from rating curve extended above 800 cfs by logarithmic plotting; no flow most of each year.

Remarks.--Records fair except those for periods of no gage-height record, which are poor. No reported diversion above station.

Cooperation.--This is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. Records collected and compiled jointly with the Water Resources Branch, Department of Northern Affairs and National Resources, Canada.

Revisions (water years).--WSP 1209: 1943(M). WSP 1389: 1928(M), 1933, 1936, 1939, 1943-45, 1950(M).

Rating table, Mar. 1 to Oct. 31, 1956 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 1-19)

2.4	0	3.0	1.8
2.5	.2	3.1	2.9
2.6	.3	3.2	4.7
2.7	.5	3.4	10.4
2.8	.8	3.7	21
2.9	1.1	4.0	35

Discharge, in cubic feet per second, March to October 1956

Day			March	April	May	June	July	Aug.	Sept.	Oct.		
1			0	a15	0.9	0.2	1.0					
2			0	21.0	.9	.2	.5					
3			0	*23.0	.7	.2	.4					
4			0	26.0	.7	.1	.3					
5			0	28.0	.9	.1	.2					
6			0	22.6	1.4	*0	.2					
7			*0	14.7	1.1	0	.2					
8			0	11.4	2.1	0	.1					
9			0	10.7	1.6	0	.1					
10			0	16.7	1.4	0	0					
11			0	*16.7	2.4	0	0					
12			0	12.0	1.9	0	0					
13			0	10.7	1.9	0	0					
14			0	11.7	1.3	0	0					
15			0	10.4	1.1	0	0					
16			0	8.0	*.9	0	0					
17			0	6.6	.8	0	0					
18			0	4.9	.6	0	0					
19			0	3.8	.5	0	0					
20			0	3.2	.4	0	0		(*)			
21			0	2.8	.3	0	0					
22			a.1	2.6	.2	.1	0					
23			*.1	2.4	.2	.1	0					
24			.1	1.8	.1	.3	0					
25			*7	1.3	.1	.1	0					
26			65	1.1	.1	.5	0					
27			a90	1.0	.2	.9	0					
28			a20	.9	.6	*.6	0					
29			a10	.9	.5	1.2	0					
30			a20	.9	.3	1.4	0					
31			a15	-------	.2	-------	0		------	(*)		
Total			227.3	292.8	26.3	6.0	3.0	0	0	0		
Mean			7.33	9.76	0.85	0.20	0.10	0	0	0		
Ac-ft			451	581	52	12	6.0	0	0	0		

Calendar year : Max Min Mean Ac-ft
The season : Max - Min - Mean - Ac-ft 1,100

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* Discharge measurement or observation of no flow made on this day.
a No gage-height record; discharge interpolated or estimated on basis of 3 discharge measurements, weather records, and records for nearby streams.

McEachern Creek at international boundary

(International gaging station)

Location.--Lat 48°59'30", long 106°55'40", in SW¼ sec. 1, T. 37 N., R. 36 E., on left bank half a mile downstream from East Fork, half a mile south of international boundary, and 8 miles north of Thoeny, Mont.

Drainage area.--160 sq mi.

Records available.--March 1927 to October 1956 in reports of Geological Survey. April 1924 to October 1956 in reports of Department of Northern Affairs and National Resources, Canada. Seasonal records only most years. Published as "at Dolson's Ranch" April 1924 to October 1926.

Gage.--Wire-weight gage read once daily. Concrete control since October 1938. Altitude of gage is 2,540 ft (from topographic map). Prior to October 1938, staff gage at site 350 ft upstream at same datum.

Extremes.--Maximum discharge observed during season, 180 cfs Mar. 27 (gage height, 4.08 ft, backwater from ice); no flow most of season.

1924-56: Maximum discharge, 7,080 cfs Apr. 15, 1952 (gage height, 13.85 ft, from floodmark), from rating curve extended above 2,800 cfs on basis of slope-area determination of peak flow; no flow at times each year.

Remarks.--Records fair. Several diversions for irrigation above station.

Cooperation.--This is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. The records have been collected and compiled jointly with the Water Resources Branch, Department of Northern Affairs and National Resources, Canada.

Revisions (water years).--WSP 1176: 1939(M). WSP 1389: 1927, 1931(M), 1933-36, 1938(M), 1939, 1942(M), 1943, 1944-45(M).

Rating tables, Mar. 1 to Oct. 31, 1956, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Mar. 1 to May 16

1.3	0	2.0	3.4
1.4	.1	2.1	5.2
1.5	.3	2.2	8.0
1.6	.5	2.4	16.0
1.7	.9	2.6	27.0
1.8	1.4	2.8	44.0
1.9	2.2	3.0	65

May 17 to Oct. 31

1.1	0
1.2	.1
1.3	.1
1.4	.3
1.5	.5
1.6	.7

Discharge, in cubic feet per second, March to October 1956

Day			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		
1			0	33.4	0.1	a0.1						
2			0	b40	a.1	a.1						
3			0	*40.4	a.2	0						
4			0	42.2	a.2	0						
5			0	54	a.3	0						
6			0	b47	.3	*0						
7			*0	35.0	.3	0						
8			0	27.8	.3	0						
9			0	19.0	.3	0						
10			0	22.2	a.3	0						
11			0	*32.6	a.2	0						
12			0	27.0	.2	0						
13			0	17.0	a.5	0						
14			0	15.2	a.8	0						
15			0	17.0	1.1	0						
16			0	12.8	*.8	0						
17			0	7.2	a.6	0						
18			0	5.5	.3	0						
19			0	a3.6	a.3	0						
20			0	1.7	a.3	0			(*)			
21			0	1.2	a.3	0						
22			0	a1.0	a.3	0						
23			*0	a.9	a.2	.1						
24			0	a.8	a.2	a.1						
25			*b20	.6	a.2	a.1						
26			b90	a.5	a.2	0						
27			*b140	a.3	.2	0						
28			b30	.2	.2	*0						
29			22.2	a.2	a.2	0						
30			35.0	.1	.1	0						
31			27.0	-------	a.1	-------			------			
Total			364.2	506.4	9.7	0.5	0	0	0	0		
Mean			11.7	16.9	0.31	0.02	0	0	0	0		
Ac-ft			722	1,000	19	1.0	0	0	0	0		

Calendar year	: Max	Min	Mean	Ac-ft
The season	: Max -	Min -	Mean -	Ac-ft 1,740

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* Discharge measurement or observation of no flow made on this day.

a No gage-height record; discharge interpolated or estimated on basis of records for nearby stations.

b Stage-discharge relation affected by ice.

Willow Creek near Glasgow, Mont.

Location.--Lat 48°07', long 106°40', in NW¼NE¼ sec. 10, T. 27 N., R. 39 E., on right bank about 6 miles south of Glasgow and about 8 miles upstream from mouth.

Drainage area.--536 sq mi.

Records available.--October 1953 to September 1956.

Gage.--Water-stage recorder.

Extremes.--Maximum discharge during year, 747 cfs Aug. 31 (gage height, 8.23 ft); no flow at times.
1953-56: Maximum discharge, 3,280 cfs Apr. 6, 1954; maximum gage height, 17.26 ft May 17, 1955; no flow at times each year.

Remarks.--Records fair. A total of 152 stockwater, diversion and detention reservoirs upstream have an aggregate capacity of about 6,800 acre-ft; hay or pasture lands amounting to 3,460 acres are served by flood or water spreader irrigation to extent of available flow. Records of water temperatures and suspended sediment loads for the water year 1956 are given in WSP 1451.

Rating table, water year 1955-56 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 4-9, May 6-12, June 24)

1.4	0	2.0	5.0
1.5	.2	2.3	16
1.6	.5	3.0	54
1.7	1.1	4.0	133
1.8	2.0	6.0	400
1.9	3.2	8.0	708

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						0	2.2	0	12	0.5	0	145
2			(*)			0	1.6	0	4.3	.4	0	26
3						0	2.5	*0	2.5	*.4	0	6.2
4						0	*.9	0	1.1	3.7	0	4.6
5						0	.6	0	.6	30	0	2.1
6						0	.4	.9	.4	19	0	1.4
7						0	.3	*27	.1	6.8	*.2	.7
8						0	.1	47	0	6.2	51	.6
9				(*)		0	0	*20	0	4.3	6.8	.5
10	(*)				(*)	0	*0	14	0	*2.1	1.9	.3
11						0	0	*21	0	1.6	2.5	.3
12						*0	0	9.6	0	.7	108	.3
13						0	0	3.7	0	.4	30	.3
14						0	0	1.8	*0	.2	10	.2
15						0	0	.4	0	0	3.5	0
16						*0	0	.5	0	*0	1.6	0
17						10	0	*.1	0	1.6	*.7	0
18						154	0	0	*0	3.9	.6	0
19						*403	0	0	0	1.9	.4	0
20						400	0	0	0	1.4	.2	0
21						*246	0	0	*356	.5	0	0
22						*128	0	0	*280	.2	0	0
23						62	0	0	*498	0	*0	0
24						*41	0	0	*121	0	0	0
25						32	0	0	*46	0	3.3	0
26						24	0	0	25	0	2.4	0
27						15	0	0	*12	*0	1.0	0
28						*6	0	*18	4.6	0	.6	0
29						5	0	148	2.1	0	22	0
30					------	*4.3	0	47	1.0	0	178	0
31		------			------	2.6	------	30	------	0	600	------
Total	0	0	0	0	0	1,532.9	8.6	389.0	1,366.7	85.8	1,024.7	188.5
Mean	0	0	0	0	0	49.4	0.29	12.5	45.6	2.77	33.1	6.28
Ac-ft	0	0	0	0	0	3,040	17	772	2,710	170	2,030	374

Calendar year 1955:	Max 2,440	Min 0	Mean 73.5	Ac-ft 53,180
Water year 1955-56:	Max 600	Min 0	Mean 12.6	Ac-ft 9,110

* Discharge measurement or observation of no flow made on this day.

Milk River at Nashua, Mont.

Location.--Lat 48°07'50", long 106°21'50", in NE¼NE¼ sec. 1, T. 27 N., R. 41 E., on right bank at downstream side of highway bridge, 0.6 mile southwest of Nashua and 5 miles upstream from Porcupine Creek.

Drainage area.--23,300 sq mi, approximately.

Records available.--October 1939 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 2,027.75 ft (revised) above mean sea level, datum of 1929, adjustment of 1948.

Average discharge.--17 years, 775 cfs (561,100 acre-ft per year).

Extremes.--Maximum daily discharge during year, 3,170 cfs Mar. 28; maximum gage height, 13.34 ft Mar. 29 (backwater from ice); minimum discharge, 45 cfs June 14 (gage height, 2.48 ft).

1939-56: Maximum discharge, 45,300 cfs Apr. 18, 1952 (gage height, 31.38 ft); minimum observed, 4.6 cfs Apr. 18, 1946 (gage height, 1.54 ft).

Remarks.--Records good except those for period of ice effect, which are poor. Diversions for irrigation of about 140,000 acres above station. Flow regulated by Fresno and Nelson Reservoirs (see p. 238).

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used July 4-16, Aug. 19, 20)

2.5	48	3.6	490
2.6	65	4.0	740
2.8	115	5.0	1,100
3.0	180	6.0	1,400
3.3	300	6.4	1,540

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	505	264	*239	227	180	190	2,100	512	247	604	260	762
2	542	268	243	204	180	194	1,800	420	273	558	*268	617
3	565	260	247	190	180	187	1,530	381	239	469	282	374
4	542	247	219	208	180	176	*1,400	*388	173	441	300	344
5	505	286	227	235	180	176	1,370	476	148	*400	311	355
6	462	316	219	239	180	180	1,290	542	136	381	296	*368
7	427	*448	223	247	180	235	1,170	528	*148	400	333	362
8	400	754	223	243	*180	*231	1,110	558	212	368	388	344
9	355	700	223	*227	176	212	1,010	584	142	394	498	333
10	350	374	215	201	159	194	*817	584	124	374	558	300
11	350	243	208	187	160	162	666	558	127	381	558	282
12	*350	200	201	184	160	136	617	462	95	420	578	260
13	344	150	212	173	160	136	542	400	68	441	654	235
14	350	150	227	173	160	139	520	*381	*53	462	630	212
15	344	150	235	175	160	145	512	374	50	434	604	190
16	316	150	*235	175	159	176	490	368	55	*374	591	184
17	306	150	231	175	156	212	462	362	53	306	578	*190
18	*300	150	243	175	166	208	*455	362	63	204	572	212
19	300	200	260	175	170	159	427	362	78	166	542	215
20	296	250	260	175	176	223	322	374	90	136	*528	223
21	286	250	239	180	180	300	194	374	80	118	542	227
22	282	*282	212	180	187	500	148	344	226	108	505	227
23	282	282	190	185	194	720	187	311	565	105	*455	231
24	278	273	162	*185	190	*956	215	300	695	*108	420	231
25	268	227	162	185	184	1,360	187	*322	762	108	362	*223
26	*268	219	201	185	190	1,560	194	316	994	112	333	208
27	278	250	204	180	190	2,350	476	278	*970	118	316	212
28	278	270	194	180	187	3,170	801	251	900	124	300	212
29	278	260	215	180	184	3,160	789	223	833	124	273	204
30	273	250	235	180	------	*2,620	660	328	715	159	296	201
31	264	------	247	180	------	2,400	------	273	------	223	374	------
Total	10,944	8,273	6,851	5,988	5,088	22,767	22,461	12,296	9,314	9,120	13,505	8,538
Mean	353	276	221	193	175	734	749	397	310	294	436	285
Ac-ft	21,710	16,410	13,590	11,880	10,090	45,160	44,550	24,390	18,470	18,090	23,790	16,930

Calendar year 1955: Max 10,200 Min - Mean 1,565 Ac-ft 1,133,000
Water year 1955-56: Max 3,170 Min 50 Mean 369 Ac-ft 268,100

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 12 to Apr. 2.

Missouri River near Wolf Point, Mont.

Location.--Lat 48°04', long 105°32', in NW¼ sec. 28, T. 27 N., R. 48 E., on right bank 500 ft downstream from bridge on State Highway 13, 6 miles southeast of Wolf Point, and 6 miles downstream from Wolf Creek.

Drainage area.--83,200 sq mi, approximately.

Records available.--September 1928 to September 1956.

Gage.--Water-stage recorder and wire-weight gage read twice daily. Datum of gage is 1,958.57 ft above mean sea level, datum of 1929. Prior to Apr. 13, 1930, staff and chain gages at Wolf Point ferry landing 6 miles upstream at different datum.

Average discharge.--11 years (1928-39, prior to Fort Peck Reservoir reaching operational level), 7,219 cfs (5,226,000 acre-ft per year); 13 years (1943-56, after operational level was reached), 11,010 cfs (7,970,000 acre-ft per year).

Extremes.--Maximum discharge during year, 31,500 cfs Oct. 19 (gage height, 9.22 ft); minimum daily, 3,640 cfs June 6.

1928-56: Maximum discharge, 66,800 cfs Mar. 25, 1939 (gage height, 14.4 ft, ice present), from rating curve extended above 39,000 cfs; maximum gage height observed, 17.45 ft Mar. 20, 1930 (ice jam); minimum daily discharge, 320 cfs Dec. 10, 1941.

Remarks.--Records good except those for period of ice effect, which are poor. Discharge measurements made at 5-day intervals during open water and 10-day intervals during periods of ice effect. Diversions for irrigation of about 1,000,000 acres above station. Flow regulated by Fort Peck Reservoir (see p.84).

Revisions (water years).--WSP 876: Drainage area. WSP 1146: 1931.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	29,800	21,100	7,300	7,000	6,500	5,700	7,500	6,780	6,560	6,870	10,100	10,300
2	29,800	20,400	7,800	7,000	6,700	6,000	7,000	6,520	6,270	7,810	10,100	8,890
3	30,000	19,500	7,400	6,300	7,200	6,000	6,900	6,250	6,180	10,200	10,400	7,700
4	29,800	18,800	6,900	6,400	6,200	5,700	6,700	6,150	6,240	10,200	10,500	7,270
5	30,100	17,800	7,100	6,500	5,700	5,500	6,370	6,300	5,540	9,930	10,200	7,140
6	29,900	16,800	6,800	7,000	5,400	5,500	6,200	6,850	3,640	8,430	10,400	7,090
7	29,600	15,800	7,200	7,200	6,600	5,500	5,730	6,630	3,690	6,460	10,500	7,050
8	29,800	15,100	6,900	7,500	6,100	5,500	5,150	6,760	4,800	6,130	10,500	7,010
9	29,800	14,100	6,900	8,000	5,900	6,000	6,730	6,580	5,230	5,980	10,500	7,000
10	29,700	13,000	6,700	8,000	5,700	6,000	7,070	6,730	5,370	7,910	10,600	7,000
11	30,000	11,800	7,300	7,800	5,500	6,000	6,920	6,980	5,370	9,980	10,600	6,850
12	30,200	10,700	7,100	7,400	5,400	6,000	6,610	6,780	5,390	10,200	10,500	6,780
13	30,300	9,750	6,600	7,000	5,000	6,000	5,690	6,730	5,490	10,300	10,500	6,700
14	30,500	8,500	5,600	7,000	4,300	6,000	5,270	6,700	5,390	10,400	10,500	6,660
15	31,200	6,800	5,700	6,500	5,200	6,000	5,040	6,470	6,100	10,300	10,500	6,680
16	30,700	5,900	7,000	6,500	5,900	6,000	4,870	6,700	6,120	10,300	10,500	6,730
17	30,500	5,800	7,600	7,000	5,600	6,000	4,800	6,580	6,130	10,300	10,500	6,680
18	30,900	6,300	7,300	7,500	6,700	6,000	5,250	6,440	6,070	10,300	10,500	6,700
19	31,400	7,200	7,300	7,800	6,400	6,000	5,120	6,440	6,100	10,200	10,600	6,710
20	31,100	7,500	7,300	8,000	5,800	5,500	5,030	6,030	6,050	10,000	10,100	6,730
21	31,000	7,600	7,300	7,700	5,400	6,000	4,910	6,130	6,130	10,000	10,400	6,800
22	30,900	7,600	7,100	7,500	6,000	6,200	5,900	6,300	6,270	10,100	10,400	6,760
23	30,400	7,400	7,200	7,300	6,000	6,500	5,840	6,540	6,410	10,000	10,400	6,700
24	29,300	7,300	7,000	7,300	5,700	6,700	5,840	6,490	6,170	9,980	10,400	6,750
25	28,100	7,200	6,900	7,300	5,400	7,000	6,080	6,290	7,180	9,860	10,500	6,150
26	27,600	7,100	6,800	7,200	5,700	7,200	6,270	6,440	6,750	10,000	10,400	4,820
27	26,600	7,000	6,700	7,100	5,000	7,600	6,030	6,300	6,800	10,100	10,300	5,400
28	24,800	7,000	6,500	7,000	5,200	8,300	6,180	6,470	7,230	10,000	10,400	6,270
29	23,800	7,100	6,500	6,500	5,400	8,500	6,510	6,660	7,430	9,980	10,400	6,340
30	23,100	7,200	6,700	6,000	------	8,300	6,750	6,370	7,210	10,000	10,300	6,360
31	22,400	------	6,700	6,200	------	8,000	------	6,290	------	10,000	10,800	------
Total	903,100	325,150	215,200	220,500	167,600	197,200	180,260	201,680	179,310	292,220	323,300	206,020
Mean	29,130	10,840	6,942	7,113	5,779	6,361	6,009	6,506	5,997	9,426	10,430	6,867
Ac-ft	‡1,791	644,900	426,800	437,400	332,400	391,100	357,500	400,000	355,700	579,600	641,300	408,600

Calendar year 1955: **Max** 31,400 Min 4,960 Mean 16,180 Ac-ft 11,720,000
Water year 1955-56: **Max** 31,400 Min 3,640 Mean 9,321 Ac-ft 6,766,000

‡ Expressed in thousands.

Note.--Stage-discharge relation affected by ice Nov. 14 to Apr. 4.

Redwater Creek at Circle, Mont.

Location.--Lat 47°25', long 105°35", in SW¼ sec. 11, T. 19 N., R. 48 E., on left bank at Circle, three-quarters of a mile upstream from Horse Creek.

Drainage area.--534 sq mi.

Records available.--April 1929 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 2,380 ft (by barometer). Sharp-crested weir since Sept. 24, 1938. Prior to June 1, 1941, and Mar. 23, 1943, to Feb. 16, 1948, chain gage at site a third of a mile upstream at same datum. June 1, 1941, to Mar. 22, 1943, staff gage at site 200 ft upstream from present site at datum 2.8 ft lower. Feb. 17, 1948, to May 7, 1950, staff or wire-weight gage at site 200 ft upstream from present site at present datum.

Average discharge.--20 years (1931-32, 1935-36, 1938-56), 15.7 cfs (11,370 acre-ft per year).

Extremes.--Maximum discharge observed during year, 538 cfs Mar. 20 (gage height, 7.88 ft, ice present), discharge measurement; maximum gage height, 8.51 ft Mar. 19 (backwater from ice); no flow at times.

1929-56: Maximum discharge, 6,220 cfs June 17, 1944 (gage height, 18.5 ft, from floodmark), from rating curve extended above 2,500 cfs; no flow at times in most years.

Remarks.--Records fair except those for period of ice effect, which are poor. Few minor diversions for irrigation of hay meadow above station.

Revisions (water years).--WSP 1006: 1929-30, 1932-39.

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge in cubic feet per second)

3.1	0	3.8	5.9
3.2	.2	3.9	9.8
3.3	.6	4.0	16
3.4	1.0	4.5	55
3.5	1.4	5.0	105
3.6	2.1	6.0	243
3.7	3.3		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.1	0.1	0	0	0	*30	7.1	1.5	0.7	0		
2	.1	.1	0	0	*0	*200	6.7	1.7	.5	0		
3	.1	.1	0	*0	0	250	5.9	1.7	.4	0		
4	*.1	.1	0	.2	0	230	5.6	1.6	.3	0		
5	.1	.1	*0	.4	.1	*220	5.1	1.7	.2	0		
6	.1	.1	0	.2	.2	170	*4.6	1.9	.2	.1		
7	.1	.1	0	0	.1	120	4.1	1.7	.2	.2		
8	.1	.1	0	0	.1	*90	3.6	1.6	.2	.1		
9	.1	.1	0	0	.2	80	3.3	1.4	.1	.1		
10	.1	.1	0	0	.2	60	3.0	1.9	.1	0		
11	.1	.1	0	0	.2	40	2.9	2.2	.1	0		
12	.1	.1	.1	0	.2	20	2.7	2.1	.1	0		
13	.1	.1	0	0	.1	15	2.6	2.2	.1	0		
14	.1	.1	0	0	0	10	2.5	2.1	.1	0		
15	.1	.1	0	0	0	10	2.4	2.1	*.1	0		
16	.1	*.1	0	0	0	15	2.3	*1.9	0	0		
17	.1	0	0	0	0	30	2.3	1.7	0	*0		(*)
18	0	0	0	0	0	200	2.2	1.4	.1	0		
19	0	0	0	0	0	450	2.2	1.1	.1	0		
20	.1	0	0	0	0	*530	2.1	1.2	.1	0	(*)	
21	.1	.2	0	0	0	200	2.0	1.0	.1	0		
22	0	.1	0	0	.1	*90	2.0	.8	.1	0		
23	0	.1	.2	0	0	52	1.9	.7	.3	0		
24	.1	0	.2	0	0	34	1.8	.6	.2	0		
25	.1	0	0	0	0	24	1.7	.6	.2	0		
26	.1	.1	.2	0	0	20	1.6	.5	*.1	0		
27	.1	0	.3	0	0	15	*1.5	.4	.1	0		
28	0	0	.1	0	*0	7.5	1.5	.4	0	0		
29	0	0	0	0	0	8.6	1.5	.7	0	0		
30	.1	0	0	0	------	8.2	1.4	.8	0	0		
31	.1	------	0	0	------	7.5	------	.8	------	0		------
Total	2.5	2.1	1.1	0.8	1.5	3,236.8	90.1	42.0	4.8	0.5	0	0
Mean	0.08	0.07	0.04	0.03	0.05	104	3.00	1.35	0.16	0.02	0	0
Ac-ft	5.0	4.2	2.2	1.6	3.0	6,420	179	83	9.5	1.0	0	0

Calendar year 1955:	Max	950	Min	0	Mean	10.6	Ac-ft	7,710
Water year 1955-56:	Max	530	Min	0	Mean	9.24	Ac-ft	6,710

Peak discharge (base, 80 cfs).--Mar. 2 (time and discharge unknown); Mar. 19 (time and discharge unknown).

* Discharge measurement or observation of no flow made on this day.

Note.--Stage-discharge relation affected by ice Dec. 23 to Mar. 22 (no gage-height record Jan. 13 to Mar. 18 except scattered days; discharge estimated on basis of 2 observations of no flow, 4 discharge measurements, and weather records).

Middle Fork Poplar River at international boundary

(International gaging station)

Location.--Lat 48°59'30", long 105°41'40", in SE$\frac{1}{4}$ sec. 6, T. 37 N., R. 46 E., on left bank half a mile south of international boundary, 1$\frac{1}{2}$ miles upstream from Coal Creek, and 18 miles northwest of Scobey, Mont.

Drainage area.--381 sq mi.

Records available.--March 1931 to October 1956 (no winter records most years).

Gage.--Water-stage recorder. Altitude of gage 2,460 (from topographic mao).

Extremes.--Maximum discharge during season, 324 cfs Mar. 27 (gage height, 4.44 ft, backwater from ice); no flow Mar. 1-19.

1931-56: Maximum discharge, 12,700 cfs Apr. 6, 1954 (gage height 10.25 ft, from floodmark), from rating curve extended above 2,500 cfs on basis of slope-area determination of peak flow; no flow at times.

Remarks.--Records good except those for periods of ice effect, which are fair, and those for periods of no gage-height record, which are poor.

Cooperation.--This is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. Records collected and compiled jointly with the Water Resources Branch, Department of Northern affairs and National Resources, Canada.

Revisions (water years).--WSP 1389: 1931, 1935-37(M), 1939-40, 1942(M), 1943, 1948(M), 1950(M).

Rating table, Mar. 1 to Oct. 31, 1956, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.0	0.2	1.7	13.2
1.1	.5	2.0	25.2
1.2	1.2	2.5	49.5
1.3	2.3	3.0	94
1.4	4.2	3.5	159
1.5	6.5	4.0	247

Discharge, in cubic feet per second, March to October 1956

Day			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	
1			0	a80	*11.7	26.9	5.7	1.3	0.6	1.2		
2			0	a50	13.2	21.6	5.2	1.4	.5	1.2		
3			0	*40.3	13.2	18.8	4.8	2.9	.4	1.2		
4			0	a35	12.5	16.0	5.2	1.9	.4	1.2		
5			*0	a40	14.0	12.8	5.7	1.6	.5	1.3		
6			0	a70	19.2	11.4	5.5	1.2	.5	1.4		
7			0	a120	19.6	9.9	5.2	1.1	.4	1.3		
8			0	a170	20.8	8.2	4.8	1.0	.4	1.3		
9			0	a150	21.2	7.0	4.2	.9	.3	1.4		
10			0	a110	21.2	5.7	3.4	.9	.3	1.5		
11			0	a90	32.7	5.0	2.7	.9	.3	1.8		
12			0	a110	33.2	4.0	*2.3	.7	.3	1.9		
13			0	*101	28.6	*3.4	1.9	.5	.3	2.1		
14			0	42.8	26.1	3.1	1.4	.5	.4	2.1		
15			0	28.6	24.8	2.9	1.2	.4	.4	2.2		
16			0	23.2	23.2	2.7	1.1	.4	.4	2.2		
17			0	23.2	20.8	2.3	1.2	.4	.6	2.2		
18			0	21.6	18.8	2.5	.9	.4	.7	2.3		
19			0	18.8	17.2	3.8	1.2	.4	.7	2.5	†4.3	
20			a20	16.8	16.0	4.0	2.3	.4	.7	2.7		
21			a30	15.2	14.4	8.0	1.3	.3	.6	2.7		
22			a80	14.4	*13.2	15.2	.9	.3	.6	3.2		
23			*b110	13.2	12.8	24.4	.7	.3	.5	2.9		
24			a115	12.5	12.5	26.5	.7	.3	.5	3.1		
25			b120	12.1	13.2	24.4	.7	.3	.5	3.2		
26			b165	11.7	13.6	16.8	.7	.3	.5	3.4		
27			*b265	11.4	14.8	12.5	.7	.3	*.5	3.6		
28			a220	10.6	23.6	9.5	.7	.4	.5	3.6		
29			a150	10.6	30.4	7.6	.7	.4	.7	3.6		
30			a100	11.0	35.0	6.5	.7	.7	1.0	3.4		
31			a90	-------	33.6	-------	.8	.7	------	3.4		
Total			1,465	1,464.0	625.1	323.4	74.5	23.5	15.0	71.1		
Mean			47.3	48.8	20.2	10.8	2.40	0.76	0.50	2.29		
Ac-ft			2,910	2,900	1,240	641	148	47	30	141		

Calendar year : Max Min Mean Ac-ft
The season : Max - Min - Mean - Ac-ft 8,060

* Discharge measurement or observation of no flow made on this day.
† Result of discharge measurement.
a No gage-height record; discharge estimated on basis of 4 discharge measurements, weather records, and records for nearby stations.
b Stage-discharge relation affected by ice.

East Fork Poplar River at international boundary

(International gaging station)

Location.--Lat 49°00'00", long 105°24'30", in SW¼ sec. 3, T. 1, R. 26 W., second meridian, on left bank 10 ft north of international boundary, 400 ft southwest of Canadian custom post of East Poplar, 14 miles upstream from mouth, and 14 miles north of Scobey, Mont.

Drainage area.--256 sq mi.

Records available.--March 1931 to October 1956 (no winter records most years).

Gage.--Water-stage recorder. Datum of gage is 2,410.92 ft above mean sea level (International Boundary Surveys datum). Prior to Oct. 5, 1953, at site 80 ft upstream at same datum.

Extremes.--Maximum discharge during season, 281 cfs Mar. 25 (gage height, 6.93 ft, backwater from ice); no flow Feb. 28, 29.

1931-56: Maximum discharge, 2,760 cfs Mar. 22, 1939 (gage height, 12.40 ft); maximum gage height, 12.8 ft Mar. 25, 1943, from floodmark (backwater from ice); no flow at times.

Remarks.--Records fair. Several diversions for irrigation above station.

Cooperation.--This is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. Records collected and compiled jointly with the Water Resources Branch, Department of Northern Affairs and National Resources, Canada.

Revisions (water years).--WSP 1389: 1932, 1939, 1942-43, 1947.

Discharge, in cubic feet per second, February to October 1956

Day		Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		
1		-	1.5	70	*8.6	6.5	3.9	2.0	1.1	3.5		
2		-		70	8.8	6.7	3.8	1.9	1.1	3.2		
3		-		*65	8.6	6.9	4.1	2.2	1.2	3.2		
4		-		50	8.8	6.5	4.3	2.2	1.1	2.9		
5		-		50	9.1	7.4	4.1	2.0	1.4	3.5		
6		-		70	9.6	6.3	4.6	1.9	1.5	3.2		
7		-		85	9.6	6.5	4.7	1.8	1.6	3.6		
8		-		65	11.4	6.3	4.3	1.9	1.5	3.3		
9		-		55	11.1	6.1	3.8	1.9	1.9	3.2		
10		-	2	42.2	11.1	6.1	3.6	1.7	1.8	3.2		
11		-		18.2	11.4	5.9	3.2	1.6	1.9	3.3		
12		-		19.6	12.0	5.1	*3.2	1.7	1.9	3.3		
13		-		*19.2	11.1	*5.1	2.7	1.4	1.9	3.8		
14		-		18.2	10.5	4.4	3.1	1.2	2.0	3.9		
15		-		14.9	9.6	3.6	2.5	1.1	2.5	3.6		
16		-		12.0	10.2	4.3	2.7	1.1	2.2	3.2		
17		-		10.8	8.3	4.3	2.8	.8	2.0	3.2		
18		-		10.5	8.6	4.4	2.6	.8	2.5	3.8		
19		-		10.2	8.1	4.3	2.6	.8	2.2	4.1		
20		-	20	9.9	7.9	3.9	2.7	.8	2.5	3.6		
21		-	*25	9.3	8.3	4.6	2.3	.8	3.1	4.4		
22		-	40	8.6	*7.4	5.5	2.2	.8	2.9	4.3		
23		-	90	8.6	7.1	5.5	2.1	.6	2.3	3.9		
24		-	95	8.3	7.9	5.1	1.6	.5	2.8	4.9		
25		-	185	6.9	8.1	5.7	1.5	.5	2.8	4.6		
26		-	180	7.6	7.6	4.9	1.8	.5	3.2	4.1		
27		-	*110	7.6	7.9	4.6	1.9	.5	**3.3	3.6		
28		0	90	7.6	8.1	4.4	2.9	.8	2.9	4.7		
29		*0	80	8.1	7.1	4.6	3.1	*.8	3.2	4.9		
30		-	95	8.1	7.9	4.3	2.5	1.1	3.5	4.9		
31		------	75	-------	6.5	-------	2.2	1.0	------	5.3		
Total		-	1,118.5	846.4	278.3	159.8	93.4	38.7	65.8	118.2		
Mean		-	36.1	28.2	8.98	5.33	3.01	1.25	2.19	3.81		
Ac-ft		-	2,220	1,680	552	317	185	77	131	234		

Calendar year : Max Min Mean Ac-ft
The season : Max - Min - Mean - Ac-ft 5,400

* Discharge measurement or observation of no flow made on this day.

** Field estimate made on this day.

Note.--Stage-discharge relation affected by ice Mar. 1 to Apr. 9 (no gage-height record Mar. 10-19; discharge estimated on basis of 1 discharge measurement, weather records and records for nearby stations).

Poplar River near Poplar, Mont.

Location.--Lat 48°10'10", long 105°10'40", in NE¼NE¼ sec. 19, T. 28 N., R. 51 E., on right bank 4 miles north of Poplar and about 8 miles upstream from mouth.

Records available.--August to November 1908 (gage heights only), March 1909 to October 1924 (no winter records), August 1947 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 1,970 ft (from topographic map). Prior to May 1, 1911, staff gage at site 3½ miles upstream at different datum. May 1, 1911, to Oct. 4, 1913, at site 14 miles upstream at different datum. Oct. 5, 1913, to Oct. 31, 1924, at site 2 miles upstream at different datum.

Average discharge.--9 years (1947-56), 190 cfs (137,600 acre-ft per year).

Extremes.--Maximum daily discharge during year, 580 cfs Mar. 27; minimum observed, 0.9 cfs Mar. 15, but may have been less during periods of no gage-height record.

1908-24, 1947-56: Maximum discharge, 37,400 cfs Apr. 6, 1954 (gage height, 17.86 ft, from floodmark); no flow at times.

Flood of July 10, 1946, reached a stage of 18.1 ft, from floodmark (discharge, 40,000 cfs, from slope-area determination of peak flow made at site 20 miles upstream).

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of about 8,000 acres above station.

Revisions (water years).--WSP 1176: 1948. WSP 1389: 1911.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.0	8.0	2.6	78
2.1	15	3.0	150
2.2	24	4.0	388
2.3	34	5.0	690

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	14	28	17	6	2	1	410	68	67	27	12	35
2	14	27	16	4			420	68	64	31	12	28
3	14	21	15	3			430	68	62	35	13	25
4	14	26	14	3			*450	*67	60	35	13	22
5	15	30	13	*3			317	72	*54	35	19	19
6	15	27	*12	3			*265	78	56	*39	18	18
7	14	22	12	3			209	78	53	39	21	18
8	14	30	11	3			209	80	48	35	17	17
9	14	34	9	3			186	81	42	31	14	16
10	15	37	8	3	(*)		220	93	35	28	13	15
11	15	32	10	3	1		213	109	33	31	16	13
12	*15	19	13				186	110	29	35	17	13
13	15	8	14				160	109	28	40	16	13
14	16	8	8				152	110	27	73	14	13
15	17	12	14			(*)	148	112	25	34	13	13
16	17	14	16			2	134	109	21	23	11	12
17	18	17	17			5	146	102	20	21	11	11
18	18	18	13			5	140	95	27	19	12	11
19	18	20	6			10	123	86	30	19	11	11
20	18	21	3			15	114	80	24	27	11	11
21	18	23	3			150	102	73	22	21	11	9.3
22	19	*24	3			*350	92	70	21	18	10	9.3
23	19	24	4			430	83	65	24	19	9.3	10
24	19	24	6			500	80	64	27	17	9.3	*10
25	20	23	8			530	75	60	29	14	9.3	10
26	21	22	7			*560	75	60	31	13	8.7	10
27	22	21	6			580	70	58	32	13	8.0	10
28	23	21	6			420	68	56	34	13	10	10
29	24	20	6			380	68	56	30	13	12	10
30	25	19	7		------	390	68	56	28	14	24	11
31	27	------	8		------	400	------	59	------	14	35	------
Total	547	672	305	97	39	4,742	5,413	2,452	1,083	826	430.6	433.6
Mean	17.6	22.4	9.84	3.13	1.34	153	180	79.1	36.1	23.6	13.9	14.5
Ac-ft	1,080	1,330	605	192	77	9,410	10,740	4,860	2,150	1,640	854	860

Calendar year 1955: Max 9,000 Min 3 Mean 233 Ac-ft 168,700
Water year 1955-56: Max 580 Min - Mean 46.6 Ac-ft 33,800

Peak discharge (base, 500 cfs).--Mar. 27 (time and discharge unknown).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 13 to Apr. 3. No gage-height record Jan. 11 to Apr. 5; discharge estimated on basis of 6 discharge measurements, engineer's notes, and weather records.

Big Muddy Creek at Daleview, Mont.

Location.--Lat 48°55', long 104°57', near center of north line sec. 5, T. 36 N., R. 52 E., on right bank half a mile west of Daleview, half a mile upstream from Whitetail Creek, and 6 miles north of Redstone.

Records available.--August 1947 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 2,120 ft (by barometer).

Average discharge.--9 years, 22.1 cfs (16,000 acre-ft per year).

Extremes.--Maximum daily discharge during year, 60 cfs Mar. 26; Maximum gage height observed, 6.03 ft Mar. 26 (backwater from ice); no flow at times.

1947-56: Maximum discharge, 6,360 cfs Apr. 7, 1952 (gage height, 17.15 ft), from rating curve extended above 1,300 cfs on basis of slope-area determination of peak flow; no flow at times.

Remarks.--Records poor. No known regulation. Diversions for irrigation of about 90 acres above station.

Revisions (water years).--WSP 1209: 1948(M). WSP 1389: 1948.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.8	1.9	0.7			0	20	*5.1	1.6	0.8	2.5	8.7
2	.8	*2.0	*.7			0	20	5.2	1.4	.8	2.5	6.4
3	.9	2.0	.6			0	18	5.0	1.5	.8	3.1	5.1
4	.9	2.1	.5			0	*16	4.5	1.4	.9	2.9	4.3
5	1.0	2.2	.5	(*)		0	15	4.6	1.4	1.0	2.6	3.7
6	1.0	2.2	.6			0	15	5.5	1.4	1.4	2.0	3.5
7	1.1	2.0	.6			0	14	5.5	1.2	1.4	1.8	2.9
8	1.1	2.0	.7		(*)	0	13	5.2	1.3	1.4	1.4	2.7
9	1.4	2.3	.7			0	12	5.4	1.3	1.3	.9	2.5
10	1.6	2.2	.6			0	14	5.5	1.0	1.1	.6	2.4
11	1.8	1.8	.6			0	12	6.9	.8	.8	.6	2.3
12	1.7	1.5	.6			0	12	6.5	.8	.7	.5	1.8
13	1.6	1	.5			0	*13	5.9	*.8	*.8	.4	1.9
14	1.6	1	.4			0	15	5.9	.7	.8	.5	1.6
15	1.6	1	.2			0	13	5.5	.7	.7	.4	1.8
16	1.6	1	.1			0	12	5.0	.8	.7	.4	1.9
17	1.4	1	.1			0	10	4.0	.7	.7	.3	1.8
18	1.6	1	.1			10	9.8	3.5	1.0	.7	.2	1.6
19	*1.6	1.2	0			20	9.0	3.0	1.5	.9	.4	1.6
20	1.8	1.2	0			50	9.0	2.8	1.6	1.4	.6	1.6
21	1.9	1.2	0			55	8.2	2.6	2.2	2.0	.6	1.5
22	2.0	1	0			40	6.8	2.3	2.2	2.2	.4	1.3
23	1.8	.8	0			25	6.3	2.1	2.5	2.5	.4	1.0
24	1.8	.8	0			30	6.2	2.0	2.5	2.5	.4	1.0
25	1.9	.8	0			40	5.9	2.0	2.1	2.3	.3	1.0
26	1.9	.8	0			60	5.6	1.9	1.5	2.4	.3	1.0
27	2.0	.6	0			*50	5.1	2.0	1.3	2.3	.3	1.1
28	2.0	.6	0		(*)	30	5.0	1.9	1.1	2.2	1.0	1.1
29	2.5	.6	0			20	4.9	1.8	1.0	2.1	*2.9	1.4
30	2.0	.6	0		------	30	5.1	1.8	1.0	2.2	17	1.6
31	2.0	------	0		------	25	------	1.6	------	2.1	14	------
Total	48.7	40.4	8.8	0	0	485	330.9	122.5	40.3	43.9	62.2	72.1
Mean	1.57	1.35	0.28	0	0	15.6	11.0	3.95	1.34	1.42	2.01	2.40
Ac-ft	97	80	17	0	0	962	656	243	80	87	123	143

Calendar year 1955: Max 4,840 Min 0 Mean 36.3 Ac-ft 26,260
Water year 1955-56: Max 60 Min 0 Mean 3.43 Ac-ft 2,490

Peak discharge (base, 50 cfs).--About Mar. 26 (time and discharge unknown).
* Discharge measurement or observation of no flow made on this day.

Note.--Stage-discharge relation affected by ice Nov. 12 to Apr. 7 (no gage-height record Jan. 17 to Mar. 21, Mar. 23; discharge estimated on basis of 3 observations of no flow and weather records).

Yellowstone Lake at Lake Hotel, Yellowstone National Park

Location.--Lat 44°33', long 110°25', at National Park Service boat dock, 1,500 ft southwest of Lake Hotel and 2 miles southwest of lake outlet.

Drainage area.--1,010 sq mi, approximately.

Records available.--October 1921 to September 1956.

Gage.--Staff gage read once daily. Datum of gage is 7,729.45 ft above mean sea level, datum of 1929. Prior to June 17, 1940, staff gage at Lake Hotel dock 1,500 ft northeast and at same datum.

Extremes.--Maximum gage height observed during year, 6.54 ft June 18; minimum observed, 0.90 ft Dec. 7-14.

1921-56: Maximum gage height observed, that of June 18, 1956; minimum observed, -0.1 ft Dec. 7, 8, 1931.

Remarks.--No regulation.

Cooperation.--Gage readings furnished by National Park Service except during winter.

Gage height, in feet, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.48	1.10	0.94	-	-	-	-	-	e4.60	6.09	4.27	2.66
2	1.46	1.10	.94	-	-	-	-	-	e4.82	6.06	4.18	2.58
3	1.44	1.10	.94	-	-	1.30	-	-	5.04	6.06	4.11	2.54
4	1.44	1.08	.92	-	1.30	-	-	-	5.18	5.96	4.05	2.51
5	1.42	1.08	.92	-	-	-	-	1.28	5.41	5.96	3.96	2.49
6	1.40	1.08	.92	-	-	-	-	-	5.51	5.76	3.92	2.46
7	1.36	1.06	.90	1.30	-	-	1.08	-	5.60	5.73	3.86	2.44
8	1.34	1.04	.90	-	-	-	-	-	5.68	5.68	3.78	e2.40
9	1.32	1.02	.90	-	-	-	-	-	5.74	5.64	3.74	e2.37
10	1.30	1.02	.90	-	-	1.32	-	-	5.86	5.58	3.68	e2.34
11	1.26	1.00	.90	-	1.26	-	-	-	5.96	5.54	3.64	e2.31
12	1.24	1.00	.90	-	-	-	-	1.54	6.06	5.46	3.55	e2.28
13	1.22	1.00	.90	-	-	-	-	-	6.16	5.41	3.49	e2.25
14	1.22	1.00	.90	1.28	-	-	1.04	-	6.23	5.36	3.44	e2.22
15	1.20	.98	-	-	-	-	-	-	6.36	5.26	3.41	e2.19
16	1.18	.96	-	-	-	-	-	-	6.42	5.18	3.36	2.15
17	1.18	.94	-	-	-	1.30	-	-	6.52	5.16	3.31	2.12
18	1.16	.92	-	-	1.26	-	-	-	6.54	5.11	3.26	2.09
19	1.16	.92	-	-	-	-	-	1.86	6.46	5.04	3.16	2.07
20	1.20	.94	-	-	-	-	-	-	6.46	4.96	3.16	2.09
21	1.20	.94	-	1.30	-	-	1.04	-	6.48	4.86	3.11	2.01
22	1.26	.98	-	-	-	-	-	-	6.46	4.81	3.04	1.96
23	1.22	.98	-	-	1.20	-	-	2.66	6.46	4.76	e2.99	1.91
24	1.20	.96	1.16	-	-	1.20	-	3.12	6.36	4.71	2.92	1.86
25	1.18	.96	-	-	-	-	-	3.22	6.36	4.62	2.91	1.86
26	1.16	.96	-	-	-	-	-	3.34	6.32	4.56	2.86	1.86
27	1.16	.96	-	-	-	-	-	3.66	6.26	4.46	2.86	1.81
28	1.14	.96	-	1.38	-	-	1.18	3.86	6.20	4.44	2.84	1.81
29	1.12	.94	-	-	-	-	-	4.02	6.20	4.41	2.77	1.80
30	1.12	.94	-	-		-	1.24	4.24	6.14	4.36	2.74	1.80
31	1.12		1.26	-		1.08		4.36		4.31	2.71	

e Gage height estimated by comparison with gage heights for Yellowstone River at lake outlet.

Yellowstone River at Yellowstone Lake Outlet, Yellowstone National Park

Location.--Lat 44°34', long 110°23', on left bank 550 ft downstream from Fishing Bridge and a quarter of a mile downstream from outlet of Yellowstone Lake.

Drainage area.--1,010 sq mi, approximately.

Records available.--December 1922 to September 1956 (prior to October 1926, gage-height records only).

Gage.--Water-stage recorder. Datum of gage is 7,727.77 ft above mean sea level, datum of 1929. Prior to Oct. 2, 1928, staff gage at site 550 ft upstream at datum 1.07 ft higher.

Extremes.--Maximum discharge during year, 7,610 cfs June 21 (gage height, 7.55 ft); minimum, 313 cfs Nov. 13 (gage height, 1.82 ft), but may have been less during period of ice effect.

1926-56: Maximum discharge, that of June 21, 1956; minimum daily, 165 cfs Jan. 24 to Feb. 3, 1950, but may have been less during periods of ice effect; minimum gage height, 1.45 ft Dec. 17, 1936.

Remarks.--Records excellent except those for periods of ice effect, which are fair. No artificial regulation.

Cooperation.--Water-stage recorder inspected by National Park Service during summer.

Rating tables, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 24 to May 2, June 7-18)

Oct. 1 to June 18				June 19 to Sept. 30			
1.8	306	4.0	1,850	3.0	890	6.0	4,510
2.1	417	5.0	3,180	3.5	1,270	7.0	6,420
2.5	585	6.0	4,610	4.0	1,740	7.6	7,720
3.0	860	7.0	6,260	5.0	2,950		
3.5	1,270	7.7	7,600				

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	791	599	531	550	600	575	627	727	4,340	6,760	3,580	1,730
2	779	594	531	550	600	575	642	727	4,640	6,710	3,510	1,690
3	768	585	525	550	600	575	637	722	4,940	6,670	3,440	1,640
4	768	585	475	550	600	600	632	727	5,260	6,550	3,330	1,600
5	750	572	450	550	600	600	632	727	5,510	6,400	3,220	1,550
6	732	562	450	550	600	600	632	732	5,760	6,270	3,120	1,530
7	716	554	450	550	600	600	627	738	5,920	6,130	3,030	1,500
8	716	554	450	550	600	600	627	744	6,030	6,010	2,940	1,470
9	700	549	450	575	600	600	623	768	6,170	5,910	2,870	1,450
10	688	544	450	600	600	600	613	803	6,330	5,790	2,800	1,430
11	683	562	450	625	600	600	608	835	6,500	5,670	2,740	1,410
12	673	544	450	650	600	600	608	841	6,710	5,590	2,650	1,400
13	658	402	450	650	600	600	604	854	6,920	5,520	2,590	1,380
14	652	400	425	650	575	600	599	860	7,100	5,400	2,520	1,350
15	647	400	425	650	550	600	599	874	7,320	5,290	2,480	1,320
16	642	450	425	650	525	600	594	894	7,440	5,150	2,420	1,300
17	637	475	425	650	525	600	599	921	7,520	5,020	2,370	1,280
18	632	500	425	650	525	600	599	966	7,560	4,900	2,300	1,250
19	627	531	450	650	525	625	599	1,050	*7,520	4,790	2,250	1,220
20	652	540	475	675	525	625	599	1,170	7,500	4,680	2,200	1,220
21	652	562	500	675	550	650	599	1,320	7,570	4,580	2,160	1,210
22	663	554	525	675	*540	650	604	1,530	7,540	4,490	2,110	1,170
23	658	549	575	675	550	650	613	1,780	7,410	*4,370	2,070	1,150
24	647	531	650	650	550	663	632	2,060	7,320	4,290	*2,030	1,130
25	642	544	650	600	550	658	642	*2,340	7,260	4,170	1,980	1,100
26	632	544	625	600	550	658	658	2,730	7,170	4,090	1,950	1,090
27	623	540	600	575	550	658	673	3,040	7,080	3,990	1,920	1,070
28	613	536	600	575	575	642	688	3,320	7,020	3,910	1,870	*1,050
29	608	527	575	575	575	632	710	3,560	6,950	3,820	1,840	1,020
30	613	*536	575	575	------	627	*722	3,800	6,880	3,740	1,800	1,010
31	608	-----	550	575	------	623	------	4,050	------	3,660	1,760	------
Total	20,870	15,925	15,587	18,825	16,540	19,086	18,841	46,210	199,190	160,320	77,850	39,720
Mean	673	531	503	607	570	616	628	1,491	6,640	5,172	2,511	1,324
Cfsm	0.666	0.526	0.498	0.601	0.564	0.610	0.622	1.48	6.57	5.12	2.49	1.31
In.	0.77	0.59	0.57	0.69	0.61	0.70	0.69	1.70	7.33	5.90	2.87	1.46
Ac-ft	41,400	31,590	30,920	37,340	32,810	37,860	37,370	91,660	395,100	318,000	154,400	78,780

Calendar year 1955: Max 4,090 Min 290 Mean 1,129 Cfsm 1.12 In. 15.17 Ac-ft 817,000
Water year 1955-56: Max 7,570 Min 400 Mean 1,773 Cfsm 1.76 In. 23.88 Ac-ft 1,287,000

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 14-18, Dec. 3 to Mar. 23.

Lamar River near Tower Falls ranger station, Yellowstone National Park

Location.--Lat 44°56', long 110°22', on left bank 0.5 mile north of Cooke City highway, three-quarters of a mile upstream from mouth, and 2 miles northeast of Tower Falls ranger station.

Drainage area.--640 sq mi.

Records available.--September 1922 to September 1956 (no winter records 1922-25, 1935-46).

Gage.--Water-stage recorder. Altitude of gage is 5,910 ft (from topographic map). Prior to Sept. 16, 1925, staff gages and Sept. 16, 1925, to July 29, 1927, water-stage recorder, at same site and at datum 1.00 ft higher.

Average discharge.--20 years (1925-35, 1946-56), 834 cfs (603,800 acre-ft per year).

Extremes.--Maximum discharge during year, 11,300 cfs June 2 (gage height, 9.11 ft); minimum daily, 80 cfs Dec. 14.

1922-56: Maximum discharge recorded, 13,600 cfs May 25, 1928 (gage height, 9.75 ft); minimum observed, 40 cfs (discharge measurement) Mar. 16, 1945, but may have been less during periods of no gage-height record in winter.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. No regulation or diversion.

Cooperation.--Water-stage recorder inspected by officials of National Park Service.

Revisions (water years).--WSP 1176: 1949.

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 20 to June 29)

1.0	109	4.0	2,200
1.3	173	5.0	3,520
1.6	275	6.0	5,120
2.0	462	7.0	6,990
2.5	732	8.0	9,030
3.0	1,110	9.0	11,400

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	145	110	*108	140	90	95	170	620	8,990	2,280	529	227
2	141	110	105	140	100	95	140	600	9,740	2,300	503	206
3	141	120	100	130	105	90	140	600	8,840	2,180	503	194
4	139	120	100	130	105	90	160	620	9,050	1,780	442	191
5	139	130	100	130	105	95	160	832	8,570	1,650	417	182
6	143	115	100	125	105	90	130	860	6,860	1,650	393	176
7	139	115	100	120	105	90	150	982	5,230	1,860	383	176
8	136	115	100	120	100	95	160	1,280	5,700	1,690	374	176
9	139	120	100	110	100	95	150	1,370	6,440	1,600	350	217
10	139	120	100	120	100	90	190	1,480	6,860	1,530	350	206
11	141	120	100	120	100	85	240	1,400	6,880	1,480	341	260
12	143	100	100	120	100	85	270	1,190	7,230	1,530	314	292
13	139	105	90	120	100	85	290	990	6,910	1,340	292	292
14	139	110	80	120	100	85	340	874	6,080	1,220	279	223
15	136	95	90	*115	100	85	420	966	6,420	1,110	275	197
16	134	95	110	115	95	90	550	1,480	5,960	1,030	267	185
17	132	110	105	115	100	95	530	2,570	4,290	950	260	176
18	130	125	100	115	100	100	520	3,440	4,000	897	264	170
19	130	130	105	110	100	110	650	4,160	4,180	853	264	165
20	136	135	105	110	100	115	1,010	4,880	*4,340	804	248	165
21	165	135	105	110	100	120	1,200	5,810	4,310	771	234	163
22	173	125	160	110	105	130	1,200	6,670	3,480	764	223	163
23	185	120	220	110	100	140	966	7,310	3,040	*738	217	163
24	147	115	250	105	*95	170	1,020	7,770	3,420	708	*210	157
25	134	110	180	100	95	200	890	*8,110	3,350	702	210	152
26	132	110	170	105	95	210	818	8,250	3,060	656	203	150
27	136	110	160	110	95	160	825	7,890	3,140	618	223	150
28	130	110	150	100	95	150	750	7,950	3,110	618	223	*155
29	*128	110	120	100	95	140	*690	7,590	3,000	586	217	168
30	139	110	120	100	------	*150	650	7,130	2,740	607	296	168
31	126	-----	140	90	-----	170	-----	7,550	------	529	279	------
Total	4,356	3,455	3,773	3,565	2,885	3,600	15,369	113,224	165,220	37,031	9,583	5,665
Mean	141	115	122	115	99.5	116	512	3,652	5,507	1,195	309	189
Cfsm	0.220	0.180	0.191	0.180	0.155	0.181	0.800	5.71	8.60	1.87	0.483	0.295
In.	0.25	0.20	0.22	0.21	0.17	0.21	0.89	6.58	9.60	2.15	0.56	0.33
Ac-ft	8,640	6,850	7,480	7,070	5,720	7,140	30,480	224,600	327,700	73,450	19,010	11,240

Calendar year 1955: Max 5,940 Min 70 Mean 674 Cfsm 1.05 In. 14.29 Ac-ft 488,000
Water year 1955-56: Max 9,740 Min 80 Mean 1,005 Cfsm 1.57 In. 21.37 Ac-ft 729,400

Peak discharge (base, 5,500 cfs).--June 2 (1 a.m.) 11,300 cfs (9.11 ft); June 12 (12 p.m.) 8,110 cfs (7.70 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 1 to about Apr. 15. No gage-height record Nov. 2-30, Dec. 2 to Mar. 29, Mar. 31 to Apr. 19, Apr. 28, Apr. 30 to May 4; discharge estimated on basis of 4 discharge measurements, weather records, records for Gardiner River near Mammoth, and inflow to Yellowstone River between stations at Lake Outlet and at Corwin Springs.

Gardiner River near Mammoth, Yellowstone National Park

Location.--Lat 45°00', long 110°42', on left bank at Wyoming-Montana State Line, 400 ft upstream from highway bridge, three-quarters of a mile downstream from Boiling River, 1½ miles north of Mammoth, and 2½ miles upstream from mouth.

Drainage area.--200 sq mi.

Records available.--October 1938 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 5,580 ft (from topographic map).

Average discharge.--18 years, 211 cfs (152,800 acre-ft per year).

Extremes.--Maximum discharge during year, 2,080 cfs June 4 (gage height, 4.46 ft); minimum, 60 cfs Mar. 11 (gage height, 1.33 ft).

1938-56: Maximum discharge, that of June 4, 1956; maximum gage height, 4.55 ft June 20, 1943; minimum discharge, 35 cfs Mar. 28, 1942 (gage height, 1.08 ft).

Remarks.--Records good. No regulation or diversion.

Cooperation.--Water-stage recorder inspected by officials of National Park Service.

Rating table, water year 1955-56 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Sept. 5-30)

1.4	68	2.8	630
1.6	103	3.3	925
1.9	186	3.8	1,370
2.4	413	4.3	1,900

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	112	88	*103	114	78	88	92	176	1,600	536	229	152
2	112	92	101	112	88	88	90	172	1,830	526	225	147
3	110	107	90	107	97	86	86	183	1,740	520	217	147
4	110	105	92	107	99	86	88	198	1,810	476	209	147
5	110	110	95	105	97	90	88	251	1,720	444	206	144
6	112	103	95	103	95	86	84	274	1,440	449	194	144
7	110	103	94	95	95	82	86	363	1,140	460	198	144
8	108	103	95	97	92	88	88	470	1,080	439	190	144
9	110	105	97	90	90	88	90	487	1,230	378	190	147
10	110	107	92	101	92	82	94	455	1,290	358	190	152
11	110	103	95	101	92	79	97	429	1,340	353	186	155
12	112	86	94	99	92	80	101	349	1,330	353	179	176
13	110	88	81	99	92	80	103	269	1,320	329	172	152
14	110	99	68	*97	90	80	110	251	1,260	325	169	144
15	110	81	78	99	90	82	118	325	1,170	325	162	138
16	110	79	101	99	81	86	125	476	1,070	320	166	136
17	110	99	95	99	90	90	125	608	918	310	169	133
18	110	114	92	97	94	92	125	663	773	306	166	133
19	110	116	97	97	92	93	133	773	762	292	162	133
20	112	121	97	95	94	93	147	890	*768	283	162	133
21	110	120	94	95	97	93	166	1,140	843	278	159	133
22	112	110	103	95	100	96	172	1,460	746	274	155	133
23	110	105	176	95	95	100	179	1,470	696	251	152	130
24	110	100	141	90	*90	105	198	1,460	707	*243	*152	130
25	107	100	125	84	86	110	217	*1,600	707	238	152	133
26	110	100	118	94	88	114	217	1,700	663	238	152	130
27	110	100	114	97	90	100	206	1,600	652	234	155	133
28	*107	101	105	86	90	90	209	1,720	646	238	155	136
29	107	103	84	88	90	92	*217	1,830	630	247	155	*138
30	110	103	86	86	------	*95	186	1,570	592	260	169	133
31	101	-----	118	82	-----	92	-----	1,540	------	234	159	------
Total	3,402	3,051	3,116	3,005	2,656	2,806	4,037	25,152	32,473	10,517	5,463	4,230
Mean	110	102	101	96.9	91.6	90.5	135	811	1,082	339	176	141
Cfsm	0.550	0.510	0.505	0.484	0.458	0.452	0.675	4.06	5.41	1.70	0.880	0.705
In.	0.63	0.57	0.58	0.56	0.49	0.52	0.75	4.68	6.04	1.96	1.02	0.79
Ac-ft	6,750	6,050	6,180	5,960	5,270	5,570	8,010	49,890	64,410	20.860	10,840	8,390

Calendar year 1955:	Max	928	Min	67	Mean	179	Cfsm	0.895	In.	12.15	Ac-ft	129,700
Water year 1955-56:	Max	1,830	Min	68	Mean	273	Cfsm	1.36	In.	18.59	Ac-ft	198,200

Peak discharge (base, 700 cfs).--June 4 (3 a.m.) 2,080 cfs (4.46 ft).
* Discharge measurement made on this day.
Note.--No gage-height record Oct. 4-17, Nov. 21-27, Feb. 21-23, Mar. 12-25, 27-29; discharge estimated on basis of weather records and records for nearby streams.

Yellowstone River at Corwin Springs, Mont.

Location.--Lat 45°07', long 110°48', in NW¼ sec. 30, T. 8 S., R. 8 E., on left bank 20 ft downstream from highway bridge at Corwin Springs, 1½ miles upstream from Mol Heron Creek, and 7 miles (revised) northwest of Gardiner.

Drainage area.--2,630 sq mi, approximately.

Records available.--September 1910 to September 1956.

Gage.--Water-stage recorder and supplemental wire-weight gage read once daily. Altitude of gage is 5,090 ft (by barometer). Prior to April 1935, chain and staff gages on bridge at same datum.

Average discharge.--46 years, 3,026 cfs (2,191,000 acre-ft per year).

Extremes.--Maximum discharge during year, 23,700 cfs June 2 (gage height, 9.39 ft); minimum daily, 500 cfs Nov. 15.

1910-56: Maximum discharge observed, 26,500 cfs June 14, 15, 1918 (gage height 11.5 ft), from rating curve extended above 18,000 cfs; minimum discharge observed, 389 cfs Feb. 23, Mar. 5, 9, 1937 (gage height, 0.05 ft).

Remarks.--Records good except those for periods of ice effect, which are poor. Natural storage in Yellowstone Lake. Diversions for irrigation of about 960 acres, of which 40 acres lie below station.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 27-30)

0.5	630	4.0	5,320
1.0	930	6.0	10,700
2.0	1,960	9.0	22,000
3.0	3,420	9.1	22,400

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,350	1,010	1,030	1,030	b970	1,000	1,200	2,130	20,500	11,400	4,840	2,510
2	1,320	930	1,030	1,010	1,020	1,010	1,070	2,050	22,200	10,900	4,720	2,430
3	1,300	1,120	954	994	1,060	1,020	1,070	2,060	21,100	11,400	4,640	2,330
4	1,290	1,100	874	994	1,070	1,010	1,140	2,090	*21,600	10,500	4,460	2,260
5	1,300	1,130	b840	1,030	1,100	1,020	1,170	2,610	21,500	9,950	4,330	2,210
6	1,270	1,020	b800	1,020	1,020	1,010	986	2,860	19,100	9,280	4,200	2,170
7	1,260	1,010	777	1,010	1,040	938	1,050	3,130	15,900	9,370	4,080	2,120
8	1,240	1,000	783	1,000	1,030	994	1,120	3,410	16,300	8,990	4,010	2,090
9	1,250	1,020	860	978	1,010	1,000	1,090	4,050	17,900	8,700	3,900	2,100
10	1,220	1,040	874	986	1,010	1,020	1,160	4,270	18,600	8,430	3,830	2,120
11	1,260	1,030	881	1,020	1,010	994	1,270	4,160	18,800	8,390	3,740	2,160
12	1,250	994	840	1,030	1,010	978	1,350	3,810	19,400	8,370	3,640	2,250
13	1,220	650	771	1,050	1,020	1,000	1,380	3,370	19,300	8,040	3,520	2,210
14	1,200	b540	640	1,060	b1,020	994	1,510	3,120	17,600	7,720	3,440	2,040
15	1,180	b500	670	1,050	b1,000	962	1,710	3,290	18,100	7,450	3,390	1,940
16	1,170	b600	867	1,070	b950	970	1,940	4,160	18,000	7,190	3,320	1,890
17	1,150	881	909	1,070	b930	1,010	1,840	6,050	15,400	6,930	3,260	1,850
18	1,140	1,030	874	1,080	b910	1,060	1,820	7,900	14,600	6,700	3,210	1,820
19	1,130	970	909	1,090	b920	1,070	2,000	9,400	14,700	6,500	3,130	1,770
20	1,150	994	867	1,080	b940	1,110	2,320	11,000	15,100	6,360	3,080	1,730
21	1,220	1,100	847	1,080	962	1,140	2,730	12,800	15,000	6,220	3,020	1,740
22	1,250	1,100	888	1,100	962	1,160	2,940	14,700	14,000	6,120	2,920	1,730
23	1,290	1,040	1,350	1,110	978	1,200	2,640	16,200	12,900	5,930	2,850	1,680
24	1,210	1,030	1,510	1,060	978	1,240	2,760	17,200	13,100	5,770	2,800	1,660
25	1,170	970	1,160	1,010	946	1,380	2,680	17,700	13,200	5,700	2,760	1,620
26	1,150	1,000	1,120	b980	946	1,420	2,530	18,200	*12,500	5,520	2,720	1,600
27	1,150	994	1,110	b900	970	1,200	2,540	18,200	13,200	5,360	2,720	1,560
28	1,140	1,000	1,060	b850	*978	*1,190	2,420	18,600	13,100	5,280	*2,670	*1,570
29	1,120	1,010	*923	b800	994	1,120	2,360	18,400	12,800	5,170	2,610	1,590
30	1,140	*1,030	847	b850	------	1,140	*2,220	17,400	12,200	*5,150	2,700	1,570
31	*1,120	-----	994	*b930	-----	1,210	------	*18,100	------	4,920	2,610	------
Total	37,610	28,843	28,859	31,322	28,804	33,570	54,016	272,720	497,700	233.810	107,120	58,320
Mean	1,213	961	931	1,010	993	1,083	1,801	8,797	16,590	7,542	3,455	1,944
Cfsm	0.461	0.365	0.354	0.384	0.378	0.412	0.685	3.34	6.31	2.87	1.31	0.739
In.	0.53	0.41	0.41	0.44	0.41	0.47	0.76	3.86	7.04	3.31	1.51	0.82
Ac-ft	74,600	57,210	57,240	62,130	57,130	66,590	107,100	540,900	987,200	463.800	212,500	115,700

Calendar year 1955: Max 13,600 Min 500 Mean 2,556 Cfsm 0.972 In. 13.19 Ac-ft 1,850,000
Water year 1955-56: Max 22,200 Min 500 Mean 3,860 Cfsm 1.47 In. 19.97 Ac-ft 2,802,000

Peak discharge (base, 12,000 cfs).--June 2 (4:30 to 6 a.m.) 23,700 cfs (9.39 ft); June 13 (4 to 5 a.m.) 20,700 cfs (8.68 ft).

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

Mill Creek near Pray, Mont.

Location.--Lat 45°21', long 110°37', in SE¼NW¼ sec. 33, T. 5 S., R. 9 E., on downstream side of left abutment of private bridge, a quarter of a mile downstream from Davis Creek, 4½ miles upstream from mouth, and 4½ miles southeast of Pray.

Records available.--March 1951 to September 1956 (discontinued).

Gage.--Staff gage read twice daily. Altitude of gage is 5,090 ft (by barometer).

Extremes.--Maximum daily discharge during year, 1,600 cfs May 23; maximum gage height observed, 4.6 ft Nov. 17; minimum daily discharge, 10 cfs Dec. 29.

1951-56: Maximum discharge observed, 2,300 cfs June 6, 1952 (gage height, 3.20 ft, from graph based on gage readings); minimum observed, 3.9 cfs Nov. 9, 1952, Feb. 9, 1953 (gage height, 0.28 ft).

Maximum stage known, about 6.0 ft in May 1948, from information by local residents.

Remarks.--Records fair except those for periods of ice effect, which are poor. Diversions for irrigation of about 3,500 acres, of which 2,600 acres lie downstream from station.

Rating tables, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 31 to Nov. 2)

Oct. 1-11		Oct. 12 to Sept. 30			
1.2	37	0.9	13	1.8	190
1.3	54	1.1	25	2.2	440
		1.2	34	2.7	1,030
		1.3	48	3.5	2,400
		1.5	90		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	39	30	40	40	26	28	32	61	1,360	252	49	28
2	39	31	35	36	30	27	33	55	1,370	252	48	28
3	39	55	32	38	33	28	34	55	1,440	246	46	28
4	40	67	31	39	33	28	35	65	1,470	230	45	28
5	37	63	30	38	29	27	35	74	1,370	235	45	27
6	39	51	29	38	29	26	28	76	1,290	205	42	27
7	39	35	28	39	30	32	26	120	1,210	183	40	28
8	42	30	26	38	30	40	29	183	1,090	186	38	28
9	40	21	26	35	30	36	35	195	1,030	175	36	28
10	42	20	28	31	30	28	45	220	1,020	153	35	29
11	42	28	27	31	30	26	46	210	974	140	33	30
12	43	59	22	27	31	26	51	183	904	123	32	29
13	40	19	15	32	35	26	67	175	864	114	32	15
14	38	19	13	31	36	27	81	146	825	108	30	18
15	35	25	16	30	29	30	99	164	760	105	29	25
16	34	30	26	29	24	31	120	215	676	90	28	27
17	31	40	33	32	27	33	99	282	640	83	29	30
18	29	50	38	29	28	32	96	388	596	83	29	30
19	31	55	39	34	30	32	117	618	521	76	30	28
20	30	57	40	42	34	31	150	736	494	74	28	27
21	28	58	40	43	32	35	190	1,120	476	69	29	28
22	28	57	39	42	31	34	183	1,520	432	61	32	29
23	28	56	38	38	31	35	140	1,600	402	59	33	28
24	28	55	37	25	32	39	133	1,550	372	*63	31	28
25	29	54	38	18	32	49	130	1,390	*352	61	30	30
26	30	52	39	25	31	65	102	1,320	332	55	29	30
27	30	45	35	29	30	51	78	1,360	320	57	28	30
28	30	40	20	28	*28	*40	81	1,210	306	53	*30	*29
29	30	39	*10	27	28	27	72	1,080	288	55	28	29
30	32	*39	25	24	------	32	*65	1,020	264	55	27	28
31	*28	------	40	*26	------	33	------	*988	------	55	28	------
Total	1,070	1,280	935	1,014	879	1,043	2,432	18,379	23,448	3,756	1,049	827
Mean	34.5	42.7	30.2	32.7	30.3	33.4	81.1	593	782	121	33.8	27.6
Ac-ft	2,120	2,540	1,850	2,010	1,740	2,050	4,820	36,450	46,510	7,450	2,080	1,640

Calendar year 1955:	Max 908	Min 10	Mean 100	Ac-ft 72,690
Water year 1955-56:	Max 1,600	Min 10	Mean 153	Ac-ft 111,300

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 10, Nov. 13 to Dec. 14, Dec. 23-31, Jan. 24 to Feb. 11, Feb. 15, 19, 24-29, Mar. 12, 13, 29.

Yellowstone River near Livingston, Mont.

Location.--Lat 45°36', long 110°34', in NW¼ sec. 12, T. 3 S., R. 9 E., on right bank 50 ft downstream from bridge on U. S. Highway 89, 2 miles downstream from Suce Creek, and 5 miles south of Livingston.

Drainage area.--3,580 sq mi, approximately.

Records available.--May 1897 to December 1905, August 1928 to September 1932, March 1938 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 4,545 ft (from topographic map). May 2, 1897, to Dec. 31, 1905, chain gage on highway bridge at different datum. Aug. 23, 1928, to Sept. 30, 1932, and Mar. 14, 1938, to Feb. 3, 1951, chain gage on highway bridge at present datum.

Average discharge.--30 years, 3,649 cfs (2,642,000 acre-ft per year).

Extremes.--Maximum discharge during year, 25,800 cfs June 2 (gage height, 8.57 ft); minimum daily, 850 cfs Nov. 16, Dec. 15.

1897-1905, 1928-32, 1938-56: Maximum discharge observed, 30,600 cfs June 20, 1943 (gage height, 9.34 ft); minimum daily, 590 cfs Jan. 22, 1940.

Remarks.--Records good except those for periods of ice effect, which are fair. Diversions for irrigation of 24,200 acres, of which 2,000 acres lie below station.

Rating tables, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Nov. 23 to Dec. 3)

Oct. 1 to June 1				June 2 to Sept. 30			
1.3	1,110	4.0	6,800	2.1	1,880	6.0	14,400
1.6	1,500	7.0	17,400	3.0	3,480	8.5	25,500
2.5	3,000	8.0	21,900	4.0	6,480		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,900	*1,630	1,720	1,400	1,150	1,320	1,560	*2,570	21,100	12,600	5,270	2,860
2	1,880	1,510	1,730	1,400	1,100	1,350	1,510	2,470	24,300	12,100	5,170	2,780
3	1,850	1,560	1,660	1,400	1,150	1,320	1,390	2,450	23,800	12,400	5,040	2,680
4	1,820	1,730	1,500	1,420	1,250	1,320	1,440	2,480	*23,700	11.600	4,880	2,600
5	1,820	1,720	1,300	1,440	1,400	1,310	1,500	2,670	23,900	11,200	4,700	2,550
6	1,820	1,720	1,450	1,460	1,430	1,320	1,460	3,190	22,200	10,900	4,550	2,500
7	1,790	1,630	1,400	1,440	1,440	1,200	1,330	3,360	19,100	10,900	4,410	2,440
8	1,780	1,630	1,300	1,420	1,430	1,200	1,430	3,810	18,500	10,300	4,350	2,410
9	1,740	1,660	1,350	1,370	1,400	1,250	1,440	4,360	19,500	9,980	4,210	2,400
10	1,740	1,680	1,400	1,400	1,360	1,250	1,490	4,560	20,200	9,660	4,080	2,400
11	1,760	1,740	1,440	1,420	1,370	1,150	1,600	4,650	20,700	9,460	4,030	2,430
12	1,780	1,570	1,460	1,440	1,400	1,100	1,670	4,360	21,300	9,380	3,900	2,480
13	1,760	1,300	1,360	1,460	1,430	1,250	1,760	3,930	21,300	9,120	3,770	2,570
14	1,730	950	1,170	1,470	1,350	1,250	1,850	3,580	20,000	8,810	3,700	2,380
15	1,720	900	850	1,400	1,300	1,200	2,020	3,540	20,100	8,550	3,650	2,270
16	1,720	850	1,000	1,300	1,200	1,250	2,240	4,120	20,100	8.240	3,580	2,220
17	1,680	900	1,050	1,350	1,150	1,300	2,360	5,630	18,000	7,900	3,530	2,200
18	1,670	1,200	1,050	1,400	1,150	1,360	2,260	7,760	16,700	7,640	3,460	2,150
19	1,640	1,500	1,050	1,450	1,250	1,400	2,310	8,900	16,600	7,340	3,410	2,120
20	1,640	1,700	1,250	1,450	1,300	1,440	2,590	10,200	17,000	7,130	3,330	2,080
21	1,680	1,800	1,600	1,450	1,350	1,500	2,980	12,100	16,900	6,950	3,300	2,070
22	1,740	1,850	1,500	1,450	1,390	1,500	3,360	14,500	16,200	6,840	3,220	2,050
23	1,790	1,760	1,500	1,450	1,420	1,600	3,280	16,600	15,000	6,620	3,150	2,020
24	1,740	1,720	1,800	1,450	1,400	1,640	3,150	18,000	14,900	6,410	3,080	2,000
25	1,700	1,660	1,600	1,350	1,390	1,780	3,190	19,000	*15,100	6,280	3,020	1,980
26	1,670	1,680	1,550	1,300	1,370	1,840	3,000	19,200	14,300	6,110	3,000	1,940
27	1,680	1,680	1,550	1,250	*1,370	1,680	3,020	19,100	14,100	5,940	2,960	1,930
28	1,670	1,700	1,500	1,200	1,360	*1,490	2,860	20,200	13,900	5,800	*3,020	*1,930
29	1,660	1,700	*1,300	1,200	1,320	1,460	2,760	20,600	13,600	5,660	2,960	1,940
30	1,670	*1,720	1,100	*1,200	------	1,470	2,700	19,500	13,300	*5,630	2,980	1,960
31	1,700	------	1,150	1,200	------	1,530	------	*19,400	------	5,400	3,000	------
Total	53,940	46,350	42,640	42,790	38,380	43,030	65,510	286,790	555,400	262,850	116,710	68,340
Mean	1,740	1,545	1,375	1,380	1,323	1,388	2,184	9,251	18,510	8.479	3,765	2,278
Ac-ft	107,000	91,930	84,580	84,870	76,130	85,350	129,900	568,800	‡1,102	521,400	231,500	135,600

Calendar year 1955: Max	13,900	Min	850	Mean	2,901	Ac-ft	2,100,000
Water year 1955-56: Max	24,300	Min	850	Mean	4,434	Ac-ft	3,219,000

Peak discharge (base, 13,500 cfs).--June 2 (12:15 p.m.) 25,800 cfs (8.57 ft).

* Discharge measurements made on this day.

‡ Expressed in thousands.

Note.--Stage-discharge relation affected by ice Nov. 13-22, Dec. 4-10, Dec. 15 to Jan. 3, Jan. 15 to Feb. 4, Feb. 14-20, Mar. 7-16.

Shields River near Wilsall, Mont.

Location.--Lat 46°09', long 110°35', in SE¼NW¼ sec. 34, T. 5 N., R. 9 E., on left bank 11 miles northeast of Wilsall and 12 miles upstream from Flathead Creek.

Records available.--May 1935 to September 1956.

Gage.--Wire-weight gage read once daily. Altitude of gage is 5,590 ft (by barometer). May 10, 1935, to Oct. 12, 1942, staff gage at site 800 ft downstream at different datum. Oct. 13, 1942, to May 21, 1948, staff gage at present site and datum.

Average discharge.--21 years, 60.2 cfs (43,580 acre-ft per year).

Extremes.--Maximum discharge observed during year, 718 cfs May 28 (gage height, 4.18 ft); minimum daily, 9 cfs Jan. 26-31.

1935-56: Maximum discharge, 1,770 cfs June 4 or 5, 1948, from rating curve extended above 730 cfs; maximum gage height observed, 5.02 ft June 3, 1953; minimum daily discharge, 2.3 cfs Feb. 11-15, 1936.

Remarks.--Records fair except those for periods of ice effect, which are poor. Diversions for irrigation of 3,100 acres, of which 830 acres lie below station.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 20 to Apr. 1, Apr. 20 to May 15)

1.9	8	2.6	78
2.0	10	3.0	172
2.1	14	3.5	380
2.2	20	4.0	630
2.4	43	4.5	920

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	14	*13	*15	15	10	11	16	*48	*490	31	26	16
2	15	13	15	15	*11	11	15	45	505	28	25	15
3	15	14	14	15	12	11	14	45	480	29	24	14
4	*15	14	13	15	13	11	13	45	440	29	24	14
5	15	14	12	14	14	11	12	45	415	28	24	14
6	15	14	13	13	15	12	13	54	345	26	22	12
7	16	13	13	14	15	12	12	63	229	26	22	12
8	15	14	13	15	13	12	13	80	193	26	24	12
9	15	14	13	15	13	11	13	94	181	26	24	12
10	15	14	13	15	13	10	14	120	175	27	24	12
11	15	13	15	15	14	10	20	138	178	27	24	12
12	16	12	15	15	14	10	31	130	169	27	21	12
13	1s	11	12	15	12	11	36	111	156	25	18	12
14	18	10	12	13	11	12	74	105	138	28	16	12
15	16	10	12	13	10	12	111	120	142	29	13	11
16	16	11	12	13	10	11	120	153	153	29	11	10
17	16	12	10	13	11	11	116	210	135	28	11	9.8
18	16	14	10	13	11	10	113	308	128	27	11	9.8
19	16	16	12	13	12	9.8	118	390	*109	26	12	9.6
20	16	17	15	13	13	9.6	120	410	105	26	14	9.2
21	16	17	15	12	14	9.8	118	450	98	27	14	9.4
22	16	16	15	12	15	10	111	535	92	27	13	10
23	16	15	13	12	14	10	109	610	78	26	14	11
24	16	14	14	10	13	10	94	646	70	24	14	10
25	16	14	16	10	12	12	82	630	67	*23	15	*9.8
26	16	13	16	9	11	19	74	605	54	22	15	9.6
27	14	11	14	9	*11	28	68	595	45	24	16	9.6
28	15	14	15	9	11	28	67	685	35	27	16	10
29	15	16	15	9	11	*24	59	668	33	26	*16	10
30	15	16	*15	9	------	20	54	652	31	26	20	11
31	14	------	15	9	------	19	------	505	------	26	19	------
Total	482	409	422	392	359	408.2	1,830	9,295	5,469	826	562	340.8
Mean	15.5	13.6	13.6	12.6	12.4	13.2	61.0	300	182	26.6	18.1	11.4
Ac-ft	956	811	837	778	712	810	3,630	18,440	10,850	1,640	1,110	676

Calendar year 1955: Max 495 Min 8 Mean 46.8 Ac-ft 33,880
Water year 1955-56: Max 685 Min 9 Mean 56.8 Ac-ft 41,250

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Oct. 27 to Nov. 7, Nov. 10-28, Dec. 3 to Mar. 18.

Shields River at Clyde Park, Mont.

Location.--Lat 45°53'10", long 110°37'05", in NW¼NW¼ sec. 33, T. 2 N., R. 9 E., on right bank just downstream from highway bridge, three-quarters of a mile west of Clyde Park and 2 miles upstream from Brackett Creek.

Drainage area.--544 sq mi.

Records available.--March 1921 to September 1923, April 1929 to December 1932, February 1934 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 4,780 ft (from topographic map). Mar. 31, 1921, to Sept. 30, 1923, wire-weight gage at present site at different datum. Apr. 27, 1929, to Jan. 5, 1951, wire-weight gage at present site and datum.

Average discharge.--25 years (1929-32, 1934-56), 155 cfs (112,200 acre-ft per year).

Extremes.--Maximum discharge during year, 1,900 cfs Mar. 26 (gage height, 4.65 ft); maximum gage height, 5.77 ft Mar. 25 (backwater from ice); minimum discharge, 14 cfs Sept. 20, 21, 22.

1921-23, 1929-32, 1934-56: Maximum discharge, 4,450 cfs Mar. 29, 1943; maximum gage height observed, 7.39 ft June 5, 1948; minimum discharge observed, 1.8 cfs Aug. 29, 1935 (gage height, 0.72 ft).

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of about 19,500 acres, of which 500 acres lie below station.

Rating tables, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar· 26 to Apr· 4)

Oct· 1 to May 29				May 30 to Sept· 30			
1·5	30	2·5	395	1·5	11	2·0	115
1·7	75	3·0	700	1·6	18	2·5	380
2·0	165	4·0	1,450	1·7	33	3·0	700
				1·8	53	4·0	1,450

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	46	*40	*60	75	55	50	276	*340	*1,050	51	41	22
2	46	50	58	75	*61	50	176	340	1,060	49	33	21
3	46	50	55	75	65	48	162	340	1,000	47	33	20
4	*46	55	50	77	70	50	198	340	940	51	35	20
5	48	58	45	75	75	55	252	351	854	47	33	21
6	46	52	50	72	72	57	169	384	749	49	28	21
7	48	45	55	70	70	55	162	384	616	45	32	21
8	42	47	50	68	70	60	206	384	466	41	33	21
9	40	48	55	65	67	60	227	422	422	43	33	21
10	36	50	55	60	67	55	310	558	374	39	35	20
11	42	50	53	63	65	50	362	648	356	45	37	20
12	44	55	50	63	62	60	305	654	338	45	37	22
13	46	54	40	62	57	65	325	596	290	43	35	24
14	44	40	38	62	55	65	362	540	238	45	28	21
15	44	35	35	60	45	60	390	522	232	49	27	18
16	42	45	40	60	35	70	444	552	272	45	26	18
17	40	55	40	58	38	75	444	668	238	41	24	17
18	40	60	38	58	40	80	412	826	210	39	22	17
19	40	65	40	57	43	75	395	932	*180	37	21	17
20	42	70	45	56	45	75	406	1,000	170	30	22	14
21	44	65	60	55	48	80	462	1,140	160	28	20	14
22	48	60	75	55	50	90	498	1,260	147	33	20	15
23	50	55	90	55	43	100	510	1,310	131	37	20	16
24	52	50	75	52	41	200	474	1,330	123	39	20	16
25	55	50	70	50	40	500	422	1,390	115	*37	20	*15
26	58	50	65	53	45	1,250	390	1,320	98	39	18	15
27	60	60	60	55	*47	462	384	1,290	80	37	20	15
28	58	70	70	52	48	276	356	1,330	72	37	21	17
29	58	72	70	50	50	*266	346	1,390	61	35	*22	26
30	55	72	*73	48	------	340	340	1,310	53	33	26	27
31	54	------	75	45	------	462	------	1,130	------	33	22	------
Total	1,460	1,619	1,735	1,881	1,569	5,241	10,165	24,981	11,095	1,269	844	572
Mean	47·1	54·0	56·0	60·7	54·1	169	339	806	370	40·9	27·2	19·1
Ac-ft	2,900	3,210	3,440	3,730	3,110	10,400	20,160	49,550	22,010	2,520	1,670	1,130

Calendar year 1955:	Max 750	Min 22	Mean 123	Ac-ft 88,830
Water year 1955-56:	Max 1,390	Min 14	Mean 171	Ac-ft 123,800

Peak discharge (base, 400 cfs).--Mar· 26 (3:30 a·m·) 1,900 cfs (4·65 ft); Mar· 31 (9 a·m·) 540 cfs (2·87 ft); Apr· 22 (8 p·m·) 510 cfs (2.71 ft); May 25 (7:30 a·m·) 1,430 cfs (3·98 ft)·

* Discharge measurement made on this day·

Note·--Stage-discharge relation affected by ice Oct· 30 to Mar· 25 (no gage-height record Dec· 31 to Feb· 1, Feb· 3-26; discharge estimated on basis of 3 discharge measurements, weather records, and records for station near Wilsall)·

Brackett Creek near Clyde Park, Mont.

Location.--Lat 45°52'00", long 110°40'10", in SE¼NE¼ sec. 1, T. 1 N., R. 8 E., rear right bank on upstream side of private bridge, 3½ miles (revised) southwest of Clyde Park and 4 miles upstream from mouth.

Records available.--March 1921 to September 1923, April 1934 to September 1956.

Gage.--Wire-weight gage read once daily. Altitude of gage is 4,930 ft (from topographic map). Mar. 30, 1921, to Sept. 30, 1923, staff gage at site three-quarters of a mile upstream at different datum. Apr. 5, 1934, to May 24, 1949, staff gage and May 25, 1949, to Dec. 14, 1953, wire-weight gage, at site 25 ft upstream at present datum.

Average discharge.--22 years (1921-23, 1934-35, 1937-56), 29.1 cfs (21,070 acre-ft per year).

Extremes.--Maximum discharge observed during year, 263 cfs May 21 (gage height, 2.92 ft); maximum observed gage height, 3.40 ft Dec. 31 (backwater from ice); minimum daily discharge, 4 cfs Mar. 7, 10, 11.

1921-23, 1934-56: Maximum discharge, 1,400 cfs May 22, 1948 (gage height, 4.9 ft, from floodmark), from rating curve extended above 330 cfs; minimum daily, 0.5 cfs Dec. 23, 24, 1952.

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of 650 acres above station.

Rating tables, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 24		Mar. 25 to Sept. 30			
0.7	7.0	0.8	6.6	1.4	50
.9	14	.9	10	2.0	126
1.0	19	1.1	22	3.0	275

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8.5	*7	*12	15	5.5	6.5	25	*75	*150	37	12	12
2	8.2	7	10	16	*6.5	6.5	22	79	154	37	11	10
3	8.8	9.5	11	17	7	7	21	79	139	40	12	12
4	*8.5	11	11	17	7.5	7	22	78	132	46	11	15
5	10	14	10	17	8	5.5	23	78	125	38	9.6	15
6	11	12	12	15	8.5	4.5	25	86	116	29	8.5	15
7	10	14	11	13	8.5	4	22	90	106	30	8.5	14
8	9.4	14	11	12	8	5.5	22	112	101	29	8.9	13
9	8.8	11	11	10	8	5.5	24	130	97	29	9.3	12
10	8.8	12	9.5	9.5	8.5	4	32	127	95	25	10	11
11	9.1	11	11	10	8.5	4	39	148	90	26	9.3	13
12	9.1	9.5	12	9	8.5	4.5	37	154	86	29	9.3	12
13	9.7	9	11	8.5	7.5	5.5	48	149	94	26	9.3	13
14	10	8.5	10	7.5	7.5	5.5	70	140	91	24	7.0	12
15	9.1	8	8.5	7.5	6.5	5.5	92	149	66	25	7.0	9.6
16	8.8	8.5	12	8	5.5	6	99	164	66	26	8.1	9.6
17	8.8	8.5	11	8.5	5	6.5	100	214	66	23	7.7	8.9
18	8.8	9	10	8.5	5	6.5	103	230	57	21	7.0	8.1
19	8.5	10	11	8.5	6.5	7	105	240	*50	22	6.6	8.9
20	8.2	12	12	8.5	7.5	7.5	121	228	46	18	6.6	8.9
21	8.2	13	15	8.5	7.5	9	134	254	48	17	6.6	8.9
22	9.1	13	17	8.5	7.5	13	127	240	52	15	6.6	8.9
23	12	12	18	8	8	30	116	222	46	12	7.0	8.9
24	13	11	17	6	7.5	50	99	212	47	12	8.5	8.1
25	14	10	16	5.5	7	71	84	196	46	*13	8.9	*7.7
26	12	9	16	6	7	46	80	174	42	13	9.3	7.4
27	10	10	16	6.5	*6.5	32	82	170	40	13	10	7.4
28	10	11	15	6.5	6.5	28	77	166	40	14	9.3	7.7
29	10	12	15	6	6.5	*22	78	168	39	13	*10	9.6
30	9	12	*15	5.5	------	25	78	161	37	13	12	11
31	8	------	14	5.5	------	26	------	152	------	12	13	------
Total	297.4	318.5	391.0	298.5	208.0	466.5	2,007	4,865	2,364	727	273.9	318.6
Mean	9.59	10.6	12.6	9.63	7.17	15.0	66.9	157	78.8	23.5	9.03	10.6
Ac-ft	590	632	776	592	413	925	3,980	9,650	4,690	1,440	555	632

Calendar year 1955: Max	136	Min	1.5	Mean	24.6	Ac-ft	17,830
Water year 1955-56: Max	254	Min	4	Mean	34.3	Ac-ft	24,880

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Oct. 30 to Nov. 3, Nov. 7, Nov. 11 to Mar. 24.

Boulder River near Contact, Mont.

Location.--Lat 45°33'20", long 110°12'00", in SE¼ sec. 23, T. 3 S., R. 12 E., on left bank half a mile below Boulder Falls, 3 miles north of Contact, 6 miles upstream from East Fork of Boulder River, and 22 miles southwest of Big Timber.

Records available.--May 1910 to September 1916, April to August 1929, October 1950 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 4,930 ft (from topographic map). Prior to July 15, 1951, staff gages at site 1½ miles downstream at different datums.

Average discharge.--7 years (1910-11, 1950-56), 362 cfs (262,100 acre-ft per year).

Extremes.--Maximum discharge, 3,490 cfs June 2 (gage height, 5.84 ft); minimum, 22 cfs Jan. 9 (gage height, 1.37 ft).

1910-16, 1929, 1950-56: Maximum discharge observed, 4,750 cfs June 27, 1916 (gage height, 8.4 ft, site and datum then in use); minimum, 6.5 cfs Feb. 20, 1954 (gage height, 0.95 ft).

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of about 10 acres above station.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 21 to June 5)

1.5	33	3.0	545
1.8	73	3.5	930
2.1	134	4.0	1,380
2.4	220	6.0	3,880

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	95	70	70	74	*55	50	56	120	*2,860	1,070	337	156
2	95	*68	*68	66	61	*51	52	*116	3,100	964	310	144
3	93	82	60	60	61	52	48	113	2,800	845	295	136
4	91	87	63	70	59	52	56	111	2,970	738	265	134
5	*89	87	56	70	56	52	54	122	3,030	730	242	132
6	87	71	67	67	54	48	49	136	2,430	794	229	127
7	89	78	68	65	52	43	48	142	1,810	904	220	120
8	89	80	65	62	52	47	54	175	1,920	845	213	116
9	86	78	67	53	54	50	52	216	2,380	811	206	118
10	87	84	65	67	53	47	57	234	2,650	820	206	116
11	89	78	62	65	56	53	62	242	2,720	820	202	134
12	89	40	65	63	56	48	60	229	2,910	768	199	132
13	87	34	60	63	54	48	65	199	2,810	700	185	164
14	89	56	50	56	50	48	75	182	2,420	670	180	142
15	87	54	50	45	44	47	86	188	2,670	632	182	127
16	86	54	58	45	52	47	105	265	2,640	590	182	118
17	86	60	56	61	60	49	103	443	1,800	552	180	113
18	82	70	55	59	58	48	103	662	*1,580	515	185	109
19	82	80	60	58	54	50	116	947	1,800	497	182	107
20	86	86	66	55	52	52	142	1,290	1,960	491	175	103
21	87	92	71	58	54	53	175	1,610	1,890	485	167	101
22	86	84	80	56	56	56	199	1,980	1,390	485	162	103
23	86	75	84	56	54	62	175	2,250	1,240	461	156	99
24	86	77	84	53	53	67	164	2,410	1,440	437	152	*95
25	84	71	82	46	50	73	149	2,620	1,520	443	152	95
26	80	71	82	48	52	73	146	2,600	1,340	*414	152	91
27	80	68	84	53	52	63	142	2,560	1,410	403	*152	89
28	78	71	73	53	48	57	132	3,260	1,430	398	149	99
29	80	70	50	52	50	50	127	2,860	1,380	381	149	101
30	84	71	45	55	------	*57	122	2,300	1,240	364	172	99
31	78	------	*73	55	------	57	------	2,370	------	337	167	------
Total	2,673	2,147	2,039	1,809	1,562	1,650	2,974	32,952	63,540	19,364	6,105	3,520
Mean	86.2	71.6	65.8	58.4	53.9	53.2	99.1	1,063	2,118	625	197	117
Ac-ft	5,300	4,260	4,040	3,590	3,100	3,270	5,900	65,360	126,000	38,410	12,110	6,980

Calendar year 1955: Max 2,550 Min 33 Mean 287 Ac-ft 208,100
Water year 1955-56: Max 3,260 Min 34 Mean 383 Ac-ft 278,300

Peak discharge (base, 2,200 cfs).--May 28 (12 m.) 3,420 cfs (5.78 ft); June 2 (1:30 a.m.) 3,490 cfs (5.84 ft); June 12 (3 a.m.) 3,320 cfs (5.62 ft); June 16 (2 a.m.) 3,200 cfs (5.50 ft); June 20 (2 a.m.) 2,230 cfs (4.74 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 11-21, Dec. 16-20, Dec. 29 to Jan. 2, Jan. 14 to Feb. 8, Feb. 14-20, Feb. 28 to Mar. 2, Mar. 11-13.

Boulder River at Big Timber, Mont.

Location.--Lat 45°50'05", long 109°56'20", in NE¼SE¼ sec. 14, T. 1 N., R. 14 E., on left bank 1 mile east of Big Timber and 2 miles upstream from mouth.

Records available.--April 1947 to December 1953, March 1955 to September 1956.

Average discharge.--7 years (1947-53, 1955-56), 570 cfs (412,700 acre-ft per year).

Gage.--Water-stage recorder. Altitude of gage is 4,060 ft (from topographic map).

Extremes.--Maximum discharge during year, 9,840 cfs May 28 (gage height, 7.84 ft); minimum, 62 cfs Mar. 12 (gage height, 2.29 ft).

1947-53, 1955-56: Maximum discharge, that of May 28, 1956; minimum daily, 45 cfs Dec. 25, 1952.

Remarks.--Records good except those for period of ice effect, which are poor. Diversions for irrigation of 13,300 acres, of which 250 acres lie below station.

Rating tables, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second) (Shifting-control method used Oct. 9 to Nov. 10, Mar. 27 to May 10, May 25 to June 1)

Oct. 1 to June 21				June 22 to Sept. 30			
2.5	95	4.0	1,150	3.1	111	4.0	750
2.7	160	5.0	2,600	3.4	210	4.5	1,630
3.0	320	6.0	4,780	3.7	390	5.0	2,600
3.5	680	7.0	7,190				

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	187	127	180	140	75	115	153	302	4,780	1,880	272	140
2	187	117	165	125	85	110	134	*308	*5,330	1,710	250	134
3	169	*142	155	115	95	115	123	308	4,950	1,500	246	134
4	*156	156	160	120	100	105	117	308	5,000	1,310	214	128
5	169	153	150	115	100	95	134	314	5,070	1,240	199	131
6	182	142	160	105	95	90	123	394	4,190	1,280	184	128
7	196	127	175	100	95	80	115	415	3,330	1,480	177	128
8	187	134	170	120	85	85	130	464	3,270	1,390	163	123
9	169	134	170	140	90	90	127	584	3,710	1,300	160	120
10	153	134	160	160	100	85	130	664	3,950	1,330	156	123
11	169	130	165	150	100	75	145	698	3,970	1,370	147	131
12	182	120	170	150	95	85	149	707	4,080	1,300	137	143
13	174	110	140	140	90	100	142	672	3,990	1,170	131	177
14	169	130	100	135	85	110	160	640	3,550	1,080	128	180
15	164	140	100	100	80	100	192	632	3,750	961	134	156
16	164	140	110	80	85	135	232	734	3,790	846	134	150
17	169	150	125	100	95	142	266	970	2,920	750	134	160
18	164	155	105	140	100	142	254	1,270	2,530	660	143	150
19	160	160	140	130	105	169	266	1,690	2,680	576	147	166
20	156	170	150	120	115	182	302	2,230	*2,960	504	140	163
21	169	180	160	140	125	169	387	2,840	2,920	444	128	156
22	164	175	165	130	135	156	457	3,400	2,380	435	128	150
23	174	165	175	120	130	187	450	3,770	2,010	408	128	143
24	160	170	175	110	125	192	401	4,100	2,120	366	123	*137
25	145	170	170	100	120	210	374	4,780	2,420	350	126	137
26	138	165	170	110	120	210	344	5,020	2,180	*334	128	128
27	142	160	165	120	125	*187	350	5,020	2,240	318	*126	126
28	138	170	160	115	*122	156	314	6,840	2,320	326	126	131
29	142	*172	*130	105	120	134	308	6,890	2,260	299	126	137
30	145	200	100	95	------	134	308	*4,880	2,120	299	134	140
31	160	------	120	*86	------	142	------	4,420	------	266	150	------
Total	5,103	4,498	4,640	3,716	2,992	4,087	7,087	66,264	100,770	27,482	4,819	4,250
Mean	165	150	150	120	103	132	236	2,138	3,359	887	155	142
Ac-ft	10,120	8,920	9,200	7,370	5,930	8,110	14,060	131,400	199,900	54,510	9,560	8,430

Calendar year 1955: Max - Min - Mean - Ac-ft -
Water year 1955-56: Max 6,890 Min 75 Mean 644 Ac-ft 467,500

Peak discharge (base, 3,000 cfs).--May 28 (9 p.m.) 9,840 cfs (7.84 ft); June 2 (11:30 a.m.) 5,790 cfs (6.42 ft); June 12 (9:30 a.m.) 4,370 cfs (5.83 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 11 to Mar. 16 (no gage-height record Nov. 13-17, 27, 28).

Sweetgrass Creek above Melville, Mont.

Location.--Lat 46°09', long 110°05', in NW¼ sec. 27, T. 5 N., R. 13 E., on right bank 9 miles northwest of Melville.

Drainage area.--59.6 sq mi.

Records available.--May 1907 to December 1924, April 1937 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 5,490 ft (by barometer). May 5, 1907, to Sept. 30, 1912, staff gage at site 6 miles upstream at different datum. Aug. 21, 1913, to Dec. 31, 1924, staff gage at site 1,500 ft downstream at different datum. Apr. 17, 1937, to Sept. 25, 1951, water-stage recorder at site 1,000 ft downstream at different datum.

Average discharge.--21 years (1918-19, 1920-21, 1937-56), 82.6 cfs (59,800 acre-ft per year).

Extremes.--Maximum discharge during year, 2,060 cfs May 28 (gage height, 3.93 ft), from rating curve extended above 800 cfs; minimum, 4.1 cfs Apr. 3 (gage height, 0.78 ft).

1907-24, 1937-56: Maximum discharge, that of May 28, 1956; minimum, 2.1 cfs Mar. 15, 1954 (gage height, 0.67 ft).

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of 200 acres above station.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.9	9.0	2.0	243
1.0	16	2.5	473
1.2	36	3.0	873
1.4	68	3.5	1,480
1.6	114		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	23	19	19	20	*9	10	12	18	561	164	87	39
2	22	*20	18	20	10	*10	10	*17	*603	151	85	39
3	21	21	16	18	12	10	10	18	503	145	81	39
4	21	20	18	21	13	9	10	17	527	134	78	39
5	*21	20	20	20	12	9	10	20	527	128	76	39
6	21	20	20	19	11	9	9.0	27	408	125	74	35
7	20	20	19	19	11	9	9.0	30	279	122	72	34
8	20	20	20	18	10	9	10	33	267	120	70	34
9	20	20	20	16	10	9	11	37	378	114	72	33
10	20	21	20	18	11	8	12	42	433	117	70	33
11	20	20	21	19	11	8	12	44	428	122	66	32
12	20	19	18	17	12	8	11	44	428	122	63	33
13	20	19	8	16	11	9	12	44	368	131	61	33
14	20	19	15	13	10	9	14	44	368	131	59	32
15	20	19	20	12	9	9	14	46	438	128	59	29
16	20	20	20	13	9	9	15	49	438	122	57	27
17	20	21	20	14	11	11	14	50	306	117	57	25
18	20	22	19	15	12	13	13	76	259	114	59	25
19	20	22	18	14	14	13	13	236	251	109	57	25
20	20	21	19	14	15	13	14	383	*283	104	55	24
21	20	20	20	13	15	13	14	527	255	96	50	24
22	20	19	23	14	14	13	15	596	190	96	50	24
23	20	18	24	14	13	15	14	568	161	94	47	24
24	20	19	22	12	12	18	13	582	187	89	47	*24
25	20	19	24	11	10	21	13	554	232	*87	49	25
26	20	19	20	10	10	17	13	521	204	85	49	24
27	20	19	18	10	10	13	14	533	201	87	52	24
28	20	19	13	10	9	14	13	1,260	222	85	49	25
29	20	*19	12	9	11	14	14	1,010	222	83	*47	25
30	21	19	18	9	------	*12	15	575	190	81	46	24
31	21	------	*23	9	------	12	------	458	------	83	43	------
Total	631	593	585	457	327	356	373.0	8,459	10,117	3,486	1,887	892
Mean	20.4	19.8	18.9	14.7	11.3	11.5	12.4	273	337	112	60.9	29.7
Ac-ft	1,250	1,180	1,160	906	649	706	740	16,780	20,070	6,910	3,740	1,770

Calendar year 1955: Max 557 Min 5 Mean 62.5 Ac-ft 45,220
Water year 1955-56: Max 1,260 Min 8 Mean 76.9 Ac-ft 55,860

Peak discharge (base, 540 cfs).--May 22 (3 a.m.) 719 cfs (2.84 ft); May 28 (5 p.m.) 2,060 cfs (3.93 ft); June 2 (2 a.m.) 773 cfs (2.90 ft); June 5 (2 a.m.) 619 cfs (2.73 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 2 to Dec. 24, Jan. 4-17, 21, Jan. 25 to Mar. 24.

Rosebud Creek near Absarokee, Mont.

Location.--Lat 45°29', long 109°27', in NW¼ sec. 13, T. 4 S., R. 18 E., on right bank 80 ft downstream from Smith Bridge, half a mile downstream from confluence of East and West Rosebud Creeks, and 2 miles south of Absarokee.

Records available.--April 1935 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 4,160 ft (by barometer). Prior to July 14, 1942, staff gage at same site and datum.

Average discharge.--21 years, 404 cfs (292,500 acre-ft per year).

Extremes.--Maximum discharge during year, 3,820 cfs May 29 (gage height, 4.42 ft); minimum daily, 80 cfs Jan. 30.

1935-56: Maximum discharge observed, 4,850 cfs June 22, 1937 (gage height, 6.36 ft), from rating curve extended above 2,000 cfs; minimum observed, 31 cfs May 25, Dec. 29, 1936.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Large fluctuations in flow caused by powerplant at Mystic Lake on West Rosebud Creek. Diversions for irrigation of about 16,000 acres above station.

Revisions (water years).--WSP 1036: 1944.

Rating tables, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to May 27

1.3	117	3.0	1,330
1.6	218	3.5	2,030
2.0	455		

May 28 to Sept. 30

1.2	127	3.0	1,360
1.6	275	4.0	2,810
2.0	505	4.5	4,040
2.5	880		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	210	141	181	190	140	130	167	327	1,750	1,110	856	355
2	210	130	164	160	130	130	147	321	1,920	978	856	308
3	174	*154	133	150	150	110	167	379	1,830	880	785	231
4	193	167	130	190	150	100	189	372	1,820	*792	710	240
5	189	154	128	195	150	90	206	372	1,830	732	665	303
6	*185	141	139	175	150	120	181	359	1,540	688	598	271
7	181	141	181	175	160	*110	185	334	1,200	800	526	*271
8	174	151	181	175	150	110	214	294	1,020	912	485	271
9	147	151	189	125	*150	110	193	334	1,080	936	426	235
10	130	151	170	170	155	120	277	372	1,120	944	*432	208
11	170	154	160	155	160	110	252	353	1,150	996	432	249
12	147	122	167	145	150	90	232	327	1,180	1,070	438	271
13	136	117	210	120	140	110	223	294	1,260	1,050	350	313
14	136	128	218	120	150	110	193	242	1,230	978	313	308
15	139	151	218	120	150	110	206	256	1,480	928	366	303
16	133	170	230	100	140	130	170	266	1,730	888	360	275
17	130	141	230	90	130	150	210	299	1,540	856	401	257
18	160	170	200	110	140	170	206	347	1,220	785	533	271
19	189	218	175	110	130	200	185	427	1,060	755	526	266
20	202	202	240	110	120	*266	185	548	1,120	748	505	257
21	214	198	220	110	140	350	202	*748	1,210	778	478	244
22	223	177	250	100	140	500	189	1,060	1,120	792	438	240
23	170	160	240	95	140	731	206	1,180	920	785	426	212
24	167	170	220	90	140	497	223	1,270	872	680	420	168
25	232	144	210	100	140	399	266	1,400	1,010	688	414	189
26	232	151	200	90	110	294	*282	1,440	1,030	680	377	197
27	210	125	*200	100	100	232	316	1,440	1,010	710	328	189
28	160	*139	190	100	110	185	288	2,360	1,070	808	322	189
29	147	151	150	90	130	185	288	*3,000	1,180	880	322	186
30	154	202	140	80	------	198	232	2,110	1,210	896	344	154
31	144	------	170	120	------	202	------	1,760	------	856	372	------
Total	5,388	4,671	5,834	3,960	4,045	6,349	6,480	24,591	38,712	26,379	14,804	7,431
Mean	174	156	188	128	139	205	216	793	1,290	851	478	248
Ac-ft	10,690	9,260	11,570	7,850	8,020	12,590	12,850	48,780	76,780	52,320	29,360	14,740

Calendar year 1955:	Max 1,060	Min 70	Mean 258	Ac-ft 187,000
Water year 1955-56:	Max 3,000	Min 80	Mean 406	Ac-ft 294,800

Peak discharge (base, 1,600 cfs).--May 29 (2 a.m.) 3,820 cfs (4.42 ft); June 16 (2 p.m.) 1,780 cfs (3.36 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Dec. 16 to Mar. 19 (no gage-height record Jan. 14 to Feb. 8, Feb. 10 to Mar. 6, Mar. 8-19, 21, 22; discharge estimated on basis of 3 discharge measurements, weather records, and records for Mystic Lake powerplant).

Stillwater River near Absarokee, Mont.

Location.--Lat 45°33', long 109°23', in SE¼ sec. 21, T. 3 S., R., 19 E., on right bank 3 miles downstream from Rosebud Creek, 4 miles northeast of Absarokee, and 10 miles southwest of Columbus.

Records available.--July 1910 to September 1914, March 1935 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 3,875 ft (from topographic map). Prior to Oct. 1, 1942, staff or wire-weight gages at site 2 miles upstream at different datum.

Average discharge.--21 years (1935-56), 910 cfs (658,800 acre-ft per year).

Extremes.--Maximum discharge during year, 8,600 cfs May 28 (gage height, 6.03 ft); minimum daily, 190 cfs Jan. 31.

1910-14, 1935-56: Maximum discharge, 10,600 cfs June 3, 1948 (gage height, 6.63 ft); minimum observed, 58 cfs Apr. 2, 1936.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Flow partly regulated by powerplant at Mystic Lake on West Rosebud Creek. Diversions for irrigation of about 24,300 acres, of which 400 acres lie below station.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.1	300	3.5	2,560
1.5	460	4.5	4,400
2.0	790	6.0	8,500
2.5	1,220		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	438	312	300	380	210	270	348	701	5,530	2,720	1,440	632
2	427	309	290	350	230	270	321	687	6,220	2,370	1,420	586
3	396	*327	260	320	250	250	339	738	5,650	2,100	1,370	496
4	396	348	250	400	250	240	357	738	5,730	*1,770	1,250	502
5	396	339	250	410	260	230	378	738	5,860	1,630	1,180	562
6	*387	327	260	370	260	220	348	782	4,860	1,630	1,090	526
7	392	321	280	340	260	*230	345	790	3,700	1,960	1,010	*502
8	378	339	260	330	230	220	374	768	3,420	2,120	950	478
9	351	339	280	270	*220	220	364	854	3,830	2,100	878	449
10	330	342	260	320	250	220	449	934	4,090	2,100	*870	427
11	357	340	260	310	260	230	438	926	4,110	2,220	862	472
12	345	290	280	300	260	220	405	894	4,400	2,300	862	502
13	339	260	250	290	260	220	387	830	4,510	2,200	768	612
14	339	270	250	290	250	220	364	738	4,050	2,020	694	606
15	339	270	250	260	240	220	382	738	4,510	1,910	722	568
16	330	270	270	230	220	240	378	775	5,020	1,820	730	520
17	327	270	260	270	240	300	422	934	3,850	1,730	752	508
18	348	290	250	290	250	400	427	1,220	3,150	1,590	926	496
19	374	310	250	290	250	500	392	1,570	3,100	1,510	934	496
20	387	320	280	270	270	659	400	2,100	3,440	1,490	918	472
21	396	350	300	270	280	562	449	*2,750	3,380	1,500	862	449
22	405	330	350	260	280	645	484	3,550	2,940	1,520	798	454
23	364	300	375	260	280	782	532	3,990	2,430	1,500	760	427
24	351	300	450	250	280	708	526	4,300	2,510	1,360	738	387
25	405	310	449	240	270	606	568	4,580	3,040	1,370	730	382
26	400	310	432	240	250	496	*580	4,600	2,820	1,350	687	387
27	387	280	*460	250	230	410	659	4,550	2,840	1,360	645	374
28	342	*270	449	240	240	354	606	6,650	3,030	1,460	632	382
29	330	270	340	230	250	354	619	*7,460	3,110	1,540	612	396
30	336	280	310	210	------	357	568	5,500	3,030	1,540	632	378
31	339	------	340	190	------	354	------	4,980	------	1,480	680	------
Total	11,431	9,193	9,545	8,930	7,280	11,207	13,209	71,365	118,160	55,270	27,402	14,428
Mean	369	306	308	288	251	362	440	2,302	3,939	1,783	884	481
Ac-ft	22,670	18,230	18,930	17,710	14,440	22,230	26,200	141,600	234,400	109,600	54,350	28,620

Calendar year 1955: Max 4,010 Min 140 Mean 660 Ac-ft 478,200
Water year 1955-56: Max 7,460 Min 190 Mean 977 Ac-ft 709,000

Peak discharge (base, 4,400 cfs).--May 28 (9 p.m.) 8,600 cfs (6.03 ft); June 2 (9 a.m.) 6,710 cfs (5.42 ft); June 16 (8:30 a.m.) 5,500 cfs (4.98 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 11 to Dec. 24, Dec. 29 to Mar. 19 (no gage-height record Jan. 30 to Mar. 6, Mar. 9, 10, 13, 14, 16, 18, 19; discharge estimated on basis of 2 discharge measurements, weather records, and records for nearby stations).

Clarks Fork below Crandall Creek, near Painter, Wyo.

Location.--Lat 44°52', long 109°34', in sec. 1, T. 56 N., R. 106 W., on right bank 2 miles downstream from Crandall Creek, 4 miles east of Crandall Creek guard station, and 9 miles north of Painter.

Drainage area.--446 sq mi.

Records available.--August 1929 to September 1932, August 1949 to September 1956 (no winter records).

Gage.--Water-stage recorder. Altitude of gage is 6,160 ft (from topographic map). Aug. 9, 1929, to Sept. 30, 1932, at same site at different datum.

Extremes.--Maximum discharge during year, 7,740 cfs June 1 (gage height, 9.67 ft); minimum not determined, probably occurred during period of no gage-height record.
1929-32, 1949-56: Maximum discharge, that of June 1, 1956; minimum not determined, probably occurred during period of no gage-height record.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Some small diversions for irrigation of hay meadows above station.

Revisions.--WSP 1389: Drainage area.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used July 5 to Sept. 3)

2.4	50	4.0	810
2.7	126	6.0	2,720
3.0	231	8.0	5,340
3.5	480	9.4	7,340

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	84	55						350	6,940	2,830	1,140	264
2	81	55						350	7,240	2,500	1,130	235
3	79	55						400	6,700	2,150	997	223
4	*74	55						*420	*6,960	1,840	834	216
5	74	55						528	6,770	1,720	719	201
6	71	55						579	5,440	1,750	618	*197
7	71	55						691	4,080	2,010	540	186
8	71	55						834	4,110	2,060	492	182
9	67	55						890	5,020	2,060	456	235
10	67	55						954	5,450	2,060	*450	216
11	65	55						898	5,720	*2,110	432	235
12	63	-						789	6,220	2,230	420	290
13	63	-						705	6,240	2,030	415	272
14	63	-						650	5,490	1,840	415	260
15	60	-						726	6,150	1,660	420	252
16	58	-						1,080	5,940	1,540	432	247
17	56	-						1,630	4,160	1,490	432	235
18	56	-						1,990	3,550	1,600	444	223
19	54	-						2,330	*3,760	1,650	456	212
20	65	-						2,700	4,090	1,620	444	204
21	65	-						3,300	3,780	1,420	415	197
22	71	-						*4,580	3,040	1,440	388	190
23	69	-						4,860	2,640	1,360	366	179
24	60	-						5,090	3,160	1,350	351	165
25	60	-						4,960	3,400	1,300	337	152
26	58	-						6,080	3,240	1,260	327	145
27	60	-						*5,910	3,420	1,240	327	136
28	56	-						6,430	3,620	1,270	308	145
29	56	-						6,290	3,650	1,250	286	148
30	55	-			------			5,870	3,370	1,200	361	148
31	55	------			------		------	6,080	------	1,100	294	------
Total	2,007	-	-	-	-	-	-	78,944	143,350	52,940	15,446	6,190
Mean	64.7	-	-	-	-	-	-	2,546	4,778	1,708	498	206
Ac-ft	3,980	-	-	-	-	-	-	156,600	284,300	105,000	30,640	12,280

Calendar year : Max Min Mean Ac-ft
Water year : Max Min Mean Ac-ft

Peak discharge (base, 5,100 cfs).--June 1 (9 p.m.) 7,740 cfs (9.67 ft); June 15 (7 p.m.) 6,890 cfs (9.10 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 30 to Nov. 11. No gage-height record May 1-3.

Sunlight Creek near Painter, Wyo.

Location.--Lat 44°45'00", long 109°31'40", in NE¼ sec. 16, T. 55 N., R. 105 W., on left bank 1½ miles downstream from Painter Gulch and 4½ miles west of Painter.

Drainage area.--135 sq mi.

Records available.--August 1929 to September 1932, July 1945 to September 1956 (no winter records 1951-52).

Gage.--Water-stage recorder. Altitude of gage is 6,700 ft (by barometer).

Average discharge.--12 years (1929-32, 1945-50, 1952-56), 117 cfs (84,760 acre-ft per year).

Extremes.--Maximum discharge during year, 1,220 cfs June 2 (gage height, 3.41 ft); minimum not determined.

1929-32, 1945-56: Maximum discharge, 2,110 cfs June 26, 1932 (gage height, 4.31 ft), from rating curve extended above 660 cfs; minimum observed, 11 cfs Jan. 17, 1946 (discharge measurement), but may have been less during period of no gage-height record.

Maximum stage known, about 5.8 ft during 1918.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of about 500 acres above station.

Revisions.--WSP 1389: Drainage area.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 18-24, May 29 to June 6, June 25 to July 16)

0.0	19	1.5	283
.1	26	2.0	470
.4	54	2.5	710
.7	98	3.0	1,020
1.0	153	3.5	1,390

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	34	24	(*) 24	22	21	21	25	62	1,040	502	228	74
2	33	25				21	25	63	1,080	450	217	70
3	32	27				21	25	63	1,030	390	194	68
4	*32	28				25	25	*72	*1,040	346	175	66
5	33	27				25	25	108	978	350	160	63
6	31	25				25	25	122	782	390	147	*59
7	29	25				25	25	145	650	418	141	55
8	29	25				23	30	197	655	422	131	57
9	30	25				23	35	197	788	422	128	63
10	31	28				23	*40	207	818	414	*137	58
11	31	27				23	40	182	902	*426	128	57
12	30	23				23	35	171	985	430	122	60
13	29					23	40	149	978	370	119	59
14	29					23	40	137	896	358	120	54
15	29					23	55	147	985	343	120	53
16	29					23	60	207	872	326	120	53
17	29					23	66	340	615	305	115	52
18	27					25	68	466	*590	286	117	52
19	23					30	84	570	640	280	115	50
20	25					30	108	690	680	280	108	50
21	25					30	129	788	615	286	100	51
22	25					30	119	*884	450	293	95	51
23	25					30	88	932	390	286	93	46
24	24					30	82	971	474	277	90	32
25	24					30	72	950	546	277	90	32
26	24					25	66	938	528	277	88	33
27	25					25	66	*884	595	268	90	34
28	24					25	62	985	635	268	85	36
29	24					25	63	950	645	271	82	42
30	24				------	25	60	872	605	262	98	42
31	24	------			------	25	------	908	------	242	85	------
Total	863	723	744	682	609	778	1,683	14,357	22,487	10,515	3,838	1,572
Mean	27.8	24.1	24.0	22.0	21.0	25.1	56.1	463	750	339	124	52.4
Ac-ft	1,710	1,430	1,480	1,350	1,210	1,540	3,340	28,480	44,600	20,860	7,610	3,120

Calendar year 1955: Max 675 Min - Mean 89.7 Ac-ft 64,940
Water year 1955-56: Max 1,080 Min - Mean 161 Ac-ft 116,700

Peak discharge (base, 700 cfs).--June 2 (12:30 a.m.) 1,220 cfs (3.41 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 30 to Nov. 3, Nov. 6-7, Nov. 12 to Apr. 16 (no gage-height record Nov. 13-20, Nov. 29 to Dec. 21, Jan. 18 to Apr. 16; discharge estimated on basis of 2 discharge measurements and weather records).

Clarks Fork at Chance, Mont.

Location.--Lat 45°00', long 109°05', in E½NE¼ sec. 31, T. 9 S., R. 22 E., on left bank 0.4 mile upstream from Sand Coulee and 1 mile north of Wyoming-Montana State line.

Records available.--July 1921 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 3,980 ft (from topographic map). Prior to Nov. 15, 1934, staff gage and Nov. 15, 1934, to July 26, 1951, water stage recorder, at bridge 0.4 mile downstream at different datum. July 27, 1951, to Sept. 30, 1953, water-stage recorder at present site at datum 0.98 ft higher.

Average discharge.--22 years (1934-56), 916 cfs (663,200 acre-ft per year).

Extremes.--Maximum discharge during year, 8,800 cfs June 2 (gage height, 7.54 ft); minimum, 48 cfs Oct. 19 (gage height, 0.74 ft).

1921-56: Maximum discharge observed, 10,900 cfs May 26, 1928 (gage height, 6.5 ft), site and datum then in use); minimum, 48 cfs Jan. 16, 1943, Oct. 19, 1955.

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of about 10,000 acres above station.

Rating tables, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 29 to June 21)

Oct. 1 to May 20				May 21 to Sept. 30			
0.7	40	2.5	895	1.3	200	4.0	2,700
.9	80	3.0	1,380	1.7	370	6.0	6,100
1.4	235	4.0	2,730	2.5	895	7.5	9,000
1.8	425	5.0	4,450	3.0	1,380		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	114	108	265	280	210	224	325	*599	7,680	3,580	*1,290	392
2	123	126	255	275	220	228	275	599	8,340	3,040	1,300	360
3	*120	159	240	265	250	228	255	593	7,840	2,800	1,220	340
4	114	214	230	275	280	228	267	581	7,740	2,320	1,030	325
5	111	210	220	270	285	224	284	691	7,820	*2,060	887	311
6	105	210	240	250	250	221	255	785	6,680	2,050	785	*306
7	88	207	250	260	220	204	247	863	4,800	2,300	698	298
8	88	200	240	280	215	210	259	1,020	4,390	2,500	650	288
9	88	195	230	263	205	200	255	1,160	5,360	2,500	593	293
10	82	190	230	263	205	190	271	1,260	5,600	2,510	587	330
11	80	185	230	288	205	185	345	1,240	*6,260	2,510	569	306
12	80	180	240	298	210	200	355	1,130	6,950	2,750	539	316
13	78	180	230	284	210	210	*335	1,010	7,360	2,570	521	370
14	78	185	220	250	205	215	420	855	6,390	2,300	503	330
15	76	190	230	210	170	225	527	831	6,750	2,180	503	325
16	66	200	250	220	200	235	638	998	7,040	2,010	521	302
17	66	*200	240	*240	225	247	593	1,610	5,130	1,840	605	302
18	54	195	220	250	260	259	551	2,310	4,200	1,720	624	298
19	50	275	250	255	280	325	612	2,910	4,190	1,610	599	288
20	52	295	*320	240	285	365	740	3,460	4,750	1,590	612	280
21	54	320	310	240	243	*325	887	4,000	4,570	1,620	575	271
22	56	295	350	240	239	330	972	4,040	3,770	1,700	539	267
23	58	265	380	240	243	386	823	5,060	3,040	1,650	509	263
24	60	265	360	240	*235	381	755	5,700	3,320	1,570	485	247
25	54	275	300	220	220	420	740	5,830	3,930	1,590	479	224
26	54	275	290	220	220	485	677	6,190	3,710	1,500	467	214
27	56	255	280	220	220	408	657	6,330	3,850	1,440	461	207
28	58	265	260	210	218	311	638	*6,800	4,160	1,460	443	210
29	58	255	250	190	224	298	638	7,700	4,090	1,480	425	214
30	62	255	240	200	------	306	638	6,910	4,170	1,470	449	214
31	68	------	260	210	------	320	------	6,870	------	1,310	461	------
Total	2,351	6,629	8,110	7,646	6,652	8,593	15,234	89,935	163,880	63,530	19,929	8,691
Mean	75.8	221	262	247	229	277	508	2,901	5,463	2,049	643	290
Ac-ft	4,660	13,150	16,090	15,170	13,190	17,040	30,220	178,400	325,100	126,000	39,530	17,240

Calendar year 1955: Max	5,220	Min	50	Mean	677	Ac-ft	490,300
Water year 1955-56: Max	8,340	Min	50	Mean	1,096	Ac-ft	795,800

Peak discharge (base, 5,400 cfs).--June 2 (5 a.m.) 8,800 cfs (7.54 ft); June 13 (5 a.m.) 7,780 cfs (7.07 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 9 to Jan. 7, Jan. 14 to Feb. 20, Feb. 24-27, Mar. 9-15.

Clarks Fork at Edgar, Mont.

Location.--Lat 45°28', long 108°51', in SW¼ sec. 24, T. 4 S., R. 23 E., on right bank just downstream from highway bridge, half a mile east of Edgar and 6 miles upstream from Rock Creek.

Records available.--July 1921 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 3,440 ft (by barometer). July 29, 1921, to Sept. 17, 1940, chain gage and Sept. 18, 1940, to Aug. 31, 1953, wire-weight gage, at same site and datum.

Average discharge.--23 years (1930-31, 1934-56), 1,028 cfs (744,200 acre-ft per year).

Extremes.--Maximum discharge during year, 9,080 cfs June 2 (gage height, 7.99 ft); minimum, 218 cfs Oct. 22.

1921-56: Maximum discharge observed, 10,900 cfs June 2, 1936 (gage height, 8.62 ft). minimum observed, 41 cfs July 25, 1931.

Remarks.--Records good except those for period of ice effect, which are poor. Diversions for irrigation of about 41,500 acres, of which about 840 acres lie below station. In addition, about 6,300 acres of land lying above station are irrigated by diversions from the adjoining Rock Creek basin.

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.5	215	4.0	1,810
2.0	360	5.0	3,140
2.5	575	6.0	4,840
3.0	875	8.0	9,100

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	384	360	480	400	320	420	489	*753	7,820	3,640	*1,410	610
2	384	378	470	390	340	420	466	710	8,640	3,130	1,430	555
3	*378	378	450	380	380	420	411	704	8,730	*2,920	1,390	516
4	351	444	460	390	400	420	403	692	8,370	2,550	1,240	494
5	348	466	480	400	410	410	458	658	8,570	2,270	1,100	466
6	339	458	460	380	380	400	435	833	7,980	2,090	965	*444
7	342	471	470	380	350	370	392	905	6,080	2,210	805	431
8	324	458	460	400	350	400	453	1,030	5,160	2,510	722	411
9	321	458	470	380	350	380	476	1,240	5,760	2,590	664	415
10	309	450	480	380	350	360	444	1,320	6,350	2,520	590	415
11	303	420	470	390	350	340	440	1,380	*6,810	2,500	595	431
12	276	390	*470	390	360	370	507	1,290	7,100	2,690	636	419
13	276	370	460	370	360	400	*480	1,180	7,580	2,690	605	565
14	273	400	450	330	340	450	489	1,050	7,100	2,470	540	575
15	264	400	440	290	300	500	585	912	7,190	2,310	535	535
16	249	420	430	250	330	550	669	928	7,600	2,190	555	525
17	261	440	420	*280	360	600	792	1,300	6,280	1,930	585	512
18	240	450	410	320	390	700	680	2,000	4,800	1,710	805	507
19	235	460	430	350	410	900	680	2,610	4,500	1,550	875	484
20	323	480	460	330	430	942	772	3,110	4,700	1,450	854	471
21	228	460	500	330	440	*716	935	3,800	4,710	1,470	812	453
22	232	450	520	330	450	540	1,090	4,520	4,320	1,590	734	458
23	270	440	540	350	460	595	1,090	5,160	3,440	1,620	692	471
24	291	450	520	350	*450	625	920	5,680	3,190	1,440	642	471
25	297	460	480	330	430	647	928	6,060	3,780	1,440	615	435
26	285	470	430	330	400	605	861	6,240	3,780	1,400	625	392
27	300	450	420	330	400	636	812	6,700	3,700	1,360	636	357
28	*294	450	400	330	400	516	805	6,860	3,840	1,440	590	351
29	303	450	380	320	400	440	779	*7,910	3,940	1,550	540	364
30	312	460	370	300	------	419	786	7,560	3,940	1,650	545	399
31	333	------	380	320	------	423	------	7,360	------	1,460	600	------
Total	9,234	13,091	14,060	10,800	11,090	15,914	19,527	92,455	175,760	64,340	23,932	13,932
Mean	298	436	454	348	382	513	651	2,982	5,859	2,075	772	464
Ac-ft	18,320	25,970	27,890	21,420	22,000	31,560	38,730	183,400	348,600	127,600	47,470	27,630

Calendar year 1955: Max 4,730 Min 162 Mean 784 Ac-ft 567,300
Water year 1955-56: Max 8,730 Min 228 Mean 1,268 Ac-ft 920,600

Peak discharge (base, 5,300 cfs).--June 2 (4 p.m.) 9,080 cfs (7.99 ft); June 16 (1 p.m.) 8,070 cfs (7.53 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 10 to Mar. 19.

Rock Creek near Red Lodge, Mont.

Location.--Lat 45°07', long 109°18', in SW¼ sec. 17, T. 8 S., R. 20 E., on left bank at downstream side of bridge, 3 miles upstream from West Fork and 4 miles southwest of Red Lodge.

Records available.--April to December 1932, May 1934 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 6,100.52 ft above mean sea level, datum of 1929. Prior to Oct. 1, 1937, staff gage at same site and datum.

Average discharge.--22 years, 167 cfs (120,900 acre-ft per year).

Extremes.--Maximum discharge during year, 1,800 cfs June 16 (gage height, 4.02 ft); minimum daily, 24 cfs Feb. 15, 16, Mar. 11.

1932, 1934-56: Maximum discharge, 2,590 cfs June 5, 1952; maximum gage height observed, 4.80 ft June 16, 1937; minimum discharge observed, 14 cfs Nov. 29, 1954 (discharge measurement).

Remarks.--Records good except those for periods of ice effect or no gage height record, which are poor. Flow partly regulated by Glacier Lake. No diversion above station.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-10, June 10 to July 15)

Oct. 1 to May 28				May 29 to Sept. 30			
1.2	24	2.7	315	1.8	93	3.5	795
1.5	47	3.0	475	2.1	145	4.0	1,430
2.0	115	3.5	795	2.5	254	4.5	2,440
2.4	205	4.0	1,430	3.0	486		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	58	43	40	42	32	30	36	54	1,040	641	475	160
2	57	48	38	41	32	31	35	55	1,120	612	470	152
3	55	49	36	41	34	30	36	54	1,080	562	*423	149
4	54	54	38	41	36	30	35	55	1,180	540	378	143
5	*52	52	40	40	36	29	34	63	1,130	529	336	139
6	50	48	42	38	34	29	35	64	842	535	306	134
7	51	47	42	37	32	28	36	70	595	573	285	130
8	49	50	40	36	30	30	34	82	595	556	262	130
9	49	50	40	40	30	28	34	90	709	562	251	141
10	48	50	38	38	30	26	36	96	967	556	244	141
11	50	47	40	36	28	24	36	98	1,060	578	237	141
12	47	37	40	36	30	26	36	97	1,110	573	230	154
13	49	34	38	36	28	26	37	92	1,230	573	227	158
14	47	32	36	34	26	26	41	92	1,080	568	227	149
15	48	40	40	34	24	28	43	97	1,330	556	237	139
16	48	42	42	32	24	30	48	109	1,490	540	230	136
17	48	44	40	34	30	30	48	136	1,020	524	247	130
18	47	*49	38	34	32	30	49	169	912	497	231	128
19	49	56	36	38	34	31	*51	223	912	491	232	126
20	50	58	*44	39	36	32	57	306	956	491	244	124
21	51	58	43	38	38	32	63	392	731	497	227	124
22	51	52	46	36	38	*32	63	475	641	491	217	121
23	50	50	56	36	34	39	61	554	612	497	214	116
24	50	46	52	36	*29	42	63	626	635	491	208	111
25	50	46	47	35	28	43	61	689	635	497	208	107
26	49	44	46	33	26	42	61	689	641	497	208	*104
27	51	42	45	36	27	36	58	676	646	508	211	104
28	48	42	43	*35	29	36	56	1,310	*671	518	194	107
29	49	42	42	36	30	36	56	1,080	747	508	184	106
30	51	42	40	34	---	36	54	*890	696	486	*186	103
31	48	------	42	32	------	36	------	890	------	475	172	------
Total	1,554	1,394	1,290	1,134	897	984	1,393	10,373	27,013	16,522	8,081	3,907
Mean	50.1	46.5	41.6	36.6	30.9	31.7	46.4	335	900	533	261	130
Ac-ft	3,080	2,760	2,560	2,250	1,780	1,950	2,760	20,570	53,580	32,770	16,030	7,750

Calendar year 1955:	Max 524	Min 22	Mean 115	Ac-ft 83,530
Water year 1955-56:	Max 1,490	Min 24	Mean 204	Ac-ft 147,800

Peak discharge (base, 660 cfs).--May 28 (5:30 p.m.) 1,430 cfs (4.00 ft); June 5 (1 a.m.) 1,310 cfs (3.85 ft); June 16 (4 a.m.) 1,800 cfs (4.02 ft); June 29 (3 a.m.) 842 cfs (3.38 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 13 to Dec. 20, Dec. 29-31, Jan. 15, 16, 20, 25, 26, Jan. 28 to Feb. 26, Mar. 7-17 (no gage-height record Jan. 31 to Feb. 3, Feb. 5-10, 12-17, 19-23; discharge estimated on basis of 2 discharge measurements and weather records).

West Fork Rock Creek below Basin Creek, near Red Lodge, Mont.

Location.--Lat 45°09', long 109°23', near center of sec. 3, T. 8 S., R. 19 E., on left bank an eighth of a mile downstream from Basin Creek and 6 miles west of Red Lodge.
Records available.--July 1937 to October 1956 (no winter records), discontinued.
Gage.--Water-stage recorder. Altitude of gage is 6,290 ft (from topographic map).
Extremes.--Maximum discharge during year, 727 cfs May 28 (gage height, 3.56 ft); minimum daily, 17 cfs Nov. 5-8.
1937-56: Maximum discharge, 933 cfs June 6, 1952 (gage height, 3.88 ft); minimum recorded, 10 cfs Dec. 19, 1939.
Remarks.--Records good except those for periods of no gage-height record, which are poor.

Rating table, Oct. 1, 1955, to Oct. 31, 1956 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1, 1955, to May 27, 1956

0.8	13	2.0	143
1.0	21	2.5	290
1.3	41	3.0	483
1.6	73		

May 28 to Oct. 31, 1956

1.1	31	2.5	330
1.4	65	3.5	700
1.8	138		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	28	21					-	23	480	256	221	74
2	27	22					-	23	486	*230	213	72
3	25	22					-	23	458	208	*183	70
4	25	19					-	23	462	186	160	68
5	*24	17					-	26	472	176	142	66
6	23	17					-	28	405	186	132	64
7	24	17					-	30	336	224	123	62
8	23	17					-	35	*324	224	117	*61
9	23	19					-	39	345	221	115	65
10	23	21					-	41	369	227	115	65
11	23	21					-	43	384	250	115	65
12	22	21					-	41	402	253	113	70
13	23	21					-	39	408	247	109	78
14	23	21					-	36	366	238	111	76
15	22	21					-	39	414	227	113	71
16	22	21					-	45	430	213	121	68
17	22	21					-	56	333	205	123	65
18	22	*21					-	73	288	194	134	62
19	22	20					*23	101	285	194	128	60
20	22	20					24	157	315	200	117	58
21	22	20					27	200	300	205	107	58
22	22	20					28	250	258	210	101	57
23	22	20					26	280	233	202	99	53
24	22	20					26	315	264	200	95	49
25	22	20					26	348	282	205	95	45
26	21	20					26	386	258	205	94	43
27	22	20					25	426	270	213	95	42
28	21	20					24	678	291	233	87	44
29	22	20					23	561	300	221	78	42
30	22	20			------		23	483	285	205	77	40
31	21	------			------		------	469	------	202	76	------
Total	707	600	-	-	-	-	-	5,317	10,503	6,660	3,709	1,813
Mean	22.8	20.0	-	-	-	-	-	172	350	215	120	60.4
Ac-ft	1,400	1,190	-	-	-	-	-	10,550	20,830	13,210	7,360	3,600

Calendar year : Max Min Mean Ac-ft
Water year : Max Min Mean Ac-ft

Peak discharge (base, 280 cfs).--May 28 (1:30 p.m.) 727 cfs (3.56 ft); June 16 (4 a.m.) 472 cfs (2.95 ft); June 29 (6 a.m.) 312 cfs (2.44 ft).

* Discharge measurement made on this day.

Note.--No gage-height record Nov. 12-17, 19-30, Aug. 30 to Sept. 7; discharge interpolated or estimated on basis of weather records.

Discharge, in cubic feet per second, 1956

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
Oct. 1	38	Oct. 9	34	Oct. 17	32	Oct. 25	*29
2	37	10	35	18	31	26	a30
3	36	11	34	19	31	27	a30
4	35	12	34	20	29	28	a30
5	36	13	34	21	30	29	a30
6	35	14	33	22	29	30	a30
7	35	15	33	23	30	31	a30
8	34	16	33	24	31		

Total	1,008
Mean	32.5
Runoff in acre-feet	2,000

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of weather records.

Red Lodge Creek above Cooney Reservoir, near Boyd, Mont.

Location.--Lat 45°26', long 109°16', in SW¼ sec. 34, T. 4 S., R. 20 E., on right bank just upstream from Cooney Reservoir, 9 miles west of Boyd.

Records available.--May 1937 to September 1956 (no winter records).

Gage.--Water-stage recorder. Datum of gage is 4,248.0 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 353 cfs May 29 (gage height, 3.10 ft); minimum, 9.0 cfs Oct. 16 (gage height, 0.86 ft).

1937-56: Maximum discharge recorded, 1,150 cfs June 3, 1948, from rating curve extended above 500 cfs, but may have been higher on June 27, 1944; maximum gage height observed, 6.03 ft June 17, 1944, from floodmark; no flow for many days in 1949.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Some return flow from lands irrigated by water diverted from Rock Creek and East Rosebud Creek basins. Diversions for irrigation of about 5,100 acres above station.

Rating tables, water year 1955-56 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 23		Apr. 24 to Sept. 30			
1.0	18	1.0	14	2.0	123
1.1	23	1.3	31	3.0	329
1.3	38	1.6	63	3.5	452

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a35						-	94	248	20	28	50
2	a35						-	85	226	*24	30	46
3	a35						-	82	210	32	31	47
4	*34						-	82	190	34	29	48
5	33						-	78	167	33	27	*52
6	32						-	76	150	31	27	43
7	33						-	76	132	46	24	43
8	34						-	80	117	41	*28	40
9	33						-	96	93	36	32	38
10	32						-	115	67	31	36	36
11	26						-	101	55	30	36	36
12	30						-	91	*40	29	39	35
13	24						-	85	39	30	37	41
14	29						-	78	37	29	36	37
15	29						-	73	34	28	36	36
16	21						-	71	28	24	38	32
17	18						-	*72	30	22	37	33
18	26	†12					-	75	36	23	64	30
19	27						-	79	26	22	71	29
20	29						-	88	26	22	67	28
21	35						-	94	33	20	66	26
22	37						-	110	29	24	58	26
23	a35						-	109	27	24	55	29
24	a34						*58	105	22	19	48	a28
25	a33						59	107	28	19	47	a28
26	a32						58	115	25	20	46	a27
27	a30						79	112	24	18	49	a27
28	a30						70	*184	25	18	51	a26
29	a29						85	336	20	18	49	a26
30	a27						79	318	20	23	49	a25
31	a25							274		31	49	
Total	942	-	-	-	-	-	-	3,541	2,204	821	1,320	1,048
Mean	30.4	-	-	-	-	-	-	114	73.5	26.5	42.6	34.9
Ac-ft	1,870	-	-	-	-	-	-	7,020	4,370	1,630	2,620	2,080

Calendar year : Max Min Mean Ac-ft
Water year : Max Min Mean Ac-ft

Peak discharge (base, 140 cfs).--May 29 (4 p.m.) 353 cfs (3.10 ft).

* Discharge measurement made on this day.

† Result of discharge measurement.

a No gage-height record; discharge interpolated.

Willow Creek near Boyd, Mont.

Location.--Lat 45°26', long 109°14', in SW¼SW¼ sec. 2, T. 5 S., R. 20 E., on left bank half a mile upstream from Cooney Reservoir and 8 miles west of Boyd.

Records available.--June 1937 to September 1956 (no winter records).

Gage.--Water-stage recorder. Altitude of gage is 4,260 ft (from topographic map). Prior to Apr. 23, 1948, at site half a mile downstream at different datum.

Extremes.--Maximum discharge during year, 80 cfs July 7 (gage height, 2.52 ft); minimum, 11 cfs June 12, 14.

1937-56: Maximum discharge, 469 cfs June 27, 1944 (gage height, 7.17 ft, site and datum then in use), from rating curve extended above 100 cfs; maximum gage height, 7.24 ft May 29, 1942 (backwater from Cooney Reservoir), site and datum then in use; minimum discharge recorded, 0.4 cfs Nov. 26, 1948 (gage height, 1.60 ft).

Remarks.--Records good except those for periods of ice effect or no gage height record, which are poor. Diversions for irrigation of about 1,800 acres above station. Some return flow from lands irrigated by water diverted from Rock Creek basin.

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.9	8.5
2.2	36
2.5	79

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	24						-	40	42	67	36	60
2	23						-	37	42	*63	38	60
3	21						-	36	34	70	40	60
4	*21						-	36	32	61	38	60
5	21						-	35	28	64	35	*64
6	22						-	34	27	60	35	66
7	22						-	34	27	73	35	60
8	20						-	35	28	66	*35	56
9	20						-	40	24	67	33	53
10	20						-	50	20	53	37	54
11	20						-	40	22	56	39	56
12	20						-	35	*14	60	46	49
13	18						-	33	15	58	47	54
14	20						-	31	13	57	46	54
15	20						-	30	21	51	47	51
16	20						-	28	21	51	49	44
17	20						-	*27	26	49	51	43
18	15						-	25	33	44	70	43
19	17						-	24	29	49	72	42
20	17						-	23	29	43	72	39
21	20	†27					-	22	39	42	73	42
22	20						-	21	47	43	76	42
23	21						-	21	43	44	76	42
24	22						*27	20	44	39	74	42
25	22						28	23	51	39	70	40
26	21						26	26	57	39	68	37
27	22						37	26	53	36	67	34
28	22						35	32	57	36	64	32
29	22						38	58	56	36	61	30
30	b20				-- --		36	46	67	37	60	24
31	b20	------			------		------	42	------	38	60	------
Total	633	-	-	-	-	-	-	1,010	1,041	1,591	1,650	1,433
Mean	20.4	-	-	-	-	-	-	32.6	34.7	51.3	53.2	47.8
Ac-ft	1,260	-	-	-	-	-	-	2,000	2,060	3,160	3,270	2,840

Calendar year : Max Min Mean Ac-ft
Water year : Max Min Mean Ac-ft

Peak discharge (base, 80 cfs).--July 7 (1 p.m.) 80 cfs (2.52 ft).

* Discharge measurement made on this day.

† Result of discharge measurement.

b Stage-discharge relation affected by ice.

Note.--No gage-height record Apr. 28 to May 16, July 24 to Aug. 7; discharge estimated on basis of records for Red Lodge Creek above Cooney Reservoir, near Boyd.

Red Lodge Creek below Cooney Reservoir, near Boyd, Mont.

Location.--Lat 45°27', long 109°11', in SW¼ sec. 30, T. 4 S., R. 21 E., on right bank an eighth of a mile upstream from Cottonwood Creek, half a mile downstream from Cooney Dam, and 6 miles west of Boyd.

Records available.--September 1937 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 4,140 ft (from topographic map).

Average discharge.--19 years, 90.1 cfs (65,230 acre-ft per year).

Extremes.--Maximum discharge during year, 357 cfs May 29 (gage height, 3.69 ft); minimum, 5.0 cfs Feb. 11 (gage height, 1.21 ft).

1937-56: Maximum discharge, 1,510 cfs May 30, 1942, from rating curve extended above 800 cfs by logarithmic plotting; maximum gage height, 8.16 ft June 7, 1942 (backwater from Cottonwood Creek); no flow Oct. 6, 7, 1948.

Remarks.--Records good except those for periods of ice effect, which are poor. Some return flow from lands irrigated by water diverted from Rock Creek and East Rosebud Creek basins. Flow completely regulated by Cooney Reservoir (see p. 238). Diversions for irrigation of about 6,900 acres above station.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.2	5.0	2.5	135
1.4	14	3.0	210
1.6	28	3.5	318
2.0	68	4.0	450

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	44	42	7.4	7.8	8.5	9.0	59	113	339	50	55	84
2	43	42	7.4	7.8	8.5	9.0	59	113	195	*49	57	84
3	43	43	7.5	7.8	8.5	9.0	59	113	115	48	57	84
4	*41	43	7.5	7.8	8.5	9.0	59	113	128	48	56	84
5	37	42	7.5	12	8.5	9.0	68	114	134	46	56	*93
6	36	42	7.8	8.6	8.5	9.0	86	115	150	45	57	120
7	37	43	7.8	8.2	8.5	9.0	86	115	150	45	57	121
8	37	43	7.5	7.8	8.5	9.0	88	115	148	51	*67	121
9	37	42	7.0	7.8	8.5	9.0	88	115	100	65	141	121
10	38	42	7.0	7.8	8.6	9.0	90	117	72	67	141	121
11	38	42	7.0	8.2	7.0	8.5	88	115	72	67	115	118
12	38	42	7.0	8.2	7.8	8.5	88	114	*73	73	115	120
13	38	42	7.0	7.8	8.6	8.5	86	120	75	76	114	120
14	39	41	7.0	8.2	8.5	8.5	86	125	48	76	114	120
15	39	41	7.0	8.0	8.0	10	86	125	36	79	114	120
16	39	26	7.4	8.0	8.0	11	86	124	37	79	110	118
17	39	9.5	7.4	8.2	8.0	12	86	*117	38	78	110	118
18	39	9.4	7.0	8.2	8.0	26	86	100	38	78	83	118
19	40	8.6	6.5	8.6	8.0	34	86	90	38	79	62	120
20	40	8.2	*7.0	8.6	8.0	41	86	92	39	80	62	118
21	40	*7.8	7.0	8.6	8.0	17	86	92	39	79	62	120
22	40	7.8	7.0	8.6	8.0	*22	86	89	40	79	62	120
23	40	7.8	7.5	8.6	8.0	26	86	90	39	79	62	118
24	40	7.8	7.4	8.6	*8.0	40	*85	90	39	79	62	118
25	40	7.4	7.4	8.6	8.0	39	85	90	43	113	64	106
26	40	7.5	7.4	8.6	8.0	49	85	92	55	131	64	93
27	40	7.5	7.4	8.6	8.0	57	99	96	54	131	64	93
28	41	7.4	7.4	*8.6	8.5	57	113	128	52	96	64	93
29	41	7.4	7.0	8.6	9.0	57	113	264	52	56	64	93
30	41	7.5	7.0	8.5	---	57	113	344	51	56	64	93
31	41	-----	7.8	8.5	------	57	------	347	------	55	67	------
Total	1,226	769.6	225.0	259.8	238.5	736.0	2,557	3,987	2,489	2,233	2,442	3,270
Mean	39.5	25.7	7.26	8.38	8.22	23.7	85.2	129	83.0	72.0	78.8	109
Ac-ft	2,430	1,530	446	515	473	1,460	5,070	7,910	4,940	4,430	4,840	6,490

Calendar year 1955: Max	257	Min	6.5	Mean	67.2	Ac-ft	48,660
Water year 1955-56: Max	347	Min	6.5	Mean	55.8	Ac-ft	40,530

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 17, 26, 27, 30, Dec. 3-5, 8, 13-15, 18, 19, 22, 23, 29, 30, Jan. 15, 16, Jan. 30 to Feb. 9, Feb. 14 to Mar. 16.

Yellowstone River at Billings, Mont.

Location.--Lat 45°48', long 108°28', in NE¼ sec. 34, T. 1 N., R. 26 E., on left bank 30 ft downstream from bridge on U. S. Highway 87, 1 mile northeast of Billings, and 12 miles upstream from Pryor Creek.

Drainage area.--11,870 sq mi, approximately.

Records available.--May 1904 to December 1905, August 1928 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 3,083.33 ft above mean sea level (Northern Pacific Railway benchmark). May 1904 to December 1905 chain gage at bridge 30 ft upstream at different datum. Aug. 24, 1928, to June 30, 1932, wire-weight gage at bridge 30 ft upstream at present datum. July 1, 1932, to Oct. 12, 1937, water-stage recorder at old diversion dam 3 miles upstream at different datum.

Average discharge.--25 years (1928-29, 1930-32, 1934-56), 6,621 cfs (4,793,000 acre-ft per year).

Extremes.--Maximum discharge observed during year, 56,200 cfs May 29 (gage height, 11.65 ft); minimum, 1,010 cfs Nov. 15 (gage height, 0.50 ft).

1904-5, 1928-56: Maximum discharge observed, 64,800 cfs June 27, 1944 (gage height, 12.5 ft); minimum, 430 cfs Dec. 12, 1932.

Remarks.--Records good except those for period of ice effect, which are poor. Discharge measurements generally made three times a month. Diversions for irrigation of about 350,000 acres above station. Records of chemical analyses and water temperatures for the water year 1956 are given in WSP 1451.

Rating tables, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Sept. 23-28)

Oct. 1 to Aug. 7				Aug. 8 to Sept. 30	
1.7	2,600	7.0	21,900	1.7	3,050
2.0	3,190	9.0	34,900	2.5	4,580
3.0	5,650	11.5	54,700	3.5	7,150
5.0	12,800				

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3,490	3,400	2,800	2,400	1,550	3,050	4,420	6,520	42,700	19,800	8,280	4,650
2	3,440	3,340	3,300	2,900	1,650	3,050	4,440	6,220	46,400	18,300	8,240	4,450
3	3,360	3,340	3,000	3,100	1,700	3,100	3,850	6,130	49,500	17,400	8,140	4,220
4	3,210	3,300	2,350	3,100	1,750	3,050	3,670	6,220	47,900	16,900	7,750	4,050
5	3,130	3,470	2,300	3,000	2,000	2,900	3,710	6,250	47,000	15,600	7,450	3,990
6	3,130	3,530	2,400	3,500	2,500	2,700	3,850	6,400	46,200	14,700	6,930	3,930
7	3,150	3,550	2,650	3,300	2,900	2,600	3,740	7,280	39,300	14,700	6,400	3,780
8	3,110	3,440	2,900	3,200	2,900	2,500	3,640	7,550	31,300	15,400	6,030	3,720
9	3,030	3,420	2,800	3,100	2,900	2,450	3,800	8,240	30,300	15,100	5,720	3,650
10	2,910	3,420	2,900	2,900	2,700	2,550	3,850	9,950	33,200	14,500	5,560	3,520
11	2,890	3,550	2,800	2,800	2,700	2,250	4,040	10,000	34,700	14,300	5,470	3,400
12	2,890	3,000	3,200	2,900	2,800	1,800	4,290	10,300	35,400	14,400	5,650	3,530
13	2,890	1,500	3,150	2,850	2,900	1,800	4,360	9,920	37,100	14,300	5,420	3,990
14	2,890	1,300	2,500	2,850	2,750	2,300	4,440	9,010	37,000	13,600	5,060	4,260
15	2,850	1,150	1,900	2,600	2,500	2,800	4,640	8,240	34,800	13,000	4,820	4,140
16	2,830	1,050	1,750	2,000	2,200	3,050	5,030	7,960	36,800	12,400	4,710	3,930
17	2,750	1,050	1,700	1,700	1,700	3,400	5,520	8,830	35,900	11,500	4,800	3,820
18	2,730	1,150	1,500	1,500	1,550	4,000	5,760	12,200	29,000	10,800	5,650	3,670
19	2,730	2,000	1,400	2,000	1,650	5,000	5,490	15,600	26,100	10,100	5,650	3,590
20	2,730	3,000	1,500	2,800	1,950	5,500	5,490	18,800	26,100	9,690	5,420	3,530
21	2,700	4,000	1,900	2,800	2,300	5,800	5,870	23,100	27,000	9,460	5,170	3,460
22	2,790	4,000	3,000	2,800	2,900	5,600	6,640	29,200	26,300	9,460	4,870	3,420
23	2,970	3,500	3,500	2,800	3,500	5,900	7,480	34,600	23,100	9,380	4,600	3,520
24	2,990	3,400	4,000	2,700	3,600	7,000	7,410	37,300	20,900	8,830	4,410	3,590
25	3,030	3,200	4,000	2,600	3,400	8,400	7,090	39,500	22,000	8,460	4,240	3,460
26	3,010	3,000	3,900	2,500	3,100	8,720	7,050	40,600	22,300	8,350	4,290	3,340
27	3,030	2,600	3,800	2,300	2,800	6,960	6,890	41,300	20,900	8,210	4,330	3,190
28	2,970	2,350	3,700	2,000	2,900	5,330	6,800	43,400	20,900	8,460	4,280	3,180
29	2,910	2,350	3,400	2,000	3,000	4,320	6,710	51,600	21,200	8,720	4,260	3,210
30	2,990	2,400	3,000	1,850	-	3,900	6,490	51,900	20,700	8,790	4,290	3,230
31	3,360	- -	2,500	1,600	- - - -	3,970	- - - - - -	44,600	- - - - - -	8,570	4,390	- - - - - -
Total	92,890	83,760	85,500	80,450	72,750	125,750	156,460	618,720	972,000	383,180	172,280	111,420
Mean	2,996	2,792	2,758	2,595	2,509	4,056	5,215	19,960	32,400	12,360	5,557	3,714
Ac-ft	184,200	166,100	169,600	159,600	144.300	249,400	310,300	‡1,227	‡1,928	760,000	341,700	221,000

Calendar year 1955: Max	30,700	Min	1,050	Mean	5,341	Ac-ft	3,867,000
Water year 1955-56: Max	51,900	Min	1,050	Mean	8,074	Ac-ft	5,861,000

Peak discharge (base, 25,700 cfs).--May 29 (11 p.m.) 56,200 cfs (11.65 ft); June 3 (10 p.m.) 50,800 cfs (11.07 ft); June 16 (7 p.m.) 38,000 cfs (9.45 ft).

‡ Expressed in thousands.

Note.--Stage-discharge relation affected by ice Nov. 12 to Mar. 25.

Wind River near Dubois, Wyo.

Location.--Lat 43°34'40", long 109°45'30", in NW¼NE¼ sec. 25, T. 42 N., R. 108 W., on left bank 2 miles upstream from Warm Springs Creek and 7 miles northwest of Dubois.

Drainage area.--233 sq mi.

Records available.--October 1945 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 7,188.71 ft above mean sea level (levels by Bureau of Reclamation).

Average discharge.--11 years, 184 cfs (133,300 acre-ft per year).

Extremes.--Maximum discharge during year, 1,910 cfs June 2 (gage height, 5.66 ft); minimum daily, 40 cfs Feb. 2.

1945-56: Maximum discharge, that of June 2, 1956; minimum daily, 30 cfs Dec. 12, 1949, Jan. 5, 1950.

Remarks.--Records good except those for periods of ice effect, which are fair. Diversions for irrigation of about 900 acres above station.

Rating tables, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 20 to Nov. 11)

Oct. 1 to July 3

2.3	49	4.0	670
2.6	87	4.5	1,000
2.9	159	5.0	1,380
3.2	265	5.6	1,860
3.5	400		

July 4 to Sept. 30

2.6	73
2.9	139
3.4	340
4.0	670

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	70	60	50	50	45	65	65	126	1,760	516	*254	113
2	*73	55	50	50	40	65	65	139	1,790	500	229	109
3	71	60	50	*50	45	65	65	159	1,720	*475	217	106
4	70	60	50	50	50	65	*66	159	1,630	423	198	104
5	67	64	45	50	50	70	70	197	1,600	412	188	102
6	63	60	50	55	50	65	71	200	1,440	401	177	*102
7	65	60	50	55	*55	65	73	214	1,170	406	170	100
8	67	60	50	55	55	65	76	257	*1,190	406	164	104
9	67	57	50	55	55	65	77	289	1,240	401	164	106
10	65	65	50	55	50	70	105	277	1,210	401	154	98
11	66	65	50	55	50	60	117	253	1,280	390	151	98
12	60	60	50	55	50	55	97	214	1,320	406	148	106
13	63	55	55	55	55	55	105	197	1,340	396	145	102
14	63	50	55	55	55	55	114	168	1,250	370	145	95
15	61	45	50	55	55	55	165	190	1,320	345	145	89
16	59	45	45	50	50	60	162	257	1,280	335	145	89
17	59	50	50	50	50	60	134	360	958	320	145	87
18	58	50	50	50	50	60	126	490	881	310	139	86
19	59	55	55	50	50	65	139	628	847	300	142	87
20	60	55	55	50	50	65	165	782	860	300	145	86
21	61	55	60	50	55	65	197	*902	802	290	134	86
22	63	55	60	50	55	65	225	1,060	676	290	131	84
23	59	55	70	50	55	65	197	*1,270	599	276	129	82
24	*53	55	70	50	60	70	*174	1,320	628	272	123	86
25	56	55	65	50	60	70	168	1,280	670	268	123	86
26	58	55	65	50	60	65	162	1,220	610	258	123	86
27	61	50	60	50	60	65	165	1,140	610	258	126	86
28	54	50	60	50	*65	65	151	1,240	622	268	118	91
29	59	*50	60	45	65	65	142	1,400	604	258	123	93
30	61	50	55	45	------	65	131	1,340	582	254	126	91
31	61	------	50	45	------	65	------	*1,410	------	245	123	------
Total	1,932	1,661	1,685	1,585	1,545	1,975	3,769	19,138	32,489	10,750	4,744	2,840
Mean	62.3	55.4	54.3	51.1	53.3	63.7	126	617	1,083	347	153	94.7
Ac-ft	3,830	3,290	3,340	3,140	3,060	3,920	7,480	37,960	64,440	21,320	9,410	5,630

Calendar year 1955:	Max 762	Min	42	Mean	118	Ac-ft	85,500
Water year 1955-56:	Max 1,790	Min	40	Mean	230	Ac-ft	166,800

Peak discharge (base, 850 cfs).--June 2 (4 a.m.) 1,910 cfs (5.66 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 1-4, 6-8, Nov. 12 to Apr. 3 (no gage-height record Jan. 12-23, Feb. 3-7, 18-28; discharge estimated on basis of 2 discharge measurements and weather records).

East Fork Wind River near Dubois, Wyo.

Location.--Lat 43°27'20", long 109°27'55", in SW¼NW¼ sec. 34, T. 6 N., R. 6 W., on left bank 1.1 miles upstream from mouth and 10 miles southeast of Dubois.

Drainage area.--439 sq mi.

Records available.--April 1950 to September 1956. Prior to October 1953, published as North Fork Wind River near Dubois.

Gage.--Water-stage recorder. Altitude of gage is 6,450 ft (from topographic map).

Average discharge.--6 years, 286 cfs (207,200 acre-ft per year).

Extremes.--Maximum discharge during year, 5,350 cfs June 1 (gage height, 7.92 ft); minimum daily, 27 cfs Jan. 3.

1950-56: Maximum discharge, 5,700 cfs June 26, 1954 (gage height, 7.72 ft), from rating curve extended above 3,400 cfs; maximum gage height, that of June 1, 1956; minimum daily discharge, 25 cfs Dec. 1, 1954.

Remarks.--Records good except those above 2,500 cfs and those for periods of ice effect or no gage-height record, which are fair. Diversions for irrigation of about 2,000 acres above station.

Rating tables, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 22)

Oct. 1 to May 21				May 22 to Sept. 30			
4.0	35	5.5	780	3.4	70	5.5	685
4.2	74	6.0	1,470	3.7	101	6.0	1,170
4.6	190	6.2	1,840	4.0	143	6.5	1,920
5.0	395			4.5	260	7.0	2,920
				5.0	440	7.5	4,150

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	55	46	50	30	40	50	49	125	3,740	860	*416	140
2	*57	45	50	28	35	50	48	149	3,420	823	380	135
3	53	45	45	*27	35	50	44	218	2,680	*699	432	130
4	49	45	40	29	40	50	*44	186	2,970	615	318	125
5	51	45	35	30	40	50	45	313	2,620	699	275	125
6	48	45	35	30	40	50	50	313	1,850	741	251	*125
7	46	45	35	35	*40	50	50	302	1,410	789	239	125
8	48	45	35	35	45	50	55	502	*1,620	755	225	135
9	49	45	35	35	45	50	60	467	1,940	806	212	130
10	51	45	35	35	40	50	90	395	2,060	772	210	125
11	55	45	35	35	40	45	120	330	2,180	755	208	130
12	57	40	35	35	45	40	100	280	2,120	798	198	140
13	57	40	40	40	45	40	110	255	2,060	727	198	*135
14	57	40	35	40	45	45	120	210	1,820	649	195	125
15	57	40	35	40	45	50	170	235	1,990	605	188	117
16	59	40	35	40	40	*50	170	359	1,650	555	185	111
17	57	40	30	40	35	50	140	614	1,250	550	182	109
18	55	45	30	45	35	50	130	780	1,050	520	176	105
19	53	50	30	45	35	50	140	1,030	1,290	507	210	104
20	57	55	30	45	35	50	170	1,650	1,440	498	287	96
21	57	55	30	45	35	50	200	*1,820	1,200	502	195	81
22	59	55	35	45	35	50	230	2,350	823	502	176	80
23	57	55	35	45	40	50	210	*2,790	823	472	170	76
24	*51	55	35	45	50	50	*180	2,510	1,070	480	168	76
25	49	55	35	45	50	50	170	2,740	1,110	460	165	74
26	48	55	35	45	50	51	170	2,350	1,050	448	160	77
27	51	55	35	45	50	55	170	2,180	1,170	456	150	78
28	48	55	35	45	*50	51	160	2,700	1,150	464	160	79
29	53	*55	35	45	50	49	150	2,550	1,150	516	160	81
30	57	50	30	40	------	48	130	2,310	1,100	412	155	80
31	55	------	30	40	------	49	------	*2,970	------	540	150	------
Total	1,656	1,431	1,100	1,204	1,210	1,523	3,675	35,983	51,806	18,975	6,794	3,249
Mean	53.4	47.7	35.5	38.8	41.7	49.1	122	1,161	1,727	612	219	108
Ac-ft	3,280	2,840	2,180	2,390	2,400	3,020	7,290	71,370	102,800	37,640	13,480	6,440

Calendar year 1955: Max 1,100 Min 28 Mean 144 Ac-ft 104,400
Water year 1955-56: Max 3,740 Min 27 Mean 351 Ac-ft 255,100

Peak discharge (base, 2,500 cfs).--June 1 (12:30 a.m.) 5,350 cfs (7.92 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 2 to Mar. 25. No gage-height record Nov. 15 to Mar. 25, Apr. 4-30, Aug. 23 to Sept. 13; discharge estimated on basis of 9 discharge measurements, weather records, and records for Wind River near Dubois.

Dinwoody Creek near Burris, Wyo.

Location.--Lat 43°25'55", long 109°21'01", in NE¼NE¼ sec. 9, T. 5 N., R. 5 W., on left bank 1,000 ft upstream from mouth and 6 miles northwest of Burris.

Drainage area.--114 sq mi.

Records available.--January to October 1909, May 1918 to July 1930, April 1950 to September 1956. Published as "near Crowheart" 1909 and as "near Lenore" 1918-24.

Gage.--Water-stage recorder. Datum of gage is 6,196.63 ft above mean sea level, datum of 1929. Jan. 16 to Oct. 30, 1909, chain gage at same site and datum.

Average discharge.--6 years (1950-56), 99.0 cfs (71,720 acre-ft per year).

Extremes.--Maximum discharge during year, 817 cfs June 5 (gage height, 2.95 ft); minimum daily, 0.6 cfs Oct. 7, 8.

1909, 1918-30, 1950-56: Maximum discharge, 1,710 cfs July 25, 1923 (gage height, 3.75 ft); no flow May 8-13, 1955.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Three canals above station divert water for irrigation of about 1,700 acres below station since 1936.

Revisions (water years).--WSP 1279: 1951-52.

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Sept. 27-30)

-0.6	0	1.0	51
-.5	.4	1.3	92
-.3	2.0	1.5	130
-.1	4.0	2.0	281
.1	6.5	2.5	525
.3	10	3.0	830
.7	26		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.6	13	16	17	12	12	19	41	616	470	*385	26
2	*1.1	22	16	17	12	12	21	42	706	385	330	21
3	1.2	17	16	*17	14	12	20	42	*739	321	285	16
4	1.1	15	16	17	16	14	*18	40	706	289	256	12
5	1.0	14	14	17	17	14	21	40	772	256	219	10
6	.9	9.2	12	17	18	13	18	45	739	235	182	*9.0
7	.6	15	13	17	*18	13	17	51	598	242	154	7.8
8	.6	15	14	17	18	13	17	58	*492	277	137	7.6
9	.7	13	14	17	17	14	18	69	520	*305	128	7.8
10	.8	15	14	17	16	14	17	62	586	330	120	8.0
11	1.1	19	14	17	16	13	17	55	622	339	112	10
12	1.1	18	14	17	16	13	16	53	676	352	105	15
13	2.7	17	16	17	16	14	15	51	700	380	101	22
14	3.6	15	14	17	16	14	15	41	700	395	108	27
15	5.8	13	13	17	16	14	15	35	670	380	114	29
16	6.8	12	12	17	16	15	16	30	658	365	122	28
17	8.2	12	13	16	16	15	19	30	604	347	132	26
18	10	12	14	16	16	15	19	30	486	343	130	21
19	12	15	15	16	16	16	19	37	375	347	124	17
20	13	17	15	16	16	17	19	70	370	321	118	15
21	15	18	15	16	16	18	19	200	420	321	103	13
22	15	17	16	16	16	17	20	*313	442	330	90	17
23	16	17	18	16	16	17	21	454	356	321	82	14
24	*15	17	19	15	16	17	*25	574	285	321	78	11
25	16	17	19	15	16	17	28	628	293	339	78	8.8
26	17	17	19	15	14	17	32	640	325	361	79	6.0
27	14	17	17	15	12	10	37	604	356	370	76	3.3
28	9.8	16	17	15	*11	13	41	558	410	365	72	2.2
29	18	*16	17	15	12	18	41	580	428	365	60	2.2
30	16	16	15	14	-	19	42	569	470	380	42	2.6
31	14	-----	16	12	-----	17	------	547	------	365	34	------
Total	239.7	466.2	473	500	447	457	662	6,589	16,120	10,517	4,156	415.3
Mean	7.73	15.5	15.3	16.1	15.4	14.7	22.1	213	537	339	134	13.8
Ac-ft	475	925	938	992	887	906	1,310	13,070	31,970	20,860	8,240	824

Calendar year 1955: Max 670 Min 0 Mean 65.1 Ac-ft 47,100
Water year 1955-56: Max 772 Min 0.6 Mean 112 Ac-ft 81,400

Peak discharge (base, 700 cfs).--June 5 (7 p.m.) 817 cfs (2.95 ft); June 13 (4:30 p.m.) 732 cfs (2.82 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 13 to Mar. 19. No gage-height record Jan. 27 to Feb. 27, Sept. 2-6; discharge estimated on basis of 2 discharge measurements, weather records, and records for nearby stations.

Bull Lake Creek near Lenore, Wyo.

Location.--Lat 43°14'33", long 109°01'20", in NE¼NW¼ sec. 17, T. 3 N., R. 2 W., on left bank 700 ft upstream from mouth, 2¾ miles downstream from Bull Lake, and 8½ miles southeast of Lenore.

Drainage area.--222 sq mi.

Records available.--1909 (discharge measurements only, published as "near J. K. ranch post office"), May 1918 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 5,654 ft (from topographic map). May 18, 1918, to Sept. 30, 1922, at site 300 ft upstream at datum 0.86 ft higher. Oct. 1, 1922, to Oct. 3, 1934, at present site at datum 2.00 ft lower.

Average discharge.--38 years (1918-56), 284 cfs, unadjusted (205,700 acre-ft per year).

Extremes.--Maximum discharge during year, 1,340 cfs July 2 (gage height, 3.72 ft); minimum daily, 43 cfs Nov. 6, 7.

1918-56: Maximum discharge, 6,200 cfs Aug. 8, 1951 (gage height, 7.09 ft), result of automatic spillway gates releasing on Bull Lake Dam, from rating curve extended above 2,000 cfs on basis of slope-area determination of peak flow; minimum (prior to construction of Bull Lake Dam), 8.6 cfs Dec. 17, 1933; no flow Feb. 28 to Apr. 7, 1937 (result of regulation).

Remarks.--Records good. Diversions above station for irrigation of about 600 acres downstream. Flow completely regulated by Bull Lake (see p. 237).

Revisions.--WSP 716: Drainage area.

Rating table, water year 1955-56 (gage height, in feet, and discharge, in cubic feet per second)

1.0	29	2.5	450
1.3	58	3.0	760
1.6	114	3.7	1,350
2.0	225		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	131	48	107	150	190	220	148	*143	156	1,320	*846	600
2	*143	48	110	150	190	220	148	143	159	1,320	846	594
3	136	47	110	*154	190	220	148	124	161	1,270	846	594
4	131	47	110	151	190	220	148	124	164	1,220	846	600
5	128	44	180	151	190	110	146	124	167	1,120	846	552
6	128	43	190	141	190	55	*146	124	170	910	788	*516
7	110	43	150	105	190	120	146	124	173	838	747	516
8	51	47	150	105	190	154	146	124	178	838	741	516
9	48	52	150	124	190	154	146	126	212	838	727	510
10	48	54	150	130	190	154	146	128	260	*846	727	510
11	47	56	150	133	190	154	146	131	272	846	727	510
12	47	53	150	136	190	154	146	128	272	846	708	510
13	48	64	150	138	*190	154	146	128	276	846	708	510
14	48	99	150	138	190	154	146	131	*280	846	701	510
15	48	107	190	133	190	154	146	131	280	846	708	510
16	48	180	210	133	190	154	146	126	280	846	708	510
17	50	210	210	133	190	154	146	126	280	846	708	510
18	50	210	210	133	190	154	146	128	350	846	708	510
19	50	178	210	180	200	154	146	128	564	846	708	510
20	50	131	210	200	220	154	143	131	558	846	708	510
21	50	101	210	200	220	154	141	133	*558	846	715	462
22	50	101	210	200	220	154	141	136	676	846	715	428
23	50	99	210	200	220	154	141	136	838	846	708	428
24	50	126	210	200	210	154	141	136	846	846	708	428
25	*50	154	210	200	200	154	141	126	870	846	708	428
26	50	154	110	200	200	154	141	138	974	846	701	428
27	50	154	55	200	200	151	143	143	1,070	846	701	422
28	50	143	55	200	210	150	141	154	*1,110	846	695	417
29	50	112	110	200	*220	150	141	156	1,100	846	676	417
30	50	*110	150	200	------	150	141	156	1,180	846	612	412
31	50	------	150	200	------	148	------	156	------	846	600	------
Total	2,090	3,015	4,927	5,018	5,740	4,840	4,337	4,142	14,434	28,286	22,591	14,878
Mean	67.3	100	159	162	198	156	145	134	481	912	729	496
Ac-ft	4,150	5,980	9,770	9,950	10,390	9,600	8,600	8,220	28,630	56,100	44,810	29,510

Calendar year 1955: Max 676 Min 33 Mean 210 Ac-ft 152,200
Water year 1955-56: Max 1,320 Min 43 Mean 312 Ac-ft 225,700

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* Discharge measurement made on this day.

Note.--No gage-height record from Nov. 16-18, Dec. 3 to Jan. 2, Jan. 19 to Mar. 14, Mar. 28 to Apr. 9; discharge computed on basis of 3 discharge measurements and record of gate settings at Bull Lake.

Wind River near Crowheart, Wyo.

Location.--Lat 43°14'33", long 109°00'35", in NW¼NW¼ sec. 16, T. 3 N., R. 2 W., on right bank 0.9 mile downstream from Bull Lake Creek and 9 miles southeast of Crowheart.

Drainage area.--1,920 sq mi, approximately.

Records available.--October 1945 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 5,635 ft (from topographic map).

Average discharge.--11 years, 1,273 cfs (922,200 acre-ft per year).

Extremes.--Maximum discharge during year, 10,200 cfs June 2 (gage height, 8.58 ft); minimum daily, 364 cfs Mar. 11.

1945-56: Maximum discharge, 10,800 cfs June 14, 1953 (gage height, 8.63 ft); maximum gage height, 8.90 ft July 17, 1951; minimum daily discharge, 230 cfs Mar. 25, 1955.

Flood of June 29, 1927, reached a discharge of 13,000 cfs, from discharge measurement by Bureau of Reclamation at site 1 mile downstream.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Diversions for irrigation of about 18,000 acres above station. Some regulation by Bull Lake (see p. 237).

Revisions (water years).--WSP 1116: 1946-47.

Rating tables, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 5-9)

Oct. 1-7		Oct. 8 to June 6				June 7 to Sept. 30			
3.6	475	3.3	340	6.0	3,380	4.3	840	7.0	4,540
3.7	545	3.5	465	7.0	5,400	5.0	1,470	8.0	6,960
		4.0	850	8.0	8,080	6.0	2,740	8.1	7,250
		5.0	1,880	8.4	9,480				

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	524	413	450	450	400	504	572	664	8,670	4,440	*2,620	1,180
2	*545	406	450	450	400	517	498	656	*9,210	4,200	2,480	1,140
3	538	413	450	500	400	524	452	744	8,740	3,910	2,440	1,090
4	510	452	450	500	400	524	452	736	8,340	3,620	2,240	1,100
5	503	465	400	*500	400	472	484	877	8,300	3,380	2,080	1,070
6	503	432	400	524	400	388	*452	967	7,830	3,160	1,910	*1,040
7	489	420	450	504	400	394	420	958	6,050	3,180	1,800	1,040
8	465	439	500	491	450	465	452	1,190	5,590	3,200	1,710	1,030
9	465	446	500	498	450	465	452	1,340	6,100	3,280	1,660	1,050
10	465	478	500	530	450	439	472	1,290	6,410	*3,350	1,640	1,070
11	465	530	500	510	450	364	544	1,190	6,680	3,250	1,590	1,070
12	484	500	500	510	450	426	517	1,090	7,050	3,370	1,560	1,090
13	484	500	500	510	*450	446	504	1,080	7,080	3,370	1,510	1,140
14	498	550	450	530	500	432	510	958	*6,410	3,200	1,470	1,110
15	491	550	450	498	500	432	544	931	6,710	3,080	1,450	1,070
16	484	550	500	504	450	439	640	1,000	6,540	2,950	1,460	1,050
17	484	600	500	504	450	484	680	1,400	4,770	2,850	1,470	1,040
18	484	600	500	500	450	510	586	1,840	4,060	2,770	1,510	1,040
19	478	600	500	500	450	517	579	2,340	4,320	2,720	1,550	1,000
20	484	550	500	500	450	*572	656	3,200	4,730	2,660	1,620	992
21	498	500	544	500	450	586	778	*4,120	4,480	2,650	1,580	920
22	498	500	565	500	500	600	949	5,000	3,930	2,660	1,490	880
23	498	500	616	500	550	696	913	*6,070	3,630	2,620	1,460	880
24	472	500	704	500	500	712	805	6,420	3,760	2,590	1,430	872
25	*452	550	624	500	500	720	796	6,630	4,120	2,540	1,440	864
26	446	550	530	450	500	736	*752	6,500	4,100	2,560	1,420	856
27	446	550	478	450	491	572	760	6,040	4,400	2,540	1,410	856
28	439	500	465	450	498	498	760	6,200	4,640	2,590	1,400	840
29	432	450	450	450	*530	491	720	6,740	4,670	2,640	1,300	864
30	452	*450	450	450	--	510	680	6,340	4,730	2,580	1,300	872
31	465	-	400	450	----	544	------	6,580	-----	2,660	1,260	------
Total	14,941	14,944	15,276	15,213	13,269	15,979	18,379	91,091	176,050	94,570	51,260	30,116
Mean	482	498	493	491	458	515	613	2,938	5,868	3,051	1,654	1,004
Ac-ft	29,640	29,640	30,300	30,170	26,320	31,690	36,450	180,700	349,200	187,600	101,700	59,730

Calendar year 1955: Max 3,560 Min 230 Mean 860 Ac-ft 622,700
Water year 1955-56: Max 9,210 Min 364 Mean 1,506 Ac-ft 1,093,000

Peak discharge (base, 5,000 cfs).--June 2 (10:30 a.m.) 10,200 cfs (8.58 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 13 to Dec. 20, Dec. 29 to Jan. 5, Jan. 18 to Feb. 26. No gage-height record Nov. 12-30, Jan. 19 to Feb. 13, Aug. 28-30; discharge estimated on basis of 2 discharge measurements, weather records, and records for Bull Lake Creek near Lenore.

Wyoming Canal near Lenore, Wyo.

Location.--Lat 43°13'45", long 108°53'40", in SE¼SE¼ sec. 17, T. 3 N., R. 1 W., on right bank 3.3 miles downstream from diversion dam on the Wind River and 15 miles southeast of Lenore.

Records available.--May 1949 to September 1956 in reports of Geological Survey. 1942-45 (irrigation season only) in reports of State engineer.

Gage.--Water-stage recorder. Datum of gage is 5,560.85 ft above mean sea level, datum of 1929. May 1, 1941, to Sept. 30, 1945, staff gage at site 3¼ miles upstream at different datum. May 3, 1949, to Oct. 2, 1952, water-stage recorder at site 3.0 miles upstream at different datum.

Average discharge.--7 years (1949-56), 541 cfs (391,900 acre-ft per year).

Extremes.--1949-56: Maximum daily discharge, 1,580 cfs June 23, 1953; no flow at times in most years.

Remarks.--Records good except those for periods of ice effect, which are fair. Flow used for irrigation and power on Riverton project.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	465	0	342	280	260	300	340	496	920	1,490	*1,360	682
2	*462	189	344	300	260	300	338	494	902	1,490	1,340	682
3	462	369	322	300	260	300	332	484	838	1,490	1,340	682
4	459	324	310	320	260	300	120	*484	860	1,500	1,330	682
5	454	326	287	*320	260	300	432	486	905	1,440	1,340	658
6	453	330	300	320	260	280	*422	488	932	1,470	1,320	*648
7	452	315	300	300	260	300	381	428	918	1,470	1,240	650
8	60	*322	320	300	260	320	392	502	960	1,480	1,180	650
9	0	314	340	300	260	300	387	572	1,060	*1,470	1,150	650
10	0	328	340	320	260	300	376	574	1,060	1,470	1,130	656
11	0	348	340	300	260	300	423	570	1,070	1,470	1,130	656
12	0	338	340	300	260	300	440	568	1,090	1,480	1,120	658
13	0	297	320	300	*260	320	432	568	930	1,480	1,060	648
14	0	345	280	300	260	340	432	548	*1,270	1,470	1,000	612
15	0	310	280	300	260	*340	435	586	1,330	1,460	990	612
16	0	262	300	280	240	340	440	602	1,450	1,450	990	612
17	0	348	320	280	220	340	442	626	1,370	1,450	990	612
18	0	412	340	260	220	340	442	652	1,330	1,440	988	614
19	0	411	340	280	220	360	442	674	1,400	1,430	990	616
20	0	400	340	280	240	380	442	700	1,420	1,300	992	620
21	0	378	368	280	260	378	444	756	1,420	1,000	945	620
22	0	327	378	280	280	362	447	882	1,390	1,000	932	616
23	0	303	404	280	300	352	446	910	1,360	1,080	912	616
24	0	340	426	280	300	357	464	882	1,380	1,320	848	618
25	*0	346	386	280	300	357	477	910	1,410	1,320	798	620
26	0	332	354	280	300	357	476	900	1,410	1,330	800	620
27	0	351	318	280	300	338	476	872	1,440	1,340	790	620
28	0	346	326	280	300	370	476	878	1,460	1,350	774	618
29	0	334	287	280	300	340	477	830	1,480	1,360	760	618
30	0	*336	308	280		338	500	766	1,470	1,350	720	638
31	0	- -	300	280	- -	346	------	730	-----	1,360	680	------
Total	3,267	9,681	10,260	9,020	7,680	10,255	12,573	20,418	36,235	43,010	31,939	19,104
Mean	105	323	331	291	265	331	419	659	1,208	1,387	1,030	637
Ac-ft	6,480	19,200	20,350	17,890	15,230	20,340	24,940	40,500	71,870	85,310	63,350	37,890

Calendar year 1955: Max 1,310 Min 0 Mean 530 Ac-ft 383,500
Water year 1955-56: Max 1,500 Min 0 Mean 583 Ac-ft 423,400

* Discharge measurement or observation of no flow made on this day.
Note.--Stage-discharge relation affected by ice Dec. 6-20, Dec. 31 to Mar. 20.

Wind River at Riverton, Wyo.

Location.--Lat 43°00'36", long 108°22'35", in NW¼NW¼ sec. 2, T. 1 S., R. 4 E., on right bank 8 ft downstream from bridge on State Highway 320, 1.1 miles southeast of post office in Riverton, and 1½ miles upstream from Popo Agie River.

Drainage area.--2,320 sq mi, approximately.

Records available.--May 1906 to November 1908, May 1911 to September 1927, October 1928 to September 1956. Published as Big Wind River near Arapahoe Agency, Wyo., 1906, and as Big Wind River near Riverton, Wyo., 1907-8.

Gage.--Water-stage recorder. Datum of gage is 4,903.56 ft above mean sea level, datum of 1929. May 14, 1906, to Nov. 6, 1908, staff gage at sites about 1 mile upstream at different datums. May 15, 1911, to Apr. 3, 1917, June 13 to Sept. 30, 1927, Oct. 1 to Dec. 5, 1928, chain gage and Apr. 4, 1917, to June 12, 1927, water-stage recorder, at site 600 ft downstream at different datums. Apr. 26, 1929, to Oct. 12, 1930, chain gage at present site and datum.

Extremes.--Maximum discharge during year, 8,200 cfs June 3 (gage height, 8.64 ft); maximum gage height observed, 8.90 ft Dec. 23 (backwater from ice); minimum daily discharge, 127 cfs May 16.

1906-8, 1911-27, 1928-56: Maximum discharge, 12,300 cfs June 14, 1906 (gage height, 6.00 ft, estimated, site and datum then in use), from rating curve extended above 9,500 cfs; minimum daily, 10 cfs May 18, 1955.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Diversions for irrigation of about 92,000 acres above station. The major diversion began in 1926 for the Riverton project. Waste water, comprising most of flow in Fivemile and Muddy Creeks, returns to river below station. Some regulation by Pilot Butte Reservoir, beginning 1926, and Bull Lake, beginning 1936 (combined capacity, 182,000 acre-ft). Records of water temperatures and suspended sediment loads for the water year 1956 are given in WSP 1451.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 20-22)

2.9	120	5.0	1,700
3.2	230	6.0	3,100
3.6	430	7.0	4,750
4.0	710	8.0	6,740
4.5	1,160	8.5	7,860

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	280	472	504	450	420	450	511	345	5,940	2,760	1,040	355
2	275	335	504	470	400	450	518	355	*7,470	2,500	997	315
3	280	190	472	500	400	450	454	335	7,600	2,360	952	285
4	262	270	450	*520	400	450	553	419	*7,250	1,870	808	285
5	275	222	450	520	400	*420	424	360	7,140	1,770	630	*340
6	345	239	450	520	420	420	380	518	6,960	1,440	484	320
7	350	226	450	520	450	420	402	602	5,520	1,330	*340	315
8	448	222	450	520	*450	420	414	454	4,440	1,340	260	305
9	774	248	450	540	450	420	419	694	4,420	*1,310	220	310
10	758	345	450	540	450	420	448	670	4,930	1,280	190	335
11	734	402	450	520	450	400	460	567	5,080	1,350	170	345
12	702	460	450	500	450	360	490	472	5,160	1,530	170	345
13	670	408	450	500	450	380	424	436	5,250	1,500	172	360
14	630	408	450	500	480	380	414	355	4,990	1,480	183	397
15	602	402	450	500	480	380	414	198	4,660	1,280	214	375
16	574	325	450	500	450	360	454	127	4,770	1,190	198	365
17	553	365	450	500	450	360	546	262	3,800	1,080	194	365
18	532	400	450	500	420	340	532	766	2,830	979	210	355
19	518	400	450	470	420	*320	454	1,240	*2,650	943	226	330
20	511	400	450	470	420	370	442	1,950	2,880	898	*270	330
21	518	450	460	470	420	400	525	*2,920	2,950	1,160	345	315
22	525	500	490	470	450	581	646	*3,480	2,580	1,200	305	234
23	525	500	650	470	450	630	742	4,290	2,320	1,200	257	218
24	518	525	600	470	450	686	654	*5,080	2,210	907	266	218
25	*490	*511	550	450	450	638	*581	*5,250	2,220	853	330	206
26	478	546	520	450	450	678	595	5,290	2,440	*844	340	198
27	478	532	520	450	450	623	560	4,890	2,530	808	330	206
28	478	504	500	450	450	518	574	4,680	2,770	844	355	198
29	460	511	500	450	450	466	546	5,580	2,820	919	386	198
30	466	490	450	420	------	*478	386	5,560	2,800	1,090	345	206
31	484	------	450	420	------	478	------	*5,420	------	997	360	------
Total	15,493	11,808	14,820	15,030	12,730	14,146	14,962	63,565	129,380	41,012	11,547	8,929
Mean	500	394	478	485	439	456	499	2,050	4,313	1,323	372	298
Ac-ft	30,730	23,420	29,400	29,810	25,250	28,060	29,680	126,100	256,600	81,350	22,900	17,710

Calendar year 1955: Max	1,930	Min	10	Mean	323	Ac-ft	233,700
Water year 1955-56: Max	7,600	Min	127	Mean	966	Ac-ft	701,000

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 18, 19, 22, 23, Dec. 4 to Mar. 21. No gage-height record Nov. 20-21, Dec. 8 to Feb. 9, Feb. 11-13, Aug. 8-12; discharge estimated on basis of 2 discharge measurements, weather records, and records for nearby stations.

North Popo Agie River near Milford, Wyo.

Location.--Lat 42°51'50", long 108°54'25", in SW¼NE¼ sec. 3, T. 33 N., R. 101 W., on right bank at Pine Bar Ranch, 2¼ miles downstream from Paradise Creek, 6¼ miles southwest of Milford, and 8½ miles northwest of Lander.

Drainage area.--99 sq mi, approximately.

Records available.--August 1945 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 6,190 ft (from topographic map).

Average discharge.--11 years, 125 cfs (90,560 acre-ft per year).

Extremes.--Maximum discharge during year, 1,460 cfs June 5 (gage height, 5.92 ft); minimum daily, 9.6 cfs Mar. 2-5.

1945-56: Maximum discharge, 2,060 cfs June 7, 1952 (gage height, 6.59 ft); minimum daily, 8 cfs Dec. 17, 1946.

Remarks.--Records good. Two small diversions above station for irrigation of hay meadows.

Rating table, water year 1955-56 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Dec. 31 to Jan. 7, Apr. 26 to May 22)

0.2	8	2.5	229
.6	25	3.0	350
1.0	47	4.0	604
1.5	83	5.0	940
2.0	139	6.0	1,520

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	29	14	17	28	16	10	15	*73	*1,100	408	176	44
2	28	11	17	28	16	9.6	14	82	1,120	365	164	40
3	*26	18	16	24	15	9.6	14	99	1,080	348	157	40
4	25	20	16	24	15	9.6	14	118	1,120	310	128	41
5	24	18	18	22	15	9.6	15	129	1,250	*305	115	*36
6	21	14	16	*19	*15	10	14	158	912	292	102	32
7	25	20	16	19	14	10	15	185	732	295	95	30
8	24	*21	16	18	14	10	15	200	788	288	90	30
9	24	20	15	15	14	11	17	266	884	285	87	30
10	21	22	15	17	14	10	19	209	960	282	82	30
11	23	22	14	16	14	11	21	167	980	257	79	34
12	21	17	14	16	14	11	20	144	972	290	77	44
13	20	12	*14	15	14	10	22	132	952	290	73	42
14	20	24	14	14	14	10	24	119	888	252	72	37
15	20	15	14	13	13	10	28	120	836	225	72	34
16	20	17	13	15	13	10	33	139	744	215	72	30
17	19	24	13	14	13	10	29	190	590	201	77	29
18	20	26	13	14	13	10	26	275	*562	196	84	28
19	21	25	14	14	13	10	30	408	624	190	82	28
20	26	25	15	13	13	10	40	532	638	183	87	26
21	24	26	16	13	13	11	51	652	569	179	78	27
22	25	23	19	13	13	12	61	*1,120	455	176	70	24
23	26	22	38	13	12	12	61	916	418	172	66	24
24	20	22	58	12	12	15	61	*904	468	170	62	26
25	20	20	40	12	12	19	74	995	538	172	60	27
26	19	20	31	12	12	20	83	932	512	176	59	24
27	22	18	30	14	11	14	86	792	505	169	56	24
28	18	17	28	14	10	15	82	774	492	164	52	26
29	16	18	20	15	*10	*18	73	1,070	470	162	49	26
30	21	16	23	16	-	14	69	868	468	181	48	28
31	18		28	15	- -	15	------	868	-----	*185	46	------
Total	686	587	631	507	387	366.4	1,126	13,636	22,627	7,383	2,617	941
Mean	22.1	19.6	20.4	16.4	13.3	11.8	37.5	440	754	238	84.4	31.4
Ac-ft	1,360	1,160	1,250	1,010	768	727	2,230	27,050	44,880	14,640	5,190	1,870

Calendar year 1955: Max 582 Min 8.8 Mean 86.3 Ac-ft 62,500
Water year 1955-56: Max 1,250 Min 9.6 Mean 141 Ac-ft 102,100

Peak discharge (base, 600 cfs).--June 5 (1 a.m.) 1,460 cfs (5.92 ft).
* Discharge measurement made on this day.

Little Popo Agie River near Lander, Wyo.

Location.--Lat 42°43'00", long 108°38'34", in NE¼SE¼ sec. 27, T. 32 N., R. 99 W., on left bank 700 ft downstream from bridge on U. S. Highway 287, 2½ miles downstream from Red Canyon Creek, and 9½ miles southeast of post office in Lander.

Drainage area.--130 sq mi, approximately.

Records available.--March 1946 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 5,436.49 ft above mean sea level, datum of 1929.

Average discharge.--10 years, 83.0 cfs (60,130 acre-ft per year).

Extremes.--Maximum discharge during year, 671 cfs May 29 (gage height, 4.56 ft); maximum gage height, 4.88 ft Dec. 16 (backwater from ice); minimum daily discharge, 19 cfs Nov. 2, Feb. 26-29, Apr. 3, 4, 6, 7.

1946-56: Maximum discharge, 1,160 cfs June 7, 1952 (gage height, 5.83 ft); minimum daily, 16 cfs Aug. 20, 1946, Feb. 27, 1947.

Remarks.--Records good except those for periods of ice effect, which are fair. Diversions for irrigation of about 600 acres above station.

Revisions.--WSP 1339: Drainage area.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 1-16)

2.1	13	3.5	315
2.3	32	4.0	475
2.6	77	4.5	650
3.0	167		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	26	21	23	28	21	22	23	*57	*510	144	60	38
2	26	19	23	28	20	21	21	60	562	131	57	37
3	*26	23	22	28	22	22	19	70	545	127	57	36
4	26	31	21	28	24	22	19	75	520	115	54	36
5	24	29	21	28	24	22	20	85	556	*106	46	*36
6	24	24	21	*26	*24	22	19	96	492	102	42	33
7	25	26	22	26	24	21	19	102	366	100	40	32
8	25	*28	22	26	24	21	21	122	369	96	37	32
9	24	29	22	26	24	21	21	109	381	94	36	31
10	23	29	22	26	24	23	24	106	390	92	36	30
11	24	30	22	25	24	22	25	100	390	86	35	31
12	23	28	22	25	24	21	23	94	375	88	41	32
13	24	25	*22	25	24	21	26	98	*378	86	48	31
14	24	25	22	25	24	21	30	90	375	81	46	29
15	24	25	22	25	22	21	33	90	357	75	46	29
16	24	25	22	25	21	22	37	90	321	68	46	29
17	24	25	22	24	20	25	32	111	255	67	51	29
18	24	25	22	24	20	25	29	144	237	63	52	29
19	24	25	22	24	20	25	31	189	246	60	57	29
20	24	27	22	24	20	30	36	249	249	58	70	29
21	25	29	29	24	20	28	44	321	231	56	60	29
22	26	30	32	24	20	28	52	*327	187	56	56	29
23	28	30	62	24	20	33	51	366	164	56	52	29
24	26	30	81	24	20	48	48	*366	170	52	51	29
25	25	29	57	24	20	50	57	433	181	51	48	29
26	25	28	45	24	19	45	65	468	173	52	46	29
27	28	26	41	24	19	33	68	447	164	51	46	29
28	25	25	40	24	19	31	68	416	162	51	42	26
29	24	25	35	24	*19	*22	60	604	154	56	41	26
30	29	23	30	24	------	22	56	514	154	60	40	28
31	28	------	25	22	------	24	------	426	------	*62	40	------
Total	777	794	916	778	626	814	1,077	6,825	9,614	2,442	1,479	921
Mean	25.1	26.5	29.5	25.1	21.6	26.3	35.9	220	320	78.8	47.7	30.7
Ac-ft	1,540	1,570	1,820	1,540	1,240	1,610	2,140	13,540	19,070	4,840	2,930	1,830

Calendar year 1955: Max 219 Min 18 Mean 47.2 Ac-ft 34,150
Water year 1955-56: Max 604 Min 19 Mean 73.9 Ac-ft 53,670

Peak discharge (base, 350 cfs).--May 29 (10:30 a.m.) 671 cfs (4.56 ft).
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 13-25, Nov. 28 to Dec. 21, Dec. 29 to Jan. 4, Jan. 9, 10, Jan. 15 to Feb. 29, Mar. 6-8, 11-16.

Popo Agie River near Riverton, Wyo.

Location.--Lat 42°59'51", long 108°22'29", in N½NW¼ sec. 11, T. 1 S., R. 4 E., on right bank 1¾ miles upstream from mouth and 1.9 miles southeast of Riverton. Prior to Sept. 19, 1956, at site 600 ft downstream.

Drainage area.--2,010 sq mi, approximately.

Records available.--May 1941 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 4,915 ft (from topographic map). Prior to Sept. 19, 1956, at site 600 ft downstream.

Average discharge.--15 years, 602 cfs (436,100 acre-ft per year).

Extremes.--Maximum discharge during year, 5,430 cfs June 6 (gage height, 6.53 ft); minimum daily, 87 cfs Sept. 26, 27.

1941-56: Maximum discharge, 9,820 cfs June 22, 1947 (gage height, 8.57 ft), from rating curve extended above 7,600 cfs; minimum daily, 56 cfs Sept. 16, 1955.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Diversions for irrigation of about 43,000 acres above station. Records of water temperatures and suspended sediment loads for the water year 1956 are given in WSP 1451.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 23-26, July 5 to Sept. 30)

1.5	81	4.0	1,560
1.6	101	5.0	2,960
2.0	245	6.0	4,560
2.5	420	6.4	5,210
3.0	740		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	166	190	240	180	130	140	222	380	3,970	1,250	395	171
2	155	174	240	190	120	140	226	338	*4,510	1,160	370	152
3	152	163	230	190	130	140	219	357	4,780	1,050	380	147
4	150	169	200	*200	130	160	219	405	4,670	929	366	145
5	142	190	150	200	130	*160	208	475	4,640	*873	325	*145
6	137	190	170	200	130	160	205	535	5,120	852	*298	145
7	145	180	170	210	130	160	196	614	4,340	719	252	135
8	169	180	170	210	130	160	205	*670	3,460	691	216	130
9	166	183	170	210	*140	160	222	712	3,540	691	199	128
10	*166	196	170	210	140	160	230	719	3,810	670	186	125
11	160	200	170	210	140	150	268	642	4,050	663	171	123
12	155	190	170	210	140	140	264	568	3,980	635	171	121
13	155	180	170	210	150	150	244	600	3,820	635	174	128
14	158	180	170	210	150	150	240	607	3,700	607	166	128
15	155	180	150	200	150	160	233	523	3,460	548	150	125
16	155	180	160	200	140	180	268	505	3,150	511	142	123
17	155	180	170	190	140	200	294	517	2,600	470	150	*121
18	152	190	170	180	130	230	272	614	2,000	436	166	112
19	150	190	170	180	140	*280	256	775	*1,820	390	193	105
20	150	200	170	170	140	310	240	1,120	1,980	343	*219	*103
21	150	230	190	170	140	320	264	1,510	2,000	307	248	97
22	152	260	240	170	140	330	325	*1,930	1,650	289	233	93
23	155	270	300	170	140	330	385	2,460	1,280	280	212	93
24	158	270	260	170	140	320	380	*2,760	1,160	268	196	99
25	160	*272	240	170	140	320	*361	*3,440	1,260	240	193	97
26	160	270	220	160	140	284	390	3,940	1,410	*226	183	87
27	169	260	220	160	140	298	400	3,790	1,380	226	174	87
28	183	250	220	160	140	325	442	3,470	1,350	226	160	99
29	190	250	200	150	140	268	448	4,130	1,330	226	147	99
30	186	240	180	140	------	*240	395	4,900	1,270	464	145	95
31	190	------	170	130	------	240	------	3,970	------	390	150	------
Total	4,946	6,257	6,020	5,710	3,990	6,765	8,521	47,976	87,490	17,265	6,730	3,558
Mean	160	209	194	184	138	218	284	1,548	2,916	557	217	119
Ac-ft	9,810	12,410	11,940	11,330	7,910	13,420	16,900	95,160	173,500	34,240	13,350	7,060

Calendar year 1955:	Max 1,960	Min 56	Mean 328	Ac-ft 237,500
Water year 1955-56:	Max 5,120	Min 87	Mean 561	Ac-ft 407,000

Peak discharge (base, 3,160 cfs).--June 6 (5 p.m.) 5,430 cfs (6.53 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 11-24, Nov. 26 to Mar. 24 (no gage-height record Nov. 13-24, Nov. 27 to Mar. 21; discharge estimated on basis of 4 discharge measurements, weather records, and records for nearby stations).

Muskrat Creek near Shoshoni, Wyo.

Location.--Lat 43°08'55", long 108°09'30", in NW¼SW¼ sec. 15, T. 2 N., R. 6 E., on right bank 2 miles upstream from mouth and 7 miles southwest of Shoshoni.

Drainage area.--760 sq mi, approximately.

Records available.--June 1950 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 4,770 ft (from topographic map).

Average discharge.--6 years, 0.86 cfs (623 acre-ft per year).

Extremes.--Maximum discharge during year, 1,450 cfs May 29 (gage height, 3.22 ft); no flow most of year.

1950-56: Maximum discharge, 3,600 cfs July 24, 1955 (gage height 4.90 ft, from floodmarks), by slope-area determination of peak flow; no flow most of each year.

Flood of July 24, 1923, reached a discharge of 6,400 cfs, by slope-area determination of peak flow.

Remarks.--Records poor. Discharge measurements, observation of no flow, or field estimates of flow made several times a month during periods of possible flow. Records of suspended sediment loads for the water year 1956 are given in WSP 1451.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			0			0		0				
2			0			0		0				
3			0			a10		0				
4			0			a5		0				
5			0			0		0				
6			0			0		0				
7			0			0		0				
8			0			0		0				
9			0			0		0				
10			0			0		0				
11			0			0		0				
12			0			0		0				
13			0			0		0				
14			0			0		0				
15			0			0		0				
16			0			0		0				
17			0			0		0				
18			0			0		0				
19			0			0		0				
20			0			0		0				
21			0			0		0				
22			0			0		0				
23			18			0		0				
24			a10			0		0				
25			a3			0		36				
26			0			0		9				
27			0			0		0				
28			0			0		14				
29			0			0		485				
30			0		------	0		58				
31		------	0		------	0	------	a7	------			------
Total	0	0	31	0	0	15	0	609	0	0	0	0
Mean	0	0	1.0	0	0	0.5	0	19.6	0	0	0	0
Ac-ft	0	0	61	0	0	30	0	1,210	0	0	0	0

	Max	Min	Mean	Ac-ft
Calendar year 1955:	113	0	0.98	712
Water year 1955-56:	485	0	1.79	1,300

Peak discharge (base, 100 cfs).--Dec. 23 (8:30 a.m.) 123 cfs (2.52 ft); May 25 (10 p.m.) 748 cfs (2.70 ft); May 29 (1:30 p.m.) 1,450 cfs (3.22 ft).

a No gage-height record; discharge estimated on basis of 1 field estimate, weather records, normal recession, and records for nearby stations.

Fivemile Creek above Wyoming Canal near Pavillion, Wyo.

Location.--Lat 43°18'04", long 108°42'04", in NW¼NE¼ sec. 25, T. 4 N., R. 1 E., on right bank 1,400 ft upstream from Wyoming Canal siphon and 4 miles north of Pavillion.

Drainage area.--143 sq mi.

Records available.--October 1949 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 5,495 ft (from topograohic map).

Average discharge.--7 years, 1.00 cfs (724 acre-ft per year).

Extremes.--Maximum discharge during year, 87 cfs May 28 (gage height, 2.77 ft); maximum gage height observed, 3.17 ft Mar. 15 (backwater from ice); no flow at times.

1949-56: Maximum discharge, 1,750 cfs Sept. 6, 1951 (gage height, 5.60 ft, from floodmarks), from rating curve extended above 350 cfs; no flow at times each year.

Flood in September 1948 reached a stage about half a foot higher than that of Sept. 6, 1951 (discharge, 2,600 cfs, by slope-area determination of peak flow).

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. Discharge measurements, observation of no flow, or estimates of flow generally made once a week in springtime and twice monthly at other times. Records of suspended sediment loads for the water year 1956 are given in WSP 1451.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			0			0	1.8	0.7	a1			
2			0			0	1.8	.4	a.5			
3			0			a3	1.4	.1	0			
4			0			a3	1.1	.6	0			
5			0			a1	1.5	.4	0			
6			0			0	1.3	.5	0			
7			0			0	1.3	1.0	0			
8			0			a2	2.3	.6	0			
9			0			b3	3.2	.2	0			
10			0			b2	2.9	.6	0			
11			0			b0	2.0	.4	0			
12			0			b0	1.8	.7	0			
13			0			b0	1.5	2.6	0			
14			0			b0	1.5	1.3	0			
15			0			b0	1.5	.8	0			
16			0			b.1	1.6	.2	0			
17			0			b3	2.0	0	0			
18			0			b5	1.6	0	0			
19			0			b5	1.7	0	0			
20			0			b8	1.5	0	0			
21			0			b12	1.2	0	0			
22			0			b13	1.2	0	0			
23			a4			14	1.8	0	0			
24			a3			8.8	1.8	0	0			
25			a4			6.8	1.4	7.8	0			
26			0			3.3	1.4	4.7	0			
27			0			.2	1.7	11	0			
28			0			2.2	1.7	35	0			
29			0			1.6	1.9	22	0			
30			0		------	1.5	1.0	a7	0			
31		------	0		------	1.3	------	a3	------			------
Total	0	0	11	0	0	99.8	50.4	101.6	1.5	0	0	0
Mean	0	0	0.35	0	0	3.22	1.68	3.28	0.05	0	0	0
Ac-ft	0	0	22	0	0	198	100	202	3.0	0	0	0

Calendar year 1955: Max 7.9 Min 0 Mean 0.28 Ac-ft 204
Water year 1955-56: Max 35 Min 0 Mean 0.72 Ac-ft 525

Peak discharge (base, 500 cfs).--No peak above base.

a No gage-height record; discharge estimated on basis of 2 discharge measurements and weather records.

b Stage-discharge relation affected by ice.

Fivemile Creek near Riverton, Wyo.

Location.--Lat 43°12'14", long 108°23'54", in SW¼SW¼ sec. 27, T. 3 N., R. 4 E., on right bank 12½ miles north of Riverton and 13 miles upstream from mouth.

Drainage area.--342 sq mi.

Records available.--September 1949 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 5,020 ft (from topographic map). Prior to Apr. 4, 1951, wire-weight gage at site 50 ft downstream at same datum.

Average discharge.--7 years, 73.0 cfs (52,890 acre-ft per year).

Extremes.--Maximum discharge during year, 420 cfs May 31 (gage height, 7.44 ft); minimum daily, 8.8 cfs Apr. 6.

1949-56: Maximum discharge, 1,690 cfs July 25, 1950 (gage height, 11.0 ft, from floodmarks), from rating curve extended above 1,100 cfs on basis of velocity-area study and logarithmic plotting; minimum daily, 2.0 cfs Nov. 17, 18, 1951.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Discharge measurements generally made every two weeks. Records of water temperatures and suspended sediment loads for the water year 1956 are given in WSP 1451.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 26 to Apr. 6, June 11 to Aug. 12)

4.1	8	5.5	122
4.4	15	6.0	184
4.6	27	6.5	251
5.0	65		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	134	36	28	28	20	11	14	50	80	183	227	152
2	132	35	28	30	20	12	13	43	99	200	226	167
3	130	40	33	30	20	12	13	43	100	194	216	154
4	116	40	32	30	21	12	13	43	100	193	204	153
5	97	39	30	30	22	12	13	42	106	213	204	146
6	91	35	29	30	22	11	8.8	42	91	214	200	148
7	89	34	28	30	22	12	9.2	50	89	210	187	136
8	70	33	31	30	22	15	11	46	95	202	187	146
9	58	39	33	30	22	13	11	47	161	201	174	168
10	54	40	33	30	22	12	11	68	140	185	157	154
11	50	40	33	30	22	12	10	57	144	187	167	151
12	48	34	33	29	21	12	10	53	138	202	181	140
13	48	31	33	28	20	12	10	62	179	213	179	138
14	47	33	33	28	19	11	13	56	193	201	179	140
15	47	28	31	27	18	11	40	46	184	209	170	126
16	45	28	32	26	18	12	55	51	170	211	174	110
17	44	28	35	25	18	13	57	57	176	214	179	108
18	43	29	38	25	18	15	34	63	175	215	179	106
19	43	31	38	25	17	16	32	74	200	205	181	104
20	42	34	30	25	15	17	53	70	193	207	183	108
21	41	37	26	25	13	18	62	74	190	202	168	104
22	40	38	33	25	12	19	62	94	194	202	163	104
23	38	38	170	25	11	18	65	89	197	200	144	112
24	38	38	100	25	10	17	65	91	207	193	136	111
25	38	38	32	25	10	15	61	94	207	193	136	105
26	39	38	31	24	10	15	58	104	201	183	151	97
27	38	38	29	23	10	11	53	108	193	179	151	95
28	40	36	28	22	10	11	62	170	192	190	146	96
29	37	32	28	21	11	15	57	244	187	211	147	98
30	36	28	28	20	------	16	52	170	171	223	152	106
31	36	------	26	20	------	15	------	96	------	220	152	------
Total	1,849	1,048	1,172	821	496	423	1,028.0	2,403	4,752	6,255	5,400	3,783
Mean	59.6	34.9	37.8	26.5	17.1	13.6	34.3	77.5	158	202	174	126
Ac-ft	3,670	2,080	2,320	1,630	984	839	2,040	4,770	9,430	12,400	10,700	7,500

Calendar year 1955: Max 431 Min 23 Mean 84.9 Ac-ft 61,490
Water year 1955-56: Max 244 Min 8.8 Mean 80.4 Ac-ft 58,360

Peak discharge (base, 500 cfs).--No peak above base.

Note.--Stage-discharge relation affected by ice Nov. 15 to Mar. 25 (no gage-height record Nov. 15-23, Feb. 4-10; discharge estimated on basis of 1 discharge measurement and weather records).

Fivemile Creek near Shoshoni, Wyo.

Location.--Lat 43°13'20", long 108°13'06", in NW¼SW¼ sec. 19, T. 3 N., R. 6 E., on right bank 1¼ miles upstream from normal high-water line of Boysen Reservoir and 5 miles west of Shoshoni.

Drainage area.--397 sq mi.

Records available.--May 1941 to September 1942, August 1948 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 4,750 ft (from topographic map). Prior to Sept. 30, 1942, chain gage at site 1 mile downstream at different datum.

Average discharge.--9 years, 121 cfs (87,660 acre-ft per year).

Extremes.--Maximum discharge during year, 968 cfs Mar. 3 (gage height, 5.33 ft); maximum gage height, 7.50 ft Dec. 23 (backwater from ice); minimum daily discharge, 20 cfs Mar. 28.

1941-42, 1948-56: Maximum discharge observed, 3,200 cfs Aug. 7, 1941 (gage height, 8.03 ft, from floodmark, site and datum then in use), by slope-area determination of peak flow; maximum gage height, 9.61 ft Dec. 27, 1954 (backwater from ice); minimum daily discharge, 1.0 cfs Jan. 4-6, 1942.

Flood of July 24, 1923, discharge 3,500 cfs, estimated by Bureau of Reclamation.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Records of water temperatures and suspended sediment loads for the water year 1956 are given in WSP 1451.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-8, June 8-26, Aug. 18-29)

2.7	20
3.0	68
3.3	135
3.7	270
4.1	420

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	214	64	50	55	40	36	31	103	277	312	408	326
2	207	63	50	54	35	37	28	90	246	340	412	337
3	207	72	60	54	35	183	30	88	214	340	404	330
4	211	*74	57	54	37	55	30	90	204	333	388	344
5	190	72	55	54	40	53	30	82	214	360	360	312
6	193	66	52	54	40	52	27	95	183	356	352	277
7	200	66	50	54	42	52	27	108	193	372	333	*256
8	193	66	70	54	43	64	24	97	172	368	337	263
9	141	66	70	54	43	68	*24	92	235	*380	330	284
10	101	74	70	55	40	52	24	128	246	356	326	284
11	92	80	70	57	*41	52	24	123	256	352	326	288
12	*88	68	*70	60	43	47	23	118	211	360	333	277
13	84	61	70	60	40	47	21	120	242	376	326	256
14	86	50	70	60	37	45	23	118	270	368	319	*256
15	82	50	50	60	35	47	40	97	*267	368	309	232
16	82	50	55	*60	30	47	97	*99	249	372	302	218
17	82	50	62	60	22	50	78	99	277	360	312	214
18	82	50	70	60	22	66	70	108	291	372	319	218
19	80	55	70	60	22	47	72	138	295	368	323	214
20	80	60	70	60	22	50	76	144	284	372	326	218
21	80	65	120	60	22	50	92	141	291	372	291	218
22	80	*65	185	60	22	47	125	232	302	376	*277	211
23	76	65	*300	60	22	54	133	267	305	376	267	211
24	*76	65	250	60	24	47	133	*239	323	360	263	214
25	76	65	190	60	25	45	125	228	323	356	263	197
26	76	65	138	57	25	*34	103	200	312	344	277	186
27	76	65	99	54	*25	23	*101	214	298	333	277	172
28	74	65	84	52	28	20	118	291	288	352	284	172
29	72	57	59	50	32	30	115	412	305	372	291	172
30	72	50	*58	47	------	31	110	372	284	400	305	193
31	68	------	56	45	------	30	------	323	------	*408	309	------
Total	3,521	1,884	2,780	1,744	934	1,561	1,954	5,056	7,857	11,234	9,949	7,350
Mean	114	62.8	89.7	56.3	32.2	50.4	65.1	163	262	362	321	245
Ac-ft	6,980	3,740	5,510	3,460	1,850	3,100	3,880	10,030	15,580	22,280	19,730	14,580

Calendar year 1955: Max 910 Min 35 Mean 148 Ac-ft 107,500
Water year 1955-56: Max 412 Min 20 Mean 153 Ac-ft 110,720

Peak discharge (base, 500 cfs).--Dec. 23 (6 p.m.) 950 cfs (7.50 ft); Mar. 3 (4:30 p.m.) 968 cfs (5.33 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 14 to Dec. 24, Dec. 30 to Feb. 29. No gage-height record Feb. 5-29, Mar. 5; discharge estimated on basis of 2 discharge measurements, weather records, and records for station near Riverton.

Poison Creek near Shoshoni, Wyo.

Location.--Lat 43°14'15", long 108°08'20", in SW¼NE¼ sec. 29, T. 38 N., R. 94 W., on left bank half a mile upstream from normal high-water line of Boysen Reservoir and 1 mile west of Shoshoni.

Drainage area.--519 sq mi.

Records available.--March 1949 to December 1953 (monthly discharge only, October 1950 to September 1952), October 1955 to September 1956 (discontinued).

Gage.--Water-stage recorder. Altitude of gage is 4,750 ft (from topographic map).

Average discharge.--5 years (1949-53, 1955-56), 0.65 cfs (471 acre-ft per year).

Extremes.--Maximum discharge during year, 1,560 cfs May 25 (gage height, 3.23 ft), by slope-area determination of peak flow; no flow for many days.

1949-53, 1955-56: Maximum discharge, that of May 25, 1956; no flow at times each year.

Flood of July 24, 1923, discharge, 3,000 cfs, estimate by Bureau of Reclamation.

Flood of July 24, 1955, discharge, 2,350 cfs (gage height, 4.38 ft), by slope-area determination of peak flow.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are fair. Discharge measurements or estimates of flow generally made once a week. Records of water temperatures and suspended sediment loads for the water year 1956 are given in WSP 1451.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.1	0.2	0			0	e0.3	e0.3	3			
2						0			1			
3						.3			.5			
4						8.0			.2			
5						10			.1			
6						.5			.1			
7						.5			.1			
8						3.0			.1			
9						1.0			0			
10						.5						
11						.1						
12		0				.1						
13						.1						
14						.1						
15						.1						
16						.3						
17						1.0						
18						2.0						
19						4.0						
20						5.0						
21						3.0						
22						2.0						
23	.2		1.0			.3						
24			.1									
25			0					27				
26								f274				
27								5				
28								3				
29								f130				
30					------			5				
31		------			------		------	4	------			------
Total	4.0	2.2	1.1	0	0	44.3	9.0	455.2	5.1	0	0	0
Mean	0.13	0.07	0.04	0	0	1.43	0.3	14.7	0.17	0	0	0
Ac-ft	7.9	4.4	2.2	0	0	88	18	903	10	0	0	0

	Max	Min	Mean	Ac-ft
Calendar year 1955:	-	-	-	-
Water year 1955-56:	274	0	1.42	1,030

e Stage-discharge relation indefinite.

f Fragmentary gage-height record.

Note.--No gage-height record Oct. 1 to Apr. 17, May 27, 28, May 30 to Sept. 30; discharge estimated on basis of 2 discharge measurements, 31 field estimates of flow, 36 observations of no flow, weather records, and typical recession.

Badwater Creek at Lybyer Ranch, near Lost Cabin, Wyo.

Location.--Lat 43°21'02", long 107°33'22", in SE¼NE¼ sec. 18, T. 39 N., R. 89 W., on right bank 2,000 ft downstream from Sioux Creek and 6 miles northeast of Lost Cabin.

Drainage area.--138 sq mi.

Records available.--September 1948 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 5,715.42 ft above mean sea level, datum of 1929.

Average discharge.--8 years, 5.05 cfs (3,660 acre-ft per year).

Extremes.--Maximum discharge during year, 154 cfs May 26 (gage height, 6.20 ft); maximum gage height observed, 6.30 ft Mar. 22 (backwater from ice); no flow for many days.
1948-56: Maximum discharge, 445 cfs July 8, 1949 (gage height, 7.35 ft); maximum gage height, 8.88 ft Mar. 30, 1952 (backwater from ice); no flow at times each year.

Remarks.--Records good except those for period of ice effect, which are fair. Diversions for irrigation of about 350 acres above station.

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 14-21)

4.3	0	4.7	2.4
4.4	.1	5.0	14
4.5	.3	5.3	38
4.6	.8	5.4	48

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	3.6	2	2	1	*1	9.0	1.2	2.0	0		
2	0	4.4	2	2	1	1	7.6	.9	.7	0		
3	0	3.2	2	2	1	1	6.4	.9	.3	0	(*)	
4	0	4.4	2	*2	1	2	4.4	2.0	.4	0		
5	0	5.2	2	2	1	3	4.8	8.4	.1	0		(*)
6	0	4.4	2	2	1	1	*4.0	8.8	.2	0		
7	0	4.8	2	2	1	1	4.0	8.8	.6	0		
8	0	4.4	2	2	2	1	5.6	8.8	.7	0		
9	0	5.6	2	2	2	1	4.8	9.2	.1	0		
10	*0	6.4	2	2	*1	1	5.6	9.2	.1	0		
11	0	6.4	2	2	1	1	16	8.8	.1	.1		
12	0	5	2	2	1	1	7.6	8.0	.1	.1		
13	0	3	2	2	1	1	12	9.2	.1	0		
14	0	2	2	2	1	1	12	9.2	.3	0		
15	.2	2	2	2	1	1	16	9.2	.3	0		
16	.4	2	2	2	1	2	20	8.8	.4	0		
17	.6	2	2	2	1	2	18	7.2	.4	0		
18	.9	2	2	2	1	5	8.8	6.4	.3	0		
19	1.0	2	2	2	1	10	9.2	6.4	.4	0		
20	1.0	2	2	2	1	15	11	6.4	.3	0		
21	1.6	3	2	2	1	20	12	*7.2	.3	0		
22	3.6	3	3	2	1	*15	11	7.6	**.2	0		
23	4.8	3	4	2	1	12	6.8	9.2	.2	0		
24	5.6	3	5	2	1	12	4.0	7.2	.2	0		
25	6.0	*2	5	2	1	12	*4.4	9.2	.2	0		
26	6.0	2	5	2	1	12	5.6	42	.1	0		
27	6.8	2	4	2	1	12	4.4	20	0	0		
28	7.2	2	4	2	1	10	3.6	7.2	0	0		
29	7.2	2	3	2	1	10	2.4	9.2	0	0		
30	7.2	2	2	1	------	10	2.4	5.2	0	0		
31	5.2	------	2	1	------	10	------	3.6	------	0		------
Total	65.3	98.8	79	60	31	187	243.4	265.4	9.1	0.2	0	0
Mean	2.11	3.29	2.5	1.9	1.1	6.0	8.11	8.56	0.30	0.06	0	0
Ac-ft	130	196	157	119	61	371	483	526	18	0.4	0	0

Calendar year 1955:	Max 112	Min	0	Mean	10.1	Ac-ft	7,330
Water year 1955-56:	Max 42	Min	0	Mean	2.84	Ac-ft	2,060

Peak discharge (base, 150 cfs).--May 26 (2 a.m.) 154 cfs (6.20 ft).
* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
Note.--Stage-discharge relation affected by ice Nov. 12 to Apr. 1 (no gage-height record Nov. 15-25, Dec. 18 to Jan. 4, Jan 16 to Apr. 1; discharge estimated on basis of 5 discharge measurements and weather records).

Badwater Creek at Bonneville, Wyo.

Location.--Lat 43°16'09", long 108°04'46", in NW¼NE¼ sec. 14, T. 38 N., R. 94 W., on right bank at Bonneville, 3 miles upstream from normal high-water line of Boysen Reservoir.

Drainage area.--790 sq mi, approximately.

Records available.--April 1947 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 4,774.17 ft above mean sea level, datum of 1929.

Average discharge.--9 years, 8.37 cfs (6,060 acre-ft per year).

Extremes.--Maximum discharge during year, 7,260 cfs May 25 (gage height, 6.6 ft, from floodmarks), from rating curve extended above 1,100 cfs on basis of slope-area determination of peak flow; no flow for many days.

1947-56: Maximum discharge, that of May 25, 1956; no flow for many days each year. Flood of July 24, 1923, reached a discharge of 18,600 cfs, by slope-area determination of peak flow.

Remarks.--Records fair. Diversions for irrigation of about 800 acres above station. Discharge measurements, field estimates of flow, or observation of no flow generally made once a week. Records of suspended sediment loads for the water year 1956 are given in WSP 1451.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						0	18	5	f16			
2						0	16	g2	10			
3						0	16	0	6.0			
4						2	12	0	2.5			
5						20	12	0	1.0			
6						30	14	0	.5			
7						5	14	3	.2			
8						13	14	3	.2			
9						17	14	0	0			
10						14	12	0	0			
11						0	12	0	0			
12						0	13	0	0			
13						0	14	0	0			
14						0	12	1	0			
15						0	12	0	0			
16						5	11	0	0			
17						25	16	0	0			
18						69	g14	0	g2			
19						100	g9	0	g1			
20						110	7	0	0			
21						139	7	0	0			
22						138	6	0	0			
23						284	5	0	0			
24						286	6	0	0			
25						203	6	484	0			
26						155	6	g383	0			
27						55	5	g267	0			
28						14	6	g30	0			
29						18	7	g771	0			
30					------	18	5	g44	0			
31		------			------	18	------	g24	------			------
Total	0	0	0	0	0	1,738	321	2,017	39.4	0	0	0
Mean	0	0	0	0	0	56.1	10.7	65.1	1.31	0	0	0
Ac-ft	0	0	0	0	0	3,450	637	4,000	78	0	0	0

Calendar year 1955:	Max 267	Min 0	Mean 9.82	Ac-ft 7,110
Water year 1955-56:	Max 771	Min 0	Mean 11.2	Ac-ft 8,160

Peak discharge (base, 1,000 cfs).--May 25 (11:30 p.m.) 7,260 cfs (6.6 ft); May 29 (1:30 p.m.) 2,900 cfs (4.13 ft).

f Fragmentary gage height record.

g Computed from twice-daily staff-gage readings.

Muddy Creek near Pavillion, Wyo.

Location.--Lat 43°22'19", long 108°36'39", in NW¼NW¼ sec. 35, T. 5 N., R. 2 E., on left bank 1¼ miles upstream from Wyoming Canal siphon, 3 miles downstream from Sheep Creek, and 9½ miles northeast of Pavillion.

Drainage area.--257 sq mi.

Records available.--March 1949 to December 1953, October 1954 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 5,370 ft (from topographic map).

Average discharge.--6 years (1949-53, 1954-56), 5.53 cfs (4,010 acre-ft per year).

Extremes.--Maximum discharge during year, 919 cfs May 29 (gage height, 6.96 ft, from floodmark); no flow for many days.
1949-53, 1954-56: Maximum discharge, 2,300 cfs June 5, 1949 (gage height, 9.70 ft, from floodmark), from rating curve extended above 1,100 cfs on basis of slope-area determination of peak flow; no flow at times most years.

Remarks.--Records fair except those for periods of ice effect, fragmentary and no gage-height record, which are poor. Discharge measurements or field estimates generally made once a week during spring and summer and twice a month at other times. Records of water temperatures and suspended sediment loads for the water year 1956 are given in WSP 1451.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.7	2.2	1.0	0.5	0.2	0.7	7.0	6.2	a5	0	a2.0	0
2	.7	2.0	1.0	.7	.2	1.0	6.2	6.2	a3	0	0	0
3	.8	2.0	1.0	.8	.2	2.0	6.8	5.0	a1	0	0	0
4	.8	2.0	1.0	.8	.2	3.0	6.8	5.0	a.5	0	0	0
5	.7	1.5	1.0	.8	.2	3.0	4.6	5.0	f.4	0	0	0
6	.8	1.5	1.0	.8	.3	2.0	5.0	5.0	.3	0	0	0
7	1.0	1.5	1.0	.7	.4	2.0	6.8	5.0	.3	0	0	0
8	1.0	1.0	1.0	.6	.5	2.0	6.2	4.2	.3	0	0	0
9	1.0	1.0	1.0	.6	.5	3.0	5.0	3.8	.3	0	0	0
10	.9	1.0	1.0	.6	.5	3.0	8.0	3.8	.3	0	0	0
11	.9	.5	.8	.6	.5	3.0	8.6	4.2	.2	0	0	0
12	1.0	.4	.6	.6	.5	2.0	7.4	5.0	.1	f57	0	0
13	1.4	.3	.5	.6	.5	2.0	7.4	5.0	0	a26	0	0
14	1.4	.2	.5	.6	.5	2.0	6.8	4.2	0	a3.0	0	0
15	1.4	.1	.5	.5	.5	3.0	6.8	3.8	0	0	0	0
16	1.4	.1	.5	.5	.5	4.0	6.2	4.2	0	0	0	0
17	1.4	0	.5	.5	.5	5.0	6.2	3.8	0	0	0	0
18	1.4	0	.5	.5	.5	5.0	6.2	3.8	0	0	0	0
19	1.4	0	.5	.5	.5	5.0	5.6	3.8	0	0	0	0
20	1.4	0	.5	.5	.5	5.0	5.6	3.8	0	0	0	0
21	1.4	.1	.5	.5	.5	6.0	6.8	3.4	0	0	0	0
22	1.4	.1	1.0	.5	.5	7.0	6.8	3.8	0	0	0	a.1
23	1.4	.1	5.0	.5	.5	10	7.4	4.2	0	0	0	a.5
24	2.2	.1	4.0	.5	.5	12	7.4	3.0	0	0	0	a.8
25	2.2	.1	2.0	.5	.5	10	7.4	f167	0	0	0	a1.0
26	3.0	.2	1.0	.4	.5	10	7.4	f21	0	0	0	a1.0
27	3.4	.4	.5	.4	.6	9	7.4	f86	0	0	0	a1.0
28	3.4	.6	.5	.3	.6	9	7.4	f38	0	0	0	a1.0
29	3.4	.8	.5	.3	.6	8	6.8	f178	0	a7.6	0	a1.0
30	3.8	1.0	.5	.3	------	8	6.2	f102	0	a23	0	a1.0
31	3.4	------	.5	.3	------	8	------	a10	------	f42	0	------
Total	50.5	20.8	31.4	16.8	13.0	154.7	200.2	707.2	11.7	158.6	2.0	7.4
Mean	1.63	0.69	1.01	0.54	0.45	4.99	6.67	22.8	0.39	5.12	0.06	0.25
Ac-ft	100	41	62	33	26	307	397	1,400	23	315	4.0	15

Calendar year 1955: Max 104 Min 0 Mean 3.14 Ac-ft 2,270
Water year 1955-56: Max 178 Min 0 Mean 3.75 Ac-ft 2,723

Peak discharge (base, 1,000 cfs).--No peak above base.
a No gage-height record; discharge estimated on basis of 1 discharge measurement.
f Fragmentary record; discharge computed on basis of partly estimated gage heights.
Note.--Stage-discharge relation affected by ice Nov. 2 to Apr. 1.

Muddy Creek near Shoshoni, Wyo.

Location.--Lat 43°17'10", long 108°16'30", in NE¼NW¼ sec. 34, T. 4 N., R. 5 E., on left bank 2¼ miles upstream from normal high-water line of Boysen Reservoir and 9 miles northwest of Shoshoni.

Drainage area.--340 sq mi, approximately.

Records available.--March 1949 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 4,780 ft (from topographic map).

Average discharge.--7 years, 18.1 cfs (13,190 acre-ft per year).

Extremes.--Maximum discharge during year, 1,040 cfs May 30 (gage height, 6.78 ft); no flow for many days.

1949-56: Maximum discharge, 1,430 cfs July 22, 1951 (gage height, 7.50 ft); no flow at times in most years.

Flood of July 24, 1923, reached a discharge of 16,300 cfs, from slope-area determination of peak flow.

Remarks.--Records good except those for period of ice effect, which are fair. Discharge measurements, observations of no flow, or field estimates of flow generally made once a week in springtime and twice a month at other times. Records of water temperatures and suspended sediment loads for the water year 1956 are given in WSP 1451.

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Nov. 11, Mar. 25 to Apr. 14, May 25, 26)

2.6	7.0	3.6	77
2.8	11.5	4.0	133
3.0	20	5.0	315
3.3	44		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.2	5.4	1.5	2.5		0	14	18	18	24	34	40
2	5.6	5.6	1.5	2.0		0	13	13	14	33	36	29
3	5.8	6.6	.8	1.8		.1	13	51	59	29	50	20
4	5.8	7.6	.8	1.6		.5	14	34	111	27	63	18
5	5.8	6.6	.8	1.5		5.0	13	21	71	37	63	32
6	6.2	5.6	.8	1.4		1.0	13	14	40	44	85	27
7	7.0	5.6	.8	1.3		1.0	13	14	30	47	93	17
8	6.6	5.0	.8	1.1		1.3	14	16	15	41	58	13
9	6.2	5.6	.8	1.0		1.6	13	14	11	39	50	12
10	6.6	6.6	.8	.5		2.0	13	15	10	39	40	11
11	6.2	7.8	.8	.5		.5	16	22	10	36	44	16
12	6.4	4.0	1.1	.5		.5	16	38	12	28	52	18
13	6.6	3.5	1.3	.5		.5	15	29	11	44	52	20
14	8.0	2.5	1.5	.5		1.0	16	29	14	33	28	19
15	7.0	2.0	1.2	.5		2.0	16	26	12	32	29	12
16	7.0	1.0	.5	.5		4.0	16	21	12	37	40	10
17	7.0	1.0	.3	.5		8.0	18	18	14	40	44	10
18	7.4	1.0	.2	.5		15	18	14	15	40	58	12
19	6.8	1.0	0	.4		26	19	14	18	29	58	10
20	6.6	1.0	0	.3		25	34	12	33	23	66	7.8
21	6.6	1.5	0	.2		24	47	13	47	21	76	7.4
22	6.6	2.0	3.5	.1		23	25	8.8	53	18	52	7.8
23	6.2	1.7	10	.1		22	20	13	54	18	46	8.0
24	6.2	1.5	12	.1		22	19	15	49	22	43	8.0
25	6.0	1.5	15	.1		21	16	31	43	19	49	7.8
26	6.0	1.5	15	0		18	13	54	40	22	40	7.8
27	6.0	1.5	15	0		18	13	35	35	24	32	7.8
28	6.4	1.5	15	0		15	27	63	33	28	29	7.6
29	6.2	1.5	7.0	0		18	34	117	34	29	40	8.6
30	6.2	1.5	3.5	0	------	15	28	230	21	50	43	12
31	6.4	------	3.0	0	------	15	------	44	------	49	36	------
Total	198.6	100.7	115.3	20.0	0	306.0	559	1,056.8	939	1,002	1,529	436.6
Mean	6.41	3.36	3.72	0.65	0	9.87	18.6	34.1	31.3	32.3	49.3	14.6
Ac-ft	394	200	229	40	0	694	1,110	2,100	1,860	1,990	3,030	866

Calendar year 1955:	Max 361	Min 0	Mean 15.5	Ac-ft 11,190
Water year 1955-56:	Max 230	Min 0	Mean 17.1	Ac-ft 12,510

Peak discharge (base, 500 cfs).--May 30 (8:30 a.m.) 1,040 cfs (6.78 ft).

Note.--Stage-discharge relation affected by ice Nov. 12 to Mar. 24 (no gage-height record Dec. 5 to Mar. 20; discharge estimated on basis of 16 field estimates, 10 observations of no flow, and weather records).

Wind River below Boysen Reservoir, Wyo.

Location.--Lat 43°25'30", long 108°10'42", in NW¼SW¼ sec. 9, T. 5 N., R. 6 E., Wind River meridian, on right bank 0.6 mile downstream from Boysen Dam and 13 miles north of Shoshoni.

Drainage area.--7,741 sq mi.

Records available.--May 1951 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 4,608.58 ft above mean sea level, datum of 1929, supplementary adjustment of 1940.

Average discharge.--5 years, 1,099 cfs (796,200 acre-ft per year).

Extremes.--Maximum discharge during year, 4,170 cfs July 12 (gage height, 7.90 ft); minimum daily, 363 cfs Nov. 6.

1951-56: Maximum discharge, 11,100 cfs June 19, 1951 (gage height, 11.90 ft); minimum daily, 33 cfs Oct. 12, 1951.

Remarks.--Records good. Flow regulated by Boysen Reservoir since October 1951 (see p. 237). Natural flow also affected by Bull Lake, Pilot Butte, and Washakie Reservoirs (combined capacity, 190,000 acre-ft), and diversions for irrigation of about 140,000 acres above station.

Rating table, water year 1955-56 (gage height, in feet, and discharge, in cubic feet per second)

3.2	345
4.0	640
5.0	1,200
6.0	1,930
7.0	2,910

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	735	1,210	*1,480	996	1,520	1,830	942	954	1,050	1,260	1,250	1,790
2	696	1,200	1,470	1,010	1,520	1,820	948	954	1,040	1,270	1,260	1,800
3	696	1,200	1,490	*1,550	1,600	1,820	930	936	1,040	*1,270	*1,240	1,810
4	691	1,210	1,490	1,560	1,890	1,820	930	930	1,080	1,270	1,250	1,800
5	691	1,200	1,490	1,580	1,890	1,820	930	930	1,120	1,270	1,250	1,820
6	*691	363	1,520	1,730	1,890	1,820	924	930	1,130	1,270	1,250	1,800
7	681	1,220	1,500	2,030	1,650	1,680	918	924	1,120	1,270	1,250	*1,830
8	663	1,210	1,520	2,020	1,890	1,040	930	930	1,110	1,270	1,250	1,820
9	681	1,220	1,530	2,030	1,890	942	924	930	1,070	1,290	1,250	1,820
10	686	1,230	1,520	2,050	1,890	936	918	936	1,060	1,290	1,250	1,820
11	691	1,220	1,540	2,040	1,880	936	930	942	1,070	1,300	1,250	1,820
12	696	1,220	1,130	2,030	1,870	936	924	942	1,060	*1,260	1,250	1,820
13	764	375	1,510	2,030	*1,870	942	912	948	1,090	*1,330	1,250	1,800
14	691	1,240	1,740	2,030	1,870	942	918	942	1,150	1,300	1,250	1,820
15	681	1,340	1,770	2,030	1,870	942	912	942	1,580	1,300	1,250	1,830
16	681	1,690	1,630	2,020	1,870	*942	936	1,020	1,580	1,300	1,250	1,820
17	691	1,250	1,570	2,000	1,850	936	948	1,160	1,580	1,300	1,250	1,820
18	691	1,130	990	2,020	1,860	936	*942	1,150	1,580	1,290	1,250	1,830
19	691	1,270	1,540	2,030	1,580	936	936	1,170	1,570	1,290	1,260	1,500
20	691	415	1,390	2,010	1,780	569	936	1,340	1,570	1,280	1,250	1,810
21	691	1,240	1,530	1,990	1,840	552	936	1,440	1,570	1,280	1,250	1,810
22	802	1,350	1,530	1,980	1,830	936	936	1,470	1,570	1,270	1,250	1,810
23	691	1,240	1,640	1,980	1,830	960	948	*1,460	1,550	1,270	1,250	1,820
24	691	678	1,560	1,860	1,600	948	954	1,460	1,560	1,270	1,250	1,690
25	691	1,460	996	1,530	1,090	954	948	1,470	1,560	1,260	1,250	1,800
26	*705	1,540	854	1,530	1,250	948	948	1,460	1,120	1,260	1,250	1,800
27	696	798	1,600	1,530	1,810	924	960	1,470	1,250	1,260	1,580	1,810
28	681	1,500	1,580	1,570	*1,820	930	954	1,300	1,260	1,250	1,800	1,810
29	691	1,450	1,520	1,030	1,830	930	960	1,430	1,260	1,250	1,800	1,820
30	700	1,480	1,540	1,520	------	930	954	1,160	1,260	1,250	1,800	1,820
31	992	------	1,620	1,520	------	930	------	1,100	------	1,250	1,800	------
Total	21,910	35,149	45,790	54,836	50,830	34,487	28,086	35,130	38,610	39,550	41,290	53,970
Mean	707	1,172	1,477	1,769	1,753	1,112	936	1,133	1,287	1,276	1,330	1,800
Ac-ft	43,460	69,720	90,820	108,800	100,800	68,400	55,710	69,680	76,580	78,450	81,900	107,000

Calendar year 1955: Max 1,970 Min 363 Mean 1,186 Ac-ft 858,300
Water year 1955-56: Max 2,050 Min 363 Mean 1,310 Ac-ft 951,300

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* Discharge measurement made on this day.

Note.--No gage-height record Nov. 13-16, Jan. 31 to Feb. 9; discharge computed on basis of valve settings at Boysen Dam furnished by Bureau of Reclamation.

South Fork Owl Creek above Curtis Ranch, near Thermopolis, Wyo.

Location.--Lat 43°41', long 108°44', in NW¼ sec. 11, T. 8 N., R. 1 E., on right bank 1.7 miles southwest of Curtis Ranch, 5 miles upstream from Red Creek, and 26 miles northwest of Thermopolis.

Drainage area.--139 sq mi.

Records available.--October 1943 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 5,840 ft (by barometer).

Average discharge.--13 years, 26.3 cfs (19,050 acre-ft per year).

Extremes.--Maximum discharge during year, 394 cfs June 5 (gage height, 2.65 ft); no flow at times during fall and winter.

1943-56: Maximum discharge, 1,520 cfs June 24, 1945 (gage height, 4.25 ft), from rating curve extended above 350 cfs; no flow at times during winter months 1943-56.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Two diversions above station for irrigation of about 400 acres.

Revisions (water years).--WSP 1209: 1945-47(M), 1948(P).

Rating tables, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to June 12				June 13 to Sept. 30			
0.3	0	1.3	32	0.7	2.0	1.6	52
.4	.5	1.5	50	.8	3.5	1.8	85
.5	1.0	1.7	79	1.0	8.0	2.0	130
.6	2.0	2.0	144	1.2	15	2.4	255
.7	4.0	2.5	295	1.4	29		
.9	10	3.0	510				
1.1	19						

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.5	0	0	0		0	0	12	306	87	49	8.0
2	5.2	*0	0	0		**1	0	12	306	87	43	7.0
3	*5.5	0	0	.8		1	0	21	*284	80	37	6.8
4	4.6	0.3	0	1.0		2	0	21	292	69	29	7.0
5	4.6	1.1	0	2.0		2	0	37	281	72	25	*6.8
6	3.8	0	0	1.5		1	0	39	219	78	23	6.2
7	2.6	.1	0	*1.0		1	0	37	170	78	23	5.5
8	3.2	.6	0	.5	(*)	1	0	53	192	72	*21	5.5
9	3.4	2.6	0	.2		1	*0	50	198	*72	19	6.8
10	4.3	1.6	0	0		1	0	42	201	71	19	8.0
11	4.6	0	0	0		0	0	37	207	64	19	8.0
12	4.6	0	0	0		0	0	36	219	67	16	5.5
13	4.0	0	0	0		0	0	31	202	55	15	3.7
14	4.3	0	0	0		0	0	26	185	52	14	3.0
15	4.3	0	0	0		1	0	30	241	49	13	2.3
16	4.6	0	0	0		*1	.5	33	199	46	13	4.5
17	4.9	0	0	0		1	1.0	51	118	40	28	4.5
18	5.2	0	0	0		5	2.5	76	110	38	20	5.1
19	5.5	0	0	0		7	10	98	132	35	19	4.1
20	5.8	0	0	0		10	25	130	*142	36	18	5.3
21	6.4	0	0	0		11	30	*167	122	37	17	4.7
22	6.1	0	3.4	0		13	26	184	93	36	17	5.3
23	6.1	0	5.2	0		15	26	213	97	42	16	4.7
24	2.0	0	1.7	0		15	*24	204	110	39	14	4.3
25	2.4	0	.8	0		15	26	225	112	38	13	3.2
26	3.4	0	.4	0		*15	23	219	110	36	12	4.1
27	4.3	0	1.7	0		12	18	210	110	38	12	4.3
28	1.1	0	.8	0		10	16	225	112	42	11	4.9
29	.5	*0	0	0		5	14	*198	108	49	10	5.5
30	1.7	0	0	0	------	1	12	184	101	39	11	4.5
31	3.0	------	0	0	------	1	------	219	------	42	9.8	------
Total	127.5	6.3	14.0	7.0	0	149	254.0	3,120	5,279	1,686	605.8	159.1
Mean	4.11	0.21	0.45	0.23	0	4.8	8.47	101	176	54.4	19.5	5.30
Ac-ft	253	12	28	14	0	296	504	6,190	10,470	3,340	1,200	316

Calendar year 1955: Max 92 Min 0 Mean 10.1 Ac-ft 7,340
Water year 1955-56: Max 306 Min 0 Mean 31.2 Ac-ft 22,620

Peak discharge (base, 320 cfs).--June 5 (3 a.m.) 394 cfs (2.65 ft).

* Discharge measurement or observation of no flow made on this day.

** Field estimate made on this day.

Note.--Stage-discharge relation affected by ice Jan. 3-7. No gage-height record Jan. 8, 9, Mar. 1 to Apr. 20, Aug. 18-22; discharge estimated on basis of 2 discharge measurements, 1 field estimate of flow, 1 observation of no flow, and weather records.

North Fork Owl Creek near Anchor, Wyo.

Location.--Lat 43°42', long 108°55', in sec. 12, T. 43 N., R. 101 W., on left bank half a mile upstream from Cup Creek and 4¾ miles west of Anchor.

Drainage area.--54.9 sq mi.

Records available.--May 1941 to September 1956 (no winter records 1941-44).

Gage.--Water-stage recorder. Altitude of gage is 6,720 ft (by barometer). Prior to Aug. 29, 1948, water-stage recorder at site half a mile downstream at different datum.

Average discharge.--12 years (1944-56), 13.4 cfs (9,710 acre-ft per year).

Extremes.--Maximum discharge during year, 277 cfs Aug. 17 (gage height, 4.86 ft); no flow Nov. 18.

1941-56: Maximum discharge, 3,200 cfs July 23, 1955 (gage height 8.0 ft, from floodmark), from rating curve extended above 320 cfs on basis of slope-area determination of peak flow; no flow at times during most winters.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. One small diversion for irrigation of hay meadows above station.

Rating tables, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 23-27, May 22-28, Sept. 6-11)

Oct. 1 to May 19		May 20 to Sept. 30			
2.8	0	3.1	1.5	3.7	11
2.9	1.0	3.2	2.0	3.8	18
3.0	4.0	3.3	2.5	4.0	41
3.1	10	3.4	3.0	4.3	97
3.2	19	3.5	4.5	4.6	175
3.3	35	3.6	7.0	4.9	295

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.9	0.9	1.2	1.3	0.2	0.4	15	10	68	9.0	5.0	3.0
2	1.9	*.9	1.5	1.1	.2	*.4	15	10	40	14	4.0	3.0
3	*1.6	1.0	1.5	1.1	.2	.4	15	10	*51	16	3.6	3.0
4	1.6	1.0	1.2	1.1	.2	.4	15	12	61	9.4	3.6	3.0
5	1.3	.9	1.0	1.1	.2	.6	15	15	41	9.0	3.6	*2.8
6	.7	1.0	1.0	1.3	.3	1.0	15	15	23	8.6	3.6	2.8
7	.8	1.0	1.0	*1.3	.4	1.0	15	15	20	8.6	3.6	2.8
8	.9	1.0	1.2	1.3	.5	1.0	15	20	31	8.2	*3.6	2.7
9	.9	1.0	1.5	1.3	.5	1.0	*16	16	32	*7.4	3.6	2.7
10	.9	1.0	1.5	1.0	.5	1.0	16	15	33	6.2	3.6	2.7
11	1.0	.9	1.5	.7	.5	1.0	17	14	34	6.0	3.6	2.6
12	.8	1.0	1.5	.5	.4	1.0	11	13	37	6.2	3.6	2.4
13	.9	1.1	1.7	.4	.4	1.0	15	12	41	5.2	3.6	2.0
14	.9	1.1	1.7	.3	.4	1.0	14	11	41	4.8	3.6	2.0
15	1.0	1.1	1.3	.2	.5	1.0	14	10	44	3.4	3.8	1.9
16	.9	1.1	1.4	.2	.5	**1.0	14	15	20	3.4	3.8	1.9
17	1.0	.3	1.5	.2	.5	1.0	14	20	8.6	3.4	17	1.9
18	1.0	0	1.5	.2	.5	1.0	14	25	11	3.4	8.0	1.9
19	1.0	.3	1.5	.3	.5	5.0	14	30	17	3.4	6.0	1.9
20	1.3	1.1	1.5	.6	.5	10	14	40	*18	3.4	5.0	1.9
21	1.9	1.1	2.0	1.0	.4	20	14	*50	16	3.2	4.0	1.9
22	1.3	1.1	2.0	1.0	.4	30	14	57	11	3.2	4.0	1.9
23	1.3	1.1	2.0	1.0	.4	32	14	86	10	3.2	4.0	1.9
24	.2	1.1	2.0	1.0	.4	29	*14	80	11	3.2	4.0	1.8
25	.2	1.1	2.0	1.0	.4	30	14	61	11	3.0	4.0	1.8
26	.3	1.1	2.0	.8	.4	30	13	34	11	3.0	4.0	1.9
27	.4	1.1	2.0	.6	.4	19	12	41	12	4.0	4.0	1.9
28	.4	1.1	2.0	.5	.4	18	10	178	8.6	4.0	3.5	1.9
29	.6	*1.1	1.8	.4	.4	17	10	55	8.2	7.0	3.5	1.9
30	.7	1.1	1.6	.3	------	16	10	80	10	10	3.5	1.8
31	.8	------	1.5	.2	------	15	------	*95	------	14	3.0	------
Total	30.4	28.7	48.6	23.3	11.5	286.2	418	1,145	780.4	196.8	137.3	67.6
Mean	0.98	0.96	1.57	0.75	0.40	9.23	13.9	36.9	26.0	6.35	4.43	2.25
Ac-ft	60	57	96	46	23	568	829	2,270	1,550	390	272	134

Calendar year 1955: Max 90 Min 0 Mean 4.77 Ac-ft 3,450
Water year 1955-56: Max 178 Min 0 Mean 8.67 Ac-ft 6,300

Peak discharge (base, 165 cfs).--May 28 (4 p.m.) 226 cfs (4.84 ft); Aug. 17 (3 p.m.) 277 cfs (4.86 ft).

* Discharge measurement made on this day.

** Field estimate made on this day.

Note.--Stage-discharge relation affected by ice Oct. 25 to Mar. 22. No gage-height record Jan. 1-7, Jan. 15 to Mar. 18, Mar. 28 to May 21, May 30-31, July 16-29, Aug. 4-13, Aug. 19 to Sept. 5; discharge estimated on basis of 8 discharge measurements, 1 field estimate of flow, and weather records.

Owl Creek near Thermopolis, Wyo.

Location.--Lat 43°41', long 108°18', in sec. 19, T. 43 N., R. 95 W., on right bank at McCumber Ranch, 1½ miles downstream from Mud Creek and 6 miles northwest of Thermopolis.

Drainage area.--484 sq mi.

Records available.--July 1910 to October 1912, April 1915 to November 1917, November 1931 to November 1932, and May 1938 to September 1956 in reports of Geological Survey. March 1911 to November 1917, November 1931 to November 1932, and May 1938 to September 1956 in reports of State engineer. No winter records prior to 1932.

Gage.--Water-stage recorder. Altitude of gage is 4,560 ft (by barometer). Prior to May 1938, staff or chain gages at several sites within 3 miles of present site at various datums. May 1938 to October 1938 chain gage at present site and datum.

Average discharge.--18 years (1938-56), 34.0 cfs (24,630 acre-ft per year).

Extremes.--Maximum discharge during year, 215 cfs May 29 (gage height, 2.15 ft); minimum daily, 0.7 cfs Sept. 18-21.

1910-17, 1931-32, 1938-56: Maximum discharge, 1,190 cfs June 4, 1944 (gage height, 5.61 ft), from rating curve extended above 750 cfs; no flow at times during irrigation seasons of 1912, 1916, 1939-40.

Remarks.--Records good except those for period of ice effect or no gage-height record, which are fair. Diversions above station for irrigation of about 14,000 acres.

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.4	0.6	1.0	18
.5	1.0	1.2	38
.6	2.0	1.5	85
.7	4.0	2.0	185
.8	7.0		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.5	2.4	4.0	7.0	2.0	8.0	2.5	4.3	78	31	6.7	6.1
2	1.3	*3.0	4.0	7.0	2.0	*8.5	2.5	3.4	117	24	12	3.8
3	*1.2	2.0	3.5	7.0	2.5	9.0	2.5	2.6	*81	30	10	2.8
4	1.2	1.7	3.0	7.0	3.0	9.0	2.5	12	83	22	7.0	2.2
5	1.1	1.4	3.0	8.0	3.5	9.0	2.5	16	115	20	4.0	*1.4
6	1.2	1.8	3.0	8.0	3.5	8.0	2.5	22	71	24	3.4	1.6
7	1.2	1.9	3.0	*8.0	3.5	7.0	2.5	17	56	29	2.0	2.0
8	1.2	1.9	3.5	8.0	*3.5	8.0	2.6	16	46	25	*1.9	1.7
9	1.0	1.9	4.0	8.0	3.5	9.0	2.6	17	71	*25	1.8	1.4
10	1.2	1.8	4.0	8.0	3.0	9.0	2.8	14	76	25	3.6	1.3
11	1.2	1.5	4.0	7.0	3.5	7.0	3.2	17	72	20	3.2	1.2
12	1.2	1.5	4.0	6.0	4.0	6.0	3.0	16	71	22	2.8	1.1
13	1.6	1.0	4.0	6.0	5.0	6.0	2.6	14	62	18	3.2	1.6
14	1.8	1.0	3.5	6.0	5.0	7.0	2.6	8.5	59	15	3.8	1.7
15	1.7	1.0	3.5	6.0	4.5	9.0	2.6	4.6	61	14	4.0	1.5
16	1.7	1.0	3.5	6.0	3.0	*10	2.6	4.0	80	12	4.0	.9
17	1.7	1.0	3.5	6.0	3.0	10	2.8	6.4	41	10	3.4	.8
18	1.5	1.5	3.5	6.0	3.0	7.0	3.8	12	32	8.0	10	.7
19	1.2	2.0	3.5	6.0	4.5	5.0	4.0	31	36	7.0	17	.7
20	1.9	2.5	3.5	6.0	5.0	3.0	3.4	43	*56	6.0	15	.7
21	1.3	3.5	5.0	5.0	5.5	2.5	9.0	*50	56	5.0	4.0	.7
22	1.0	4.0	7.0	4.0	6.0	2.5	28	51	46	5.6	1.8	.8
23	1.2	3.5	10	3.5	8.0	2.5	25	38	35	5.2	1.1	.8
24	1.2	3.5	12	3.5	8.0	2.5	*22	62	35	4.6	1.0	.9
25	2.2	4.0	13	3.5	8.0	2.5	12	56	41	3.6	1.1	.9
26	2.8	4.5	13	3.5	8.0	*2.5	9.5	*78	38	2.4	1.1	.9
27	2.6	4.5	12	3.5	8.0	2.5	9.0	53	43	1.8	1.0	1.0
28	1.7	3.5	10	3.0	8.0	2.5	7.5	56	44	2.4	1.3	1.0
29	2.0	*3.5	9.0	3.0	8.0	2.5	6.7	145	42	5.5	2.6	1.0
30	2.4	3.5	8.0	2.5	------	2.0	5.5	89	36	9.0	3.6	1.0
31	2.2	------	7.0	2.0	------	2.5	------	56	------	9.5	5.5	------
Total	48.2	71.8	177.5	174.0	138.0	181.5	190.3	1,014.8	1,780	441.6	142.9	44.2
Mean	1.55	2.39	5.72	5.61	4.76	5.85	6.34	32.7	59.3	14.2	4.61	1.47
Ac-ft	96	142	352	345	274	360	377	2,010	3,530	876	283	88

Calendar year 1955:	Max	134	Min	0.1	Mean	5.93	Ac-ft	4,290
Water year 1955-56:	Max	145	Min	0.7	Mean	12.0	Ac-ft	8,730

Peak discharge (base, 230 cfs).--No peak above base.

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 2, 3, 8, Nov. 11 to Mar. 25. No gage-height record Nov. 14 to Jan. 7, Jan. 31 to Apr. 8, July 9-23; discharge estimated on basis of 7 discharge measurements, weather records, and records for nearby stations.

Gooseberry Creek near Grass Creek, Wyo.

Location.--Lat 44°00'00", long 108°41'10", in SE¼NW¼ sec. 36, T. 47 N., R. 99 W., on right bank 15 ft downstream from bridge, 3 miles downstream from Enos Creek, and 4½ miles northwest of town of Grass Creek.

Drainage area.--155 sq mi.

Records available.--July 1945 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 5,522.15 ft above mean sea level, unadjusted. Prior to Apr. 23, 1953, at datum 1.35 ft higher.

Average discharge.--11 years, 12.7 cfs (9,200 acre-ft per year).

Extremes.--Maximum discharge during year, 295 cfs May 29 (gage height, 3.53 ft); maximum gage height observed, 3.62 ft (water running over ice); no flow Jan. 30 to Feb. 11.
1945-56: Maximum discharge, 593 cfs June 22, 1948 (gage height, 4.97 ft, present datum), from rating curve extended above 150 cfs; no flow at times during 1950-56.

Remarks.--Records good except those above 100 cfs, which are fair, and those for periods of ice effect, backwater from beaver dam, or no gage height record, which are poor. Many small diversions for irrigation of hay meadows above station.

Revisions (water years).--WSP 1209: 1949(M), 1950(P).

Rating table, water year 1955-56, except period of ice effect or backwater from beaver dam (gage height, in feet, and discharge, in cubic feet per second)

0.7	0.1	1.4	15
.8	.5	1.6	29
.9	1.0	2.0	72
1.0	2.0	2.5	135
1.1	3.5	3.0	208
1.2	6.0	3.5	290

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.8	0.5	1.5	1.5	0	1.5	10	11	88	0.5	1.1	0.1
2	1.5	*.5	1.5	2.0	0	*1.5	2.9	8.4	68	.8	.8	.1
3	*1.3	1.0	1.0	2.5	0	1.5	2.0	8.4	*50	1.5	.6	.1
4	1.2	1.0	1.0	2.5	0	3	1.6	8.4	38	1.8	.4	.1
5	1.3	1.0	1.0	3.0	0	5	1.1	13	31	1.4		**.1
6	1.4	1.0	1.0	*3.0	0	2	1.1	16	27	1.5		.1
7	1.4	1.0	1.0	3.0	0	2	1.2	14	21	.8		.2
8	1.3	1.0	1.0	3.0	*0	2	1.1	14	19	.6	(**)	.2
9	1.3	1.0	1.0	2.5	0	2	1.1	16	16	*.4		.2
10	1.0	1.0	1.0	2.5	0	2	1.3	16	14	1.0		.2
11	.9	1.0	1.0	2.5	0	2	2.2	15	12	.8		.2
12	1.0	.5	1.0	2.5	.5	2	1.1	15	9.2	.8		.2
13	1.1	.5	1.0	2.5	.5	2	1.8	16	6.4	2.3		.2
14	1.2	.5	1.0	2.5	.5	2	2.2	9.2	4.5	2.0		.2
15	1.4	.5	1.0	2.0	.5	2	4.8	8.0	5.0	1.6		.2
16	1.5	.5	1.0	1.5	.5	2	13	6.8	4.2	1.4	.1	.3
17	1.4	.5	1.0	1.5	.5	5	12	7.6	2.4	1.6		.3
18	1.5	.5	1.0	1.5	.5	5	8.0	8.8	2.3	1.5		.3
19	1.5	.5	1.0	1.5	.5	10	8.0	12	2.4	1.3		.3
20	1.5	.5	1.0	1.0	.5	*15	9.6	13	*2.0	1.0		.3
21	1.6	1.0	2	1.0	.5	15	14	*16	2.4	.7		.3
22	2.0	1.0	4	1.0	.5	10	14	27	4.0	.5		.3
23	2.3	1.5	4	1.0	1.0	10	14	30	1.9	.3		.3
24	2.8	1.5	3	1.0	1.5	10	*9.6	27	1.4	.1		.4
25	2.3	2.0	2	.5	1.5	10	9.6	30	1.2	.1		.4
26	2.2	2.5	2	.5	1.5	10	9.2	32	1.0	.1		.4
27	2.0	2.0	2	.5	1.5	10	12	35	.8	.1	1.7	.4
28	1.5	2.0	2	.5	1.5	10	9.2	87	.8	.5	.9	.4
29	1.0	*1.5	1.5	.5	1.5	*10	6.4	245	.9	.7	.4	.4
30	.5	1.5	1.5	0	------	10	9.6	153	.7	.8	.1	.4
31	.5	------	1.5	0	------	10	------	112	------	.8	.1	------
Total	45.2	31.0	46.5	51.0	15.5	184.5	193.7	1,030.6	437.5	29.3	8.3	7.6
Mean	1.46	1.03	1.50	1.65	0.53	5.95	6.46	33.2	14.6	0.95	0.27	0.25
Ac-ft	90	61	92	101	31	366	384	2,040	868	58	16	15

Calendar year 1955: Max 78 Min 0 Mean 2.15 Ac-ft 1,560
Water year 1955-56: Max 245 Min 0 Mean 5.68 Ac-ft 4,120

Peak discharge (base, 150 cfs).--May 29 (6 a.m.) 295 cfs (3.53 ft).
* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
Note.--Stage-discharge relation affected by ice Oct. 27 to Mar. 29. Stage-discharge relation affected by beaver dam Sept. 5-30. No gage-height record Nov. 16 to Mar. 26, July 24-27, Aug. 5-26, Aug. 30 to Sept. 4; discharge estimated on basis of 4 discharge measurements, 1 field estimate, 1 observation of no flow, and weather records.

Fifteenmile Creek near Worland, Wyo.

Location.--Lat 44°01'15", long 108°00'45", in NE¼NW¼ sec. 27, T. 47 N., R. 93 W., on right bank 700 ft upstream from Bighorn Canal spillway, 1¾ miles upstream from mouth, and 2¾ miles west of Worland.

Drainage area.--594 sq mi.

Records available.--March 1951 to September 1956 in reports of Geological Survey. October 1941 to September 1944 in reports of State engineer at site 1,500 ft downstream, not equivalent owing to inflow.

Average discharge.--5 years (1951-56), 6.93 cfs.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 4,080 ft (by barometer).

Extremes.--Maximum discharge during year, 492 cfs Sept. 13 (gage height, 2.28 ft); no flow for many days each month.

1951-56: Maximum discharge, 3,300 cfs May 22, 1952 (gage height, 5.77 ft); no flow for many days each month.

Remarks.--Records fair prior to Mar. 19, good thereafter. Discharge measurements generally made daily or oftener each time there was flow. Bureau of Land Management has extensive spreader systems on some of the tributaries above station. Records of suspended sediment loads for the water year 1956 are given in WSP 1451.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 19)

0.2	0	0.8	56
.3	3	1.1	121
.4	9	1.4	202
.6	27		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			0		0	**a38		0		0	0	1.5
2			0		0	a32		0		3.3	0	.6
3			0		0	a29		0		2.8	0	0
4			0		0	a140		0		0	0	0
5			0		0	a55		0		0	0	0
6			0		0	a10		0		0	0	0
7			0		0	a6		0		0	0	0
8			0		0	a19		0		0	0	0
9			0		0	a17		0		0	0	0
10			0		0	a2		0		0	0	0
11			0		0	0		0		0	0	0
12			0		0	0		0		0	0	0
13			0		0	0		0		0	0	108
14			0		0	0		0		0	0	15
15			0		0	0		0		0	0	7.2
16			0		0	a2		0		0	0	3.0
17			0		0	a3		0		0	0	.9
18			0		0	a80		0		0	0	0
19			0		0	73		0		0	0	0
20			0		0	45		0		0	0	0
21			0		0	11		0		0	0	0
22			0		0	9.3		0		0	0	0
23			0		a17	1.2		2.8		0	0	0
24			a200		a50	0		0		0	0	0
25			a55		a31	0		0		0	0	0
26			a13		a38	0		0		0	0	0
27			**a4		a36	0		0		0	39	0
28			0		**a14	0		0		0	37	0
29			0		a24	0		0		0	6.0	0
30			0		------	0		0		0	3.0	0
31		------	0		------	0	------	0	------	0	2.4	------
Total	0	0	272	0	210	572.5	0	2.8	0	6.1	87.4	136.2
Mean	0	0	8.8	0	7.2	18.5	0	0.09	0	0.20	2.82	4.54
Ac-ft	0	0	540	0	417	1,140	0	5.6	0	12.1	173	270

Calendar year 1955: Max 279 Min 0 Mean 9.68 Ac-ft 7,010
Water year 1955-56: Max 200 Min 0 Mean 3.52 Ac-ft 2,560

Peak discharge (base, 400 cfs).--Dec. 24 (about 11 a.m.) about 490 cfs; Sept. 13 (9:30 a.m.) 492 cfs (2.28 ft).

** Field estimate made on this day.

a No gage-height record (stage-discharge relation affected by ice during most of periods); discharge estimated on basis of 11 discharge measurements and 3 field estimates of flow.

Bighorn River near Manderson, Wyo.

Location.--Lat 44°12', long 107°55', in sec. 28, T. 49 N., R. 92 W., on downstream wing wall on left bank, a quarter of a mile west of Rairden, 1¼ miles downstream from Fivemile Creek, and 6 miles southeast of Manderson.

Records available.--April 1949 to September 1953, October 1955 to September 1956 (discontinued).

Gage.--Water-stage recorder. Datum of gage is 3,924.39 ft above mean sea level, datum of 1929, supplementary adjustment of 1929. Prior to June 2, 1953, wire-weight gage at same site and datum.

Average discharge.--5 years (1949-53, 1955-56), 1,325 cfs (959,900 acre-ft per year).

Extremes.--Maximum discharge during year, 4,940 cfs Feb. 24; maximum gage height observed, 11.10 ft Feb. 6 (backwater from ice); minimum daily discharge, 255 cfs May 17.

1949-53, 1955-56: Maximum discharge observed, 10,600 cfs June 1, 1951 (gage height 10.15 ft): minimum daily, 180 cfs Apr. 13, May 8, 1952.

Flood of Feb. 19, 1948, reached a stage of 16.45 ft (ice jam) from floodmark (discharge, about 9,500 cfs).

Remarks.--Records good except those for periods of no gage-height record, which are fair. Diversions for irrigation of about 213,000 acres above station. Flow largely regulated by Boysen Reservoir beginning on Oct. 11, 1951 (see p. 237). Records of water temperatures and suspended sediment loads for the water year 1956 are given in WSP 1451.

Rating table, water year 1955-56 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 2-3, May 26-29)

3.7	240	6.0	2,050
4.0	340	7.0	3,520
4.5	590	8.0	5,260
5.0	950		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	814	1,150	1,680	1,920	1,750	2,100	1,090	455	542	460	596	1,460
2	769	1,400	*1,660	1,370	1,800	2,100	1,110	415	475	500	590	1,480
3	*614	1,420	1,680	1,430	1,800	2,130	1,100	415	465	536	590	1,480
4	614	1,460	1,960	1,890	1,800	2,420	1,090	385	445	530	572	1,500
5	578	1,460	1,710	1,890	2,000	2,490	1,090	360	405	530	*572	1,500
6	*542	1,490	1,920	*1,680	2,200	2,390	*1,070	348	455	500	572	1,550
7	560	685	1,920	2,030	2,200	2,280	1,060	352	475	475	560	1,540
8	560	1,270	*2,060	2,200	2,200	2,050	1,080	320	475	480	572	1,550
9	548	1,460	2,030	2,100	2,200	1,350	1,100	312	470	480	638	1,560
10	554	1,470	1,960	2,130	2,500	1,130	1,080	364	480	475	608	1,560
11	572	1,520	1,890	2,140	2,800	1,130	1,080	340	475	475	584	1,550
12	727	1,530	1,890	2,240	2,800	1,310	1,060	294	470	510	*608	1,530
13	806	1,490	1,490	2,140	2,600	*1,250	1,050	316	460	*548	584	1,670
14	870	830	2,110	2,170	2,450	1,160	894	324	475	530	584	1,530
15	838	1,630	2,240	2,170	2,240	1,160	854	297	525	505	578	1,510
16	814	1,960	2,270	2,170	2,140	1,160	762	279	942	530	560	1,510
17	814	2,240	2,520	2,200	2,100	1,140	762	255	950	510	572	1,520
18	814	1,770	2,310	2,200	2,200	*1,410	727	380	*1,050	505	584	1,520
19	838	1,570	1,500	2,130	2,300	1,250	727	425	942	505	602	1,480
20	830	1,640	2,000	2,110	2,300	1,300	699	440	862	520	620	1,080
21	838	785	2,200	2,170	2,200	894	678	590	1,050	542	614	1,480
22	814	*1,330	2,700	2,140	2,130	846	678	720	*986	572	608	1,510
23	838	1,540	3,380	2,110	2,350	1,200	734	755	934	*602	602	1,560
24	838	1,480	*2,900	*2,110	*3,850	1,230	644	692	942	572	578	1,560
25	838	910	1,890	1,890	1,920	1,210	590	748	950	554	578	1,440
26	822	1,620	1,200	1,680	1,290	1,210	542	*769	878	554	608	1,520
27	854	1,680	1,030	1,620	1,450	*1,140	*530	790	460	548	760	1,530
28	846	950	1,680	1,650	*2,030	1,100	536	1,010	536	584	1,210	1,570
29	846	1,820	1,780	1,750	2,030	1,080	515	886	505	678	1,360	1,610
30	846	1,530	1,860	1,290	------	1,080	505	1,110	455	626	1,440	1,670
31	*830	------	1,890	1,820	------	1,090	------	692	------	602	1,440	------
Total	23,286	43,090	61,310	60,540	63,630	44,790	25,437	15,838	19,534	16,538	21,544	45,530
Mean	751	1,436	1,978	1,953	2,194	1,445	848	511	651	533	695	1,518
Ac-ft	46,190	85,470	121,600	120,100	126,200	88,840	50,450	31,410	38,750	32,800	42,730	90,310

Calendar year 1955: Max - Min - Mean - Ac-ft -
Water year 1955-56: Max 3,850 Min 255 Mean 1,205 Ac-ft 874,800

* Discharge measurement made on this day.

Note.--No gage-height record Nov. 12 to Mar. 4, Mar. 12-18; discharge estimated on basis of Pure Oil Co. gage readings 4 miles upstream and records for Wind River below Boysen Reservoir.

Tensleep Creek near Tensleep, Wyo.

Location.--Lat 44°03'40", long 107°23'10", in NW¼ sec. 12, T. 47 N., R. 88 W., on left bank a quarter of a mile downstream from Canyon Creek and 4 miles northeast of Tensleep.

Drainage area.--228 sq mi.

Records available.--September 1910 to December 1912, April 1915 to November 1924, October 1943 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 4,667.59 ft above mean sea level, datum of 1929. Prior to Oct. 1, 1916, staff gage at same site at datum 1.00 ft higher. Oct. 1, 1916, to May 10, 1918, staff gage at same site and datum.

Average discharge.--22 years (1915-24, 1943-56), 150 cfs (108,700 acre-ft per year).

Extremes.--Maximum discharge during year, 1,340 cfs May 27 (gage height, 5.09 ft); minimum daily, 30 cfs Feb. 1.

1910-12, 1915-24, 1943-56: Maximum discharge, 2,890 cfs June 15, 1924 (gage height, 7.05 ft), from rating curve extended above 2,400 cfs; minimum daily, 30 cfs, Jan. 31, Feb. 1, 1951, Feb. 1, 1956.

Remarks.--Records good except those for period of no gage-height record, which are fair. Diversions for irrigation of about 500 acres above station.

Revisions (water years).--WSP 1239: 1916, 1918(M), 1924(M), 1945(M), 1948(M).

Rating table, water year 1955-56 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to May 9, May 23 to June 6)

1.6	28	3.0	326
1.7	37	4.0	770
2.0	76	5.0	1,350
2.5	176		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	45	46	45	40	30	40	42	67	831	141	56	51
2	41	45	*45	45	32	40	42	66	864	130	53	53
3	40	48	44	*45	36	45	42	78	*844	154	54	53
4	39	47	41	44	37	45	41	74	815	174	52	53
5	*41	48	41	42	40	45	42	94	898	143	47	51
6	42	46	45	42	*41	45	40	103	725	126	*44	47
7	42	46	44	42	41	45	39	108	491	118	42	46
8	40	46	45	42	41	45	41	120	444	114	41	*44
9	40	47	45	41	40	45	42	137	478	108	39	44
10	40	49	45	41	40	45	41	164	486	99	37	44
11	40	52	45	41	40	45	42	166	482	94	38	44
12	41	46	45	41	40	45	42	150	474	92	35	44
13	44	40	45	41	40	45	42	139	440	*90	33	45
14	42	47	45	42	40	45	42	105	416	90	32	46
15	42	38	40	42	39	45	42	103	420	85	32	41
16	41	33	40	41	38	45	45	99	404	82	32	40
17	42	37	45	40	42	45	46	110	302	78	33	39
18	42	48	45	41	41	50	47	143	242	73	38	37
19	42	52	45	41	39	50	48	186	*254	67	56	37
20	45	52	45	41	39	50	49	428	239	64	68	37
21	45	53	45	41	39	50	51	645	213	60	64	37
22	46	53	45	41	39	50	56	892	210	58	53	37
23	51	49	50	41	40	45	58	*950	186	57	49	36
24	48	48	50	41	41	45	62	968	157	56	45	37
25	51	47	50	41	40	45	62	1,010	150	54	42	37
26	49	47	45	41	40	45	67	*1,050	152	51	40	36
27	52	47	45	42	40	*45	*76	1,080	148	51	44	36
28	49	46	45	42	*40	40	79	853	148	52	44	36
29	52	46	45	40	40	41	76	805	148	52	41	37
30	48	46	40	36	------	41	68	650	145	53	47	37
31	*52	------	40	36	------	41	------	625	------	56	53	------
Total	1,374	1,395	1,380	1,277	1,135	1,393	1,512	12,168	12,206	2,722	1,334	1,262
Mean	44.3	46.5	44.5	41.2	39.1	44.9	50.4	393	407	87.8	44.6	42.1
Ac-ft	2,730	2,770	2,740	2,530	2,250	2,760	3,000	24,130	24,210	5,400	2,750	2,500

Calendar year 1955: Max 1,190 Min 31 Mean 123 Ac-ft 89,310
Water year 1955-56: Max 1,080 Min 30 Mean 107 Ac-ft 77,770

Peak discharge (base, 1,300 cfs).--May 27 (4 a.m.) 1,340 cfs (5.09 ft).

* Discharge measurement made on this day.

Note.--No gage-height record Dec. 8 to Jan. 3, Feb. 29 to Mar. 27, May 23, July 13-15; discharge estimated on basis of 4 discharge measurements and records for Medicine Lodge Creek near Hyattville.

Medicine Lodge Creek near Hyattville, Wyo.

Location.--Lat 44°18', long 107°33', in NW¼ sec. 22, T. 50 N., R. 89 W., on left bank a quarter of a mile downstream from North Fork and 4½ miles northeast of Hyattville.

Drainage area.--86 sq mi, approximately.

Records available.--June 1943 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 4,770 ft (by barometer).

Average discharge.--13 years, 34.5 cfs (24,990 acre-ft per year).

Extremes.--Maximum discharge during year, 408 cfs May 27 (gage height, 2.29 ft); minimum daily, 9.4 cfs Feb. 6-8.

1943-56: Maximum discharge, 1,160 cfs June 24, 1945 (gage height, 4.10 ft, from floodmark), from rating curve extended above 550 cfs; minimum daily, 8.2 cfs Feb. 13-16, 1955.

Remarks.--Records good. Small diversion for irrigation of hay meadows above station.

Revisions (water years).--WSP 1239: 1945, 1946(M).

Rating table, water year 1955-56 (gage height, in feet, and discharge, in cubic feet per second)

0.4	7	1.1	74
.5	10	1.4	142
.6	15	1.7	230
.8	31	2.1	365

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12	12	12	11	9.7	10	11	12	312	37	14	13
2	12	11	12	11	9.7	10	11	12	312	36	14	13
3	12	12	12	11	9.7	12	11	13	*267	33	14	12
4	12	12	12	*11	9.7	12	11	13	260	32	14	12
5	*12	12	12	11	9.7	12	11	15	278	29	14	12
6	12	12	12	11	*9.4	12	11	16	227	28	*13	12
7	12	11	12	11	9.4	12	11	17	150	27	14	12
8	12	11	12	10	9.4	12	11	19	159	26	14	*12
9	11	11	12	10	9.7	12	11	22	164	26	14	12
10	11	12	12	10	9.7	12	11	27	162	24	14	12
11	12	12	12	10	9.7	12	11	32	148	23	14	12
12	12	12	12	10	9.7	12	11	32	134	23	13	12
13	12	11	12	11	9.7	12	11	30	124	*22	12	12
14	12	12	12	11	9.7	12	11	26	112	21	12	12
15	12	11	12	11	10	12	11	25	101	21	12	12
16	12	11	12	11	10	12	12	24	92	21	12	12
17	12	12	12	11	10	14	12	30	71	20	12	12
18	12	12	12	11	10	14	12	53	88	20	13	12
19	12	12	12	11	10	14	12	122	*71	20	15	12
20	12	12	12	10	10	14	13	215	60	19	14	12
21	12	12	12	10	10	14	14	330	62	18	14	12
22	12	12	12	10	10	13	14	340	72	17	12	12
23	12	11	12	10	10	13	14	*354	72	16	12	12
24	12	11	12	10	10	14	13	302	57	16	12	12
25	12	11	12	10	10	12	13	330	53	16	12	12
26	12	11	12	10	10	12	13	*323	49	16	12	12
27	12	11	12	10	10	*12	*13	334	46	15	12	11
28	12	11	12	10	*10	11	12	284	43	15	12	11
29	12	11	12	10	10	11	12	239	39	16	12	10
30	12	11	12	10	------	11	12	230	38	15	12	10
31	*12	------	12	10	------	11	------	248	------	15	13	------
Total	370	345	372	324	284.9	378	356	4,069	3,823	683	403	356
Mean	11.9	11.5	12.0	10.5	9.82	12.2	11.9	131	127	22.0	13.0	11.9
Ac-ft	734	684	738	643	565	750	706	8,070	7,580	1,350	799	706

Calendar year 1955:	Max 354	Min 8.2	Mean 34.2	Ac-ft 24,790
Water year 1955-56:	Max 354	Min 9.4	Mean 32.1	Ac-ft 23,320

Peak discharge (base, 350 cfs).--May 27 (2:30 a.m.) 408 cfs (2.29 ft).

* Discharge measurement made on this day.

Greybull River near Pitchfork, Wyo.

Location.--Lat 44°06', long 109°10', in SE¼ sec. 24, T. 48 N., R. 103 W., on left bank at downstream side of Z Bar T Ranch bridge, a quarter of a mile upstream from Rose Creek and 4 miles west of Pitchfork.

Drainage area.--309 sq mi.

Records available.--April 1946 to September 1949, May 1951 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 6,709.33 ft above mean sea level, datum of 1929. Prior to May 9, 1951, water-stage recorder at site 300 ft downstream at different datum. May 9, 1951, to June 7, 1952, at site 30 ft upstream at same datum.

Average discharge.--8 years, 162 cfs (117,400 acre-ft per year).

Extremes.--Maximum discharge during year, 2,120 cfs June 4 (gage height, 5.57 ft); minimum daily, 20 cfs for several days during October to February.

1946-49, 1951-56: Maximum discharge, 4,000 cfs June 6, 1952 (gage height, 6.10 ft, site then in use), from rating curve extended above 1,200 cfs; minimum daily, 8 cfs Mar. 17-23, Apr. 12-14, 1953.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Diversions for irrigation of about 1,000 acres above station.

Rating tables, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 17 to May 4, May 24-30)

Oct. 1 to May 30

2.5	22	3.7	305
2.7	42	4.0	485
3.0	88	4.5	900
3.4	185	5.0	1,580

May 31 to Sept. 30

2.9	49	4.0	365
3.0	62	4.5	700
3.3	115	5.0	1,170
3.6	195 .	5.5	1,970

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	29	*20	25	25	20	22	32	52	1,510	610	350	95
2	26	20	25	25	20	*22	33	54	1,530	543	320	93
3	*26	22	25	25	20	22	32	67	*1,360	474	300	99
4	25	22	25	25	20	25	42	67	1,510	444	250	97
5	25	22	20	25	20	30	30	92	1,590	522	200	*91
6	24	25	20	*25	25	30	32	96	1,210	565	180	76
7	24	25	25	25	25	30	32	86	960	595	170	74
8	22	27	25	25	*25	25	32	108	1,090	565	165	74
9	22	25	25	25	25	25	31	110	1,290	588	*162	76
10	22	25	25	25	25	25	33	110	1,430	*543	162	76
11	23	25	25	25	25	25	41	102	1,560	536	160	76
12	23	25	25	25	25	25	34	90	1,630	588	152	88
13	25	22	25	25	25	25	34	83	1,540	529	152	82
14	25	20	25	25	20	25	35	77	1,400	480	149	72
15	25	20	25	25	20	25	41	84	1,560	468	141	66
16	25	20	25	22	20	25	55	108	1,190	438	141	66
17	25	20	25	22	20	25	46	170	825	420	133	66
18	25	20	25	22	20	30	34	240	780	404	131	66
19	25	20	25	22	20	35	38	332	897	392	133	64
20	26	22	25	22	20	*40	48	492	*990	387	131	65
21	26	25	25	22	20	45	64	*646	825	376	120	65
22	27	25	25	22	22	45	68	860	565	365	115	57
23	28	25	30	22	25	45	67	977	565	370	113	57
24	25	25	35	22	25	45	64	1,030	678	355	105	57
25	26	25	35	22	25	45	*64	1,060	740	325	105	54
26	25	25	30	22	22	40	61	*1,110	678	330	103	54
27	26	25	25	22	22	35	58	966	756	365	103	54
28	24	25	25	22	22	35	51	1,230	852	387	103	54
29	24	25	25	20	22	*35	50	1,050	852	515	95	54
30	22	*25	20	20	------	35	50	922	756	414	105	53
31	20	------	25	20	------	35	------	1,010	------	398	100	------
Total	765	697	790	721	645	976	1,332	13,481	33,119	14,291	4,860	2,121
Mean	24.7	23.2	25.5	23.3	22.2	31.5	44.4	435	1,104	461	157	70.7
Ac-ft	1,520	1,380	1,570	1,430	1,280	1,940	2,640	26,740	65,690	28,350	9,640	4,210

Calendar year 1955:	Max 890	Min 18	Mean 96.3	Ac-ft 69,720
Water year 1955-56:	Max 1,630	Min 20	Mean 202	Ac-ft 146,400

Peak discharge (base, 1,200 cfs).--June 4 (10 p.m.) 2,120 cfs (5.57 ft).

* *Discharge measurement made on this day.*

Note.--Stage-discharge relation affected by ice Oct. 29 to Mar. 31. No gage-height record Nov. 2-29, Dec. 4 to Jan. 3, Jan. 25 to Mar. 19, Aug. 1-8, Aug. 31 to Sept. 1; discharge estimated on basis of 2 discharge measurements, recorded range in stage, weather records, and records for nearby stations.

Wood River at Sunshine, Wyo.

Location.--Lat 44°01', long 109°01', in sec. 29, T. 47 N., R. 101 W., on left bank 30 ft upstream from bridge on county road, half a mile northeast of Sunshine, and 3 miles downstream from Dick Creek.

Drainage area.--200 sq mi, approximately.

Records available.--August 1945 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 6,537.45 ft above mean sea level, datum of 1929. Prior to Sept. 18, 1952, water-stage recorder at present site and datum. Sept. 18, 1952, to Oct. 27, 1953, chain gage at site 30 ft downstream at same datum.

Average discharge.--11 years, 109 cfs (78,970 acre-ft per year).

Extremes.--Maximum discharge during year, 1,140 cfs May 28 (gage height, 3.88 ft), from rating curve extended above 500 cfs; minimum daily, 16 cfs Oct. 24, 25.

1945-56: Maximum discharge, 2,260 cfs June 5, 1952 (gage height, 4.85 ft), from rating curve extended above 1,300 cfs; minimum daily, 11 cfs Nov. 16-19, 1954.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Diversions for irrigation of about 1,500 acres above station.

Rating tables, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 26)

Oct. 1 to Mar. 15		Mar. 16 to Sept. 30			
1.4	16	1.4	19	2.2	162
1.5	23	1.6	36	2.5	215
1.8	58	1.8	69	2.9	370
		2.1	150	3.5	780

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	24	*30	25	35	20	30	22	58	732	167	166	40
2	24	30	25	35	20	*30	25	61	684	166	162	43
3	*24	30	25	35	20	30	25	72	*599	155	154	44
4	23	30	25	35	20	30	25	69	606	151	144	44
5	24	28	20	35	20	30	24	98	578	154	132	*47
6	27	31	20	*35	20	30	24	106	395	162	120	49
7	31	34	25	35	20	30	26	98	308	166	112	47
8	29	37	25	35	*25	30	31	116	340	165	112	46
9	30	30	25	30	25	30	26	120	390	167	*109	46
10	26	30	25	30	25	30	36	102	432	*166	106	46
11	21	31	25	30	25	25	49	82	462	172	102	46
12	20	30	25	30	25	25	40	87	494	175	95	49
13	20	25	25	30	25	25	52	77	487	166	90	47
14	17	25	25	30	30	25	58	74	474	161	85	43
15	17	25	20	30	30	30	82	87	536	158	82	40
16	17	25	25	30	25	30	82	116	432	162	87	40
17	19	25	25	30	25	30	67	142	239	171	102	40
18	20	25	25	30	25	35	58	162	189	175	92	39
19	17	25	25	30	30	40	67	180	215	172	106	39
20	17	30	30	30	30	40	85	206	*230	171	102	37
21	17	30	30	30	30	40	92	*245	199	172	87	36
22	17	30	30	30	30	45	102	345	163	170	82	35
23	17	30	35	30	30	45	85	375	160	168	74	35
24	16	25	35	25	30	45	77	365	175	177	67	35
25	16	25	35	25	30	40	*77	426	192	177	65	36
26	17	25	40	25	30	35	82	*420	184	172	61	37
27	18	25	40	25	30	35	72	360	199	174	61	37
28	20	25	40	25	30	25	63	780	190	174	52	39
29	20	25	35	25	30	*20	63	756	185	199	42	39
30	32	*25	35	25	------	20	60	620	180	175	49	36
31	30	------	30	25	------	20	------	636	------	178	44	------
Total	667	841	875	930	755	975	1,677	7,441	10,649	5,238	2,944	1,237
Mean	21.5	28.0	28.2	30.0	26.0	31.5	55.9	240	355	169	95.0	41.2
Ac-ft	1,320	1,670	1,740	1,840	1,500	1,930	3,330	14,760	21,120	10,390	5,840	2,450

Calendar year 1955:	Max 246	Min 16	Mean 46.1	Ac-ft 33,400
Water year 1955-56:	Max 780	Min 16	Mean 93.5	Ac-ft 67,890

Peak discharge (base, 830 cfs).--May 28 (8 p.m.) 1,140 cfs (3.88 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 30 to Nov. 4, Nov. 11 to Apr. 1 (no gage-height record Feb. 10-29, discharge estimated on basis of 1 discharge measurement, weather records, and records for nearby stations).

Greybull River at Meeteetse, Wyo.

Location.--Lat 44°09'20", long 108°52'35", in sec. 4, T. 48 N., R. 100 W., on left bank at Meeteetse, 1,800 ft upstream from bridge on State Highway 120 and 3 miles upstream from Meeteetse Creek.

Drainage area.--690 sq mi, approximately.

Records available.--June to September 1897, April to October 1903, July 1920 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 5,741.42 ft above mean sea level, datum of 1929, supplementary adjustment of 1943. Prior to Aug. 29, 1920, staff gages at several sites within half a mile of present site at various datums. Aug. 29, 1920, to Apr. 29, 1938, water-stage recorder at several sites within half a mile of present site at various datums.

Average discharge.--36 years (1920-56), 346 cfs (250,700 acre-ft per year).

Extremes.--Maximum discharge during year, 2,290 cfs June 5 (gage height, 4.20 ft); minimum daily, 30 cfs Feb. 3.

1897, 1903, 1920-56: Maximum discharge, 10,500 cfs June 20, 1937 (gage height, 7.47 ft, site and datum then in use), from rating curve extended above 1,500 cfs; minimum daily, 28 cfs Feb. 16, 1933, Nov. 27, 1954.

Remarks.--Records good except those for period of ice effect, which are fair. Slight regulation by upper Sunshine Reservoir beginning May 1940 (capacity, 53,000 acre-ft). Diversions for irrigation of about 6,000 acres above station. Records of water temperatures and suspended sediment loads for the water year 1956 are given in WSP 1451.

Rating tables, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 18-22)

Oct. 1 to May 25				May 26 to Sept. 30			
0.8	40	2.0	310	1.6	135	3.0	840
1.0	71	2.5	540	2.0	250	3.6	1,410
1.5	167	3.0	900	2.5	480		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	76	68	50	55	40	40	74	141	1,180	645	645	289
2	78	*50	55	60	35	*40	65	137	1,270	680	638	268
3	*80	60	55	60	30	40	55	156	*1,150	624	624	264
4	80	68	50	55	35	45	50	152	1,240	610	568	264
5	78	57	45	55	35	45	*60	210	1,320	652	589	*274
6	76	55	40	*55	*35	45	55	218	784	645	659	278
7	78	60	50	55	45	45	52	198	610	673	659	246
8	74	57	50	55	*50	45	60	224	728	659	645	240
9	74	58	50	*50	50	50	52	239	744	666	*561	243
10	73	60	50	50	45	50	74	224	856	*704	534	246
11	69	61	50	55	45	45	86	198	864	704	534	264
12	71	50	50	55	45	40	63	188	938	736	528	309
13	73	45	50	55	45	35	80	181	938	688	510	191
14	71	40	50	50	45	40	85	174	784	617	498	158
15	69	40	45	50	45	50	101	183	965	582	462	148
16	68	40	50	50	45	60	108	202	832	610	462	160
17	68	40	50	50	45	70	83	275	624	631	468	268
18	66	40	50	50	45	100	61	373	652	638	492	268
19	68	45	50	50	40	130	*73	546	696	638	468	289
20	68	50	55	55	40	*130	92	719	*728	610	426	293
21	69	55	60	55	40	140	152	*852	744	631	395	289
22	69	60	70	55	40	150	188	740	645	624	420	285
23	76	55	75	55	40	160	167	860	554	645	410	285
24	73	55	75	50	40	160	*160	876	696	680	415	274
25	66	55	70	50	40	160	169	852	776	652	456	257
26	68	55	65	50	40	*160	160	776	666	645	444	260
27	73	55	65	50	40	120	158	*760	624	680	450	274
28	69	50	65	50	40	90	147	1,080	666	696	400	293
29	69	*50	65	45	40	*76	147	1,120	659	784	343	297
30	76	50	60	45	------	76	141	760	704	631	330	301
31	83	------	55	45	------	80	------	840	------	610	301	------
Total	2,249	1,584	1,720	1,620	1,200	2,517	3,018	14,454	24,637	20,290	15,334	7,775
Mean	72.5	52.8	55.5	52.3	41.4	81.2	101	466	821	655	495	259
Ac-ft	4,460	3,140	3,410	3,210	2,380	4,990	5,990	28,670	48,870	40,240	30,410	15,420

Calendar year 1955:	Max 804	Min 35	Mean 151	Ac-ft 109,300
Water year 1955-56:	Max 1,320	Min 30	Mean 263	Ac-ft 191,200

Peak discharge (base, 1,750 cfs).--June 5 (11 a.m.) 2,290 cfs (4.20 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 2, 3, Nov. 12 to Mar. 28 (no gage-height record Nov. 14-29; discharge estimated on basis of 1 discharge measurement, weather records, and records for nearby stations).

Greybull River near Basin, Wyo.

Location.--Lat 44°25', long 108°11', in NW¼ sec. 8, T. 51 N., R. 94 W., on left bank 250 ft downstream from bridge on State Highway 130, 2 miles upstream from Dorsey Creek, and 8 miles west of Basin.

Drainage area.--1,130 sq mi, approximately.

Records available.--April 1930 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 3,990 ft (by barometer). Apr. 14 to Sept. 30, 1930, chain gage at site 250 ft upstream at datum 2.92 ft higher. Oct. 1, 1930, to Sept. 20, 1934, chain gage and Sept. 21, 1934, to Apr. 14, 1936, water-stage recorder, at site 250 ft upstream at datum 1.92 ft higher. Apr. 15, 1936, to Aug. 13, 1951, water-stage recorder at site 200 ft upstream at present datum.

Average discharge.--26 years, 178 cfs (129,000 acre-ft per year).

Extremes.--Maximum discharge during year, 1,250 cfs July 13 (gage height, 4.66 ft); maximum gage height, 5.16 ft Dec. 24 (backwater from ice); minimum daily discharge, 6.5 cfs Oct. 26.

1930-56: Maximum discharge, 5,390 cfs Aug. 12, 1941 (gage height, 8.48 ft, site then in use), from rating curve extended above 950 cfs on basis of slope-area determination of peak flow; maximum gage height, 8.60 ft Mar. 26, 1943, site then in use (ice jam); no flow at times in 1931-34, 1936, 1939.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Diversions above station for irrigation of about 39,000 acres. Slight regulation by upper Sunshine Reservoir beginning May 1940 (capacity, 53,000 acre-ft).

Revisions (water years).--WSP 826: 1936.

Rating tables, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Feb. 29		Mar. 1 to Sept. 30			
2.0	6	1.9	4	2.4	64
2.1	11	2.0	9	2.7	145
2.2	19	2.1	16	3.0	245
2.3	30	2.2	28	3.6	520

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8.5	12	100	70	70	65	93	10	261	36	28	56
2	10	14	*100	75	75	65	107	9.0	470	33	38	39
3	9.5	16	100	75	80	65	69	8.5	*487	50	42	27
4	9.5	15	90	*75	80	70	41	10	321	50	41	24
5	*11	15	90	75	80	80	38	11	482	48	*34	23
6	11	14	90	80	*80	75	41	9.0	253	34	38	23
7	11	14	90	80	80	75	33	9.0	58	15	26	22
8	13	15	90	80	80	75	34	9.0	28	15	24	18
9	13	13	90	80	80	75	48	8.5	26	24	22	15
10	16	13	90	80	80	75	48	11	48	17	22	15
11	16	20	90	80	80	75	50	11	58	14	22	16
12	15	35	95	80	80	75	54	9.0	74	*23	38	23
13	16	70	100	80	85	75	31	8.5	69	190	28	50
14	16	100	90	80	85	75	15	8.5	48	36	15	54
15	22	110	90	80	85	75	15	8.0	91	15	15	34
16	18	120	90	70	70	85	15	8.0	121	14	14	30
17	17	120	90	75	65	85	15	8.0	*52	14	21	26
18	13	120	90	75	65	130	15	9.0	33	22	26	24
19	10	120	90	75	65	*200	15	8.5	27	23	28	26
20	9.5	120	100	80	70	210	15	14	34	16	34	23
21	8.5	120	110	80	70	220	15	28	62	15	21	22
22	8.0	120	120	80	70	210	15	13	157	21	14	20
23	7.0	120	150	80	70	220	15	*8.5	66	16	18	20
24	7.0	120	180	80	70	245	15	56	54	15	14	22
25	7.0	120	140	80	75	234	15	50	148	20	15	20
26	6.5	120	110	80	70	203	15	28	169	15	18	18
27	7.0	120	110	80	70	*154	*15	18	96	15	23	18
28	7.0	110	100	80	60	110	16	178	64	23	44	20
29	7.0	100	90	70	*65	96	15	504	50	38	31	26
30	7.5	100	80	70	------	96	12	231	38	64	34	27
31	*9.5	------	75	70	------	93	------	60	------	24	54	------
Total	347.0	2,226	3,120	2,395	2,155	3,686	940	1,362.0	3,945	955	842	781
Mean	11.2	74.2	101	77.3	74.3	119	31.3	43.9	132	30.8	27.2	26.0
Ac-ft	688	4,420	6,190	4,750	4,270	7,310	1,860	2,700	7,820	1,890	1,670	1,550

Calendar year 1955: Max 336 Min 3.9 Mean 49.5 Ac-ft 30,220
Water year 1955-56: Max 504 Min 6.5 Mean 62.2 Ac-ft 45,120

Peak discharge (base, 1,300 cfs).--No peak above base.

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 1-6, Nov. 11 to Mar. 23. No gage-height record Apr. 14-27; discharge estimated on basis of 1 discharge measurement.

Dry Creek at Greybull, Wyo.

Location.--Lat 44°30', long 108°03', in sec. 5, T. 52 N., R. 93 W., on left bank half a mile north of Greybull and half a mile upstream from mouth.

Records available.--April 1951 to December 1953, October 1955 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 3,780 ft (by barometer). Prior to Nov. 12, 1952, at site 1 mile upstream at different datum.

Extremes.--Maximum discharge during year, 360 cfs Mar. 19 (gage height, 6.78 ft, backwater from ice); maximum gage height, 6.84 ft Mar. 19 (backwater from ice); no flow Oct. 3-9, May 15-19.

1951-53; 1955-56: Maximum discharge, 860 cfs July 17, 1951 (gage height, 4.06 ft, site and datum then in use), from rating curve extended above 500 cfs; maximum gage height, that of Mar. 19, 1956; no flow Oct. 3-9, May 15-19, 1956.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions above station for irrigation of about 800 acres.

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second) (Shifting-control method used June 5 to July 2, Sept. 7-13)

3.1	0	3.6	8.0
3.2	.5	3.7	12
3.3	1.5	4.0	33
3.4	3.0	4.3	63
3.5	5.0		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.2	*0.4	*7.0	10	4.0	3.0	4.6	1.4	3.2	39	23	30
2	.1	.4	7.0	10	4.0	3.0	4.4	1.5	4.6	41	35	24
3	0	.4	6.0	10	4.0	3.0	4.2	1.4	3.0	47	54	20
4	0	.4	5.0	*10	5.0	3.0	4.4	1.1	*8.0	46	62	22
5	*0	.4	5.0	10	5.0	3.0	4.4	1.6	29	44	*42	24
6	0	.4	5.0	10	**5.0	3.0	4.0	1.4	23	24	38	26
7	0	.4	5.0	10	5.0	3.0	4.0	1.3	22	17	39	22
8	0	.4	5.0	10	5.0	3.0	4.0	1.2	13	22	40	*23
9	0	.4	5.0	10	5.0	3.0	4.0	.5	22	17	31	23
10	.4	.4	5.0	10	5.0	3.0	4.2	**.2	22	16	30	28
11	.4	.3	6.0	10	5.0	2.0	4.4	**.2	34	14	31	28
12	.3	.3	7.0	10	5.0	2.0	4.6	.3	31	*16	36	31
13	.1	.3	7.0	10	5.0	2.0	4.4	.2	29	23	31	34
14	.2	.3	7.0	10	5.0	2.0	19	.2	32	20	19	17
15	.2	.3	7.0	10	5.0	2.0	12	*0	36	12	18	11
16	.2	.3	7.0	9.0	4.0	10	7.7	0	53	10	14	8.8
17	.2	.3	7.0	8.0	3.0	20	4.0	0	43	5.3	11	8.4
18	.2	.3	7.0	7.0	3.0	60	4.0	*0	37	5.9	17	17
19	.3	.3	7.0	7.0	3.0	*90	3.8	0	*41	5.0	30	22
20	.3	.3	8.0	8.0	3.0	80	3.4	.3	34	8.8	28	22
21	.4	.6	8.0	8.0	3.0	60	3.8	.4	36	6.5	18	22
22	.6	.8	8.0	8.0	3.0	35	4.4	.6	52	8.4	14	31
23	.2	1.0	10	8.0	3.0	20	5.6	**.2	46	8.0	13	32
24	.2	2.0	15	8.0	3.0	10	5.6	.2	29	9.2	12	25
25	.2	4.0	15	8.0	3.0	7.0	4.4	.4	52	14	15	22
26	.2	7.0	15	7.0	3.0	5.0	*5.0	.4	53	13	22	22
27	.2	8.0	15	6.0	3.0	4.0	4.6	1.3	37	16	32	20
28	.3	8.0	15	6.0	3.0	*4.0	3.0	.6	33	22	39	19
29	.3	7.0	13	5.0	*3.0	4.0	1.5	8.4	34	33	37	19
30	.4	7.0	12	4.5	------	4.5	1.5	4.0	36	47	31	17
31	.4	------	10	4.0	------	4.6	------	2.7	------	35	38	------
Total	6.5	52.4	261.0	261.5	115.0	458.1	148.9	32.0	927.8	645.1	900	670.2
Mean	0.21	1.75	8.42	8.44	3.96	14.8	4.96	1.03	30.9	20.8	29.0	22.3
Ac-ft	13	104	518	519	228	909	295	63	1,840	1,280	1,790	1,330

Calendar year 1955:	Max -	Min -	Mean -	Ac-ft -
Water year 1955-56:	Max 90	Min 0	Mean 12.2	Ac-ft 8,890

Peak discharge (base, 350 cfs).--Mar. 19 (6 p.m.) 360 cfs (6.78 ft).
* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.

Note.--Stage-discharge relation affected by ice Oct. 24 to Mar. 30 (no gage-height record Nov. 13-19, Dec. 3 to Feb. 29, Mar. 6-18; discharge estimated on basis of 2 discharge measurements, 1 field estimate of flow, and weather records).

Shell Creek near Shell, Wyo.

Location.--Lat 44°34', long 107°42', in sec. 17, T. 53 N., R. 90 W., on right bank 1½ miles upstream from White Creek and 5 miles northeast of Shell.

Drainage area.--148 sq mi.

Records available.--January 1941 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 4,367.20 ft above mean sea level (U. S. Bureau of Public Roads benchmark).

Average discharge.--15 years, 120 cfs (86,940 acre-ft per year).

Extremes.--Maximum discharge during year, 1,190 cfs June 1 (gage height, 4.88 ft); minimum daily, 22 cfs Dec. 29.

1941-56: Maximum discharge, 3,020 cfs June 24, 1945 (gage height, 7.49 ft), from rating curve extended above 1,600 cfs; minimum daily, 18 cfs Mar. 5, 7, 1950, Jan. 30, 31, 1951.

Remarks.--Records good. Diversions above station for irrigation of about 100 acres.

Revisions (water years).--WSP 1239: 1941, 1945(M).

Rating table, water year 1955-56 (gage height, in feet, and discharge, in cubic feet per second)

1.4	19	3.0	280
1.6	30	3.5	460
2.0	70	4.0	690
2.5	150	4.5	980

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	44	32	41	42	35	36	36	51	914	134	78	48
2	44	29	*40	39	39	36	34	50	860	132	77	48
3	43	44	38	39	40	38	34	53	764	132	76	47
4	42	51	37	*39	40	37	34	51	740	120	74	47
5	*42	45	38	38	40	36	34	65	725	113	71	47
6	43	40	43	38	40	35	28	68	585	110	*70	47
7	42	41	41	37	*39	34	33	74	440	107	68	47
8	43	42	40	37	38	36	34	94	448	104	65	*47
9	41	42	40	37	40	37	34	118	460	99	63	45
10	40	44	39	37	40	35	36	132	452	98	60	44
11	41	42	39	37	40	30	36	107	396	94	59	44
12	41	30	39	37	40	35	36	112	370	*99	83	44
13	40	25	35	37	40	39	36	96	342	92	87	44
14	41	40	30	37	39	37	40	86	324	87	93	45
15	42	29	38	34	38	37	42	92	298	81	86	45
16	41	33	43	34	40	38	45	98	277	80	76	45
17	42	44	41	38	41	40	45	146	241	68	66	45
18	43	51	38	38	40	40	45	208	262	78	59	44
19	42	53	41	38	39	42	47	310	232	84	55	44
20	44	51	40	37	40	43	53	512	*212	84	53	44
21	45	49	40	37	40	43	58	890	229	84	51	44
22	44	44	41	37	40	43	60	932	235	84	50	44
23	44	40	44	37	40	45	53	*956	215	81	51	43
24	41	42	44	37	40	47	51	932	182	78	51	43
25	44	41	40	35	39	49	49	980	172	77	51	43
26	41	42	39	37	39	46	*52	962	164	77	56	42
27	44	35	40	38	40	*39	53	*974	156	78	54	42
28	40	42	37	35	39	35	51	890	150	77	52	42
29	44	42	22	32	*38	34	53	725	146	76	49	41
30	43	42	40	36	------	37	51	685	139	76	49	41
31	*42	------	48	34	------	36	------	776	------	69	49	------
Total	1,313	1,227	1,216	1,145	1,143	1,195	1,293	12,225	11,130	2,853	1,982	1,336
Mean	42.4	40.9	39.2	36.9	39.4	38.6	43.1	394	371	92.0	63.9	44.5
Ac-ft	2,600	2,430	2,410	2,270	2,270	2,370	2,560	24,250	22,100	5,660	3,930	2,650

Calendar year 1955: Max 1,260 Min 22 Mean 117 Ac-ft 84,730
Water year 1955-56: Max 980 Min 22 Mean 104 Ac-ft 75,500

Peak discharge (base, 750 cfs).--June 1 (3 a.m.) 1,190 cfs (4.88 ft).
* Discharge measurement made on this day.
Note.--No gage-height record Aug. 30 to Sept. 7, Sept. 14-30; discharge estimated on basis of recorded range in stage.

Bighorn River at Kane, Wyo.

Location.--Lat 44°45', long 108°12', in sec. 9, T. 55 N., R. 94 W., on right bank 2 miles upstream from Five Springs Creek and 6½ miles south of Kane. Prior to May 17, 1956, at site 12½ miles downstream.

Drainage area.--15,900 sq mi, approximately.

Records available.--August 1928 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 3,660 ft (from Fairchild Aerial Survey map made for the U. S. Bureau of Reclamation). Prior to Apr. 25, 1932, chain gage on highway bridge 12½ miles downstream at different datums. Apr. 25, 1932, to Nov. 25, 1943, water-stage recorder 150 ft upstream from bridge at different datum. Nov. 26, 1943, to May 16, 1956, water-stage recorder 26 ft downstream from bridge at different datum.

Average discharge.--28 years, 2,288 cfs (1,658,000 acre-ft per year).

Extremes.--Maximum discharge during year, 4,950 cfs May 27 (gage height, 3.80 ft); maximum gage height observed, 9.88 ft Feb. 25 (backwater from ice, site and datum then in use); minimum daily discharge, 716 cfs May 8, 9, 18.

1928-56: Maximum discharge, 25,200 cfs June 16, 1935 (gage height, 11.10 ft, site and datum then in use); minimum daily, 179 cfs July 22, 1934.

Maximum stage known, 14.8 ft Sept. 30, 1923, sites and datum of April 1932 to May 1956.

Remarks.--Records good except those for period of ice effect, which are poor. Diversions for irrigation of about 275,000 acres above station. Some regulation by Boysen Reservoir since October 1951 (see p. 237). Records of chemical analyses, water temperatures, and suspended sediment loads for the water year 1956 are given in WSP 1451.

Rating tables, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 25 to Nov. 15, Apr. 26, May 4-16, 27-29)

Oct. 1 to May 16		May 17 to Sept. 30	
2.9	710	1.1	700
3.0	770	1.5	1,040
4.0	1,400	2.0	1,640
5.0	2,190	3.0	3,430
5.5	2,650	3.7	4,950

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,630	*1,380	2,000	2,600	2,100	2,300	1,630	1,170	3,690	1,090	844	1,540
2	1,410	1,360	2,100	2,600	1,800	2,400	1,630	1,120	4,270	1,060	844	1,610
3	1,390	1,800	2,200	2,400	2,000	2,600	1,620	986	4,180	1,080	869	1,640
4	*1,140	*2,170	2,100	2,200	2,100	2,700	1,590	884	3,820	1,150	887	1,660
5	*1,190	2,170	2,000	2,200	2,100	3,100	1,560	860	3,760	1,140	860	1,720
6	1,020	1,570	2,300	2,500	2,100	3,000	1,550	842	3,730	1,100	*844	1,740
7	1,060	1,990	2,200	2,500	2,100	3,000	1,530	734	2,800	959	836	*1,810
8	1,070	980	2,400	2,500	2,300	2,800	1,550	*716	2,190	887	804	*1,810
9	1,070	1,470	2,500	2,500	2,600	2,800	1,530	716	2,120	869	812	1,820
10	1,120	1,850	2,400	2,500	2,600	2,500	*1,560	764	2,190	*878	*860	1,840
11	1,120	1,910	2,500	2,500	2,600	2,200	*1,540	1,010	2,290	836	852	1,820
12	1,080	2,370	2,300	2,500	2,600	2,000	1,550	998	2,240	*812	828	1,840
13	1,110	1,930	2,200	2,500	3,000	2,000	1,510	914	2,140	914	878	1,870
14	1,120	1,930	2,400	2,500	3,200	2,000	1,480	878	1,970	941	820	2,040
15	1,230	1,010	2,500	2,500	3,200	2,000	1,450	902	1,890	836	780	1,820
16	1,180	1,200	2,400	2,500	3,000	2,000	1,400	950	2,020	780	780	1,820
17	1,150	*1,400	2,600	2,500	2,900	2,000	1,400	*724	2,340	788	756	1,810
18	1,170	2,100	2,700	2,500	2,700	2,400	1,370	716	2,040	756	820	1,820
19	1,250	2,500	2,800	2,500	2,600	*2,700	1,400	1,010	*2,140	748	860	1,820
20	1,260	2,100	2,700	2,500	2,500	2,400	*1,380	1,570	*1,900	748	914	1,790
21	1,200	2,000	2,400	2,500	2,600	2,200	1,350	2,780	1,810	748	932	1,490
22	1,320	2,000	2,600	2,500	2,700	2,100	1,360	3,990	2,240	756	887	1,780
23	1,320	1,500	2,800	*2,500	2,700	2,060	1,390	*4,420	2,050	788	860	1,820
24	1,340	1,900	3,000	2,500	2,700	2,240	1,430	4,450	1,820	*860	852	1,840
25	1,330	1,900	3,200	2,500	3,300	2,240	1,410	*4,310	1,780	796	828	1,820
26	1,350	1,700	2,800	2,500	2,900	2,080	*1,360	4,630	1,840	780	836	1,720
27	1,340	1,800	*2,400	2,300	2,500	2,020	1,250	*4,720	1,700	772	878	1,790
28	1,390	2,000	2,000	2,200	2,500	*1,830	1,220	4,770	1,260	764	1,070	1,790
29	1,410	1,900	2,500	2,100	*2,300	1,710	1,220	4,540	1,240	820	1,490	1,840
30	1,340	*2,000	2,600	2,100	------	1,630	1,190	3,930	1,150	941	1,500	1,900
31	1,440	------	2,600	2,100	------	1,630	------	3,630	------	950	1,510	------
Total	38,550	53,890	76,200	75,300	74,300	70,640	43,410	64,634	70,610	27,347	28,391	53,430
Mean	1,244	1,796	2,458	2,429	2,562	2,279	1,447	2,085	2,354	882	916	1,781
Ac-ft	76,460	106,900	151,100	149,400	147,400	140,100	86,100	128,200	140,100	54,240	56,310	106,000

Calendar year 1955: Max 6,360 Min 560 Mean 1,925 Ac-ft 1,392,000
Water year 1955-56: Max 4,770 Min 716 Mean 1,849 Ac-ft 1,342,000

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 17 to Mar. 22. Discharge computed from twice-daily wire-weight-gage readings Oct. 1 to May 16.

Shoshone River below Buffalo Bill Reservoir, Wyo.

Location.--Lat 44°31'00", long 109°05'50", in lot 71, sec. 3, T. 52 N., R. 102 W., on left bank half a mile downstream from Trail Creek, 1 mile west of Cody city limits, and 5½ miles downstream from Buffalo Bill Reservoir.

Drainage area.--1,570 sq mi, approximately.

Records available.--January 1921 to September 1956. Prior to October 1944, published as "below Shoshone Reservoir."

Gage.--Water-stage recorder. Altitude of gage is 4,900 ft (from topographic map). Prior to Oct. 1, 1949, at site 2½ miles upstream at different datum.

Average discharge.--35 years, 1,234 cfs (894,000 acre-ft per year).

Extremes.--Maximum discharge during year, 5,770 cfs June 17 (gage height, 8.10 ft); minimum daily, 306 cfs Nov. 26, 27, Dec. 1-19.

1921-56: Maximum discharge, 14,700 cfs May 28, 1928 (gage height, 10.62 ft, site and datum then in use), from rating curve extended above 7,500 cfs; minimum daily, 14 cfs Nov. 19, 1933.

Maximum flood known since construction of Buffalo Bill Reservoir, 18,700 cfs June 15, 1918, by computation of flow over dam.

Remarks.--Records good. Flow completely regulated by Buffalo Bill Reservoir (see p. 237). Diversions above station for irrigation of about 20,000 acres above and 40,000 acres below station.

Rating table, water year 1955-56 (gage height, in feet, and discharge, in cubic feet per second)

3.0	175	6.0	2,150
3.5	330	7.0	3,580
4.0	540	8.0	5,550
4.5	820	8.1	5,770
5.0	1,190		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	784	*323	*306	394	560	590	550	890	3,500	4,840	1,330	946
2	790	326	306	338	580	*590	694	890	3,550	4,430	1,320	946
3	790	326	306	334	580	590	897	946	3,610	4,050	1,310	946
4	*790	326	306	338	575	590	855	1,030	3,600	3,560	1,320	946
5	790	326	306	338	575	590	808	1,030	3,580	3,130	1,320	946
6	790	326	306	*338	575	590	834	1,030	3,580	3,010	1,320	946
7	796	326	306	338	*575	595	890	1,030	3,520	3,000	1,320	939
8	796	326	306	338	575	595	890	1,180	3,580	3,060	1,320	*932
9	796	326	306	338	580	595	841	1,530	3,600	3,040	1,320	932
10	869	326	306	338	585	600	808	1,540	3,610	3,060	1,310	932
11	974	326	306	338	585	595	808	1,540	3,630	*3,010	1,310	932
12	974	326	306	338	585	658	808	1,530	3,650	3,000	1,310	932
13	974	326	306	338	585	855	834	1,540	3,650	2,980	1,310	932
14	981	326	306	338	585	682	890	1,540	3,630	2,790	*1,300	925
15	712	326	306	338	585	555	890	2,120	3,610	2,630	1,300	925
16	465	326	306	338	585	555	890	2,890	*5,050	2,400	1,300	925
17	410	326	306	342	580	555	820	3,080	*5,750	2,250	1,300	925
18	342	326	306	342	580	555	848	3,100	5,370	2,080	1,300	925
19	350	326	306	346	580	550	834	3,150	4,880	1,950	1,300	925
20	358	326	346	402	580	545	890	3,160	5,220	1,840	1,300	925
21	354	326	418	446	580	545	897	3,210	5,590	1,770	1,300	925
22	354	326	414	446	580	545	904	*3,230	5,190	1,720	1,100	925
23	350	320	490	513	585	540	904	3,310	4,550	1,650	918	925
24	346	312	422	646	590	540	911	3,370	4,210	1,580	918	925
25	323	309	422	718	595	540	*911	3,400	4,390	1,500	918	925
26	323	306	422	718	595	540	904	3,470	4,450	1,430	918	925
27	326	306	422	718	595	540	890	3,530	4,610	1,470	918	925
28	326	309	418	724	595	*540	890	3,550	4,900	1,630	918	932
29	326	309	418	724	595	540	890	3,520	5,110	1,550	918	932
30	326	309	382	736	------	545	890	3,500	5,180	1,480	918	932
31	326	------	330	658	------	545	------	3,480	------	1,400	932	------
Total	18,210	9,649	10,718	13,939	16,900	17,995	25,570	72,316	128,350	77,290	36,896	27,953
Mean	587	322	346	450	583	580	852	2,333	4,278	2,493	1,190	932
Ac-ft	36,120	19,140	21,260	27,650	33,520	35,690	50,720	143,400	254,600	153,300	73,180	55,440

Calendar year 1955: Max 1,580 Min 191 Mean 742 Ac-ft 537,100
Water year 1955-56: Max 5,750 Min 306 Mean 1,245 Ac-ft 904,000

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* Discharge measurement made on this day.

Shoshone River at Byron, Wyo.

Location.--Lat 44°47', long 108°31', in sec. 35, T. 56 N., R. 97 W., on left bank at Byron, 450 ft downstream from highway bridge and three-quarters of a mile downstream from Coon Creek.

Drainage area.--2,300 sq mi, approximately.

Records available.--January 1929 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 3,960 ft (by barometer). Prior to Apr. 23, 1932, chain gage at bridge 450 ft upstream at same datum.

Average discharge.--27 years, 931 cfs (674,500 acre-ft per year).

Extremes.--Maximum discharge during year, 5,880 cfs June 21 (gage height, 4.62 ft); minimum daily, 360 cfs Oct. 26.

1929-56: Maximum discharge, 13,900 cfs June 25, 1932 (gage height, 6.45 ft), from rating curve extended above 9,500 cfs; maximum gage height, 8.12 ft Jan. 29, 1949 (ice jam); minimum discharge observed, 29 cfs Feb. 14, 1932 (discharge measurement).

Remarks.--Records good except those for periods of ice effect, which are fair. Diversions above station for irrigation of about 133,000 acres. Flow regulated by Buffalo Bill Reservoir (see p. 237).

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Nov. 11, Nov. 21-27, May 20 to June 1, Sept. 21-30)

1.7	355	3.5	2,530
2.0	540	4.0	3,730
2.5	1,030	4.6	5,800
3.0	1,680		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	464	*394	491	572	821	*674	612	596	2,570	3,820	692	604
2	477	399	484	556	810	683	596	638	2,510	3,320	629	596
3	464	416	480	548	810	692	730	638	2,550	3,020	656	588
4	*440	416	480	519	854	701	986	701	*2,550	2,610	656	588
5	422	410	480	*498	854	683	986	710	2,380	2,290	683	556
6	440	404	480	491	740	683	898	720	2,340	2,110	701	*548
7	440	410	480	491	*740	683	953	674	2,210	1,970	638	540
8	446	422	480	491	730	683	975	526	2,210	2,060	629	548
9	404	484	480	491	720	401	975	740	2,230	2,110	647	533
10	366	491	480	512	730	683	898	740	2,290	*2,060	740	548
11	377	464	500	484	730	730	887	665	2,250	2,020	790	533
12	410	460	526	484	750	730	887	596	2,180	2,040	832	491
13	416	460	526	484	730	730	821	604	2,180	2,020	865	458
14	434	460	519	484	730	865	843	596	2,230	1,930	730	452
15	464	460	519	491	730	770	887	750	2,510	1,800	*674	458
16	533	480	519	484	780	720	887	1,580	3,170	1,670	629	477
17	498	480	540	512	821	740	865	1,860	5,240	1,460	638	484
18	422	480	570	556	854	843	810	1,880	*5,050	1,260	821	458
19	410	480	612	556	821	920	760	1,930	4,520	1,090	843	446
20	410	480	720	505	760	854	740	1,940	4,450	942	931	440
21	404	491	730	491	665	780	730	2,040	5,610	832	909	470
22	388	519	683	526	665	760	790	*2,080	5,610	832	832	512
23	382	491	854	540	701	780	730	2,040	4,660	821	512	519
24	388	477	720	604	740	790	604	2,090	4,060	683	458	498
25	377	458	608	780	683	760	*580	2,140	3,880	612	477	446
26	360	452	596	780	674	692	596	2,230	3,940	533	505	422
27	366	491	596	790	674	647	564	2,320	3,820	477	519	422
28	372	500	600	800	665	*629	564	2,490	3,940	750	470	428
29	410	500	600	832	674	620	572	2,650	4,130	854	484	452
30	399	*500	520	920	------	612	604	2,590	4,060	854	519	498
31	399	------	500	942	------	596	------	2,630	------	701	564	------
Total	12,982	13,829	17,373	18,214	21,656	22,434	23,330	44,384	101,330	49,551	20,673	15,013
Mean	419	461	560	588	747	724	778	1,432	3,378	1,598	667	500
Ac-ft	25,750	27,430	34,460	36,130	42,950	44,500	46,270	88,030	201,000	98,280	41,000	29,780

Calendar year 1955: Max 1,070 Min 244 Mean 512 Ac-ft 370,500
Water year 1955-56: Max 5,610 Min 360 Mean 986 Ac-ft 715,600

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 12-20, 28-30, Dec. 3-11, 17-18, 28-31.

Sage Creek near Lovell, Wyo.

Location.--Lat 44°51', long 108°27', in sec. 8, T. 56 N., R. 96 W., on right bank 200 ft downstream from bridge on U. S. Highway 310, 1½ miles upstream from mouth, and 3 miles west of Lovell.

Records available.--April 1951 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 3,870 ft (by barometer).

Average discharge.--5 years, 100 cfs (72,450 acre-ft per year).

Extremes.--Maximum discharge during year, 491 cfs June 21 (gage height, 4.04 ft); minimum daily, 14 cfs Feb. 1.

1951-56: Maximum discharge, 769 cfs July 10, 1951 (gage height, 5.00 ft), from rating curve extended above 360 cfs by logarithmic plotting; minimum daily, 10 cfs some days during winter period of 1952.

Remarks.--Records good except those for period of ice effect, which are fair.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	220	*70	38	22	14	*16	44	141	175	198	173	266
2	218	70	38	22	15	17	37	130	160	190	188	260
3	210	76	38	22	15	17	40	110	167	190	190	269
4	210	71	35	23	15	20	44	111	*164	186	190	262
5	*206	71	32	*24	15	20	37	99	162	192	*196	271
6	200	71	32	25	15	17	27	92	167	167	198	258
7	200	70	33	25	*15	17	24	88	162	158	200	*240
8	196	66	34	25	16	17	27	83	146	166	218	245
9	182	65	35	25	16	17	31	87	150	169	230	234
10	167	63	35	25	16	17	30	92	171	*162	251	234
11	153	59	35	25	16	16	56	118	175	158	247	228
12	173	50	33	25	16	15	45	162	148	171	232	232
13	200	40	31	25	16	15	43	157	133	164	226	230
14	208	40	28	25	16	15	51	128	153	146	204	240
15	212	40	25	25	16	15	55	105	169	150	202	238
16	220	40	25	20	16	15	55	91	173	151	212	236
17	151	40	25	17	15	20	56	90	186	150	218	247
18	112	40	25	17	15	30	58	90	208	146	249	249
19	98	40	25	17	15	*40	59	90	204	150	258	243
20	91	45	25	17	15	50	59	94	*192	158	275	238
21	92	47	27	18	15	45	58	105	341	155	240	218
22	92	50	28	20	15	40	59	110	310	158	264	186
23	92	50	29	20	15	39	58	*102	284	157	275	179
24	92	50	30	20	15	38	66	108	282	158	269	188
25	94	50	30	20	17	37	78	110	282	166	273	196
26	90	50	30	20	18	37	*92	123	280	162	289	180
27	90	50	30	20	18	37	122	128	269	158	308	186
28	81	45	30	18	17	37	120	146	238	169	298	196
29	77	40	25	17	16	*37	136	173	208	171	269	212
30	73	*38	22	17	------	39	139	180	186	167	282	216
31	72	------	22	17	------	36	------	180	------	167	280	------
Total	4,572	1,597	930	658	454	828	1,806	3,623	6,045	5,110	7,404	6,877
Mean	147	53.2	30.0	21.2	15.7	26.7	60.2	117	202	165	239	229
Ac-ft	9,070	3,170	1,840	1,310	900	1,640	3,580	7,190	11,990	10,140	14,690	13,640

Calendar year 1955: Max 269 Min 13 Mean 101 Ac-ft 73,260
Water year 1955-56: Max 341 Min 14 Mean 109 Ac-ft 79,160

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 12 to Mar. 27 (no gage-height record Nov. 12 to Mar. 19; discharge estimated on basis of 5 discharge measurements and weather records).

Bighorn River near St. Xavier, Mont.

Location.--Lat 45°19', long 107°56', in NE¼ sec. 17, T. 6 S., R. 31 E., on right bank 50 ft upstream from diversion dam of Bighorn Canal of Crow Agency, 5 miles downstream from Black Canyon Creek, and 15½ miles southwest of St. Xavier.

Records available.--October 1934 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 3,170 ft (by barometer).

Average discharge.--22 years, 3,542 cfs (2,564,000 acre-ft per year).

Extremes.--Maximum discharge during year, 8,820 cfs June 22; minimum daily, 1,230 cfs Nov. 17.
1934-56: Maximum discharge, 37,400 cfs June 16, 1935; minimum, 228 cfs Dec. 9, 1937.

Remarks.--Records good except those for periods of ice effect, which are poor. Figures of discharge given herein are sum of flow over diversion dam and that diverted by Bighorn Canal. Major regulation by 14 reservoirs in Wyoming with combined usable storage of about 1,400,000 acre-ft (for records of storage in Bull Lake, Buffalo Bill and Boysen Reservoirs see p. 237). Diversions for irrigation of about 375,000 acres above station.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,440	2,070	2,530	1,790	1,690	3,570	2,510	2,010	6,650	5,580	2,260	2,720
2	2,580	2,080	2,530	2,090	1,690	3,610	2,460	2,000	7,080	5,470	2,110	2,880
3	2,460	2,120	2,530	2,220	1,840	3,650	*2,430	1,910	7,190	4,900	2,040	2,890
4	2,430	2,230	2,430	2,060	1,960	3,750	2,570	1,850	7,070	4,340	2,060	2,920
5	2,280	2,240	2,230	2,120	2,110	3,830	2,770	1,880	6,870	4,120	2,200	2,850
6	2,220	2,180	2,130	2,400	*2,740	4,510	2,740	1,850	6,950	3,780	2,160	2,920
7	2,120	2,110	2,130	2,780	3,110	3,750	2,630	1,760	6,850	3,650	2,130	2,880
8	2,120	1,990	2,230	3,020	3,210	3,530	2,630	*1,740	*5,580	3,450	2,060	2,920
9	2,120	1,810	2,330	3,020	3,210	3,410	2,630	1,620	5,350	3,530	2,020	2,920
10	2,090	2,150	2,430	3,300	3,110	2,610	2,670	1,920	5,640	3,450	2,020	2,850
11	1,990	2,220	2,430	3,220	3,160	1,710	2,630	2,030	6,000	3,300	2,160	3,100
12	1,980	2,150	2,530	3,220	3,210	2,010	2,570	2,070	5,820	3,180	2,200	*2,850
13	2,080	1,950	*2,430	3,340	3,160	1,910	2,610	2,000	5,700	3,250	2,200	2,850
14	2,170	1,850	2,430	3,300	3,110	2,010	2,550	1,870	5,600	3,160	2,210	2,860
15	2,200	1,750	2,430	3,220	3,010	2,510	2,500	1,770	5,400	3,070	1,950	2,910
16	2,260	1,550	2,450	3,120	2,810	2,850	2,490	2,000	5,710	*2,840	1,820	2,800
17	2,300	1,230	2,230	2,720	2,610	3,130	2,410	2,940	7,240	2,660	1,780	2,840
18	*2,240	1,650	2,330	2,640	2,610	3,130	2,410	3,110	8,080	2,470	1,820	2,840
19	2,020	1,860	2,430	2,780	2,910	*3,790	2,410	3,140	7,360	1,950	2,060	2,820
20	2,000	2,960	2,630	3,180	3,010	4,470	2,380	3,780	6,600	2,100	2,150	2,780
21	1,980	3,160	2,720	3,220	3,110	4,510	2,310	4,540	6,760	2,240	*2,310	2,650
22	2,010	*3,360	2,620	3,120	3,170	3,970	2,280	6,030	7,700	2,120	2,310	2,400
23	2,020	2,660	2,920	3,120	3,530	3,210	2,310	7,000	7,820	2,190	2,180	2,750
24	2,020	2,760	3,520	3,120	4,060	3,050	2,280	7,360	6,500	2,190	1,880	2,820
25	2,070	2,960	4,020	3,120	4,370	3,250	2,190	7,390	5,940	2,110	1,820	2,880
26	2,020	2,630	4,520	3,220	4,510	3,210	2,130	7,640	5,970	1,970	1,810	2,760
27	2,050	2,330	3,800	2,820	3,650	3,090	2,130	7,400	5,980	1,890	1,980	2,610
28	2,050	2,530	2,500	2,920	3,010	2,970	2,040	7,920	6,060	1,810	2,130	2,680
29	2,120	2,530	2,220	2,820	3,090	2,770	2,010	8,090	5,810	2,100	2,320	2,760
30	2,120	2,330	2,520	2,520	------	2,630	2,040	7,830	5,850	2,300	2,640	2,790
31	2,120	------	2,220	2,120	------	2,560	------	6,870	------	2,500	2,620	------
Total	66,680	67,400	81,400	87,660	86,770	98,960	72,720	121,320	193,130	93,670	65,410	84,500
Mean	2,151	2,247	2,626	2,828	2,992	3,192	2,424	3,914	6,438	3,022	2,110	2,817
Ac-ft	132,300	133,700	161,500	173,900	172,100	196,300	144,200	240,600	383,100	185,800	129,700	167,600

Calendar year 1955: Max 7,540 Min 1,190 Mean 2,701 Ac-ft 1,956,000
Water year 1955-56: Max 8,090 Min 1,230 Mean 3,059 Ac-ft 2,221,000

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* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 3-8, 10-16, Nov. 18 to Dec. 15, Dec. 18-26, 30, 31, Jan. 15-17, 21-26, 28-31, Feb. 7-21, 26, Mar. 9-15.

Little Bighorn River at State line, near Wyola, Mont.

Location.--Lat 45°01', long 107°37', in SW¼NW¼ sec. 36, T. 9 S., R. 33 E., on right bank half a mile north of Montana-Wyoming State line, 1 mile downstream from North Fork, and 13 miles southwest of Wyola.

Drainage area.--199 sq mi.

Records available.--March 1939 to September 1956. Prior to October 1940, published as Little Horn River at State line, near Wyola.

Gage.--Water-stage recorder. Altitude of gage is 4,450 ft (from topographic map).

Average discharge.--17 years, 143 cfs (103,500 acre-ft per year).

Extremes.--Maximum discharge during year, 936 cfs May 28 (gage height, 3.64 ft); minimum, 30 cfs Mar. 11 (gage height, 1.65 ft).

1939-56: Maximum discharge, 2,730 cfs June 3, 1944 (gage height, 4.87 ft), from rating curve extended above 800 cfs; maximum gage height recorded, 5.93 ft June 9, 1944 (log jam); minimum discharge, 21 cfs Dec. 27, 1954.

Remarks.--Records good. No known diversion above station.

Rating tables, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to June 5				June 6 to Sept. 30			
1.7	32	2.7	240	1.9	60	3.0	415
1.9	48	3.1	490	2.2	127	3.5	810
2.1	71	3.5	810	2.6	238		
2.4	136						

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	73	58	66	60	40	54	59	63	626	170	103	85
2	73	61	66	62	45	54	56	64	602	168	103	82
3	73	68	58	58	52	54	55	67	570	173	101	80
4	75	71	56	58	58	54	56	66	546	162	98	80
5	75	70	51	58	62	54	56	76	546	157	97	82
6	73	66	64	58	60	*54	54	82	482	155	96	80
7	75	67	67	57	58	50	54	85	*409	152	94	78
8	76	67	63	57	56	56	56	108	379	144	94	76
9	76	70	63	56	57	55	55	*126	355	142	94	76
10	76	71	62	56	58	50	55	154	342	137	94	74
11	82	68	61	56	58	38	*56	131	324	137	94	76
12	76	46	62	56	56	49	55	128	310	137	92	80
13	76	36	56	57	56	55	56	115	294	134	89	*80
14	76	40	41	56	55	54	58	102	282	130	87	80
15	76	37	*45	46	42	54	61	104	270	127	85	78
16	75	40	58	42	36	57	64	120	260	125	87	76
17	75	45	56	55	48	54	63	166	248	*125	87	76
18	75	55	49	56	48	54	63	224	248	122	105	74
19	*73	65	50	56	52	55	63	280	232	120	94	74
20	71	84	60	57	56	55	67	364	222	117	89	74
21	71	78	67	59	60	55	73	420	232	115	85	76
22	71	71	67	57	59	55	73	448	226	113	*82	76
23	68	64	66	57	57	56	67	522	207	113	82	74
24	68	67	64	54	56	58	67	586	198	110	82	74
25	70	66	62	*52	55	61	66	594	195	110	82	74
26	68	64	61	54	52	62	66	594	190	110	82	74
27	70	58	61	54	52	59	66	634	184	110	87	74
28	66	*57	59	48	53	56	64	802	178	108	89	76
29	70	61	42	40	54	55	64	778	*175	108	87	78
30	70	63	44	40	------	56	63	650	173	108	96	74
31	67	------	50	42	------	57	------	610	------	105	89	------
Total	2,259	1,834	1,797	1,674	1,551	1,690	1,831	9,263	9,505	4,044	2,825	2,311
Mean	72.9	61.1	58.0	54.0	53.5	54.5	61.0	299	317	130	91.1	77.0
Ac-ft	4,480	3,640	3,560	3,320	3,080	3,350	3,630	18,370	18,850	8,020	5,600	4,580

Calendar year 1955: Max 702 Min 35 Mean 136 Ac-ft 98,430
Water year 1955-56: Max 802 Min 36 Mean 111 Ac-ft 80,480

Peak discharge (base, 510 cfs).--May 28 (11:30 p.m.) 936 cfs (3.64 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 18, 19, Dec. 19, 20, Dec. 30 to Jan. 1, Jan. 16, 19, 20, Jan. 24 to Feb. 8, Feb. 15-21, 26-28.

Pass Creek near Wyola, Mont.

Location.--Lat 45°03', long 107°21', in sec. 13, T. 9 S., R. 35 E., on right bank 100 ft upstream from highway bridge, 1 mile downstream from Twin Creek, 5 miles south of Wyola, and 6 miles upstream from mouth.

Drainage area.--119 sq mi.

Records available.--June 1935 to September 1956 (winter records incomplete prior to 1939), discontinued.

Gage.--Water-stage recorder. Altitude of gage is 3,860 ft (from topographic map). Prior to Dec. 21, 1950, wire-weight gage on highway bridge 100 ft downstream at same datum.

Average discharge.--18 years (1938-56), 36.1 cfs (26,140 acre-ft per year).

Extremes.--Maximum discharge during year, 247 cfs May 29 (gage height, 2.34 ft); maximum gage height, 3.87 ft Mar. 19 (backwater from ice); minimum discharge, 0.1 cfs Aug. 1 (gage height, 0.57 ft).

1935-56: Maximum discharge observed, 1,150 cfs June 4, 1944 (gage height, 4.82 ft), from rating curve extended above 400 cfs; maximum gage height observed, 6.22 ft Mar. 25, 1943 (ice jam); no flow Aug. 3, 9, 10, 1935 (pool stage).

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of about 2,500 acres above station.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.56	0	1.2	38
.6	.5	1.5	81
.7	4.0	2.0	176
.8	8.0	2.5	310
1.0	19		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.2	17	16	13	13	22	31	21	128	16	0.2	6.0
2	7.6	17	16	15	12	20	30	20	109	17	.8	6.0
3	8.0	17	15	14	13	22	26	21	96	21	.5	5.6
4	8.0	17	14	15	15	25	29	21	88	18	.2	6.4
5	7.6	17	13	16	16	23	43	19	81	16	.5	7.6
6	12	17	14	15	16	*22	32	17	*76	14	1.6	8.0
7	17	17	15	14	16	21	28	17	70	13	1.6	7.2
8	17	17	14	15	15	23	28	18	62	12	1.6	8.5
9	15	17	14	14	14	23	28	21	57	11	1.2	7.2
10	14	17	14	15	14	20	35	*51	50	10	.8	6.4
11	15	16	13	15	14	18	36	46	44	10	.8	6.8
12	15	15	14	15	14	20	*32	58	38	10	.5	6.0
13	15	14	13	15	14	23	36	42	36	10	.5	6.8
14	15	13	12	15	13	25	31	36	36	10	.5	*7.2
15	15	14	*11	13	12	22	29	32	37	10	.5	6.8
16	15	15	13	14	12	25	27	29	35	10	.2	5.6
17	15	16	12	15	14	30	25	30	35	8.0	.2	5.2
18	15	16	11	15	16	40	25	36	35	*9.0	1.9	5.6
19	*15	17	12	16	16	50	25	41	32	8.0	3.0	6.0
20	15	18	14	16	16	55	24	47	30	8.0	5.6	6.4
21	15	16	14	16	16	60	23	51	35	7.6	7.2	7.6
22	15	14	15	16	17	65	23	91	37	7.2	*4.8	9.0
23	16	*13	15	16	18	65	25	81	30	6.4	4.0	9.5
24	16	14	14	16	20	61	24	67	25	4.8	3.6	9.5
25	15	15	13	*15	23	54	24	62	26	2.6	4.4	9.5
26	15	15	12	15	20	51	22	59	25	.5	4.8	8.5
27	17	12	12	14	19	39	23	64	23	.5	5.6	9.0
28	17	14	12	14	18	26	22	115	21	.8	6.4	8.5
29	17	15	11	13	19	23	21	233	18	.5	6.4	7.6
30	16	16	12	12	------	29	21	194	16	.8	6.4	9.0
31	17	------	12	13	------	28	------	154	------	.5	6.4	------
Total	439.4	468	412	455	455	1,030	828	1,794	1,431	273.2	82.7	219.0
Mean	14.2	15.6	13.3	14.7	15.7	33.2	27.6	57.9	47.7	8.81	2.67	7.30
Ac-ft	872	928	817	902	902	2,040	1,640	3,560	2,840	542	164	434

Calendar year 1955:	Max 175	Min 1.2	Mean 31.3	Ac-ft 22,680
Water year 1955-56:	Max 233	Min 0.2	Mean 21.6	Ac-ft 15,640

Peak discharge (base, 100 cfs).--May 22 (10 a.m.) 106 cfs (1.68 ft); May 29 (3 p.m.) 247 cfs (2.34 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 2, 3, Nov. 10 to Mar. 22.

Little Bighorn River below Pass Creek, near Wyola, Mont.

Location.--Lat 45°11', long 107°23', in W½SW¼ sec. 35, T. 7 S., R. 35 E., on right bank 2¾ miles downstream from Pass Creek and 3½ miles north of Wyola.

Drainage area.--429 sq mi.

Records available.--March 1939 to September 1956. Prior to October 1940, published as Little Horn River below Pass Creek, near Wyola.

Gage.--Water-stage recorder. Altitude of gage is 3,600 ft (from topographic map).

Average discharge.--17 years, 188 cfs (136,100 acre-ft per year).

Extremes.--Maximum discharge during year, 1,200 cfs May 29 (gage height, 4.41 ft); minimum daily, 40 cfs Dec. 15; minimum gage height, 1.19 ft Aug. 15.
1939-56: Maximum discharge, 3,200 cfs June 4, 1944 (gage height, 7.00 ft), from rating curve extended above 1,500 cfs; minimum, 27 cfs Sept. 9, 1940 (gage height, 0.87 ft).

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of about 7,700 acres above station.

Rating tables, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 1, June 8 to Sept. 30				Mar. 2 to June 7			
1.2	50	2.5	329	1.4	85	3.5	749
1.6	105	3.0	527	1.8	149	4.5	1,240
2.0	179			2.5	335		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	99	96	120	100	85	140	132	113	805	126	58	68
2	98	94	105	100	90	125	134	112	758	136	52	68
3	96	99	105	110	100	141	125	115	708	157	55	70
4	90	107	100	100	110	160	138	116	648	121	57	75
5	90	107	95	100	115	132	180	120	598	121	52	81
6	99	104	100	96	115	*113	149	132	548	105	54	82
7	105	107	110	95	110	101	128	127	*464	93	51	78
8	108	105	115	95	110	104	128	134	412	92	56	78
9	105	107	115	90	105	106	125	*153	377	90	56	78
10	102	111	105	90	105	101	128	332	359	86	55	78
11	108	115	110	85	110	94	*130	242	362	88	58	78
12	110	95	100	85	110	90	127	248	336	84	58	75
13	105	90	105	85	100	110	123	206	315	74	58	76
14	102	80	80	80	100	105	123	180	285	72	57	*78
15	99	70	*40	70	90	115	122	170	279	66	51	75
16	99	90	80	65	75	108	120	166	266	71	52	75
17	99	100	100	85	90	216	120	187	245	75	52	72
18	100	110	90	100	95	315	116	232	251	*76	62	70
19	*99	120	100	100	95	411	116	281	224	78	66	66
20	99	130	110	110	100	400	115	328	221	84	65	61
21	100	120	120	110	110	299	116	432	233	86	65	55
22	98	110	120	110	130	208	120	472	260	86	61	58
23	99	100	110	105	140	199	123	519	239	86	56	60
24	98	110	105	105	150	192	120	565	192	76	*57	61
25	99	105	100	*105	130	172	115	594	189	63	57	60
26	98	100	95	100	125	164	113	565	172	60	61	65
27	104	105	95	95	115	147	116	590	149	65	66	63
28	99	*110	100	85	115	127	115	795	146	66	74	62
29	100	105	95	75	130	115	113	1,140	140	67	72	62
30	99	115	85	80	------	122	116	1,020	131	78	78	63
31	104	------	90	85	------	120	------	860	------	82	74	------
Total	3,110	3,117	3,100	2,895	3,155	5,052	3,746	11,246	10,312	2,710	1,846	2,091
Mean	100	104	100	93.4	109	163	125	363	344	87.4	59.5	69.7
Ac-ft	6,170	6,180	6,150	5,740	6,260	10,020	7,430	22,310	20,450	5,380	3,660	4,150

Calendar year 1955:	Max	726	Min	40	Mean	168	Ac-ft	121,800
Water year 1955-56:	Max	1,140	Min	40	Mean	143	Ac-ft	103,900

Peak discharge (base, 580 cfs).--Mar. 17 (9 p.m.) 598 cfs (3.17 ft); May 29 (10 to 12 a.m.) 1,200 cfs (4.41 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 12 to Mar. 2, Mar. 12-15.

Lodgegrass Creek above Willow Creek diversion, near Wyola, Mont.

Location.--Lat 45°07', long 107°36', in W½NW¼ sec. 19, T. 8 S., R. 34 E., on left bank half a mile upstream from Willow Creek diversion canal, 1½ miles downstream from Spring Creek, and 10 miles west of Wyola.

Drainage area.--83 sq mi, approximately.

Records available.--March 1939 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 4,360 ft (from topographic map).

Average discharge.--17 years, 43.6 cfs (31,570 acre-ft per year).

Extremes.--Maximum discharge during year, 427 cfs May 29 (gage height, 4.45 ft); minimum daily, 9 cfs Feb. 14-16.

1939-56: Maximum discharge, 762 cfs June 4, 1944 (gage height, 5.68 ft), from rating curve extended above 400 cfs; minimum daily, 3.0 cfs Jan. 17, 18, 25, 30, 31, 1950, Jan. 15, 16, 1954.

Remarks.--Records good except those for periods of ice effect or of no gage-height record, which are poor. Diversions for irrigation of about 400 acres above station.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.7	9.0	2.5	108
1.8	14	3.5	268
1.9	23	4.5	437

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	16	13	12	12	11	15	19	17	271	46	17	13
2	16	12	12	12	11	15	19	17	265	46	16	13
3	15	13	11	13	12	15	16	18	244	46	17	13
4	14	14	11	14	12	16	17	18	225	42	16	14
5	14	14	10	15	13	15	18	18	222	39	15	14
6	15	14	11	15	12	15	17	18	190	38	15	13
7	15	15	12	14	*12	*16	17	18	*164	36	15	12
8	15	15	12	14	12	15	17	21	148	34	16	12
9	13	15	12	14	12	13	17	*31	140	31	15	11
10	13	17	12	14	12	12	17	88	129	30	15	11
11	14	17	12	14	12	11	*18	43	122	30	14	10
12	13	15	13	14	11	13	18	42	114	30	14	10
13	14	13	12	14	10	14	17	39	106	28	14	*11
14	14	11	11	13	9	13	16	35	100	27	14	12
15	14	10	*11	12	9	13	16	33	95	24	14	11
16	14	11	11	11	9	13	15	33	89	24	14	11
17	14	12	10	12	10	14	15	41	82	*23	14	12
18	14	13	10	13	10	17	15	53	78	23	20	11
19	14	14	11	13	11	25	16	70	76	23	19	10
20	*14	15	12	13	12	35	16	83	71	22	18	10
21	14	14	13	13	12	27	17	92	74	22	16	11
22	14	14	12	13	13	30	18	102	67	21	*15	11
23	15	*12	11	12	13	35	18	130	62	20	13	12
24	14	13	11	12	13	35	18	159	59	20	12	11
25	14	12	11	12	13	30	18	167	59	18	12	11
26	15	11	11	12	13	25	18	154	55	18	12	12
27	16	10	12	11	14	20	18	164	53	18	14	12
28	16	11	13	11	14	18	18	252	49	19	14	12
29	16	12	12	10	14	17	18	406	48	19	13	13
30	15	13	11	10	------	19	18	328	46	20	15	12
31	14	------	11	11	------	18	------	268	------	18	15	------
Total	448	395	356	393	341	589	515	2,958	3,503	855	463	351
Mean	14.5	13.2	11.5	12.7	11.8	19.0	17.2	95.4	117	27.6	14.9	11.7
Ac-ft	889	783	706	780	676	1,170	1,020	5,870	6,950	1,700	918	696

Calendar year 1955: Max 210 Min 6 Mean 37.2 Ac-ft 26,910
Water year 1955-56: Max 406 Min 9 Mean 30.5 Ac-ft 22,160

Peak discharge (base, 270 cfs).--May 29 (9 a.m.) 427 cfs (4.45 ft).
* Discharge measurement made on this day.
Note.--No gage-height record Mar. 22 to Apr. 10; discharge estimated on basis of records for Pass Creek near Wyola. Stage-discharge relation affected by ice Nov. 12-20, Nov. 23 to Mar. 7, Mar. 10-19.

Little Bighorn River near Crow Agency, Mont.

Location.--Lat 45°34', long 107°27', in E½SE¼ sec. 13, T. 3 S., R. 34 E., on right bank at Chicago, Burlington & Quincy Railroad bridge, 2 miles south of Crow Agency and 14 miles upstream from mouth.

Drainage area.--1,190 sq mi, approximately.

Records available.--April 1912 to September 1924, August 1928 to December 1932, April 1938 to September 1956 (few winter records in earlier years). October 1915 to September 1940 published as Little Horn River near Crow Agency.

Gage.--Water-stage recorder. Datum of gage is 3,045.00 ft above mean sea level, datum of 1929. Apr. 11, 1912, to Sept. 30, 1918, staff or chain gage; Oct. 1, 1918, to Sept. 30, 1924, Aug. 26, 1928, to Sept. 30, 1930, water-stage recorder; Oct. 1, 1930, to Dec. 5, 1932, Apr. 1, 1938, to May 6, 1947, wire-weight or chain gage; all at same site and datum.

Average discharge.--20 years (1928-29, 1931-32, 1938-56), 260 cfs (188,200 acre-ft per year).

Extremes.--Maximum discharge during year, 1,960 cfs Mar. 22 (gage height, 8.33 ft); maximum gage height, 10.60 ft Mar. 22 (ice jam); minimum discharge, 35 cfs Aug. 27 (gage height, 3.92 ft).

1912-24, 1928-32, 1938-56: Maximum discharge observed, about 8,200 cfs July 23, 1923 (gage height, 14.0 ft); no flow July 28 to Aug. 6, 1921.

Remarks.--Records good except those for period of ice effect, which are poor. Diversions for irrigation of about 13,700 acres above station.

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 23-27, June 2-26)

3.9	33	5.0	300
4.1	60	6.0	780
4.5	148	7.5	1,560

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	73	129	135	95	105	160	235	162	1,040	122	89	96
2	82	126	140	105	110	150	261	156	945	112	69	73
3	82	114	125	120	120	160	258	159	870	124	57	65
4	82	122	120	120	130	180	229	159	805	159	51	67
5	78	138	110	115	140	190	242	165	*720	124	45	74
6	74	136	115	115	140	170	289	165	670	114	50	87
7	82	136	125	115	*130	150	254	170	600	93	50	93
8	85	136	130	110	125	130	215	170	495	62	50	85
9	96	136	130	110	125	125	204	*182	403	56	45	74
10	91	138	130	110	120	120	196	238	358	48	54	73
11	91	143	125	105	120	115	193	595	332	45	50	73
12	93	120	125	105	125	110	196	412	320	40	50	80
13	105	110	120	110	125	105	193	376	282	56	52	*82
14	98	100	*120	110	115	125	182	300	245	52	46	87
15	96	90	100	100	115	150	179	261	226	43	48	93
16	91	100	80	90	105	175	176	238	215	44	45	91
17	89	115	90	85	95	250	170	215	204	*45	43	87
18	89	120	110	95	110	400	168	226	204	57	56	85
19	93	130	100	110	115	500	165	258	207	58	71	64
20	*100	150	120	120	115	700	162	300	182	58	82	64
21	98	140	130	120	130	1,000	156	376	182	52	82	56
22	102	130	140	120	140	1,300	159	510	207	58	*65	52
23	105	120	145	120	150	1,430	162	555	226	62	56	50
24	110	115	160	115	160	1,120	165	*620	210	58	46	46
25	112	125	145	115	170	895	165	685	187	54	38	44
26	112	115	130	115	160	*625	165	695	170	52	37	43
27	119	105	110	110	150	485	162	655	146	51	46	43
28	126	*105	110	105	145	349	165	780	114	76	57	45
29	124	125	110	100	140	258	159	1,140	98	93	67	45
30	124	130	105	95	------	221	159	1,500	98	78	93	46
31	129	------	100	100	------	218	------	1,280	------	85	93	------
Total	3,031	3,699	3,735	3,360	3,730	12,066	5,784	13,703	10,961	2,231	1,783	2,063
Mean	97.8	123	120	108	129	389	193	442	365	72.0	57.5	68.8
Ac-ft	6,010	7,340	7,410	6,660	7,400	23,930	11,470	27,180	21,740	4,430	3,540	4,090

Calendar year 1955:	Max 1,200	Min	40	Mean	220	Ac-ft	159,600
Water year 1955-56:	Max 1,500	Min	37	Mean	181	Ac-ft	131,200

Peak discharge (base, 920 cfs).--Mar. 22 (10 p.m.) 1,960 cfs (8.33 ft); May 30 (7:30 a.m.) 1,590 cfs (7.59 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 12 to Mar. 22.

Little Bighorn River near Hardin, Mont.

Location.--Lat 45°44', long 107°34', on line between SE¼ sec. 18 and NE¼ sec. 19, T. 1 S., R. 34 E., on right bank 425 ft upstream from highway bridge, a quarter of a mile upstream from mouth, and 2.4 miles east of Hardin.

Records available.--June 1953 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 2,880 ft (by barometer). Prior to Oct. 7, 1953, wire-weight gage on bridge 425 ft downstream at different datum.

Extremes.--Maximum discharge during year, 1,780 cfs Mar. 23 (gage height, 7.17 ft); maximum gage height, 11.16 ft Mar. 20; minimum discharge, 4.2 cfs Aug. 10 (gage height, 2.74 ft).

1953-56: Maximum discharge, that of Mar. 23, 1956; maximum gage height, that of Mar. 20, 1956 (backwater from ice); minimum discharge, that of Aug. 10, 1956.

Remarks.--Records good except those for period of ice effect, which are poor. Diversions for irrigation of about 17,100 acres above station.

Rating tables, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 24-27, May 24-30)

Oct. 1 to June 25

3.5	75	5.0	625
3.7	117	6.5	1,500
4.4	351		

June 26 to Sept. 30

2.7	3	3.5	85
2.8	6	3.8	147
3.0	19	4.0	207
3.2	38		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	75	145	140	100	110	170	272	166	1,080	89	62	89
2	86	139	145	110	115	160	291	163	955	106	70	78
3	90	128	130	125	125	170	306	160	900	106	46	65
4	88	128	125	125	130	185	269	160	834	116	29	60
5	86	142	115	120	100	190	258	160	757	126	24	73
6	84	145	120	115	*75	195	291	160	658	98	20	76
7	84	148	130	110	100	165	306	160	581	98	21	91
8	88	148	135	110	120	145	255	*160	480	76	14	85
9	88	151	135	110	130	135	227	148	414	65	15	73
10	96	154	135	115	125	130	221	221	363	31	6.0	66
11	101	154	135	115	120	125	207	434	340	18	5.4	63
12	103	130	130	110	130	120	214	430	324	18	7.2	*62
13	103	115	125	110	130	115	217	390	298	13	16	69
14	131	105	*120	105	125	110	210	328	266	15	19	76
15	139	100	105	100	120	175	207	287	241	16	13	76
16	120	110	85	95	115	200	204	255	221	*16	6.0	82
17	115	120	95	95	105	300	197	231	207	16	12	80
18	112	125	110	100	100	450	188	210	197	8.4	9.6	75
19	*112	135	105	105	110	600	181	231	204	6.0	12	71
20	115	150	115	120	120	750	172	272	201	16	54	58
21	117	*125	130	115	135	1,100	169	324	204	20	*60	57
22	117	120	145	115	150	1,300	166	406	197	14	57	45
23	128	115	150	110	155	1,400	166	458	234	15	36	39
24	125	120	160	120	170	1,080	163	*466	252	27	16	37
25	128	130	150	120	170	906	166	520	221	24	9.6	35
26	125	120	135	115	165	*658	169	560	204	21	11	33
27	134	110	115	110	155	520	169	565	169	13	18	27
28	137	110	115	105	155	406	169	625	129	19	30	26
29	145	130	110	105	160	321	169	867	*102	48	31	31
30	137	135	105	100	------	258	166	1,270	89	80	51	37
31	148	------	105	105	------	241	------	1,270	------	60	70	------
Total	3,457	3,887	3,855	3,415	3,720	12,780	6,365	12,057	11,322	1,394.4	850.8	1,835
Mean	112	130	124	110	128	412	212	389	377	45.0	27.4	61.2
Ac-ft	6,860	7,710	7,650	6,770	7,380	25,350	12,620	23,910	22,460	2,770	1,690	3,640

Calendar year 1955:	Max	1,250	Min	18	Mean	222	Ac-ft	160,800
Water year 1955-56:	Max	1,400	Min	5.4	Mean	177	Ac-ft	128,800

Peak discharge (base, 1,000 cfs).--Mar. 23 (4 a.m.) 1,780 cfs (7.17 ft); May 30 (3:30 p.m.) 1,380 cfs (6.48 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 12 to Mar. 23.

Bighorn River at Bighorn, Mont.
(Formerly published as Bighorn River near Custer)

Location.--Lat 46°08'50", long 107°27'20", in NE¼NE¼ sec. 33, T. 5 N., R. 34 E., on right bank just downstream from bridge on U. S. Highway 10, three-quarters of a mile upstream from mouth, 1 mile southwest of Bighorn, and 4 miles east of Custer. Prior to Oct. 7, 1955, at site 4 miles upstream.

Records available.--May 1945 to September 1956. Published as "near Custer" 1945-55.

Gage.--Water-stage recorder. Altitude of gage is 2,690 ft (by barometer). May 11 to Dec. 6, 1945, wire-weight gage and Dec. 7, 1945, to Oct. 6, 1955, water-stage recorder, at site 4 miles upstream at different datum.

Average discharge.--11 years, 3,778 cfs (2,735,000 acre-ft per year).

Extremes.--Maximum daily discharge during year, 9,490 cfs May 30; maximum gage height observed, 6.83 ft Mar. 7 (backwater from ice); minimum discharge, 1,020 cfs July 29 (gage height, 1.89 ft, backwater from Yellowstone River).

1945-56: Maximum discharge, 26,200 cfs June 24, 1947 (gage height, 8.79 ft, site and datum then in use), from rating curve extended above 12,500 cfs by logarithmic plotting; maximum gage height recorded, 10.65 ft Mar. 20, 1947 (ice jam), site and datum then in use; minimum discharge, 756 cfs Dec. 13, 1949, corrected (gage height, 0.89 ft, site and datum then in use).

Remarks.--Records good except those for periods of ice effect, which are poor. Major regulation by 14 reservoirs in Wyoming and 1 in Montana with combined usable storage of about 1,400,000 acre-ft (for records of storage in Bull Lake, Buffalo Bill, and Boysen Reservoirs see p. 237). Diversions for irrigation of about 465,000 acres above station. Records of chemical analyses, water temperatures, and suspended sediment loads for the water year 1956 are given in WSP 1451.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,580	2,070	2,600	2,400	2,200	3,500	2,810	2,200	*8,120	5,250	1,900	2,690
2	2,670	2,050	2,700	2,500	2,000	4,000	2,840	2,180	7,950	5,040	1,880	2,790
3	2,690	2,130	2,700	2,500	1,800	4,200	*2,880	2,110	8,570	4,830	1,600	2,830
4	2,620	2,450	2,700	2,500	2,000	4,400	2,790	2,050	8,860	4,580	1,410	2,810
5	2,260	2,480	2,500	2,500	2,000	4,400	2,840	2,040	8,430	4,260	1,410	2,790
6	2,220	2,580	2,400	2,400	2,350	4,000	3,240	2,050	8,030	3,950	1,580	2,770
7	2,140	2,500	2,300	*2,320	3,000	4,600	3,060	2,040	7,950	3,620	*1,530	2,790
8	2,050	2,480	2,300	2,800	3,500	4,100	3,000	1,930	*6,450	3,260	1,440	2,790
9	2,050	2,280	2,350	3,000	3,600	3,700	2,980	*1,920	5,350	*3,060	1,380	2,770
10	2,050	2,050	2,500	3,200	3,600	3,600	3,000	2,220	5,370	3,020	1,360	2,750
11	2,000	2,430	2,600	3,500	3,400	2,900	3,040	2,710	5,780	2,940	1,380	2,640
12	1,920	2,250	2,700	3,500	3,200	2,500	2,940	2,790	5,880	2,790	1,560	*2,560
13	1,920	2,100	2,800	3,500	3,400	2,900	2,920	2,730	5,850	2,660	1,810	2,520
14	*2,040	2,000	2,700	3,600	3,500	3,000	2,920	2,520	6,100	2,710	1,850	2,540
15	2,090	1,900	2,600	3,600	3,300	3,200	2,860	2,350	6,020	2,690	1,850	2,520
16	2,130	1,800	2,600	3,300	3,200	3,500	2,840	2,130	6,000	2,670	1,710	2,620
17	2,180	1,700	2,600	3,000	3,100	3,800	*2,810	2,200	6,320	*2,540	1,440	2,660
18	2,240	1,600	2,500	2,800	3,000	4,000	2,840	2,860	7,130	2,450	1,340	2,670
19	2,140	1,800	2,500	2,800	2,950	4,000	2,940	3,080	7,430	2,390	1,470	2,690
20	2,040	2,200	2,700	2,700	3,000	5,000	2,920	3,300	*7,320	2,180	1,710	2,710
21	1,970	*3,100	2,850	*2,680	3,100	6,000	2,710	3,990	7,210	1,580	1,970	2,730
22	1,970	3,200	3,000	3,000	*3,150	*5,700	2,660	5,130	7,700	1,460	2,130	2,690
23	2,000	3,400	3,000	3,300	3,500	4,000	2,560	6,480	7,870	*1,460	2,200	2,560
24	2,000	3,400	3,400	3,300	4,000	3,400	2,580	7,320	7,560	1,350	2,140	2,560
25	2,000	3,000	4,200	3,200	4,600	3,200	2,540	*7,510	6,730	1,310	1,900	2,620
26	2,050	2,700	4,800	3,000	4,800	3,100	2,460	7,560	6,320	1,250	1,580	2,670
27	2,050	2,600	5,000	3,100	4,600	3,000	2,280	7,640	6,120	1,130	1,480	2,710
28	2,050	2,500	*4,650	3,000	3,900	2,950	2,220	8,030	*5,800	1,030	*2,200	2,670
29	2,040	2,700	3,000	2,900	3,500	2,900	2,220	8,540	5,540	1,020	2,290	2,670
30	2,050	2,700	2,500	2,700	------	2,860	2,240	9,490	5,420	1,290	2,310	2,690
31	2,110	------	2,300	2,500	------	2,750	------	9,160	------	1,760	2,660	------
Total	66,320	72,150	90,050	91,100	93,250	115,160	82,940	128,260	205,180	81,530	54,470	80,480
Mean	2,139	2,405	2,905	2,939	3,216	3,715	2,765	4,137	6,839	2,630	1,757	2,683
Ac-ft	131,500	143,100	178,600	180,700	185,000	228,400	164,500	254,400	407,000	161,700	108,000	159,600

Calendar year 1955: Max 8,350 Min 852 Mean 2,934 Ac-ft 2,124,000
Water year 1955-56: Max 9,490 Min 1,020 Mean 3,172 Ac-ft 2,302,000

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 12 to Mar. 29. Discharge computed on basis of once- or twice-daily wire-weight-gage readings Oct. 1-7, Nov. 3-7, 9-13, Nov. 15 to Feb. 1.

North Fork Tongue River near Dayton, Wyo.

Location.--Lat 44°45'25", long 107°37'20", in sec. 7, T. 55 N., R. 89 W., on left bank half a mile downstream from Hideout Creek and 19½ miles southwest of Dayton.

Drainage area.--32.4 sq mi.

Records available.--September 1945 to September 1956 (no winter records prior to 1950).

Gage.--Water-stage recorder. Datum of gage is 8,146.70 ft above mean sea level, datum of 1929 (Bureau of Reclamation benchmark). Prior to Sept. 28, 1950, at site 300 ft downstream at datum 5.80 ft lower.

Average discharge.--7 years (1949-56), 32.7 cfs (23,690 acre-ft per year).

Extremes.--Maximum discharge during year, 207 cfs June 4 (gage height, 3.27 ft); minimum not determined.

1945-56: Maximum discharge, 560 cfs May 21, 1948 (gage height, 2.55 ft, site and datum then in use), from rating curve extended above 170 cfs; minimum daily, 9 cfs Mar. 2, 1954, but may have been less during years of no winter records.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. No diversion above station.

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.2	11	2.5	100
1.3	14	3.0	165
1.6	27	3.5	248
2.0	55		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	22	*12	13	12	11	10	10	18	*196	53	*33	24
2	22	12					10	18	190	53	32	24
3	*21	14					10	18	182	52	32	24
4	16	16					10	19	*180	49	31	*24
5	15	15					10	21	174	*48	31	23
6	14	13					10	23	156	46	30	22
7	13	14					10	25	139	45	29	22
8	14	14					10	29	131	44	29	22
9	14	14					10	35	126	44	29	22
10	15	14					10	*39	122	42	29	22
11	16	14					11	34	116	42	29	22
12	15	13					11	21	*113	41	29	22
13	15	10					12	17	108	41	28	22
14	16	12					12	16	101	40	27	22
15	16	12					13	15	96	39	27	22
16	16	13					13	17	89	*38	27	22
17	16	14					14	22	82	37	28	22
18	17	15					14	31	80	36	28	22
19	17	15					15	46	*75	35	26	22
20	18	14					18	63	72	34	26	22
21	18	14					25	91	74	34	26	22
22	19	14					22	117	68	32	25	22
23	17	14					20	153	64	32	25	22
24	15	14					18	149	63	31	24	22
25	16	14					17	*159	62	31	24	22
26	15	14					17	160	61	*30	24	22
27	16	14					20	168	58	*31	24	22
28	13	14					19	185	57	32	24	22
29	16	14					19	165	56	32	24	22
30	15	14			------		18	162	56	33	26	22
31	14	------			------		------	178	------	33	24	------
Total	502	410	403	372	319	310	428	2,214	3,147	1,210	850	669
Mean	16.2	13.7	13.0	12.0	11.0	10.0	14.3	71.4	105	39.0	27.4	22.3
Ac-ft	996	813	799	738	633	615	849	4,390	6,240	2,400	1,690	1,330

Calendar year 1955: Max 152 Min 10 Mean 31.3 Ac-ft 22,650
Water year 1955-56: Max 196 Min - Mean 29.6 Ac-ft 21,490

Peak discharge (base, 150 cfs).--June 4 (8 p.m.) 207 cfs (3.27 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice most of period Oct. 23 to May 10 (no gage-height record Nov. 16-21, Nov. 27 to May 10; discharge estimated on basis of 1 discharge measurement, weather records, and records for Tongue River near Dayton).

South Fork Tongue River near Dayton, Wyo.

Location.--Lat 44°47', long 107°28', in sec. 33, T. 56 N., R. 88 W., on left bank 60 ft downstream from Johnson Creek and 12 miles southwest of Dayton.

Drainage area.--85.0 sq mi.

Records available.--September 1945 to September 1956 (no winter records prior to 1950).

Gage.--Water-stage recorder. Datum of gage is 7,621.78 ft above mean sea level, datum of 1929 (Bureau of Reclamation benchmark).

Average discharge.--7 years (1949-56), 74.3 cfs (53,830 acre-ft per year).

Extremes.--Maximum discharge during year, 1,120 cfs May 28 (gage height, 5.62 ft); minimum not determined.

1945-56: Maximum discharge, that of May 28, 1956; minimum daily, 7.0 cfs Mar. 25, Apr. 4, 1955, but may have been less during years of no winter records.

Maximum stage known, about 6.36 ft, date unknown.

Remarks.--Records good except those for period of ice effect or no gage-height record, which are poor. No diversion above station.

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 26 to June 2)

1.6	15	3.0	170
1.8	22	3.5	290
2.0	34	4.0	442
2.5	86	5.1	920

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	30	*18	17	15	13	11	10	28	*616	92	*44	25
2	26	20					10	28	569	92	43	22
3	*24	24					10	28	538	103	43	21
4	20	24					10	30	*524	85	49	*21
5	20	22					10	46	496	*79	60	22
6	19	20					10	58	420	76	58	23
7	19	21					10	74	354	73	54	21
8	21	23					10	96	339	71	50	20
9	19	20					10	121	330	67	47	20
10	18	21					10	*143	315	65	45	19
11	20	21					11	120	290	64	33	20
12	19	19					11	113	*265	65	26	20
13	19	15					12	86	252	65	26	19
14	20	17					13	76	236	58	24	18
15	20	17					15	78	224	53	24	18
16	19	18	16	14	12	10	17	93	205	*51	24	17
17	19	19					18	145	190	50	26	17
18	18	20					18	194	212	50	41	17
19	18	21					20	276	*180	49	38	16
20	20	20					30	354	166	46	36	16
21	21	19					40	413	180	46	26	16
22	20	19					35	459	186	46	24	17
23	19	19					30	486	156	43	23	17
24	17	20					28	483	139	42	22	16
25	19	20					26	*534	136	42	22	16
26	18	20					26	538	123	*42	22	16
27	19	17					30	577	114	48	22	16
28	15	18					29	920	106	42	24	16
29	19	19					29	711	102	40	22	17
30	19	19			------		29	590	96	40	26	16
31	18	------			------		------	569	------	44	27	------
Total	612	590	511	449	363	325	567	8,467	8,059	1,829	1,051	555
Mean	19.7	19.7	16.5	14.5	12.5	10.5	18.9	27.3	26.7	59.0	33.9	18.5
Ac-ft	1,210	1,170	1,010	891	720	645	1,120	16,790	15,980	3,630	2,080	1,100

Calendar year 1955:	Max	771	Min	7.0	Mean	77.7	Ac-ft	56,240
Water year 1955-56:	Max	920	Min	-	Mean	63.9	Ac-ft	46,350

Peak discharge (base, 650 cfs).--May 28 (2:30 p.m.) 1,120 cfs (5.62 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 22-30, Nov. 12 to Apr. 30 (no gage-height record Feb. 6-20; discharge estimated on basis of weather records and records for Tongue River near Dayton).

Tongue River near Dayton, Wyo.

Location.--Lat 44°51', long 107°19', in sec. 11, T. 56 N., R. 87 W., on left bank 1¼ miles upstream from Amsden Creek and 3½ miles southwest of Dayton.

Drainage area.--204 sq mi.

Records available.--November 1918 to September 1929, November 1940 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 4,060 ft (from topographic map).

Average discharge.--26 years (1919-29, 1940-56), 193 cfs (139,800 acre-ft per year), unadjusted.

Extremes.--Maximum discharge during year, 1,790 cfs May 28 (gage height, 4.90 ft); minimum, 32 cfs Nov. 13 (gage height, 1.41 ft), result of freezeup; minimum gage height, 1.38 ft Nov. 1.

1918-29, 1940-56: Maximum discharge, 3,400 cfs June 3, 1944 (gage height, 6.45 ft), from rating curve extended above 1,300 cfs; minimum daily, 18 cfs Nov. 29, 1919.

Remarks.--Records good except those for periods of ice effect, which are poor. Small diversion above station for Dayton municipal supply. Figures of daily discharge do not include water diverted above station by Highline ditch for irrigation.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 26-29, July 1-5)

1.4	31	3.0	440
1.6	50	3.5	735
1.9	92	4.0	1,110
2.2	145	4.5	1,530
2.5	230		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	67	38	64	64	50	*54	63	97	*1,040	206	100	70
2	63	40	60	60	45	54	*55	100	1,000	*209	100	67
3	60	53	59	59	50	53	51	108	925	234	100	66
4	54	69	60	60	57	51	50	98	880	195	97	66
5	53	67	55	60	60	53	54	147	858	186	106	67
6	53	51	58	62	55	53	46	165	742	174	105	67
7	53	56	60	60	55	50	49	195	638	168	103	64
8	54	59	59	60	54	50	53	258	593	161	102	64
9	50	70	60	59	53	50	50	293	557	157	98	63
10	50	77	60	59	54	50	55	376	540	153	98	62
11	53	69	58	59	55	49	59	305	496	149	94	60
12	51	43	62	59	55	54	56	301	460	149	83	60
13	51	b35	50	*59	54	53	*56	240	*430	147	80	60
14	53	b40	42	55	54	50	64	209	410	137	77	60
15	53	b40	56	47	b50	49	71	*223	390	132	76	59
16	53	b48	*69	53	b45	50	80	244	358	128	74	56
17	51	b55	66	63	b40	50	83	337	333	126	74	56
18	51	*b62	62	59	b55	49	83	415	363	126	98	55
19	50	b65	70	60	b55	50	90	506	321	122	92	55
20	55	b62	71	54	b55	51	103	599	297	117	88	54
21	58	b60	64	56	b53	51	115	716	321	112	74	51
22	55	b60	63	55	54	51	113	777	337	112	71	53
23	50	59	64	56	54	54	95	812	285	106	70	53
24	48	63	64	58	55	58	94	820	258	103	70	53
25	55	63	62	54	55	66	90	*872	265	102	70	51
26	51	64	59	55	55	67	97	858	269	100	70	50
27	58	56	58	58	55	56	103	925	262	102	70	49
28	43	60	56	56	55	42	102	1,410	251	102	71	51
29	58	69	36	46	55	53	102	*1,240	230	97	70	53
30	54	*69	*41	47	-------	62	*94	1,030	209	98	76	51
31	*48	-------	63	*53	-------	60	-------	1,010	-------	*100	*78	-------
Total	1,656	1,722	1,831	1,765	1,542	1,643	2,276	15,686	14,318	4,310	2,635	1,746
Mean	53.4	57.4	59.1	56.9	53.2	53.0	75.9	506	477	139	85.0	58.2
Ac-ft	3,280	3,420	3,630	3,500	3,060	3,260	4,510	31,110	28,400	8,550	5,230	3,460
(†)	20.6	1.24	0	0	0	0	0	0	13.9	21.3	19.4	16.7
						Adjusted for diversion						
Mean	74.0	58.6	59.1	56.9	53.2	53.0	75.9	506	491	160	104	74.9
Ac-ft	4,550	3,490	3,630	3,500	3,060	3,260	4,510	31,110	29,230	9,860	6,420	4,450

Observed

Calendar year 1955: Max 1,140 Min 29 Mean 161 Ac-ft 116,900
Water year 1955-56: Max 1,410 Min 35 Mean 140 Ac-ft 101,400

Adjusted

Calendar year 1955: Mean 170 Ac-ft 123,200
Water year 1955-56: Mean 147 Ac-ft 107,100

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* Discharge measurement made on this day.
† Diversion above station by Highline ditch, equivalent in cubic feet per second.
b Stage-discharge relation affected by ice.

Little Tongue River near Dayton, Wyo.

Location.--Lat 44°48'45", long 107°17'00", in sec. 24, T. 56 N., R. 87 W., on right bank a quarter of a mile downstream from entrance of main tributary and 4.5 miles south of Dayton.

Drainage area.--25.1 sq mi.

Records available.--January 1951 to December 1953, March 1955 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 4,380 ft (from topographic map).

Extremes.--Maximum discharge during year, 161 cfs May 28 (gage height, 2.01 ft); minimum daily, 1.0 cfs Aug. 13-16.

1951-53, 1955-56: Maximum discharge, 181 cfs May 23, 1952 (gage height, 2.09 ft), from rating curve extended above 120 cfs by logarithmic plotting; minimum daily, that of Aug. 13-16, 1956.

Remarks.--Records good except those for periods of ice effect, which are fair. Two water rights totaling 1.5 cfs (priorities 1883, 1903) for irrigation of 103 acres adjudicated for diversion above station.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.5	0.1	1.3	29
.6	1.2	1.5	55
.7	3.0	1.7	93
.9	8.2	1.9	144
1.1	15		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.7	1.9	2.1	2.1	*b2.0	*1.7	3.2	4.4	103	10	*2.3	1.9
2	1.7	*1.9	1.1	1.9	b1.9	1.9	*2.6	4.7	*103	10	2.3	1.7
3	1.7	2.1	1.2	*1.7	b1.8	1.9	2.6	4.9	95	*11	2.3	1.9
4	*1.6	2.1	1.9	1.7	b1.7	1.9	2.6	5.2	89	9.9	1.9	*2.1
5	1.7	2.1	2.3	1.7	b1.6	1.9	2.6	6.8	85	9.3	1.9	2.3
6	1.7	2.1	2.3	1.9	b1.6	b1.5	2.6	7.6	*78	8.8	1.7	2.3
7	1.7	2.1	2.1	1.9	1.6	b1.4	2.6	9.6	74	8.2	1.6	2.1
8	1.6	2.1	1.9	2.1	1.6	1.6	2.6	12	69	7.6	1.4	1.9
9	1.6	2.1	2.1	2.3	1.6	1.6	2.5	15	69	7.4	1.2	1.7
10	1.7	2.3	2.1	2.3	*1.6	b1.5	2.6	23	65	6.8	1.2	1.6
11	1.9	2.1	2.3	2.3	1.7	b1.4	2.8	23	64	6.8	1.2	1.4
12	1.9	1.9	2.1	2.3	1.6	b1.2	2.6	26	*60	6.5	1.1	1.4
13	1.9	1.7	b1.7	*2.1	1.6	1.6	*2.8	22	55	6.2	1.0	1.6
14	1.9	b1.6	b1.6	1.7	1.6	1.6	3.2	20	50	5.7	1.0	1.6
15	1.7	b1.5	b1.5	b1.5	*b1.4	1.6	4.2	*20	43	4.9	1.0	1.4
16	1.7	b1.6	b1.7	b1.4	b1.2	1.6	4.4	24	36	4.4	1.0	1.4
17	1.7	b1.7	b1.5	b1.8	b1.4	1.6	4.2	34	33	3.7	1.1	1.4
18	1.7	*b1.8	b1.8	b1.7	b1.5	1.7	4.2	44	30	4.0	1.6	1.4
19	1.7	1.9	b2.1	1.7	1.7	1.9	4.7	54	25	3.7	1.9	1.4
20	1.7	1.9	2.1	1.7	1.7	2.3	5.2	62	20	3.7	1.7	1.4
21	1.7	1.9	*2.1	1.7	1.7	2.1	6.0	65	20	3.5	1.2	1.4
22	1.7	1.9	2.1	1.7	1.7	2.3	6.0	70	17	3.0	1.1	1.6
23	2.1	1.9	2.5	1.9	1.7	2.6	5.2	*70	16	2.6	1.1	1.4
24	2.1	1.9	2.6	1.9	1.7	3.0	4.9	65	15	2.5	1.9	1.4
25	2.1	2.1	2.3	1.9	1.7	3.5	4.7	69	14	2.5	1.9	1.4
26	2.1	2.1	2.3	1.9	1.7	4.2	4.9	65	13	2.6	1.9	1.4
27	2.1	2.1	2.3	b1.8	1.7	3.2	4.9	70	13	2.6	2.1	1.4
28	2.1	2.3	2.3	b1.6	1.9	2.8	4.4	124	12	2.8	2.1	1.6
29	2.1	2.3	b1.7	b1.4	1.9	2.6	4.7	*122	11	2.6	1.9	1.9
30	2.1	*2.3	b2.0	b1.7	------	2.6	*4.4	117	10	2.5	2.1	1.7
31	2.1	------	2.3	b1.9	------	2.6	------	105	------	2.5	2.1	------
Total	56.8	59.3	62.0	57.2	48.1	64.9	114.9	1,364.2	1,387	168.3	49.8	49.1
Mean	1.83	1.98	2.00	1.85	1.66	2.09	3.83	44.0	46.2	54.3	1.61	1.64
Ac-ft	113	118	123	113	95	129	228	2,700	2,750	334	99	97

Calendar year 1955: Max - Min - Mean - Ac-ft -
Water year 1955-56: Max 124 Min 1.0 Mean 9.50 Ac-ft 6,900

Peak discharge (base, 100 cfs).--May 28 (1 p.m.) 161 cfs (2.01 ft).

* Discharge measurement made on this day.

b State-discharge relation affected by ice.

Wolf Creek at Wolf, Wyo.

Location.--Lat 44°36'30", long 107°14'00", in sec. 4, T. 55 N., R. 86 W., on left bank at Wolf, half a mile downstream from Red Canyon Creek.

Drainage area.--37.8 sq mi.

Records available.--April 1945 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 4,550 ft (from topographic map). Prior to May 26, 1945, staff gage at same site and datum.

Average discharge.--11 years, 28.3 cfs (20,500 acre-ft per year).

Extremes.--Maximum discharge during year, 586 cfs May 28 (gage height, 3.93 ft); minimum daily, 3.7 cfs Mar. 12.
1945-56: Maximum discharge, that of May 28, 1956, from rating curve extended above 310 cfs; minimum daily, 1.8 cfs Feb. 26, 1947.
Maximum stage known, about 5.00 ft May 18, 1944.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. One small diversion above station for irrigation of hay meadow during spring runoff only.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 21-27, June 17-22)

0.7	3.2	2.0	88
.8	4.9	2.5	168
.9	7.4	3.0	286
1.2	19	3.6	470
1.5	37		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8.1	5.9	*5.6	5.4	*5.1	4.2	7.4	15	258	30	12	8.5
2	7.8	*5.9	5.6	5.2	5.2	*4.2	6.4	15	*240	29	12	7.4
3	7.4	6.4	5.6	*4.9	5.2	4.2	6.4	16	210	*30	*12	7.8
4	*7.4	6.9	5.4	4.9	5.2	4.2	*6.2	16	192	26	11	7.4
5	7.8	6.9	5.4	4.9	5.2	4.2	6.9	20	172	25	9.9	8.5
6	7.8	6.2	5.4	5.2	5.2	4.0	6.4	24	144	25	10	*8.1
7	7.8	6.4	5.4	5.2	5.1	4.1	6.4	26	121	24	10	7.2
8	8.1	6.6	5.6	5.2	5.0	4.2	6.4	35	112	22	10	6.9
9	7.2	6.6	5.6	4.9	4.8	4.1	6.4	42	105	22	10	6.4
10	7.4	7.2	5.6	5.2	*4.8	4.0	6.9	52	100	22	10	6.6
11	8.1	6.6	5.6	5.2	4.8	3.8	7.4	51	91	21	10	6.9
12	8.1	4.6	5.9	5.2	5.0	3.7	7.4	55	84	21	9.6	6.9
13	8.1	3.9	b5.2	*5.2	*4.9	3.9	*8.1	48	80	20	9.6	7.2
14	7.8	4.7	b5.6	5.2	4.9	4.0	9.9	46	76	19	8.8	6.6
15	7.8	4.9	5.9	b4.5	b4.5	4.0	13	*46	72	18	8.8	6.4
16	7.4	5.2	5.9	4.9	b4.0	4.3	15	51	67	17	8.5	6.2
17	7.4	5.2	5.9	5.4	b4.1	4.5	15	70	64	17	8.5	6.4
18	7.2	5.9	b5.8	5.4	b4.2	4.7	14	88	72	17	11	6.4
19	6.9	6.6	b5.8	5.4	b4.2	4.8	15	107	*62	16	12	5.9
20	7.4	6.6	b5.8	5.4	b4.2	*5.1	17	123	57	15	11	5.6
21	7.8	6.4	*5.9	5.4	4.2	5.4	18	136	61	15	9.2	6.2
22	7.4	6.4	6.2	5.4	4.2	6.6	19	147	60	15	8.5	6.4
23	7.4	6.2	6.4	5.4	4.2	7.2	17	*154	51	14	8.1	6.4
24	7.2	6.2	6.6	5.6	4.2	7.4	16	153	47	14	7.4	6.4
25	7.2	5.9	6.4	5.6	4.2	9.2	16	176	46	13	7.4	6.4
26	7.2	b5.6	6.2	5.6	4.2	9.9	16	160	42	14	7.4	6.4
27	7.2	b5.4	6.2	5.6	4.2	8.8	17	183	38	14	7.8	6.4
28	6.4	5.6	6.2	b4.5	4.2	7.4	16	456	36	13	8.8	6.6
29	7.2	5.6	b4.5	b4.7	4.2	6.9	15	417	33	13	8.5	7.2
30	7.2	5.6	b5.0	4.9	------	6.6	15	*333	31	13	9.6	6.9
31	6.9	------	5.4	5.0	------	6.4	------	278	------	12	9.6	------
Total	232.1	178.1	177.6	160.5	133.4	166.0	352.6	3,539	2,824	586	297.0	204.6
Mean	7.49	5.94	5.73	5.18	4.60	5.35	11.8	114	94.1	18.9	9.58	6.82
Ac-ft	460	353	352	318	265	329	699	7,020	5,600	1,160	589	406

Calendar year 1955: Max 178 Min 3.0 Mean 24.4 Ac-ft 17,650
Water year 1955-56: Max 456 Min 3.7 Mean 24.2 Ac-ft 17,550

Peak discharge (base, 180 cfs).--May 28 (4 p.m.) 586 cfs (3.93 ft).
* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.
Note.--No gage-height record Jan. 30 to Feb. 1, Feb. 5-13, Feb. 21 to Mar. 20; discharge estimated on basis of 5 discharge measurements and weather records.

East Goose Creek near Big Horn, Wyo.

Location.--Lat 44°32'50", long 107°13'00", in NE¼ sec. 21, T. 53 N., R. 86 W., on right bank at upper end of Park Reservoir, about 500 ft upstream from Cross Creek and 14½ miles southwest of Big Horn.

Drainage area.--20.9 sq mi.

Records available.--October 1953 to September 1956.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 8,270 ft (from topographic map). Supplementary water-stage recorder at site a quarter of a mile upstream at different datum used for periods of backwater from Park Reservoir at regular gage, since June 15, 1955.

Extremes.--Maximum discharge during year, 511 cfs May 28 (gage height, 3.44 ft); minimum daily, 2.5 cfs Apr. 4, 6-8.

1953-56: Maximum discharge, 552 cfs June 14, 1955 (gage height, 3.75 ft); minimum daily, 2.0 cfs Mar. 26 to Apr. 10, Apr. 12-14, 1955.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. No diversion above station.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Backwater from Park Reservoir June 3 to July 24)

0.1	1.6	1.0	50
.2	3.1	1.5	122
.3	5.3	2.0	205
.5	12	3.0	405
.7	23	3.5	525

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.2	5.3	3.8	3.1	2.7	2.8	2.8	7.5	321	65	17	11
2	5.9	5.3	3.8	3.1	2.8	2.8	2.6	7.8	338	58	*16	9.8
3	5.6	4.9	3.8	3.8	2.8	2.8	2.6	8.1	294	56	14	9.1
4	5.6	5.1	3.8	4.0	2.8	2.8	2.5	7.8	305	51	12	9.5
5	5.6	4.9	3.8	3.5	2.8	2.8	2.8	11	*336	47	11	*9.5
6	5.6	4.6	3.8	3.1	2.8	2.8	2.5	13	239	*47	11	9.1
7	5.6	4.6	3.8	3.1	2.8	2.8	2.5	14	148	47	10	8.1
8	5.3	4.4	3.8	3.1	2.8	2.8	2.5	22	169	42	9.8	7.8
9	5.3	4.4	3.8	3.1	2.8	2.8	2.6	32	192	38	9.5	7.5
10	5.1	4.4	3.8	3.1	3.0	2.8	3.0	42	203	36	10	7.2
11	5.6	4.2	3.8	2.8	3.0	2.8	3.0	40	*190	36	10	7.5
12	*6.5	4.0	3.8	2.8	3.0	2.8	2.8	39	180	37	10	7.5
13	6.2	3.8	3.8	2.8	3.0	2.8	2.8	32	171	35	9.5	7.8
14	5.9	3.6	3.5	2.8	3.0	2.8	2.8	26	167	33	9.5	7.8
15	5.9	3.5	3.5	2.8	3.0	2.8	2.8	27	159	29	8.8	7.2
16	5.9	3.7	3.3	2.8	3.0	2.8	3.0	28	148	28	9.1	7.2
17	5.9	3.9	3.3	2.8	3.0	2.6	3.1	43	114	27	9.5	6.8
18	5.3	4.1	3.1	2.6	3.0	2.6	3.3	82	*144	*26	18	6.8
19	5.3	4.3	3.5	2.6	3.0	2.6	3.5	138	126	24	18	6.8
20	5.9	4.0	3.8	2.8	3.0	2.6	4.4	205	120	22	14	6.5
21	5.9	3.8	3.8	2.8	3.0	2.6	4.9	281	120	21	12	6.5
22	5.9	3.8	3.8	2.8	3.0	2.6	5.6	*319	98	21	11	7.2
23	5.9	3.8	3.3	2.8	3.0	2.6	5.6	307	75	21	9.8	7.2
24	5.3	3.8	3.5	2.8	2.8	2.6	5.6	*284	70	19	9.1	6.8
25	*5.3	3.8	3.1	2.8	2.8	2.6	6.2	332	80	19	8.8	6.5
26	5.3	3.8	3.1	2.8	2.8	2.6	7.5	340	78	19	8.8	6.2
27	5.3	3.8	3.1	2.8	2.8	2.6	7.8	345	80	18	10	6.2
28	5.3	3.8	3.0	2.8	2.8	2.8	7.5	441	78	19	10	6.8
29	5.3	3.8	2.9	2.8	2.8	*2.8	7.2	288	75	20	9.5	7.2
30	5.3	3.8	2.8	2.8	------	2.6	7.2	237	70	19	10	6.8
31	5.3	------	3.1	2.8	------	2.6	------	*259	------	18	11	------
Total	174.3	125.0	108.9	91.4	83.9	84.2	123.0	4,258.2	4,888	998	346.7	227.9
Mean	5.62	4.17	3.51	2.95	2.89	2.72	4.10	137	163	32.2	11.2	7.60
Ac-ft	346	248	216	181	166	167	244	8,450	9,700	1,980	688	452

Calendar year 1955: Max 430 Min 2.0 Mean 33.3 Ac-ft 24,080
Water year 1955-56: Max 441 Min 2.5 Mean 31.4 Ac-ft 22,840

Peak discharge (base, 175 cfs).--May 28 (12 m.) 511 cfs (3.44 ft); June 5 (1:30 a.m.) 456 cfs (2.80 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 29, 30, Nov. 10-12, Dec. 28-30, Jan. 31 to Feb. 2. No gage-height record Nov. 13-29; discharge estimated on basis of weather records.

Cross Creek near Big Horn, Wyo.

Location.--Lat 44°31'20", long 107°12'20", in NE¼ sec. 34, T. 53 N., R. 86 W., on left bank about 200 ft upstream from Big Horn Reservoir and 15½ miles southwest of Big Horn.

Drainage area.--10.9 sq mi.

Records available.--October 1953 to September 1956.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 8,770 ft (from topographic map).

Extremes.--Maximum discharge during year, 140 cfs June 4 (gage height, 2.87 ft); minimum daily, 1.2 cfs Apr. 1-9.

1953-56: Maximum discharge, 178 cfs May 21, 1954 (gage height, 2.47 ft); minimum daily, 0.6 cfs Mar. 26 to Apr. 14, 1955.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. No diversion above station.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.6	1.4	1.1	12
.7	2.0	1.5	32
.8	2.9	2.0	62
.9	5.0	3.0	153

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.7	2.2	2.2	2.0	1.6	1.4	1.2	2.2	108	18	6.0	3.7
2	2.5	2.2	2.2	2.0	1.6	1.4	1.2	2.3	108	18	*6.8	3.5
3	2.4	2.2	2.2	2.0	1.6	1.4	1.2	2.4	103	16	7.1	3.3
4	2.4	2.2	2.2	2.0	1.6	1.4	1.2	2.3	104	14	6.0	3.3
5	2.4	2.2	2.2	2.0	1.6	1.4	1.2	3.0	*113	13	5.4	*3.3
6	2.4	2.2	2.2	2.0	1.6	1.4	1.2	3.8	83	*12	5.0	3.1
7	2.4	2.2	2.2	1.9	1.6	1.4	1.2	4.0	55	12	4.6	2.9
8	2.3	2.2	2.2	1.9	1.6	1.4	1.2	6.0	60	12	4.4	2.9
9	2.3	2.2	2.2	1.9	1.6	1.4	1.2	9.0	65	11	4.2	2.8
10	2.2	2.2	2.2	1.9	1.6	1.4	1.4	13	69	10	4.4	2.7
11	3.0	2.2	2.2	1.9	1.6	1.4	1.4	12	*64	11	4.2	2.7
12	*3.9	2.2	2.2	1.9	1.6	1.4	1.3	11	59	12	4.0	2.6
13	3.5	2.1	2.2	1.9	1.6	1.4	1.3	9.0	54	11	3.5	2.7
14	3.0	2.1	2.1	1.9	1.6	1.4	1.3	7.6	51	9.9	3.5	2.5
15	3.0	2.2	2.1	1.8	1.6	1.4	1.3	8.0	51	9.6	3.3	2.5
16	3.0	2.2	2.1	1.8	1.6	1.4	1.3	8.3	45	9.2	3.3	2.4
17	3.0	2.2	2.1	1.8	1.6	1.3	1.3	9.0	36	8.5	3.3	2.4
18	2.6	2.2	2.1	1.7	1.6	1.3	1.4	15	*39	*8.2	4.6	2.4
19	2.4	2.2	2.1	1.7	1.6	1.3	1.5	30	34	7.8	4.6	2.4
20	2.5	2.2	2.1	1.7	1.6	1.3	1.6	50	32	7.1	4.6	2.4
21	2.5	2.2	2.1	1.7	1.6	1.3	1.7	70	32	6.8	4.4	2.4
22	2.5	2.2	2.1	1.7	1.6	1.3	1.8	90	32	6.4	4.0	2.4
23	2.5	2.2	2.1	1.7	1.6	1.3	1.8	85	24	6.0	3.7	2.4
24	2.4	2.2	2.1	1.7	1.5	1.3	1.8	*80	21	5.7	3.5	2.4
25	*2.4	2.2	2.1	1.7	1.5	1.3	1.9	83	22	6.0	3.3	2.4
26	2.2	2.2	2.1	1.7	1.5	1.3	2.3	86	20	4.0	3.3	2.4
27	2.3	2.2	2.1	1.7	1.5	1.3	2.4	90	20	4.4	3.3	2.4
28	2.4	2.2	2.0	1.7	1.5	1.3	2.2	102	20	5.7	3.5	2.4
29	2.2	2.2	2.0	1.7	1.5	1.3	2.1	77	20	6.0	3.3	2.4
30	2.2	2.2	2.0	1.7	------	1.3	2.1	66	19	6.4	3.7	2.4
31	2.2	------	2.0	1.7	------	1.3	------	*79	------	6.4	3.7	------
Total	79.7	65.8	66.0	56.4	45.8	41.9	46.0	1,115.9	1,563	294.1	132.5	80.5
Mean	2.57	2.19	2.13	1.82	1.58	1.35	1.53	36.0	52.1	9.49	4.27	2.68
Ac-ft	158	131	131	112	91	83	91	2,210	3,100	583	263	160

Calendar year 1955:	Max 156	Min 0.6	Mean 11.6	Ac-ft 8,390
Water year 1955-56:	Max 113	Min 1.2	Mean 9.80	Ac-ft 7,110

Peak discharge (base, 100 cfs).--May 28 (11 a.m.) 137 cfs (2.84 ft); June 4 (12 p.m.) 140 cfs (2.87 ft).

* Discharge measurement made on this day.

Note.--No gage-height record Oct. 1-25, Jan. 18 to May 27; discharge estimated on basis of 3 discharge measurements, weather records, and records for station on East Goose Creek. Stage-discharge relation affected by ice Oct. 31 to Nov. 11, Nov. 16-21.

West Goose Creek near Big Horn, Wyo.

Location.--Lat 44°36'45", long 107°17'50", in NW¼ sec. 36, T. 54 N., R. 87 W., on right bank about quarter of a mile downstream from Twin Lakes Branch and 16 miles west of Big Horn.

Drainage area.--24.4 sq mi.

Records available.--October 1953 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 8,440 ft (from topographic map).

Extremes.--Maximum discharge during year, 582 cfs May 28 (gage height, 4.32 ft), from rating curve extended above 380 cfs; minimum daily, 3.8 cfs Mar. 29.

1953-56: Maximum discharge, that of May 28, 1956; minimum daily, 1.0 cfs Oct. 4-6, 1954.

Remarks.--Records good except those for period of shifting control, which are fair, and those for periods of ice effect or no gage-height record, which are poor. Some regulation by Twin Lake (capacity, 1,200 acre-ft) and Dome Lake Reservoir (capacity, 1,800 acre-ft). No diversion above station.

Rating tables, water year 1955-56, except periods of ice effect or shifting control (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to May 21				May 22 to Sept. 30			
0.9	3.3	1.7	34	1.1	4.1	2.5	120
1.0	4.6	2.0	58	1.3	7.7	3.0	202
1.1	6.9	2.5	126	1.5	13	3.5	304
1.4	16			1.7	23	4.2	560
				2.0	49		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.2	4.2	4.8	4.8	4.3	4.0	4.0	11	e366	66	31	5.7
2	8.7	4.5	4.8	4.9	4.3		4.0	12	e401	59	*18	7.7
3	10	5.0	4.5	5.0	4.3		4.0	14	e366	58	34	6.7
4	9.5	6.0	4.6	5.2	4.3		4.0	13	e340	58	34	6.3
5	8.2	5.7	4.6	5.1	4.3		4.0	20	*e315	53	27	*7.7
6	8.2	5.5	4.6	5.1	4.3		4.0	25	e265	*49	26	7.9
7	7.9	5.5	4.5	4.8	4.3		4.0	30	e210	45	25	7.5
8	7.7	5.5	4.5	4.8	4.3		4.2	35	e202	47	25	7.3
9	7.7	5.5	4.5	4.8	4.3		4.5	40	178	38	25	7.3
10	7.7	5.8	4.5	4.8	4.3		4.7	46	146	36	26	6.5
11	7.9	5.5	4.5	4.8	4.3		4.6	45	*192	34	26	6.3
12	*6.9	5.0	4.7	4.8	4.3		4.6	47	190	39	25	6.1
13	4.8	4.5	4.5	4.6	4.3		5.0	40	178	40	24	8.2
14	4.8	4.3	4.4	4.6	4.3		6.0	35	163	37	24	7.3
15	4.8	4.0	4.3	4.6	4.3		7.0	35	157	37	23	5.4
16	4.8	4.3	4.4	4.5	4.1		9.0	40	141	38	23	4.9
17	4.8	4.7	4.3	4.3			9.0	50	141	48	26	4.9
18	4.8	5.0	4.2	4.3			8.0	60	*146	*45	29	4.9
19	4.6	5.4	4.3	4.3			9.0	80	144	40	27	4.7
20	4.8	5.2	4.5	4.3			11	80	125	40	26	4.6
21	5.1	5.1	4.7	4.3			13	90	122	44	26	4.9
22	5.1	5.1	4.9	4.3			13	*94	117	43	29	7.5
23	5.5	5.1	5.3	4.3			12	112	80	42	28	5.5
24	4.8	5.1	5.2	4.3		4.2	11	254	68	39	35	4.4
25	*4.6	5.1	5.1	4.3		4.5	12	431	66	33	27	5.5
26	4.6	5.1	5.0	4.3		4.7	13	439	71	36	17	5.9
27	4.5	5.1	4.9	4.3		4.4	14	467	72	36	13	5.9
28	4.5	5.1	4.9	4.3		4.0	13	551	75	35	12	5.4
29	4.5	5.1	4.8	4.3		3.8	12	467	75	34	6.7	8.4
30	4.5	5.1	4.6	4.3	------	4.0	11	343	70	34	6.1	8.4
31	4.5	------	4.7	4.3	------	4.0	------	*315	------	34	5.1	------
Total	190.0	152.1	144.1	141.7	121.9	125.6	238.6	4,321	5,182	1,317	728.9	189.7
Mean	6.13	5.07	4.65	4.57	4.20	4.05	7.95	139	173	42.5	23.5	6.32
Ac-ft	377	302	286	281	242	249	473	8,570	10,280	2,610	1,450	376

Calendar year 1955:	Max 471	Min 2.3	Mean 33.7	Ac-ft 24,410
Water year 1955-56:	Max 551	Min 3.8	Mean 35.1	Ac-ft 25,500

Peak discharge (base, 180 cfs).--May 28 (6 p.m.) 582 cfs (4.32 ft).

* Discharge measurement made on this day.

e Shifting-control method used.

Note.--Stage-discharge relation affected by ice Oct. 27 to Nov. 6, Nov. 11-29, Dec. 3, 4, Dec. 8 to Jan. 4. No gage-height record Feb. 7 to May 22; discharge estimated on basis of 1 discharge measurement, weather records, and records for nearby stations.

Goose Creek near Sheridan, Wyo.

Location.--Lat 44°42', long 107°11', in sec. 35, T. 55 N., R. 86 W., on right bank half a mile upstream from Cave Creek and 14 miles southeast of Sheridan.

Drainage area.--120 sq mi.

Records available.--September 1929 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 4,530 ft (from topographic map).

Average discharge.--27 years, 82.0 cfs (59,410 acre-ft per year).

Extremes.--Maximum discharge during year, 1,630 cfs May 28 (gage height, 4.65 ft); minimum daily, 3.1 cfs Nov. 12.

1929-56: Maximum discharge, 1,900 cfs June 18, 1937 (gage height, 4.89 ft); minimum daily, 1.6 cfs Nov. 29, 1954.

Remarks.--Records good except those for period of ice effect, which are poor. Natural flow of stream affected by transbasin diversions, storage reservoirs, diversions for irrigation and return flow from irrigated areas (for details on adjudication of diversions, see Remarks for this station in WSP 1209).

Revisions.--WSP 1006: Drainage area.

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.2	2.0	1.8	108
.4	5.3	2.0	144
.5	7.7	2.5	290
.7	15	3.0	490
1.0	30	4.0	1,110
1.5	71	4.6	1,590

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	18	3.5	*11	12	*b10	7.7	13	31	877	72	43	17
2	15	*5.1	11	11	b10	*7.7	10	*35	*838	68	29	17
3	15	17	11	11	b10	7.7	9.4	38	858	*63	*37	16
4	*15	15	10	11	b10	7.2	*11	36	981	61	39	15
5	13	13	10	*11	b10	7.2	11	59	960	55	36	16
6	12	9.7	10	10	10	6.7	7.8	70	858	50	36	*17
7	11	12	10	10	9.7	7.0	11	76	610	45	43	15
8	12	14	9.4	10	9.7	7.2	11	98	413	47	50	13
9	13	13	10	10	9.4	7.2	12	113	341	38	46	13
10	13	15	12	11	*9.0	7.5	14	126	276	34	46	13
11	16	12	12	11	9.0	7.0	13	121	377	32	45	11
12	17	3.1	13	11	9.0	7.7	13	128	369	37	43	10
13	16	5.0	10	*11	9.4	7.2	15	110	337	38	38	9.4
14	14	15	9.7	10	9.0	7.2	19	101	297	35	37	8.7
15	14	11	13	7.2	9.0	7.0	22	*102	233	33	36	10
16	7.0	13	13	12	9.4	7.0	27	114	206	33	34	15
17	8.7	12	13	12	9.4	6.7	27	156	223	41	38	16
18	9.7	12	13	10	8.7	6.5	26	200	217	41	47	17
19	9.7	14	13	10	8.7	7.5	28	245	*200	37	45	22
20	12	14	13	10	8.7	7.7	35	249	171	38	38	21
21	12	14	*13	10	8.7	7.0	40	286	168	42	33	22
22	12	13	13	10	8.4	8.4	40	300	184	43	33	26
23	13	11	14	10	8.4	10	33	*311	128	41	32	20
24	12	12	14	10	8.0	13	31	405	105	40	43	10
25	11	*11	13	10	7.7	19	33	635	90	41	39	9.4
26	10	11	12	10	8.4	25	36	832	94	49	31	12
27	12	11	12	10	8.4	20	38	1,300	89	46	26	14
28	9.6	12	11	10	8.0	12	35	1,560	87	44	24	16
29	10	11	3.5	b7.7	8.0	10	33	1,400	83	43	20	19
30	11	11	14	b7.0	------	11	31	*1,080	76	44	19	21
31	10	------	15	b8.5	------	11	------	904	------	43	19	------
Total	383.7	345.4	361.6	314.4	262.1	291.0	685.2	11,221	10,746	1,374	1,125	461.5
Mean	12.4	11.5	11.7	10.1	9.04	9.39	22.8	362	358	44.3	36.3	15.4
Ac-ft	761	685	717	624	520	577	1,360	22,260	21,310	2,730	2,230	915

Calendar year 1955: Max 877 Min 2.0 Mean 68.4 Ac-ft 49,520
Water year 1955-56: Max 1,560 Min 3.1 Mean 75.3 Ac-ft 54,690

Peak discharge (base, 760 cfs).--May 28 (1 p.m.) 1,630 cfs (4.65 ft).

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Little Goose Creek in canyon, near Big Horn, Wyo.

Location.--Lat 44°35', long 107°03', in sec. 1, T. 53 N., R. 85 W., on left bank 100 ft upstream from headgate of lower Peralta ditch and 7 miles southwest of Big Horn.

Drainage area.--51.0 sq mi.

Records available.--April 1941 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 4,880 ft (from topographic map).

Average discharge.--15 years, 62.1 cfs (44,990 acre-ft per year).

Extremes.--Maximum discharge during year, 889 cfs May 28 (gage height, 5.83 ft); minimum daily, 6.5 cfs Nov. 12, Dec. 29, Jan. 25, 28.

1941-56: Maximum discharge, 1,080 cfs June 24, 1946 (gage height, 6.13 ft), from rating curve extended above 650 cfs; minimum recorded, 2.2 cfs Dec. 4, 1949 (gage height, 0.71 ft).

Remarks.--Records good except those for period of shifting control, which are fair, and those for periods of ice effect, which are poor. Two small diversions above station for irrigation. Diversions into drainage basin above station from East Goose Creek basin diverted below station for irrigation (for details on adjudication of diversions, see Remarks for this station in WSP 1209). Three small reservoirs above station (combined capacity, about 720 acre-ft) two of which store some of the imported water.

Revisions.--WSP 1006: Drainage area.

Rating table, water year 1955-56, except periods of ice effect or shifting control (gage height, in feet, and discharge, in cubic feet per second)

0.8	6.9	2.5	128
1.0	13	3.0	204
1.2	21	4.0	410
1.5	36	6.0	935
2.0	71		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	19	8.2	*9.0	9.5	7.7	8.2	14	32	e528	70	106	50
2	16	*9.8	8.7	9.2	*7.2	*8.2	13	*34	*e490	69	99	49
3	15	15	8.7	9.0	7.2	8.2	13	34	e422	*65	92	48
4	14	15	8.7	9.0	7.4	8.2	*13	34	e365	54	82	45
5	*14	14	8.7	*9.0	7.7	7.9	14	43	337	50	79	*46
6	14	10	9.0	9.0	7.9	8.2	12	51	282	49	76	42
7	13	11	9.0	8.7	7.9	b7.5	13	*60	*244	52	*84	37
8	13	11	8.7	8.7	7.4	7.7	13	81	237	47	88	35
9	13	11	9.0	8.5	7.7	8.2	14	101	223	66	94	34
10	12	*12	9.0	8.7	7.7	b8.0	15	127	214	62	101	27
11	15	10	9.0	8.7	7.9	b7.5	15	125	201	68	102	25
12	15	b6.5	9.5	8.7	8.2	b8.0	15	139	186	*69	102	30
13	14	b8.5	b7.0	8.7	8.5	8.2	17	124	172	71	102	30
14	13	*11	b8.0	8.7	8.7	8.2	20	114	155	75	101	32
15	13	*10	b8.5	b7.0	*b8.5	8.2	24	111	162	80	96	32
16	14	9.5	9.2	*b7.5	b9.0	8.2	30	114	155	86	86	31
17	13	8.7	9.2	7.9	9.0	8.2	30	139	142	91	83	30
18	13	9.0	b8.5	7.7	9.0	8.2	30	*177	149	89	98	28
19	13	10	9.2	7.4	9.0	8.7	32	220	124	100	86	22
20	13	10	9.5	7.2	9.0	9.0	38	261	*114	100	79	18
21	14	10	*9.5	7.2	8.7	8.7	43	315	119	101	77	17
22	15	9.8	10	7.2	8.7	9.5	43	337	115	100	74	18
23	15	9.2	13	7.2	8.7	11	37	333	107	100	72	18
24	14	9.5	12	7.4	8.7	13	34	328	118	101	73	16
25	13	9.5	11	b6.5	8.5	17	32	333	100	105	74	15
26	13	b8.0	9.5	7.7	8.2	21	34	*315	79	103	74	14
27	14	b8.5	11	7.7	8.2	17	36	360	75	105	80	14
28	12	9.2	9.8	b6.5	8.2	14	32	*760	69	106	76	14
29	14	9.2	b6.5	b7.0	8.2	12	32	665	69	107	68	15
30	13	9.0	9.8	b7.5	------	*13	32	e597	70	107	58	14
31	13	------	9.8	b7.5	------	*13	------	e561	------	108	53	------
Total	429	302.1	288.0	248.2	238.7	311.9	740	7,025	5,823	2,556	2,615	846
Mean	13.8	10.1	9.29	8.01	8.23	10.1	24.7	227	194	82.5	84.4	28.2
Ac-ft	851	599	571	492	473	619	1,470	13,930	11,550	5,070	5,190	1,680

Calendar year 1955: Max 308 Min 5.7 Mean 54.8 Ac-ft 39,680
Water year 1955-56: Max 760 Min 6.5 Mean 58.5 Ac-ft 42,500

Peak discharge (base, 420 cfs).--May 28 (8 a.m.) 889 cfs (5.83 ft).

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.
e Shifting-control method used.

Goose Creek below Sheridan, Wyo.

Location.--Lat 44°49'25", long 106°57'40", in SE¼SW¼ sec. 15, T. 56 N., R. 84 W., on right bank 700 ft north of Sheridan city limits and 1,200 ft downstream from Soldier Creek.

Drainage area.--392 sq mi.

Records available.--January 1942 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 3,701.36 ft above mean sea level, datum of 1929. Prior to Aug. 3, 1951, wire-weight gage at site 600 ft upstream at datum 2.18 ft lower.

Average discharge.--14 years, 194 cfs (140,500 acre-ft per year).

Extremes.--Maximum discharge during year, 3,360 cfs May 29 (gage height, 6.97 ft); minimum daily, 11 cfs July 15-17, 19.

1942-56: Maximum discharge observed, 4,040 cfs June 4, 1944 (gage height, 11.26 ft); minimum daily, 6.9 cfs July 31, Aug. 1, 1954.

Remarks.--Records good. Some regulation by many small reservoirs (combined capacity, 15,000 acre-ft). Diversions above station for irrigation (for details on adjudication of diversions, see Remarks for this station in WSP 1209).

Rating tables, water year 1955-56 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Aug. 1-26)

Oct. 1 to May 29

0.7	36	3.0	720
1.0	83	5.0	1,710
1.5	182	6.0	2,380
2.0	318	7.0	3,390

May 30 to Sept. 30

0.7	5.0	2.0	265
.8	13	3.0	650
1.1	50	5.0	1,640
1.5	124	6.0	2,380

Note.--Same as preceding table above 6.0 ft.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	67	83	80	92	59	*126	151	158	1,610	52	21	44
2	75	69	80	85	57	132	*145	151	1,420	*52	18	32
3	70	78	72	*77	57	145	120	164	1,330	56	18	33
4	62	92	70	83	59	175	122	160	*1,360	55	20	40
5	54	86	64	88	62	124	132	173	1,380	49	20	46
6	54	83	*80	88	64	83	116	202	*1,210	35	18	47
7	50	80	81	78	64	73	105	216	1,020	27	12	47
8	56	83	78	75	59	92	116	249	726	23	14	46
9	57	88	80	77	*57	83	113	294	598	*21	17	47
10	54	93	81	72	59	70	116	359	438	18	21	42
11	48	97	72	81	61	64	122	352	550	14	27	44
12	57	73	88	*78	64	69	*120	377	530	14	15	45
13	62	48	88	77	65	a72	118	359	*494	13	13	46
14	52	62	64	73	62	a75	120	315	438	12	14	49
15	62	57	62	50	54	a76	122	308	332	11	15	47
16	61	67	*75	54	54	*72	136	*291	279	11	15	45
17	51	65	83	62	56	95	138	328	300	11	17	42
18	51	69	77	72	57	140	134	403	346	12	31	40
19	*51	80	78	72	57	242	134	462	276	11	41	37
20	56	107	81	65	61	398	138	519	218	15	40	38
21	61	95	88	65	61	*396	151	582	186	14	32	38
22	61	92	140	61	62	249	164	628	251	18	25	40
23	69	72	162	*62	69	260	169	611	178	19	20	44
24	73	83	111	70	78	284	160	598	128	13	20	46
25	73	*80	104	64	88	249	149	*830	98	13	25	41
26	75	83	88	67	85	228	147	895	*89	14	29	37
27	75	59	93	65	78	186	164	1,200	81	14	39	33
28	77	72	88	62	81	126	158	*2,090	66	15	56	32
29	78	80	59	59	95	114	151	*2,970	58	20	49	44
30	77	78	56	54	------	128	*156	*2,240	53	20	46	44
31	*80	------	64	*61	------	122	------	1,780	------	*20	*44	------
Total	1,959	2,354	2,587	2,189	1,885	4,748	4,087	20,264	16,043	692	792	1,256
Mean	63.2	78.5	83.5	70.6	65.0	153	136	654	535	22.3	25.5	41.9
Ac-ft	3,890	4,670	5,130	4,340	3,740	9,420	8,110	40,190	31,820	1,370	1,570	2,490

Calendar year 1955: Max 1,220 Min 13 Mean 145 Ac-ft 104,600
Water year 1955-56: Max 2,970 Min 11 Mean 161 Ac-ft 116,700

Peak discharge (base, 1,200 cfs).--May 29 (2:30 a.m.) 3,360 cfs (6.97 ft).

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for station near Sheridan.

Tongue River near Acme, Wyo.

Location.--Lat 44°57', long 106°56', in sec. 1, T. 57 N., R. 84 W., on right bank just upstream from Ash Creek, 400 ft downstream from highway bridge and 3.2 miles northeast of Acme.

Drainage area.--894 sq mi.

Records available.--October 1938 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 3,530 ft (from topographic map).

Average discharge.--18 years, 401 cfs (290,000 acre-ft per year).

Extremes.--Maximum discharge during year, 6,280 cfs May 29 (gage height, 8.24 ft); minimum daily, 24 cfs July 25.

1938-56: Maximum discharge, 9,110 cfs June 4, 1944 (gage height, 10.50 ft), from rating curve extended above 5,700 cfs; maximum gage height, 10.68 ft Mar. 16, 1947 (ice jam); minimum daily discharge, 3.4 cfs Aug. 24, 1940.

Remarks.--Records excellent except those prior to May 29, which are good, and those for periods of ice effect or no gage-height record, which are fair. Diversions above station for irrigation (for details on adjudication of diversions, see Remarks for this station in WSP 1209). Some regulation by many small reservoirs (combined capacity, about 15,000 acre-ft). Records of chemical analyses for the water year 1956 are given in WSP 1451.

Rating tables, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 24-28, Apr. 6-30, May 24-27)

Oct. 1 to May 28

2.7	83	4.0	810
2.8	116	5.0	1,750
3.2	274	7.0	4,150
3.5	445		

May 29 to Sept. 30

2.5	20	3.5	350
2.6	31	4.0	720
2.8	58	6.0	2,720
3.0	110	8.0	5,800
3.2	190		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	146	176	155	220	110	*210	336	284	*3,160	205	46	89
2	153	146	150	200	110	220	*324	284	2,900	*200	48	86
3	149	146	145	*195	130	240	227	299	2,610	240	48	76
4	138	164	145	200	150	300	203	a290	2,540	195	50	78
5	123	183	130	205	200	220	207	a350	2,520	177	46	86
6	120	176	*145	210	190	150	215	a400	2,210	160	52	83
7	120	161	150	200	190	140	176	a470	1,910	140	46	86
8	123	164	145	190	180	160	191	a600	1,550	128	50	80
9	131	161	150	190	*170	150	199	a700	1,340	*121	37	86
10	123	180	150	180	175	140	203	810	1,120	107	33	83
11	123	199	140	190	180	130	227	826	1,090	101	36	78
12	131	164	160	*180	185	160	*240	810	1,030	101	39	80
13	138	86	150	175	180	165	195	770	*943	101	36	78
14	142	120	110	165	170	165	176	655	848	98	30	83
15	142	*115	120	110	150	165	164	633	736	107	28	80
16	142	125	*135	170	130	*167	164	*618	640	98	31	76
17	138	135	160	170	120	225	180	715	600	86	36	71
18	131	145	150	180	140	300	183	932	672	86	41	69
19	*131	160	160	190	140	450	180	1,120	616	80	67	65
20	131	180	170	170	150	*800	191	1,290	528	73	92	60
21	142	165	190	175	140	*1,050	215	1,540	466	58	83	60
22	149	160	250	170	120	540	244	1,720	576	39	71	60
23	157	140	300	*170	140	560	274	1,820	496	30	60	65
24	161	160	240	180	150	*589	248	1,820	398	31	52	71
25	157	*160	220	170	170	527	244	1,970	362	24	46	73
26	168	160	180	190	160	459	244	*2,180	*344	28	50	73
27	164	130	200	180	150	365	270	2,280	315	27	55	71
28	176	145	180	160	165	261	279	3,250	292	29	83	67
29	164	160	110	110	180	223	284	*5,680	250	56	92	76
30	176	160	115	100	------	270	*299	4,350	220	69	89	89
31	*180	------	160	*110	------	304	------	3,440	------	*52	*89	------
Total	4,469	4,626	5,065	5,405	4,525	9,805	6,782	42,906	33,282	3,047	1,662	2,278
Mean	144	154	163	174	156	316	226	1,384	1,109	98.3	53.6	75.9
Ac-ft	8,860	9,180	10,050	10,720	8,980	19,450	13,450	85,100	66,010	6,050	3,300	4,520

Calendar year 1955:	Max 2,160	Min 30	Mean 340	Ac-ft 247,800
Water year 1955-56:	Max 5,680	Min 24	Mean 338	Ac-ft 245,700

Peak discharge (base, 1,800 cfs).--May 29 (10:30 a.m.) 6,280 cfs (8.24 ft).

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for station near Dayton and Goose Creek below Sheridan.

Note.--Stage-discharge relation affected by ice Nov. 14 to Mar. 23 (no gage-height record Nov. 27 to Dec. 6, Feb. 3-9, Feb. 18 to Mar. 1; discharge estimated on basis of 3 discharge measurements and records for station near Dayton and Goose Creek below Sheridan).

Tongue River at Tongue River Dam, near Decker, Mont.

Location.--Lat 45°08', long 106°46', in NE¼ sec. 13, T. 8 S., R. 40 E., on left bank half a mile downstream from Tongue River Dam, 4 miles upstream from Post Creek, 7 miles northeast of Decker, and 15 miles southeast of Kirby.

Records available.--May 1939 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 3,050.00 ft above mean sea level (Corps of Engineers benchmark).

Average discharge.--17 years, 439 cfs (317,800 acre-ft per year).

Extremes.--Maximum discharge during year, 3,300 cfs May 31 (gage height, 5.64 ft); minimum daily, 37 cfs Oct. 20, 21.

1939-56: Maximum discharge, 6,180 cfs June 5, 1944 (gage height, 7.46 ft), from rating curve extended above 3,500 cfs; minimum, probably less than 0.5 cfs during period of no gage-height record, Apr. 17, to May 8, 1940, when gates at dam were closed.

Remarks.--Records good. Diversions for irrigation of about 57,500 acres above station. Flow regulated by Tongue River Reservoir (see p. 238), and by eight smaller reservoirs in Wyoming with a usable capacity of 14,200 acre-ft.

Rating table, water year 1955-56 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Dec. 18, Sept. 7-30)

0.3	28	2.5	710
.7	76	3.5	1,380
1.1	155	4.5	2,220
1.7	340	6.0	3,700

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	219	195	189	192	192	183	1,040	264	3,270	258	130	192
2	219	198	189	192	192	186	1,040	284	2,530	267	130	192
3	*219	198	189	192	192	186	1,030	330	2,420	284	148	195
4	216	198	189	195	192	186	1,030	333	2,410	298	302	192
5	216	198	189	195	192	186	1,040	333	2,050	312	326	195
6	216	201	186	192	189	186	1,110	356	*1,760	312	330	192
7	216	201	189	189	189	*186	1,100	400	1,660	308	330	195
8	213	201	189	192	189	186	1,080	400	1,460	274	330	195
9	213	195	189	192	189	186	1,080	420	1,390	219	330	192
10	213	192	189	192	189	186	868	*488	938	186	330	192
11	213	195	192	189	189	186	570	528	532	183	330	192
12	213	195	192	189	189	186	*1,070	704	434	168	330	192
13	210	192	189	189	189	175	1,050	704	429	162	330	189
14	210	186	189	186	189	175	1,040	710	429	152	326	*189
15	210	186	189	186	189	178	1,020	704	429	150	275	189
16	213	189	189	189	189	178	1,000	704	424	210	192	192
17	213	186	189	189	189	178	987	704	416	213	201	195
18	216	186	189	189	186	178	959	704	420	*228	198	195
19	162	186	192	189	186	180	655	770	420	219	195	198
20	37	189	192	192	183	189	519	886	416	90	195	195
21	37	189	189	192	186	168	404	1,180	424	89	195	195
22	87	189	186	192	186	152	280	1,330	424	82	195	198
23	160	*189	186	192	186	216	170	1,440	424	82	*198	213
24	72	189	186	195	186	222	128	1,480	424	82	195	213
25	113	189	186	195	183	261	70	1,420	424	72	195	198
26	201	189	186	*195	183	447	70	1,420	424	54	195	168
27	198	189	192	195	186	677	72	1,480	424	54	195	165
28	195	189	192	195	186	721	130	1,770	416	55	195	168
29	198	189	189	192	186	804	228	2,590	294	55	195	168
30	198	189	189	189	------	798	234	3,180	280	55	192	165
31	195	------	192	189	------	893	------	3,300	------	65	192	------
Total	5,711	5,757	5,862	5,931	5,451	9,019	21,074	31,316	28,195	5,238	7,400	5,709
Mean	184	192	189	191	188	291	702	1,010	940	169	239	190
Ac-ft	11,330	11,420	11,630	11,760	10,810	17,890	41,800	62,110	55,920	10,390	14,680	11,320

Calendar year 1955: Max 3,080 Min 37 Mean 368 Ac-ft 266,200
Water year 1955-56: Max 3,300 Min 37 Mean 373 Ac-ft 271,100

* Discharge measurement made on this day.

Tongue River at Miles City, Mont.

Location.--Lat 46°21', long 105°48', in SE¼ sec. 23, T. 7 N., R. 47 E., on right bank 4 miles south of Miles City and 8 miles upstream from mouth.

Records available.--April 1938 to April 1942, April 1946 to September 1956. Published as "near Miles City" April 1938 to April 1942. Not equivalent to records published as "near Miles City" May 1929 to September 1932.

Gage.--Water-stage recorder. Altitude of gage is 2,370 ft (by barometer). April 1938 to April 1942 wire-weight gage at site 8 miles upstream at different datum.

Average discharge.--12 years (1938-39, 1940-41, 1946-56), 388 cfs (280,900 acre-ft per year).

Extremes.--Maximum discharge during year, 3,080 cfs June 3 (gage height, 4.87 ft); maximum gage height observed, 9.00 ft Mar. 23 (backwater from ice); minimum daily discharge, 4.6 cfs Oct. 1.

1938-42, 1946-56: Maximum discharge, 12,000 cfs Mar. 6, 1949 (gage height, 10.6 ft), float measurement; maximum gage height, 11.80 ft Mar. 6, 1949 (ice jam); no flow July 9-19, Aug. 13, 14, Sept. 28, 1940.

Remarks.--Records good except those for period of ice effect, which are poor. Diversions for irrigation of about 90,000 acres above station. Flow regulated by Tongue River Reservoir (see p. 238), and by eight smaller reservoirs in Wyoming with a usable capacity of 14,200 acre-ft. Records of chemical analyses and water temperatures for the water year 1956 are given in WSP 1451.

Rating tables, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Nov. 11, Apr. 30 to May 14)

-0.1	4.0	1.3	229
0.0	6.0	2.0	630
.1	9.0	3.0	1,330
.2	16	4.0	2,120
.5	45	5.0	3,170
.9	112		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.6	44	140	170	170	180	991	215	2,700	218	6.9	273
2	6.6	51	140	150	170	190	949	174	2,980	190	9.0	128
3	22	94	140	160	170	200	1,100	168	3,060	474	33	86
4	22	178	150	160	170	200	1,130	178	2,860	326	11	74
5	*22	146	150	160	170	200	1,120	269	2,280	159	6.9	72
6	32	148	150	160	165	200	1,120	284	2,360	187	6.0	76
7	41	146	150	160	160	200	1,100	260	2,080	157	6.0	66
8	43	154	150	160	160	200	1,150	*264	*1,700	128	6.0	44
9	46	146	150	160	160	190	1,170	269	1,620	143	6.6	44
10	46	148	150	160	160	180	1,180	414	1,400	*114	13	51
11	51	154	160	160	160	180	1,170	444	1,350	108	33	49
12	53	140	160	160	160	180	1,160	361	1,100	94	42	*51
13	55	120	160	150	160	180	914	373	823	69	45	50
14	49	100	160	150	160	180	956	397	598	40	52	47
15	51	*75	150	150	150	180	1,120	516	462	26	46	56
16	65	100	160	160	150	180	1,110	547	420	16	44	57
17	65	120	160	160	150	190	1,100	566	373	13	40	57
18	64	130	140	160	150	200	*1,100	566	361	19	53	56
19	65	150	150	*155	150	220	1,100	554	315	25	74	49
20	65	150	150	155	150	300	1,080	541	310	13	31	49
21	64	140	*150	155	150	500	970	579	289	11	*14	51
22	61	130	150	155	*150	750	788	598	294	11	12	51
23	50	140	160	160	150	1,500	662	740	289	12	11	51
24	43	150	160	160	150	*1,390	541	921	269	*16	11	52
25	29	160	160	160	150	1,110	492	1,080	289	12	12	56
26	24	160	160	160	155	1,480	367	1,120	247	9.0	8.4	66
27	24	150	160	160	160	1,080	321	1,220	233	9.7	10	69
28	26	140	150	160	165	830	294	1,240	233	18	1,042	70
29	20	130	150	160	170	754	242	1,280	238	16	795	70
30	21	140	170	160	------	795	222	1,500	222	7.5	480	69
31	43	------	170	170	------	921	------	1,960	------	7.5	598	------
Total	1,273.2	3,934	4,760	4,920	4,595	15,040	26,719	19,598	31,755	2,648.7	3,557.8	2,040
Mean	41.1	131	154	159	158	485	891	632	1,058	85.4	115	68.0
Ac-ft	2,530	7,800	9,440	9,760	9,110	29,830	53,000	38,870	62,990	5,250	7,060	4,050

Calendar year 1955:	Max 2,400	Min 4.6	Mean 329	Ac-ft 238,000
Water year 1955-56:	Max 3,060	Min 4.6	Mean 330	Ac-ft 239,700

Peak discharge (base, 2,600 cfs).--Mar. 23 (3:05 p.m.) discharge unknown (9.00 ft); June 3 (9 to 11 p.m.) 3,080 cfs (4.87 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 12 to Mar. 23. Discharge computed from once-daily staff-gage readings Oct. 1 to Nov. 2, July 11 to Aug. 27.

Yellowstone River at Miles City, Mont.

Location.--Lat 46°25', long 105°51', in NW¼ sec. 28, T. 8 N., R. 47 E., on left bank 50 ft upstream from bridge on State Highway 22 at Miles City and three-quarters of a mile downstream from Tongue River.

Records available.--September 1922 to August 1923, August 1928 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 2,330.20 ft above mean sea level (Montana State Highway benchmark). Prior to May 6, 1929, staff gages at pumping plant 1¼ miles downstream at different datums. May 6, 1929, to Sept. 30, 1931, wire-weight gage and Oct. 1, 1931, to Nov. 10, 1937, water-stage recorder at present site and datum. Nov. 11, 1937, to Sept. 30, 1946, water-stage recorder at pumping plant 1¼ miles downstream at different datum.

Average discharge.--27 years (1929-56), 10,740 cfs (7,775,000 acre-ft per year).

Extremes.--Maximum discharge during year, 60,700 cfs June 1 (gage height, 12.08 ft); maximum gage height, 12.42 ft Mar. 26 (backwater from ice); minimum daily discharge, 1,700 cfs Nov. 18.

1922-23, 1928-56: Maximum discharge, 96,300 cfs June 19, 1944 (gage height, 12.74 ft); maximum gage height, 21.7 ft (present site and datum) Mar. 20, 1944 (ice jam), from floodmark; minimum discharge, 996 cfs Dec. 14, 1932.

Remarks.--Records good except those for period of ice effect, which are poor. Some regulation by reservoirs on tributary streams. Diversions for irrigation of about 1,100,000 acres above station (does not include flood irrigation).

Rating tables, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 26		Mar. 27 to Sept. 30			
1.1	1,760	3.1	5,350	8.0	29,000
2.0	3,070	4.0	8,210	10.0	43,700
3.0	5,390	6.0	16,500	12.0	60,000
3.5	6,910				

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6,070	5,740	4,000	6,000	5,000	10,000	8,510	9,460	*59,100	26,300	10,000	8,030
2	6,130	5,860	5,000	5,000	4,500	9,500	8,430	9,190	53,700	25,800	9,770	7,810
3	6,160	5,950	5,000	5,000	4,000	9,000	8,620	9,070	54,000	24,900	9,540	7,780
4	6,280	5,890	6,000	5,500	4,000	9,500	8,770	8,770	57,300	23,600	9,420	7,810
5	*6,070	6,130	6,500	5,700	4,000	9,500	8,400	8,960	58,600	21,700	9,150	7,740
6	5,830	6,340	5,500	5,700	4,000	8,500	8,250	9,070	57,100	20,100	8,810	*7,350
7	5,590	6,590	5,000	5,700	4,000	8,000	8,400	9,040	56,300	18,500	*8,540	7,210
8	5,590	6,650	5,000	6,000	4,500	7,500	8,540	*9,230	*52,600	17,800	7,920	7,070
9	5,590	6,620	5,500	6,500	6,000	8,000	8,280	9,920	42,200	17,600	7,350	6,900
10	5,560	6,560	5,500	6,500	7,000	7,500	8,280	11,700	37,400	*17,600	7,000	6,790
11	5,480	6,040	5,500	6,500	7,000	6,500	8,320	14,500	39,400	16,800	6,620	6,520
12	5,300	6,470	5,500	6,500	7,000	6,500	*8,280	14,300	41,200	16,200	6,550	*6,110
13	5,220	6,150	6,000	6,500	6,500	5,500	8,210	14,000	41,800	15,900	6,760	6,080
14	*5,160	2,320	6,000	6,500	6,500	5,500	8,250	13,600	42,600	16,200	6,900	6,590
15	5,360	1,840	6,000	6,500	6,500	5,500	8,360	12,700	43,100	15,700	6,550	6,550
16	5,560	2,000	6,000	6,500	6,500	6,000	8,360	11,700	41,300	15,000	6,170	7,000
17	5,590	1,800	5,500	6,500	6,000	6,500	8,510	*10,900	41,800	14,300	5,860	7,070
18	5,560	*1,700	5,000	*5,000	6,000	7,500	*8,880	11,000	43,900	13,900	5,730	6,820
19	5,590	2,000	4,000	4,500	6,000	8,500	9,230	12,800	39,600	13,100	5,970	6,720
20	5,480	3,000	*2,750	5,000	5,500	10,000	9,420	17,000	35,000	12,100	7,040	6,620
21	5,300	4,000	4,500	5,000	*5,250	12,000	9,110	21,600	*33,900	11,300	*7,380	6,390
22	5,160	5,000	4,500	6,000	5,500	*13,800	9,040	26,900	35,300	10,700	7,320	6,170
23	5,130	6,500	5,000	6,500	6,000	14,000	9,260	33,400	35,800	*10,500	7,070	6,000
24	5,240	7,500	6,000	7,000	6,500	13,000	9,890	38,800	33,800	10,300	6,620	*5,760
25	5,510	7,500	7,000	7,000	7,000	11,000	10,700	*43,600	30,200	10,000	6,170	6,110
26	5,480	7,000	9,000	6,500	8,500	20,000	10,200	46,100	28,800	9,540	5,700	6,260
27	5,650	6,500	10,000	6,500	9,500	22,900	*10,000	48,100	29,600	9,150	5,520	6,200
28	*5,650	5,500	11,500	6,000	9,750	15,800	9,920	49,400	*28,300	9,070	6,230	6,060
29	5,590	4,000	10,000	6,000	10,000	12,800	9,610	50,900	26,900	9,040	*8,210	5,730
30	5,560	3,000	8,500	5,500	------	10,000	9,420	53,300	26,600	*9,460	8,250	5,860
31	5,590	------	7,500	5,000	------	8,960	------	58,200	------	9,770	7,920	------
Total	173,030	152,160	188,750	184,600	178,500	309,260	267,450	697,210	‡1,247	471,930	228,040	201,110
Mean	5,582	5,072	6,089	5,955	6,155	9,976	8,915	22,490	41,570	15,220	7,356	6,704
Ac-ft	343,200	301,800	374,400	366,100	354,000	613,400	530,500	‡1,383	‡2,474	936,100	452,300	398,900

Calendar year 1955: Max 36,400 Min 1,700 Mean 8,618 Ac-ft 6,240,000
Water year 1955-56: Max 59,100 Min 1,700 Mean 11,750 Ac-ft 8,528,000

Peak discharge (base, 36,700 cfs).--June 1 (3 a.m.) 60,700 cfs (12.08 ft).
* Discharge measurement made on this day.
‡ Expressed in thousands.
Note.--Stage-discharge relation affected by ice Nov. 16 to Mar. 26. Discharge computed from graph based on gage readings Apr. 18-26, May 12-18, July 19-23, Aug. 1-7, Sept. 8-10, 16-21.

South Fork Powder River near Kaycee, Wyo.

Location.--Lat 43°37', long 106°35', in SE$\frac{1}{4}$ sec. 9, T. 42 N., R. 81 W., on left bank 600 ft upstream from bridge on U. S. Highway 87, 1$\frac{1}{2}$ miles upstream from Murphy Creek, 6.6 miles southeast of Kaycee, and 7 miles upstream from confluence with Middle Fork.

Drainage area.--1,150 sq mi, approximately.

Records available.--May to December 1911 (gage heights only), April 1938 to June 1940, May 1950 to September 1956.

Gage.--Water-stage recorder. May 11 to Dec. 31, 1911, chain gage at site 2 miles downstream at different datum. Apr. 9, 1938, to June 30, 1940, chain gage at present site at datum 1.90 ft lower. May 16 to June 6, 1950, staff gage at present site and datum.

Average discharge.--7 years (1938-39, 1950-56), 35.1 cfs (25,430 acre-ft per year).

Extremes.--Maximum discharge during year, 2,550 cfs Mar. 19 (gage height, 3.60 ft); minimum daily, 3.4 cfs July 25, 26.

1938-40, 1950-56: Maximum discharge, 14,400 cfs May 22, 1952 (gage height, 7.87 ft, from floodmarks), from rating curve extended above 140 cfs on basis of slope-area determination of peak flow; no flow Feb. 9, 10, 1939.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. Discharge measurements generally made four times a month. Diversions for irrigation above station (for details on adjudication of diversions, see Remarks for this station in WSP 1209).

Rating tables, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-22, Nov. 4, 5, 7, 9, Dec. 23-28, Mar. 4-6, June 2-4, Aug. 1, 2)

Oct. 1 to May 26				May 27 to Sept. 30			
0.9	1.7	1.3	66	0.6	1.0	1.2	70
1.0	7.0	1.5	140	.7	5.7	1.5	155
1.1	19	1.9	340	.8	12	2.1	460
				1.0	33		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	14	15	12	15	7.0	70	18	30	28	10	*56	5.7
2	14	19	10	20	7.5	90	17	25	20	*15	16	5.7
3	14	21	5.0	30	8.5	125	*14	18	15	16	12	5.2
4	13	*32	6.0	*43	9.5	228	45	17	*11	12	12	7.0
5	14	18	*7.0	40	10	*219	53	12	19	10	8.8	7.6
6	18	14	8.5	35	*11	127	32	11	11	8.8	7.6	7.6
7	*19	18	10	40	13	110	40	17	9.0	8.8	*6.3	*8.2
8	17	10	12	30	14	90	50	*11	*7.0	8.2	6.3	8.2
9	15	18	15	25	16	50	*70	20	6.0	8.8	5.2	7.6
10	15	20	18	*20	18	25	123	40	5.5	8.8	4.8	7.0
11	18	8.0	21	16	20	15	172	35	5.0	9.2	33	7.0
12	19	6.5	25	13	22	*24	106	28	4.7	*7.0	36	*7.0
13	*19	5.5	19	12	20	30	82	27	6.3	4.8	*11	7.0
14	19	4.5	15	11	*19	35	76	*23	*13	4.3	10	5.2
15	19	4.0	*12	10	14	40	63	9.4	13	4.3	10	5.2
16	19	5.0	13	15	9.0	45	48	8.0	11	4.3	10	5.2
17	19	*6.0	15	*19	10	50	34	7.0	8.8	3.8	9.5	*5.7
18	19	7.0	13	22	10	56	*25	6.0	8.2	*4.3	26	5.2
19	18	9.0	14	24	11	*312	23	7.0	7.6	6.3	17	5.2
20	18	13	*15	26	*12	250	21	10	6.3	3.8	16	4.8
21	18	20	23	28	15	176	18	*65	5.7	3.8	15	5.2
22	18	15	18	30	40	123	19	83	5.7	4.3	12	5.7
23	30	17	197	31	70	88	25	200	5.2	4.3	*8.8	5.7
24	19	20	260	*24	65	72	25	111	4.8	*4.3	8.2	5.7
25	15	23	92	20	60	63	*23	*36	*67	3.4	7.6	5.7
26	15	25	56	17	55	53	23	207	54	3.4	7.0	6.3
27	*23	22	25	15	*48	*36	23	*288	19	9.8	5.7	*5.7
28	23	*20	*14	13	55	27	27	*416	14	43	5.7	5.7
29	17	18	5.0	11	60	23	27	150	12	23	*5.7	5.7
30	17	15	7.0	*9.2	------	23	32	53	11	28	6.3	5.7
31	18	------	10	8.0	------	19	------	*41	------	97	5.7	------
Total	553	448.5	972.5	672.2	729.5	2,694	1,354	2,011.4	413.8	382.8	401.2	184.4
Mean	17.8	15.0	31.4	21.7	25.2	86.9	45.1	64.8	13.8	12.3	12.9	6.15
Ac-ft	1,100	890	1,930	1,330	1,450	5,340	2,690	3,990	821	759	796	366

Calendar year 1955:	Max 1,560	Min 3.0	Mean 46.7	Ac-ft 33,830
Water year 1955-56:	Max 416	Min 3.4	Mean 29.6	Ac-ft 21,460

Peak discharge (base, 1,000 cfs).--Mar. 19 (2 p.m.) 2,550 cfs (3.60 ft); May 27 (10:30 p.m.) 2,470 cfs (3.55 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 1-3, 6, 8, Nov. 10 to Dec. 22, Dec. 29 to Jan. 16, Jan. 23 to Feb. 4, Feb. 27 to Mar. 3, Mar. 7-17. No gage-height record Jan. 17-22, Feb. 5-26, May 9-12, 16-20, June 5-12; discharge estimated on basis of 5 discharge measurements, weather records, and records for Powder River at Sussex.

Middle Fork Powder River above Kaycee, Wyo.

Location.--Lat 43°39', long 106°49', in SW¼ sec. 33, T. 43 N., R. 83 W., on right bank 2 miles upstream from Red Fork, 2 miles downstream from Beaver Creek, and 10 miles southwest of Kaycee.

Drainage area.--450 sq mi, approximately.

Records available.--April 1949 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 4,874.76 ft above mean sea level, datum of 1929.

Average discharge.--7 years, 58.4 cfs (42,310 acre-ft per year).

Extremes.--Maximum discharge during year, 367 cfs May 27 (gage height, 3.85 ft); minimum daily, 21 cfs Sept. 10, 21.

1949-56: Maximum discharge, 1,020 cfs May 18, 1950 (gage height, 5.68 ft), from rating curve extended above 680 cfs; minimum daily, 12 cfs Aug. 28, 29, 1954.

Maximum stage known, about 11.7 ft, date unknown.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation above station (for details on adjudication of diversions, see Remarks for this station in WSP 1209).

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used July 3, 4)

1.9	19	2.5	64
2.0	24	2.8	105
2.2	36	3.2	187

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	43	50	45	46	30	40	71	a108	76	28	28	23
2	43	52	39	38	35	46	61	a102	70	38	*28	22
3	43	56	30	38	47	44	56	a110	66	*57	37	23
4	42	55	30	46	55	44	55	a105	64	36	29	24
5	42	54	35	48	56	*50	60	a120	*65	32	28	24
6	42	52	47	46	56	47	51	a130	63	28	26	24
7	43	53	48	46	50	51	49	a140	57	28	26	*23
8	42	50	44	48	*46	60	60	a150	55	27	26	23
9	40	*51	*48	48	38	49	57	*a165	52	25	26	22
10	40	48	48	48	46	40	58	170	50	*25	26	21
11	41	50	45	*48	54	35	*62	148	46	26	28	22
12	43	44	52	48	51	45	55	148	42	36	28	22
13	*42	42	48	48	48	48	58	138	38	31	25	22
14	42	40	22	46	38	51	60	121	*40	28	24	22
15	43	28	*28	44	37	44	70	116	54	26	22	22
16	43	32	45	35	29	50	83	109	42	26	23	22
17	44	47	51	40	45	51	86	110	38	28	24	22
18	42	58	45	50	48	51	*79	116	38	*29	26	22
19	41	75	51	47	45	50	86	116	36	27	27	22
20	41	76	64	*44	53	56	99	119	34	26	28	22
21	42	*67	64	42	54	56	109	*119	32	26	26	21
22	45	62	74	42	57	60	114	121	32	26	24	22
23	48	43	76	45	52	65	99	118	30	26	24	24
24	48	50	70	47	*48	71	88	109	29	26	24	24
25	48	45	58	30	37	86	95	112	28	25	22	24
26	48	48	48	39	38	74	*109	131	29	25	22	24
27	52	37	49	42	38	*79	123	171	28	25	22	24
28	50	56	49	36	38	52	121	129	28	25	22	26
29	50	48	*42	22	39	54	a115	112	26	25	22	25
30	51	47	38	*30	------	65	a108	91	26	28	23	24
31	56	------	47	36	------	72	------	*82	------	28	24	------
Total	1,380	1,516	1,480	1,313	1,308	1,686	2,397	3,836	1,314	892	790	687
Mean	44.5	50.5	47.7	42.4	45.1	54.4	79.9	124	43.8	28.8	25.5	22.9
Ac-ft	2,740	3,010	2,940	2,600	2,590	3,340	4,750	7,610	2,610	1,770	1,570	1,360

Calendar year 1955: Max 617 Min 20 Mean 80.9 Ac-ft 58,590
Water year 1955-56: Max 171 Min 21 Mean 50.8 Ac-ft 36,890

Peak discharge (base, 300 cfs).--May 27 (8:30 p.m.) 367 cfs (3.85 ft); July 2 (11:30 p.m.) 322 cfs (3.78 ft).

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of 1 discharge measurement and records for station on North Fork Powder River near Mayoworth.

Note.--Stage-discharge relation affected by ice Nov. 13 to Jan. 10, Jan. 15 to Mar. 4, Mar. 10-12.

North Fork Powder River near Hazelton, Wyo.

Location.--Lat 44°01', long 107°04', in SE¼ sec. 21, T. 47 N., R. 85 W., on right bank 3 miles upstream from Twin Creek and 7.5 miles southwest of Hazelton.

Drainage area.--25.0 sq mi.

Records available.--September 1946 to September 1956 (no winter records prior to 1949).

Gage.--Water-stage recorder. Altitude of gage is 8,150 ft (from topographic map).

Average discharge.--8 years (1948-56), 12.2 cfs (8,840 acre-ft per year).

Extremes.--Maximum discharge during year, 287 cfs May 24 (gage height, 3.13 ft), from rating curve extended above 110 cfs on basis of slope-area determination at gage height 4.34 ft; minimum not determined.

1946-56: Maximum discharge, 886 cfs June 15, 1953 (gage height, 4.34 ft), from rating curve extended above 110 cfs on basis of slope-area determination of peak flow; minimum daily, 1.2 cfs Jan. 22, 1952, but may have been less during years of no winter records.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. No diversion above station.

Revisions (water years).--WSP 1279: 1947-48(M), 1949, 1950-51(M), 1952.

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.8	1.0	1.4	22
.9	2.7	1.8	51
1.0	5.3	2.2	90
1.1	8.7	2.6	156
1.2	13		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.5	3.0	2.8	2.6	2.4	2.2	2.0	3.7	90	15	5.0	4.3
2	3.5	3.1						3.6	81	15	5.3	3.5
3	3.2	3.5						4.0	74	15	6.3	3.5
4	3.2	4.0						5.0	68	14	5.0	3.5
5	3.2	4.2						7.0	64	13	4.5	3.5
6	3.2	4.0						10	*56	13	*4.3	3.7
7	3.2	*3.8						15	49	13	4.3	3.2
8	3.2	3.7						25	44	12	4.3	3.2
9	3.0	3.7						40	41	12	4.0	3.0
10	*3.0	3.8						45	40	*11	4.0	*3.0
11	3.2	3.7						35	35	11	4.3	3.0
12	3.0	3.5						30	30	12	3.7	3.2
13	3.2	3.3						25	30	10	3.2	4.0
14	3.2	3.1						21	29	8.7	3.0	3.2
15	3.0	3.0						*23	28	7.7	3.0	2.7
16	3.0						2.2	33	27	7.7	3.0	2.5
17	3.0						2.4	56	25	*7.0	3.2	2.5
18	2.7						2.6	78	29	7.0	4.3	2.5
19	2.7						2.8	109	23	6.7	5.3	2.5
20	3.0						3.0	124	21	6.7	*5.0	2.5
21	3.2						3.5	104	*22	6.3	4.0	2.5
22	3.0						4.0	96	23	7.3	3.5	3.0
23	3.1						3.7	103	20	7.0	3.5	2.7
24	3.0						3.5	115	18	6.0	3.5	2.5
25	2.9						3.7	130	18	5.6	3.2	2.5
26	3.0						4.0	97	17	5.6	3.2	2.5
27	3.1						4.0	*134	17	10	3.7	2.5
28	3.0						3.9	152	16	7.7	3.7	3.0
29	3.0						3.8	125	15	6.0	3.5	3.2
30	3.0				------		3.7	101	15	5.6	4.0	3.2
31	3.0	------			------		------	90	------	6.3	5.0	------
Total	95.5	98.4	86.8	80.6	69.6	68.2	80.8	1,939.3	1,065	230.9	125.8	90.6
Mean	3.08	3.28	2.8	2.6	2.4	2.2	2.69	62.6	35.5	9.38	4.06	3.02
Ac-ft	189	195	172	160	138	135	160	3,850	2,110	577	250	180

Calendar year 1955: Max 159 Min 2.7 Mean 14.3 Ac-ft 10,360
Water year 1955-56: Max 152 Min - Mean 11.2 Ac-ft 8,120

Peak discharge (base, 190 cfs).--May 20 (8:30 p.m.) 202 cfs (2.81 ft); May 24 (9 p.m.) 287 cfs (3.13 ft); May 27 (7 p.m.) 253 cfs (3.01 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice most of period Oct. 22 to May 15 (no gage-height record Oct. 31 to Nov. 7, Nov. 13 to May 15; discharge estimated on basis of 2 discharge measurements, weather records, and records for station near Mayoworth).

North Fork Powder River near Mayoworth, Wyo.

Location.--Lat 43°54', long 106°53', in sec. 6, T. 45 N., R. 83 W., on right bank 2 miles downstream from Pass Creek and 6 miles northwest of Mayoworth.

Drainage area.--106 sq mi.

Records available.--November 1940 to September 1956 (no winter records prior to 1943).

Gage.--Water-stage recorder. Altitude of gage is 5,590 ft (from topographic map). Prior to May 12, 1948, at site 300 ft downstream at datum 4.43 ft lower.

Average discharge.--14 years (1942-56), 33.6 cfs (24,340 acre-ft per year).

Extremes.--Maximum discharge during year, 486 cfs June 14 (gage height, 4.89 ft); minimum daily, 10 cfs Nov. 2, 3.

1940-56: Maximum discharge, 1,270 cfs Aug. 11, 1941 (gage height, 7.64 ft, site and datum then in use), from rating curve extended above 72 cfs on basis of slope-area determination of peak flow; minimum daily, 5.6 cfs Nov. 5, 1954.

Remarks.--Records good except those for periods of ice effect, which are poor. Two small diversions above station for irrigation of 223 acres on Hat Ranch.

Revisions.--WSP 1209: Drainage area.

Rating tables, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 20		Apr. 21 to Sept. 30			
2.1	8.8	2.2	13	3.3	124
2.2	13	2.5	28	3.8	224
2.4	27	2.9	65		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	19	11	21	21	b14	16	19	26	105	24	18	19
2	19	10	21	21	16	16	19	25	95	25	*17	18
3	19	10	20	20	19	16	19	29	86	*26	18	18
4	19	11	16	20	18	16	19	26	78	24	17	18
5	19	11	16	19	19	16	19	39	*72	23	17	19
6	19	11	19	19	19	16	18	51	65	19	17	19
7	18	11	22	19	18	b15	17	56	58	19	16	*18
8	18	11	22	19	*17	b16	19	65	53	20	17	18
9	18	*11	*21	19	17	b16	18	*75	48	20	16	18
10	16	19	20	19	16	b16	19	77	47	*20	17	18
11	16	24	20	*19	16	b15	*19	64	43	22	18	18
12	14	20	20	19	16	b16	19	62	39	22	17	18
13	*15	16	19	19	17	b16	19	49	37	21	17	18
14	16	21	11	19	17	16	19	42	*60	20	16	18
15	16	14	15	16	b16	b15	19	43	42	18	16	17
16	16	13	19	16	b14	16	21	40	35	18	16	14
17	16	19	19	17	b15	16	22	61	33	18	17	14
18	16	23	19	19	b16	16	23	87	57	*18	18	14
19	16	23	19	19	b16	*18	24	121	36	18	18	14
20	16	24	21	*19	16	18	26	147	33	18	19	14
21	16	21	20	17	16	18	31	*147	32	18	18	14
22	16	21	20	17	16	19	32	124	35	18	18	14
23	18	22	21	18	17	19	28	126	32	20	17	14
24	16	21	21	17	18	19	27	116	30	18	17	14
25	13	21	19	13	17	19	29	185	28	18	17	14
26	11	21	19	16	18	19	*30	130	28	17	18	13
27	12	19	19	17	17	19	30	159	27	17	18	13
28	11	19	19	19	16	18	29	211	26	20	18	14
29	11	21	13	b16	16	18	27	175	25	15	18	14
30	11	21	14	b14	------	19	26	135	24	15	18	14
31	11	------	21	b12	------	19	------	109	------	16	19	------
Total	487	520	586	554	483	527	686	2,802	1,409	605	538	480
Mean	15.7	17.3	18.9	17.9	16.7	17.0	22.9	90.4	47.0	19.5	17.4	16.0
Ac-ft	966	1,030	1,160	1,100	958	1,050	1,360	5,560	2,790	1,200	1,070	952

Calendar year 1955: Max 174 Min 10 Mean 30.3 Ac-ft 21,910
Water year 1955-56: Max 211 Min 10 Mean 26.4 Ac-ft 19,200

Peak discharge (base, 330 cfs).--June 14 (6:30 p.m.) 486 cfs (4.89 ft); June 18 (1 a.m.) 394 cfs (4.52 ft).

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

Middle Fork Powder River near Kaycee, Wyo.

Location.--Lat 43°42', long 106°31, in sec. 13, T. 43 N., R. 81 W, on left bank at Jay Bar U Ranch, 1½ miles downstream from North Fork Powder River and 6 miles east of Kaycee.

Drainage area.--980 sq mi, approximately.

Records available.--October 1933 to August 1934, April 1938 to June 1940, October 1940 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 4,533.76 ft above mean sea level, datum of 1929. Prior to Nov. 16, 1940, chain gage at same site and datum.

Average discharge.--17 years (1938-39, 1940-56), 133 cfs (96,350 acre-ft per year).

Extremes.--Maximum discharge during year, 402 cfs about May 10 (gage height, 3.20 ft); minimum daily, 0.1 cfs July 23, 24, Aug. 2.

1933-34, 1938-56: Maximum discharge, 5,230 cfs Aug. 11, 1941 (gage height, 12.57 ft), from rating curve extended above 1,900 cfs on basis of slope-area determinations at gage heights 8.98, 11.17, and 12.57 ft; no flow July 14-16, Aug. 1-11, 14, 1938, Aug. 8, 1953.

Maximum stage known, about 18.0 ft Sept. 30, 1923. Flood of June 3, 1936, reached a stage of 14.3 ft.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation above station (for details on adjudication of diversions, see Remarks for this station in WSP 1209).

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.7	0	1.2	12
.8	.2	1.5	33
.9	1.3	1.7	55
1.0	3.6	2.0	105
1.1	7.2	3.0	350

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	17	56	80	165	50	115	145	180	127	0.8	0.2	0.4
2	17	62	85	170	60	125	145	170	109	.8	*.1	.4
3	17	62	55	175	70	140	*145	150	88	*36	40	.4
4	11	*81	55	180	80	210	134	170	*66	2.3	.6	.4
5	14	94	58	185	90	*185	136	150	53	.9	.6	.4
6	13	92	70	190	100	150	134	200	40	.9	.6	.4
7	*14	88	85	195	110	120	136	280	25	.9	.6	*.4
8	14	90	95	100	*100	100	136	*290	14	.9	.6	.4
9	12	88	*95	105	90	85	*143	305	3.9	.9	.6	.4
10	9.1	99	100	*116	70	77	200	320	1.0	*.9	.6	.4
11	9.1	111	95	145	78	70	*165	250	.9	21	.6	.4
12	11	105	100	136	74	60	138	190	.7	3.9	.6	*.4
13	13	60	115	132	80	70	129	200	.4	.6	*.7	.4
14	11	50	90	132	78	80	132	*185	*1.0	.4	.7	.4
15	11	40	*50	92	60	100	136	160	36	.2	.7	.4
16	12	50	65	61	55	120	157	143	2.5	.2	.6	.4
17	11	70	80	*78	60	150	176	127	.6	.2	.6	.4
18	11	90	70	100	80	200	179	127	.6	.2	.6	.4
19	9.1	110	85	110	75	*250	179	138	.7	*.2	.6	.4
20	7.2	140	100	120	85	230	196	157	.7	.2	.5	.4
21	8.2	*165	125	125	95	200	214	194	.7	.2	.5	.4
22	12	115	175	130	110	180	242	206	.7	.2	.4	.4
23	18	80	300	135	105	160	239	179	.6	.1	*.4	.4
24	21	75	225	140	*97	150	214	157	1.2	*.1	.4	.3
25	24	70	200	125	125	160	192	150	1.2	.2	.4	.4
26	29	70	165	118	100	170	*160	204	1.2	.2	.5	.4
27	33	50	150	110	100	130	180	204	1.3	.2	.5	*.4
28	38	35	140	100	85	140	210	286	1.5	22	.5	.4
29	37	43	*90	85	100	160	200	262	.8	11	*.5	.4
30	43	70	50	70	------	155	190	202	.7	3.9	.5	.4
31	49	------	60	60	------	150	------	*157	------	.2	.3	------
Total	555.7	2,411	3,308	3,885	2,462	4,392	5,082	6,093	580.9	110.7	55.6	11.9
Mean	17.9	80.4	107	125	84.9	142	169	197	19.4	3.57	1.79	0.40
Ac-ft	1,100	4,780	6,560	7,710	4,880	8,710	10,080	12,090	1,150	220	110	24

Calendar year 1955:	Max	1,020	Min	0.5	Mean	122	Ac-ft	88,040
Water year 1955-56:	Max	320	Min	0.1	Mean	79.1	Ac-ft	57,410

Peak discharge (base, 930 cfs).--No peak above base.

* Discharge measurement made on this day.

Note.--No gage-height record Feb. 16-24, Mar. 10 to Apr. 3, Apr. 10, 11, Apr. 26 to May 14; discharge estimated on basis of 7 discharge measurements, weather records, recorded range in stage, and records for Powder River at Sussex. Stage-discharge relation affected by ice Nov. 13 to Jan. 9, Jan. 18 to Feb. 15, Feb. 25 to Mar. 9.

Powder River at Sussex, Wyo.

Location.--43°42', long 106°17', in sec. 13, T. 43 N., R. 79 W., on left bank at Sussex, 3 miles downstream from Salt Creek.

Drainage area.--3,090 sq mi, approximately.

Records available.--April 1938 to June 1940, February 1950 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 4,362.16 ft above mean sea level, datum of 1929 (Bureau of Reclamation benchmark). Apr. 10, 1938, to June 30, 1940, chain gage at site 100 ft upstream at datum 1.07 ft higher.

Average discharge.--7 years (1938-39, 1950-56), 151 cfs (109,400 acre-ft per year).

Extremes.--Maximum discharge during year, 1,660 cfs May 28 (gage height, 5.45 ft); minimum daily, 5.0 cfs Sept. 23.

1938-40, 1950-56: Maximum discharge, 32,500 cfs May 23, 1952 (gage height, 12.6 ft, from floodmarks), from rating curve extended above 1,500 cfs on basis of slope-area determination of peak flow; minimum daily, 1.5 cfs Aug. 25, 1939.

Maximum stage known, about 13.3 ft Sept. 30, 1923, from information by local resident.

Remarks.--Records fair except those for periods of ice effect and doubtful or no gage-height record, which are poor. Diversions for irrigation above station (for details on adjudication of diversions, see Remarks for this station in WSP 1209).

Rating tables, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Dec. 27, 28, Mar. 5-15, 19-29, Apr. 8 to May 26, July 31 to Aug. 3, Aug. 12, 13)

Oct. 1 to May 27, July 30 to Sept. 30				May 28 to June 14				June 15 to July 29			
3.1	23	3.9	210	3.5	16	4.0	90	3.2	4.5	3.7	51
3.3	50	4.2	370	3.6	21	4.2	195	3.3	9.0	3.9	120
3.6	103	4.5	610	3.7	28	4.5	430	3.4	15	4.1	215
				3.8	39	5.0	990	3.5	23	4.4	415
				3.9	56	5.5	1,750	3.6	34		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	41	a91	160	120	85	300	g230	215	*190	9.6	*g114	6.0
2	34	a91	125	130	90	350	g240	198	156	*16	103	6.0
3	33	a96	90	140	95	500	*g178	154	135	63	96	6.0
4	33	*a130	60	*145	100	1,000	210	178	120	56	71	6.7
5	30	125	*73	160	105	*504	235	150	146	14	47	7.4
6	31	130	80	180	*109	260	206	202	110	10	30	*8.1
7	*31	142	90	200	115	220	260	270	63	7.2	*15	8.1
8	33	130	100	220	120	202	255	*285	*46	6.8	12	7.4
9	31	119	110	250	130	190	*255	310	32	6.3	10	6.7
10	30	122	120	*290	140	142	398	316	26	6.8	19	6.7
11	28	75	130	270	150	119	565	300	22	7.6	47	6.7
12	31	60	140	250	160	*111	352	235	19	*71	99	*6.0
13	*33	50	130	230	135	125	255	250	17	14	*g47	6.0
14	34	40	115	150	*120	138	235	*245	*18	10	a15	6.0
15	33	30	*100	100	90	178	194	182	246	7.2	a14	6.0
16	31	45	110	80	60	230	194	142	86	6.3	a13	6.0
17	33	*62	100	*106	80	275	215	116	41	6.8	a12	*5.5
18	31	100	80	115	70	352	*215	108	25	6.8	a35	5.5
19	30	150	90	125	80	*580	202	127	17	*6.3	a21	5.5
20	29	200	*103	130	*90	g583	206	134	14	5.8	a19	5.5
21	28	250	150	135	100	g472	215	*182	13	5.8	a17	5.5
22	28	200	250	140	125	g334	260	332	a12	5.4	a13	5.5
23	34	150	500	145	200	g270	290	521	a11	5.8	*9.5	5.0
24	42	160	750	*150	370	g250	225	346	a10	*5.8	7.4	6.0
25	40	160	250	140	410	g275	194	*265	*93	5.8	7.4	6.7
26	42	150	210	130	285	g260	*194	452	123	5.8	6.7	6.7
27	*47	85	182	120	*200	*g220	220	*583	34	23	6.7	*8.1
28	62	*115	*166	110	220	g240	260	*1,030	20	342	6.0	7.4
29	67	130	125	105	250	g269	245	563	13	151	*5.5	7.4
30	71	150	100	*101	------	g255	235	376	9.6	693	5.5	8.1
31	80	------	110	95	------	g235	------	*276	------	g154	6.0	------
Total	1,181	3,538	4,899	4,762	4,284	9,439	7,438	9,043	1,867.6	1,734.9	929.7	194.2
Mean	38.1	118	158	154	148	304	248	292	62.3	56.0	30.0	6.47
Ac-ft	2,340	7,020	9,720	9,450	8,500	18,720	14,750	17,940	3,700	3,440	1,840	385

Calendar year 1955: Max 5,020 Min 9.8 Mean 225 Ac-ft 162,600
Water year 1955-56: Max 1,030 Min 5.0 Mean 135 Ac-ft 97,810

Peak discharge (base, 2,000 cfs).--No peak above base.
* Discharge measurement made on this day.
a Doubtful or no gage-height record; discharge estimated on basis of 1 discharge measurement, recorded range in stage, typical recession, and records for stations on Middle Fork and South Fork Powder Rivers.
g Computed from twice-daily wire-weight-gage readings.
Note.--Stage-discharge relation affected by ice Nov. 11 to Dec. 26, Dec. 29 to Mar. 4.

North Fork Crazy Woman Creek below Spring Draw, near Buffalo, Wyo.

Location.--Lat 44°11'50", long 106°46'25", in NW¼NW¼ sec. 30, T. 49 N., R. 82 W., on right bank 1 mile upstream from Little North Fork and 11 miles southwest of Buffalo.

Drainage area.--51.7 sq mi.

Records available.--October 1949 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 5,320 ft (from topographic map).

Average discharge.--7 years, 15.1 cfs (10,940 acre-ft per year).

Extremes.--Maximum discharge during year, 166 cfs May 28 (gage height, 4.09 ft); minimum daily, 1.5 cfs Jan. 29, Feb. 16.

1949-56: Maximum discharge, 446 cfs June 15, 1953 (gage height 4.96 ft), from rating curve extended above 70 cfs on basis of slope-area determination at gage height 5.42 ft; minimum daily, 1.0 cfs Nov. 27, 1952.

Flood of June 6, 1949, reached a stage of 5.42 ft, from floodmark (discharge, 610 cfs).

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation above station (for details on adjudication of diversions, see Remarks for this station in WSP 1209).

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Sept. 5-8)

2.8	2.4	3.2	17
2.9	4.5	3.4	34
3.0	7.4	3.6	59
3.1	11	4.0	142

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.6	b4.5	b4.4	b4.5	b2.1	3.3	8.0	9.4	93	23	11	8.7
2	5.4	b4.0	b4.5	4.5	2.3	3.3	7.1	10	93	23	*12	8.3
3	5.4	b4.5	4.5	4.3	2.6	3.5	6.5	15	95	*21	12	8.0
4	5.4	5.4	4.5	4.3	2.8	3.1	5.6	*12	95	18	11	8.0
5	5.4	5.4	4.5	4.3	2.7	3.1	5.9	29	97	18	9.4	8.7
6	5.1	5.1	4.5	4.0	2.6	2.9	b5.0	33	82	19	8.7	*9.0
7	5.1	4.5	4.5	4.0	*2.5	2.7	b4.5	29	66	18	8.7	8.7
8	5.4	*4.3	*4.3	4.0	b2.5	2.9	5.4	34	*66	17	8.0	8.3
9	5.4	4.5	4.5	*b4.0	b2.6	3.1	4.8	36	62	*16	8.0	7.7
10	5.4	4.8	4.3	3.8	b2.7	b2.5	*5.1	34	61	15	7.7	7.1
11	*5.1	b4.8	4.3	3.8	2.5	b2.0	5.4	29	59	15	7.7	7.1
12	4.8	b4.5	4.3	3.8	2.7	2.5	4.5	30	56	17	7.7	7.4
13	4.8	b4.2	4.3	3.8	2.5	3.0	3.5	23	51	16	7.1	7.7
14	4.8	b3.8	b3.3	3.8	2.2	3.5	4.0	19	49	13	5.9	7.7
15	5.1	b3.5	b4.0	b3.3	1.8	*4.2	4.5	26	56	12	5.6	6.8
16	5.1	b4.0	b4.2	b3.0	1.5	5.0	7.4	26	55	12	5.9	6.5
17	5.4	b4.5	b4.4	b4.0	2.0	5.5	8.7	*38	45	12	5.9	6.5
18	5.4	b5.0	b4.5	4.8	2.5	6.0	9.4	56	58	12	9.4	5.9
19	5.1	b5.8	b4.7	*5.4	3.0	7.0	11	66	46	*12	13	5.6
20	5.1	5.9	4.8	5.9	3.5	8.0	16	74	40	12	11	5.6
21	5.1	5.4	4.8	7.7	4.0	9.0	19	87	37	11	*8.7	5.4
22	5.1	*5.1	5.1	8.7	4.5	10	17	109	*37	12	7.4	5.6
23	5.6	4.8	*5.6	8.3	*5.0	11	12	104	32	11	6.8	5.6
24	5.4	4.5	5.9	5.4	4.7	12	9.8	*86	31	11	6.8	5.6
25	6.2	4.5	5.6	b4.2	4.5	14	16	113	31	11	6.8	5.6
26	5.9	4.3	5.1	b3.2	4.0	13	19	111	30	11	6.5	5.4
27	5.9	b3.5	5.1	b2.5	3.5	12	18	118	28	10	7.4	5.1
28	5.1	b3.8	b4.3	b1.9	*3.3	*11	16	132	25	12	8.7	5.4
29	5.4	b4.0	b4.0	b1.5	3.3	b9.0	13	106	24	11	8.3	5.4
30	5.4	b4.2	b3.5	b1.7	------	7.1	9.4	91	23	11	8.0	5.9
31	6.5	------	b4.0	b1.9	------	6.8	------	*86	------	12	9.0	------
Total	165.9	137.1	140.3	130.3	86.4	192.0	281.5	1,771.4	1,623	444	260.1	204.3
Mean	5.35	4.57	4.53	4.20	2.98	6.19	9.38	57.1	54.1	14.3	8.39	6.81
Ac-ft	329	272	278	258	171	381	558	3,510	3,220	881	516	405

Calendar year 1955: Max 128 Min 1.2 Mean 13.0 Ac-ft 9,400
Water year 1955-56: Max 132 Min 1.5 Mean 14.9 Ac-ft 10,780

Peak discharge (base, 160 cfs).--May 28 (2 a.m.) 166 cfs (4.09 ft).
* *Discharge measurements made on this day.*
b Stage-discharge relation affected by ice.
Note.--No gage-height record Feb. 1-7, 11-28, Mar. 12-28; discharge estimated on basis of 5 discharge measurements and weather records.

North Fork Crazy Woman Creek near Greub, Wyo.

Location.--Lat 44°05', long 106°39', in SW¼ sec. 36, T. 48 N., R. 82 W., on left bank 1 mile upstream from Middle Fork Crazy Woman Creek, 5 miles northeast of Greub, and 6 miles upstream from confluence with South Fork Crazy Woman Creek.

Drainage area.--174 sq mi.

Records available.--March 1950 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 4,650 ft (from topographic map). Prior to Sept. 13, 1950, staff gage at same site and datum.

Average discharge.--6 years, 11.4 cfs (8,260 acre-ft per year).

Extremes.--Maximum discharge during year, 199 cfs May 27 (gage height, 3.20 ft); no flow July 18-24.

1950-56: Maximum discharge, 619 cfs June 15, 1953 (gage height, 7.00 ft, from floodmarks), from rating curve extended above 190 cfs on basis of slope-area determination of peak flow; no flow Sept. 3-5, 10, 14-17, 1955, July 18-24, 1956.

Remarks.--Records good except those after July 5, which are fair, and those for periods of ice effect, backwater from beaver dam, or no gage-height record, which are poor. Diversions for irrigation above station (for details on adjudication of diversions, see Remarks for this station in WSP 1209).

Rating table, water year 1955-56, except periods of ice effect and backwater from beaver dam (gage height in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 28 to July 17)

1.1	0	1.6	8.2
1.2	.5	1.8	19
1.3	1.4	2.0	36
1.4	2.8	2.5	98
1.5	5.0		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.3	4.1	7.0	6.0	3.0	22	7.2	4.8	55	2.2	9.6	2.1
2	4.8	4.5	6.5	6.3	3.5	19	7.6	4.6	*54	2.1	*9.7	3.9
3	4.3	4.8	6.0	6.5	4.0	18	6.0	4.1	48	*2.4	8.7	3.9
4	4.1	4.6	6.5	7.0	4.5	21	7.2	*4.3	43	1.8	8.7	2.8
5	3.9	4.1	7.0	7.5	5.0	17	7.2	6.6	*45	1.5	7.6	2.2
6	2.7	3.7	8.0	7.0	5.5	10	4.5	8.3	45	1.3	6.0	*3.2
7	2.7	3.7	7.5	8.0	*5.9	7.0	5.6	18	32	1.1	4.3	6.3
8	2.7	3.5	*7.0	8.0	5.8	9.0	5.6	21	26	1.0	4.8	4.3
9	3.2	*3.9	6.0	*7.5	6.0	8.0	5.6	*25	26	.9	3.5	3.0
10	2.2	3.9	6.3	7.5	6.5	6.0	*7.2	17	22	.8	4.6	3.0
11	*2.2	3.8	6.6	7.5	6.0	4.0	6.9	14	24	.9	4.3	3.2
12	2.4	3.6	6.9	7.5	6.5	5.0	4.8	7.6	17	.9	4.3	3.0
13	2.7	3.4	6.6	7.0	6.0	6.0	4.3	6.0	*19	1.0	4.1	3.7
14	2.7	3.2	6.0	6.0	4.5	6.7	4.1	5.0	14	.6	4.1	3.2
15	2.7	3.0	6.5	5.0	3.5	*7.3	3.9	4.3	14	.2	3.2	3.9
16	2.8	3.5	6.0	4.5	2.5	12	3.5	4.3	17	.2	2.8	4.6
17	3.0	4.0	5.5	5.0	3.5	21	3.5	*3.2	15	.1	2.8	4.3
18	2.8	4.8	5.0	6.0	5.0	35	3.5	3.2	11	0	3.9	3.9
19	3.7	8.5	6.0	*6.2	7.0	60	3.5	13	17	0	6.0	3.0
20	3.7	25	8.0	6.2	9.0	50	3.2	19	9.2	0	13	2.5
21	2.5	*16	12	6.0	11	43	2.7	35	6.9	0	10	2.4
22	3.0	10	20	6.5	12	31	4.8	44	*6.9	0	6.9	2.5
23	3.2	7.6	*30	7.0	13	27	7.2	63	6.0	0	3.2	2.5
24	3.2	8.7	17	7.5	*11	21	5.6	51	4.8	0	2.4	c2.5
25	3.7	11	14	7.0	10	17	4.1	*45	4.3	6.4	2.2	c2.5
26	3.9	14	13	6.0	12	15	3.5	72	4.6	9.2	2.0	c2.4
27	4.3	5.0	14	5.5	19	12	7.2	70	3.9	10	1.5	c2.3
28	4.3	5.5	8.5	5.0	19	10	7.6	89	3.2	13	1.7	c2.4
29	4.6	6.0	5.0	4.5	22	9.0	5.6	*86	3.0	12	1.7	c2.4
30	4.6	6.5	5.5	4.0	------	*12	5.0	71	2.5	9.6	1.7	c2.7
31	3.7	------	6.5	3.5	------	8.7	------	57	------	8.2	2.1	------
Total	106.6	193.9	276.4	194.7	232.2	549.7	158.2	876.3	599.3	87.4	150.4	94.6
Mean	3.44	6.46	8.92	6.28	8.01	17.7	5.27	28.3	20.0	2.82	4.85	3.15
Ac-ft	211	385	548	386	461	1,090	314	1,740	1,190	173	298	188

Calendar year 1955: Max	216	Min	0	Mean	8.39	Ac-ft	6,080
Water year 1955-56: Max	89	Min	0	Mean	9.62	Ac-ft	6,980

Peak discharge (base, 180 cfs).--May 27 (5 p.m.) 199 cfs (3.20 ft).

* Discharge measurement made on this day.

c Backwater from beaver dam.

Note.--Stage-discharge relation affected by ice Oct. 31 to Nov. 2, Nov. 8, 11-17, Nov. 27 to Dec. 23, Dec. 28 to Feb. 26 (no gage-height record Feb. 11-17), Mar. 6-20, 28, 29, Apr. 2, 3, 6.

Middle Fork Crazy Woman Creek near Greub, Wyo.

Location.--Lat 44°03', long 106°48', in sec. 11, T. 47 N., R. 83 W., on left bank a quarter of a mile downstream from Poison Creek and 2½ miles west of Greub.

Drainage area.--82.7 sq mi.

Records available.--October 1944 to September 1956 in reports of Geological Survey. January 1943 to September 1944 in files of Bureau of Reclamation.

Gage.--Water-stage recorder. Altitude of gage is 5,190 ft (from topographic map). Prior to June 7, 1952, at site 30 ft downstream at datum 0.86 ft lower.

Average discharge.--13 years (1943-56), 21.9 cfs (15,870 acre-ft per year).

Extremes.--Maximum discharge during year, 215 cfs May 28 (gage height, 2.28 ft); minimum daily, 5.3 cfs Aug. 15, 16.

1944-56: Maximum discharge, 4,520 cfs May 2, 1947 (gage height, 5.77 ft, site and datum then in use), from rating curve extended above 110 cfs by logarithmic plotting; minimum, 3.2 cfs Aug. 31, 1954 (gage height, 0.48 ft).

Remarks.--Records good except those for periods of no gage-height record, which are poor. No diversion above station.

Rating table, water year 1955-56 (gage height in feet, and discharge, in cubic feet per second)

0.6	4.9	1.4	50
.7	6.7	1.7	92
.9	13	2.2	196
1.1	24		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.5	7.0	8.0	8.0	6.5	6.8	11	25	97	17	8.3	7.2
2	7.5	6.3	8.0	7.8	6.3	6.8	10	25	*89	*19	*7.8	6.5
3	7.2	8.0	8.0	7.5	6.5	6.6	10	27	82	19	8.9	6.3
4	6.7	8.6	7.8	7.5	6.7	6.8	11	*25	76	16	8.3	6.2
5	6.7	8.9	8.0	7.5	6.7	6.8	11	38	*73	15	6.7	7.0
6	6.5	7.5	8.0	7.5	6.7	6.6	10	44	68	14	6.3	*7.0
7	6.7	7.2	7.8	7.5	*6.7	6.4	11	40	62	14	6.3	6.7
8	6.5	7.2	*7.8	7.5	6.3	6.8	11	45	54	13	6.3	6.2
9	6.5	*8.0	7.8	*7.2	6.3	6.6	11	45	51	*12	6.2	6.0
10	6.5	6.7	7.8	7.0	6.3	6.4	*12	47	50	12	6.0	5.8
11	*6.7	6.2	7.8	7.0	6.3	6.0	14	44	45	12	6.3	6.0
12	7.0	7.2	7.8	7.0	6.5	6.2	13	43	41	13	6.5	6.2
13	7.2	7.0	7.6	6.7	6.5	6.4	15	40	*38	12	6.0	7.5
14	7.2	6.7	5.5	6.7	6.5	6.8	15	37	38	10	5.4	7.8
15	7.2	6.2	6.5	6.0	6.5	*7.0	14	37	38	9.1	5.3	6.3
16	7.5	6.2	7.8	6.3	6.3	7.0	14	34	38	8.9	5.3	6.0
17	7.2	6.5	7.8	6.3	6.5	7.0	15	*40	34	8.9	5.6	6.0
18	7.2	7.8	7.8	6.5	6.6	7.2	16	47	42	*8.9	7.5	5.8
19	6.7	8.6	7.8	*6.5	6.6	8.3	20	52	33	9.4	11	5.6
20	7.2	9.1	8.3	6.5	6.6	9.4	25	61	28	8.9	10	5.4
21	7.0	8.6	8.0	6.5	7.0	9.8	30	65	26	8.3	8.3	5.8
22	7.2	8.0	8.2	6.5	7.4	11	32	78	*26	8.3	6.5	6.2
23	9.1	7.8	*8.5	6.5	7.4	12	29	73	24	9.1	6.0	6.5
24	8.6	7.5	10	6.5	7.0	13	28	*73	22	8.0	6.0	6.2
25	8.3	7.5	9.4	6.5	7.0	13	27	99	22	7.2	5.8	6.2
26	8.9	7.0	8.3	6.5	6.8	12	26	105	21	7.0	6.3	6.0
27	9.8	7.5	8.3	6.7	6.6	11	26	124	19	7.0	6.5	6.2
28	8.3	7.8	7.5	6.5	6.7	10	25	176	18	16	6.5	6.3
29	7.8	7.8	6.0	6.5	6.8	10	25	*137	17	12	6.7	6.5
30	8.6	7.8	8.0	6.5	------	11	25	126	16	8.9	6.7	6.7
31	8.9	------	8.3	6.5	------	12	------	105	------	8.3	7.2	------
Total	231.9	224.2	244.2	212.2	192.6	262.7	542	1,957	1,288	352.2	212.5	190.1
Mean	7.48	7.47	7.88	6.85	6.64	8.47	18.1	63.1	42.9	11.4	6.85	6.34
Ac-ft	460	445	484	421	382	521	1,080	3,880	2,550	699	421	377

Calendar year 1955: Max 138 Min 4.5 Mean 15.9 Ac-ft 11,480
Water year 1955-56: Max 176 Min 5.3 Mean 16.1 Ac-ft 11,720

Peak discharge (base, 140 cfs).--May 28 (5 a.m.) 215 cfs (2.28 ft).

* Discharge measurement made on this day.

Note.--No gage-height record Dec. 10-23, Feb. 18 to Mar. 15, Mar. 21 to Apr. 10, Apr. 12 to May 4; discharge estimated on basis of 4 discharge measurements, weather records and records for station on North Fork Powder River near Mayoworth.

Crazy Woman Creek near Arvada, Wyo.

Location.--Lat 44°29', long 106°09', in sec. 17, T. 52 N., R. 77 W., on left bank a quarter of a mile upstream from mouth and 12 miles south of Arvada.

Drainage area.--956 sq mi.

Records available.--October 1939 to December 1943, January 1950 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 3,737.07 ft above mean sea level, datum of 1929. Oct. 1, 1939, to Dec. 31, 1943, chain gage at site about half a mile upstream at different datum.

Average discharge.--10 years, 39.5 cfs (28,620 acre-ft per year).

Extremes.--Maximum discharge during year, about 900 cfs Mar. 20; maximum gage height, 11.45 ft Mar. 20 (ice jam); no flow for many days in summer and fall.

1939-43, 1950-56: Maximum discharge, 1,890 cfs Aug. 7, 1955 (gage height, 10.39 ft, from floodmark), from rating curve extended above 700 cfs on basis of discharge from rating at former site about half a mile upstream at gage height 9.7 ft for present site; no flow at times in 1939-40, 1942, 1950-56.

Remarks.--Records good except those for periods of ice effect, backwater, or no gage-height record, which are poor. Diversions for irrigation above station (for details on adjudication of diversions, see Remarks for this station in WSP 1209).

Rating table, water year 1955-56, except periods of ice effect and backwater from Powder River (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 17 to Nov. 11, May 30 to June 4)

2.0	0	2.7	20
2.1	.1	3.0	40
2.2	.8	3.5	80
2.3	2.2	4.0	138
2.4	4.8	4.5	201
2.5	8.8	5.0	296

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0	6.5	12	7.0	40	48	23	142	1.2	.9	
2	0	.1	6.0	13	*10	53	44	20	*115	9.8	.7	
3	0	.1	5.0	*15	11	75	39	18	108	30	.6	
4	0	.1	5.3	17	12	90	*38	16	100	9.8	1.2	
5	0	.1	5.6	20	13	50	36	15	88	15	.6	
6	0	.1	6.0	17	13	40	35	14	79	*6.8	.2	
7	0	.1	6.3	15	13	45	33	13	*69	4.0	.1	
8	0	*.1	6.7	17	13	50	32	*12	65	1.9	0	
9	0	.1	7.0	15	11	*46	29	11	55	.9	0	
10	0	.2	7.2	16	12	25	28	11	48	.7	0	
11	0	.1	7.0	17	13	10	28	13	40	*.6	0	(*)
12	*0	.1	*7.5	16	11	12	27	15	32	.5	0	
13	0	.1	7.0	15	9.5	15	25	18	25	.4	0	
14	.1	*.1	6.5	14	8.0	*20	26	20	21	.2	0	
15	.1	.1	6.0	10	*7.0	22	25	20	*c20	.1	0	
16	.1	.1	5.5	9.0	7.5	25	20	18	c17	.1	0	
17	.1	.1	6.0	10	8.0	30	17	*16	13	.4	0	
18	.1	.1	5.5	11	8.5	100	17	11	12	.1	0	
19	.1	.1	*6.5	*13	9.0	500	27	11	10	.1	0	
20	.1	.1	8.0	11	10	700	27	32	8.4	0	0	
21	.1	*.1	10	10	11	*350	24	18	8.0	0	0	
22	.1	.1	20	10	12	*282	23	12	7.6	0	0	
23	.1	.1	200	10	17	168	*30	*10	11	0	0	
24	.1	.1	100	11	30	137	33	22	6.8	*0	0	
25	.1	.1	45	*11	*40	112	31	46	*5.6	0	0	
26	*0	4.1	30	11	35	*82	28	55	4.3	0	0	
27	0	5.0	*40	11	30	64	26	49	3.2	0	0	
28	.1	5.3	30	10	*26	56	25	97	2.7	0	*0	
29	0	*5.6	15	9.0	30	53	22	137	2.2	24	0	
30	0	6.0	10	8.0	------	47	24	179	1.8	8.8	0	
31	0	------	11	7.5	------	47	------	161	------	*3.0	0	------
Total	1.3	28.5	638.1	391.5	437.5	3,346	867	1,113	1,120.6	118.4	4.3	0
Mean	0.04	0.10	20.6	12.6	15.1	108	28.9	35.9	37.4	3.82	0.14	0
Ac-ft	2.6	57	1,270	777	868	6,640	1,720	2,210	2,220	235	8.5	0

Calendar year 1955:	Max	600	Min	0	Mean	24.4	Ac-ft	17,660
Water year 1955-56:	Max	700	Min	0	Mean	22.0	Ac-ft	16,000

Peak discharge (base, 500 cfs).--Dec. 23 (6 p.m.) about 800 cfs; Mar. 20 (9 p.m.) about 900 cfs.
* Discharge measurement or observation of no flow made on this day.
c Backwater from Powder River.
Note.--Stage-discharge relation affected by ice Nov. 12 to Mar. 21. No gage-height record May 3-17; discharge estimated on basis of 2 discharge measurements and records for nearby stations.

Powder River at Arvada, Wyo.

Location.--Lat 44°39', long 106°08", in sec. 16, T. 54 N., R. 77 W., on left bank at Arvada, three-quarters of a mile upstream from Wildhorse Creek.

Drainage area.--6,050 sq mi, approximately.

Records available.--September 1915 to September 1956 (no winter records prior to 1916). Published as "near Arvada" 1915-19.

Gage.--Water-stage recorder. Datum of gage is 3,622.01 ft above mean sea level, datum of 1929. Prior to Nov. 17, 1915, staff gage at site 16 miles downstream at different datum. May 4, 1916, to Apr. 29, 1919, chain gage at site 17 miles downstream at different datum. May 4, 1919, to Oct. 23, 1938, chain gage at site half a mile downstream at present datum.

Average discharge.--40 years (1916-56), 382 cfs (276,700 acre-ft per year).

Extremes.--Maximum discharge during year, 8,380 cfs June 16 (gage height, 8.70 ft); maximum gage height, 10.00 ft Mar. 20 (ice jam); no flow Aug. 29 to Sept. 12, Sept. 17-30. 1915-56: Maximum discharge, 72,000 cfs Sept. 29, 1923 (gage height, 23.7 ft, from floodmarks, site then in use), from rating curve extended above 2,000 cfs on basis of slope-area determination of peak flow; no flow at times during summers of many years.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation above station (for details on adjudication of diversions, see Remarks for this station in WSP 1209). Records of water temperatures and suspended sediment loads for the water year 1956 are given in WSP 1451.

Revisions (water years).--WSP 731: 1923(M).

Rating tables, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 12-20, June 18 to July 1, July 30 to Aug. 3)

Oct. 1 to Apr. 15, June 17 to Sept. 30

0.8	0	2.3	160
.9	.2	2.6	250
1.0	3.0	3.0	450
1.2	12	3.5	780
1.5	32	4.0	1,240
1.7	55	4.5	1,790
2.0	102		

Apr. 16 to June 16

2.2	29	3.5	555
2.3	46	4.0	930
2.6	130	6.0	3,400
3.0	280	8.0	6,800

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	66	25	39	60	*50	210	191	276	483	31	412	0
2	54	*23	35	65	54	225	206	255	380	100	180	0
3	40	80	40	70	58	240	*232	*255	*338	*1,560	362	0
4	33	102	45	*68	62	250	266	242	294	*175	162	0
5	30	76	50	*65	64	265	250	211	267	86	107	0
6	*23	56	55	70	67	250	250	199	218	a60	*83	0
7	21	73	*58	80	69	225	254	199	180	a45	68	0
8	20	*81	64	100	*71	*320	246	*222	152	a35	43	0
9	17	81	70	120	72	*375	236	246	130	a27	*160	0
10	13	84	73	*148	74	250	276	276	130	a21	68	0
11	13	84	76	160	76	150	*250	294	114	*a17	75	*0
12	*12	50	*78	170	78	100	368	327	88	15	42	0
13	9.6	25	76	125	80	110	468	327	61	12	25	11
14	11	*15	74	98	82	*115	395	272	43	9.6	20	20
15	11	12	74	80	*84	100	325	267	*42	7.3	67	1.9
16	11	10	74	70	84	150	263	*263	*3,650	6.0	*42	.2
17	14	8	74	60	84	250	226	215	411	25	27	0
18	17	9	73	70	84	500	*211	188	*194	*18	22	0
19	20	10	*72	*86	83	1,200	218	162	132	22	16	0
20	21	10	90	80	83	*4,500	207	159	*89	11	12	0
21	*22	*11	200	90	82	*3,100	184	204	67	7.3	8.2	0
22	22	15	400	100	81	*1,750	188	203	54	4.3	*4.7	0
23	23	20	600	110	*81	1,040	*218	*560	53	2.4	2.7	0
24	23	30	800	120	200	668	251	614	48	*1.0	1.6	0
25	25	35	700	*132	*570	536	272	549	*38	.8	.5	0
26	*24	40	800	130	450	*439	238	531	31	.5	1.0	*0
27	24	40	*1,000	110	300	378	218	396	28	.5	1.0	0
28	25	38	300	90	*200	330	234	648	26	2.2	*.5	0
29	30	*36	100	74	205	295	263	867	25	15	0	0
30	32	40	50	60	------	282	280	876	35	254	0	0
31	34	------	55	55	------	222	------	*634	------	*474	0	------
Total	740.6	1,219	6,295	2,916	3,628	18,825	7,651	10,937	7,801	3,044.9	2,013.2	33.1
Mean	23.9	40.6	203	94.1	125	607	255	353	260	98.2	64.9	1.10
Ac-ft	1,470	2,420	12,490	5,780	7,200	37,340	15,180	21,690	15,470	6,040	3,990	66

Calendar year 1955: Max 3,480 Min 0 Mean 266 Ac-ft 192,500
Water year 1955-56: Max 4,500 Min 0 Mean 177 Ac-ft 129,100

Peak discharge (base, 2,200 cfs).--June 16 (6 a.m.) 8,380 cfs (8.70 ft); July 3 (5 a.m.) 5,130 cfs (6.88 ft).

* Discharge measurement or observation of no flow made on this day.

a No gage-height record; discharge estimated on basis of 1 discharge measurement and typical recession.

Note.--Stage-discharge relation affected by ice Nov. 1, 2, Nov. 12 to Mar. 21.

North Fork Clear Creek near Buffalo, Wyo.

Location.--Lat 44°19'12", long 106°54'35", in SW$\frac{1}{4}$NE$\frac{1}{4}$ sec. 12, T. 50 N., R. 84 W., on left bank 1 mile upstream from confluence with South Fork Clear Creek, 1$\frac{1}{4}$ miles east of Hunter ranger station, and 10.5 miles west of Buffalo.

Drainage area.--29.0 sq mi.

Records available.--October 1949 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 6,950 ft (from topographic map).

Average discharge.--7 years, 12.9 cfs (9,350 acre-ft per year).

Extremes.--Maximum discharge during year, 129 cfs June 5 (gage height, 2.51 ft); minimum daily, 3.5 cfs Feb. 16.

1949-56: Maximum discharge, 407 cfs June 7, 1952 (gage height, 3.22 ft), from rating curve extended above 74 cfs by logarithmic plotting; maximum gage height, 4.91 ft Apr. 7, 1952 (backwater from ice); minimum daily discharge, 1.5 cfs Dec. 28, 1954.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Two diversions for irrigation above station into French Creek (for details on adjudication of diversions, see Remarks for this station in WSP 1209).

Rating tables, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 6				Apr. 7 to Sept. 30			
1.1	2.1	1.5	12	1.2	4.1	1.8	32
1.2	3.6	1.6	17	1.4	10	2.0	51
1.3	5.7			1.6	19	2.4	110

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.6	5.5	5.1	6.2	b5.4	3.8	6.8	11	58	13	30	8.7
2	4.4	5.7	5.1	6.2	b5.8	3.8	6.0	12	*70	14	23	7.7
3	4.2	14	5.1	6.2	*b6.4	3.8	6.2	*13	75	18	33	6.2
4	4.2	6.5	4.9	6.0	b6.0	3.8	6.5	13	84	13	28	6.2
5	4.2	6.2	4.9	5.7	b5.5	3.8	5.5	19	105	12	24	*6.2
6	4.2	b5.5	4.9	*5.7	5.1	4.0	*b6.0	23	*69	12	*23	6.2
7	4.2	*6.8	*4.9	5.7	5.1	4.0	b5.5	24	37	12	21	5.7
8	4.2	6.8	4.9	5.5	4.9	4.4	b5.7	27	36	11	20	5.4
9	4.0	6.0	5.1	5.5	4.6	4.2	b5.8	30	45	10	18	5.1
10	*4.0	6.0	5.3	5.3	4.4	4.0	b6.0	31	52	*10	17	5.4
11	4.0	b5.6	5.7	5.3	4.4	4.2	6.2	27	57	10	16	5.4
12	4.2	b5.3	6.2	5.1	4.2	4.6	6.7	28	58	10	16	5.4
13	4.2	b5.0	*7.0	5.3	4.2	4.9	9.0	21	56	10	14	5.9
14	4.2	b4.7	6.8	5.3	4.0	*5.1	11	19	55	9.7	14	5.7
15	4.2	a4.5	6.8	5.1	b3.7	5.3	12	19	*68	9.3	12	5.1
16	4.2	a4.8	7.0	5.1	b3.5	5.3	13	*23	52	9.3	7.0	5.4
17	4.2	a5.2	7.0	4.9	b3.8	4.9	12	35	28	*9.3	11	5.1
18	4.0	a5.7	6.8	*4.9	b4.0	4.4	12	37	31	9.3	41	5.1
19	4.0	a6.5	6.8	5.1	b4.3	4.9	13	27	24	9.0	36	5.1
20	4.6	a6.0	6.8	5.3	b4.6	4.9	16	32	23	8.4	*31	4.9
21	4.6	a5.5	6.8	6.0	b4.8	5.3	16	51	21	8.4	22	5.1
22	4.6	*a5.3	7.0	6.2	b5.0	b6.0	14	81	*16	8.7	18	5.4
23	4.6	5.3	7.6	6.2	*5.1	b7.0	12	100	14	8.0	14	5.1
24	4.6	5.1	8.1	6.2	4.2	b8.0	12	*81	14	8.0	12	5.4
25	4.4	5.1	7.0	6.0	4.0	b10	14	96	14	9.0	11	5.1
26	4.2	5.1	6.8	6.0	4.0	b9.0	15	87	13	26	10	5.1
27	b4.0	5.1	6.8	*5.7	4.0	8.1	15	*98	13	28	12	5.1
28	b4.2	5.1	6.5	5.5	4.0	7.3	12	82	14	36	10	5.4
29	b4.5	5.1	b5.0	5.3	4.0	8.1	11	53	13	36	9.0	5.7
30	b5.0	5.1	b5.5	5.3	------	*7.3	10	44	13	35	11	5.1
31	5.5	------	b6.0	b5.0	------	7.3	------	43	------	35	10	------
Total	134.2	174.1	190.2	172.8	133.0	171.5	301.9	1,287	1,228	457.4	579.0	168.4
Mean	4.33	5.80	6.14	5.57	4.59	5.53	10.1	41.5	40.9	14.8	18.7	5.61
Ac-ft	266	345	377	343	264	340	599	2,550	2,440	724	1,150	334

Calendar year 1955: Max 115 Min 2.0 Mean 11.2 Ac-ft 8,110
Water year 1955-56: Max 105 Min 3.5 Mean 13.6 Ac-ft 9,910

Peak discharge (base, 150 cfs).--No peak above base.

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of 1 discharge measurement and weather records.

b Stage-discharge relation affected by ice.

Clear Creek near Buffalo, Wyo.

Location.--Lat 44°20', long 106°46', in sec. 6, T. 50 N., R. 82 W., on left bank at mouth of canyon, 500 ft upstream from Mountain States Power Co.'s powerplant and 4 miles west of Buffalo.

Drainage area.--120 sq mi, approximately.

Records available.--June to September 1894, May 1896 to February 1900, June 1917 to October 1927, April 1938 to September 1956 (no winter records prior to 1918).

Gage.--Water-stage recorder. Datum of gage is 5,184.83 ft above mean sea level, datum of 1929. June to September 1894 and May 1896 to February 1900, staff gage at site 1 mile upstream at different datum. June 16, 1917, to Oct. 31, 1927, chain gage at site 160 ft downstream at different datum. Apr. 8 to Sept. 30, 1938, staff gage at site 40 ft upstream at datum 2.00 ft higher.

Average discharge.--28 years (1917-27, 1938-56), 62.3 cfs (45,130 acre-ft per year).

Extremes.--Maximum discharge during year, 462 cfs May 27 (gage height, 3.83 ft); minimum daily, 0.2 cfs Sept. 20, 21.

1894, 1896-1900, 1917-27, 1938-56: Maximum discharge observed, 1,380 cfs June 28, 1927 (gage height, 4.78 ft, site and datum then in use), from rating curve extended above 600 cfs; no flow Feb. 14-16, 1939, Nov. 12, 13, 1940.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. An average daily flow of about 7 cfs is diverted 1½ miles above station into Mountain States Power Co.'s pipeline. Diversions above station for irrigation (for details on adjudication of diversions, see Remarks for this station in WSP 1209).

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.1	0.1	1.9	15
1.2	.4	2.2	33
1.3	.8	2.5	63
1.4	1.7	3.0	158
1.5	2.9	3.5	302
1.6	4.9	4.0	525
1.7	7.6		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.4	1.8	5.6	4.3	1.7	1.1	9.6	15	326	68	38	11
2	.8	.6	6.2	4.7	1.8	1.1	3.3	18	*353	70	37	8.7
3	1.1	2.2	6.2	5.0	*1.9	1.3	7.1	24	349	76	40	6.5
4	.5	11	4.5	4.8	2.0	1.3	4.4	*16	349	66	35	7.1
5	.5	6.2	4.7	4.6	2.0	1.2	4.2	44	390	62	29	*5.9
6	*1.4	2.4	4.9	*4.4	2.2	1.0	*2.8	60	323	58	*25	6.8
7	1.9	3.1	*4.7	4.2	2.2	.8	8.8	67	218	55	24	4.4
8	1.5	*2.2	4.4	5.1	2.0	1.0	5.1	79	*198	53	22	2.8
9	.9	7.1	4.4	5.4	1.9	.8	4.7	92	204	50	19	1.9
10	.6	5.1	3.8	4.0	2.0	.9	5.2	109	218	*47	17	2.2
11	1.0	5.1	3.6	4.0	2.2	.9	6.3	86	223	45	30	1.8
12	1.3	2.2	3.3	3.8	2.2	.6	2.8	92	223	45	27	1.4
13	1.2	.9	*3.4	3.8	2.6	1.1	7.5	67	212	42	24	2.1
14	.8	.8	3.0	4.0	2.5	*1.1	13	58	209	39	22	2.9
15	.6	.7	3.2	4.0	2.2	1.1	21	60	*226	34	20	1.1
16	1.7	1.0	3.1	4.0	2.1	1.3	23	*58	226	32	16	.8
17	1.8	2.0	3.0	3.4	1.8	1.3	20	86	176	29	17	1.4
18	2.4	4.0	2.5	*2.8	1.7	1.3	18	134	184	27	46	.8
19	1.1	7.0	3.0	2.5	1.8	1.8	19	168	161	*25	55	.3
20	1.9	12	4.0	2.5	1.6	3.4	28	223	141	23	50	.2
21	2.6	11	5.0	3.4	1.7	3.3	35	320	134	21	40	.2
22	3.1	*9.0	5.5	2.9	1.9	4.7	30	353	*120	21	35	.8
23	4.0	8.0	6.0	2.5	*1.8	9.6	17	361	94	18	26	1.1
24	3.3	7.6	5.8	2.5	1.8	16	13	*330	84	16	17	.8
25	2.5	6.2	5.5	2.0	1.6	24	24	395	82	15	13	.4
26	3.4	7.4	6.0	2.1	1.1	28	30	395	78	29	11	.7
27	3.4	5.0	6.0	*2.8	1.1	18	33	422	75	34	14	.5
28	3.4	5.5	5.0	2.8	1.1	*6.2	26	*427	72	40	14	.4
29	6.2	6.5	3.5	2.4	1.2	14	17	349	71	42	10	1.0
30	4.0	6.5	3.8	2.0	-	6.8	14	296	68	*42	11	1.7
31	5.1		3.5	1.7	----	5.9	------	280	------	44	14	------
Total	64.4	150.1	137.1	108.4	53.7	160.9	452.8	5,484	5,787	1,268	798	77.7
Mean	2.08	5.00	4.42	3.50	1.85	5.19	15.1	177	193	40.9	25.7	2.59
Ac-ft	128	298	272	215	107	319	898	10,880	11,480	2,520	1,580	154

Calendar year 1955:	Max	310	Min	0.1	Mean	27.3	Ac-ft	19,740
Water year 1955-56:	Max	427	Min	0.2	Mean	39.7	Ac-ft	28,850

Peak discharge (base, 380 cfs).--May 27 (11:30 p.m.) 462 cfs (3.83 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 14-20, 23, 27, 28, Dec. 4, 5, Jan. 15, 25, Jan. 29 to Feb. 3. No gage-height record Dec. 14 to Jan 5; discharge estimated on basis of weather records.

Rock Creek near Buffalo, Wyo.

Location.--Lat 44°27', long 106°52', in NW¼ sec. 29, T. 52 N., R. 83 W., on left bank 300 ft downstream from confluence of North Fork and South Fork and 11.5 miles northwest of Buffalo.

Drainage area.--60.0 sq mi.

Records available.--October 1944 to September 1956 (no winter records 1944-45) in reports of Geological Survey. April 1941 to September 1944 in files of Bureau of Reclamation.

Gage.--Water-stage recorder. Altitude of gage is 5,260 ft (from topographic map).

Average discharge.--11 years (1945-56), 31.7 cfs (22,970 acre-ft per year).

Extremes.--Maximum discharge during year, 324 cfs May 28 (gage height, 5.72 ft); minimum daily, 0.7 cfs Sept. 20, 21.

1944-56: Maximum discharge, 1,810 cfs June 24, 1945 (gage height, 7.60 ft), from rating curve extended above 450 cfs; minimum daily, 0.5 cfs Sept. 19, 1954.

Maximum stage known, about 8.05 ft, probably during 1944.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversion for irrigation from South Piney Creek into drainage basin above station. Diversions for irrigation above station (for details on adjudication of diversions, see Remarks for this station in WSP 1209).

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 14-25)

2.8	0.4	3.7	18
2.9	.8	4.0	35
3.0	1.4	4.5	86
3.2	3.5	5.0	160
3.4	7.2	5.6	294

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.3	b3.0	5.3	4.9	a4.0	5.3	7.0	12	195	24	46	4.1
2	4.1	b3.5	5.3	4.8	a5.0	5.1	5.7	13	184	26	47	3.0
3	3.8	b4.0	5.3	5.1	*a5.7	5.1	5.9	*14	173	26	47	1.9
4	3.7	b5.0	5.3	4.9	6.8	5.1	4.8	12	169	21	47	2.0
5	4.3	b4.8	5.3	4.8	6.8	5.1	4.8	22	167	*18	47	*2.1
6	*4.6	4.5	5.3	*4.6	6.4	4.9	*5.3	28	152	17	46	2.7
7	4.6	4.8	*5.3	4.6	6.2	4.8	7.0	37	133	16	46	2.9
8	4.5	*4.8	4.9	4.6	6.2	4.9	4.8	46	*160	14	*47	3.0
9	4.0	5.5	4.8	b4.5	5.9	4.9	4.8	51	157	12	46	2.9
10	4.0	6.2	4.6	4.6	5.9	4.8	5.5	63	155	11	44	2.0
11	4.1	5.7	4.3	4.6	5.9	4.8	5.9	*49	146	9.7	8.2	1.5
12	4.8	b4.5	4.8	4.3	5.7	4.6	5.3	51	138	10	4.1	1.4
13	4.6	b4.0	*4.6	4.3	5.5	*4.6	6.8	38	133	*11	5.1	1.1
14	4.6	b3.5	b4.5	b4.0	5.1	4.8	9.2	34	130	12	3.7	1.4
15	3.7	b2.5	4.9	b3.5	4.9	4.8	12	37	135	27	3.5	1.2
16	3.5	b3.5	4.9	3.3	4.8	4.8	15	41	127	46	3.5	1.2
17	3.8	b4.5	4.9	3.8	4.8	4.9	14	67	112	43	4.0	1.1
18	3.7	b5.5	4.8	*3.7	4.6	5.9	13	89	130	44	6.6	.9
19	3.4	b7.0	4.6	3.4	4.5	7.8	14	115	120	44	9.4	.8
20	3.8	6.6	4.6	3.4	4.6	11	17	154	109	43	7.5	.7
21	5.5	5.9	4.6	3.5	4.8	8.3	20	*199	*91	43	*5.7	.7
22	6.2	5.5	6.8	3.8	5.1	6.6	20	199	83	43	4.8	.8
23	b5.9	*5.3	7.8	4.0	*6.6	9.2	14	189	74	43	4.3	1.0
24	5.9	5.3	6.6	3.8	5.5	10	12	178	73	44	4.1	1.0
25	5.5	5.3	5.3	3.8	5.1	12	13	197	70	44	4.0	1.0
26	5.3	5.3	4.6	3.7	5.1	12	16	178	57	44	4.0	.9
27	5.3	5.3	4.9	*a3.6	5.1	b7.5	16	197	35	45	4.3	1.0
28	b4.5	5.3	b4.5	a3.5	5.1	b6.0	15	280	36	46	4.6	1.3
29	b4.7	5.3	b4.0	a3.4	5.5	b5.0	13	208	34	45	4.1	2.8
30	b5.0	5.3	b4.5	a3.3	--	5.5	12	*184	27	*45	4.1	3.0
31	b4.5	-----	b4.7	a3.2	-----	*5.7	-----	180	-----	46	4.6	-----
Total	140.2	147.2	156.6	125.3	157.2	195.8	318.8	3,162	3,505	962.7	567.2	51.4
Mean	3.36	4.91	5.05	4.04	5.42	6.32	10.6	102	117	31.1	18.3	1.71
Ac-ft	207	292	311	249	312	388	632	6,270	6,950	1,910	1,130	102

Calendar year 1955: Max 178 Min 1.6 Mean 26.6 Ac-ft 19,247
Water year 1955-56: Max 280 Min 0.7 Mean 25.8 Ac-ft 18,750

Peak discharge (base, 440 cfs).--No peak above base.

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of 2 discharge measurements and weather records.

b Stage-discharge relation affected by ice.

South Piney Creek at Willow Park, Wyo.

Location.--Lat 44°27', long 107°02', in sec. 26, T. 52 N., R. 85 W., on left bank at lower end of Willow Park, 1.5 miles downstream from Penrose Creek and 11 miles southwest of Story.

Drainage area.--28.9 sq mi.

Records available.--September 1945 to September 1956 (no winter records prior to 1948).

Gage.--Water-stage recorder. Altitude of gage is 8,550 ft (from topographic map).

Average discharge.--9 years (1947-56), 42.1 cfs (30,500 acre-ft per year).

Extremes.--Maximum discharge during year, 340 cfs May 28 (gage height, 3.71 ft); minimum not determined.

1945-56: Maximum discharge, 642 cfs June 7, 1952 (gage height, 4.77 ft); minimum daily, 4.5 cfs Mar. 1 to Apr. 5, 1955, but may have been less during years of no winter records.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Some regulation by Cloud Peak Reservoir (capacity, 2,720 acre-ft), storage of which is diverted into Rock Creek just below station by Rock Creek & Piney Reservoir & Ditch Co.'s canal.

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.5	12	2.5	108
1.6	17	3.0	186
1.7	23	3.6	314
2.0	49		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	17	10	8.5	8.0	7.5	7.0	7.0	10	177	90	77	28
2	17	11					7.0	10	216	90	80	26
3	16	11					7.0	10	238	90	80	25
4	16	11					7.0	10	262	79	78	25
5	16	11					7.0	14	288	71	73	25
6	16	10					7.0	18	244	67	71	23
7	16	10					7.0	20	179	66	71	22
8	16	10					7.0	25	158	65	88	21
9	15	10					7.5	30	165	61	79	20
10	14	10					8.0	35	181	58	*68	19
11	14	9.5					8.0	32	188	58	58	18
12	14	9.0					8.0	30	186	62	48	18
13	14	9.5					8.5	25	179	64	38	18
14	14	9.5					9.0	22	182	62	34	17
15	14	9.5					10	22	199	92	32	16
16	14	*9.5					11	23	199	83	30	16
17	14	9.5					11	30	160	83	33	16
18	13	9.5					11	40	154	80	41	16
19	13	9.5					12	55	132	77	40	15
20	14	9.5					13	70	115	74	40	14
21	14	9.5					14	100	126	72	39	14
22	14	9.2					14	140	121	70	35	14
23	12	9.2					13	175	*85	74	34	14
24	13	9.2					12	170	88	74	33	14
25	13	9.2					12	165	89	76	33	14
26	13	9.2					13	*162	86	77	33	13
27	13	9.0					14	184	86	77	33	13
28	11	9.0					12	304	90	78	31	12
29	12	9.0					11	175	90	76	29	13
30	12	9.0			--		10	142	91	76	31	13
31	11	---			------		------	149	------	76	30	-----
Total	435	290.0	263.5	248.0	217.5	217.0	298.0	2,397	4,754	2,298	1,520	532
Mean	14.0	9.67	8.50	8.00	7.50	7.00	9.93	77.3	158	74.1	49.0	17.7
Ac-ft	863	575	523	492	413	430	591	4,750	9,430	4,560	3,010	1,060

Calendar year 1955:	Max 242	Min 4.5	Mean 31.9	Ac-ft 23,100
Water year 1955-56:	Max 304	Min -	Mean 35.7	Ac-ft 26,700

Peak discharge (base, 200 cfs).--May 28 (12:30 p.m.) 340 cfs (3.71 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 6, 7, 11, 12, Oct. 23 to about May 1. No gage-height record Oct. 26 to May 25; discharge estimated on basis of 1 discharge measurement, weather records, and records for station near Story and East Goose Creek.

South Piney Creek near Story, Wyo.

Location.--Lat 44°33'25", long 106°56'10", in NE¼ sec. 23, T. 53 N., R. 84 W., on left bank 2.3 miles southwest of Story and 3.3 miles upstream from confluence with North Piney Creek.

Drainage area.--70.5 sq mi.

Records available.--June 1951 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 5,700 ft (from topographic map). Prior to Oct. 1, 1951, staff gage at site 500 ft upstream at different datum.

Average discharge.--5 years, 66.3 cfs (48,030 acre-ft per year).

Extremes.--Maximum discharge during year, 805 cfs May 28 (gage height, 3.43 ft); minimum daily, 14 cfs Nov. 15, Jan. 16, Mar. 11, 12, 29.

1951-56: Maximum discharge, 1,260 cfs June 7, 1952 (gage height, 4.36 ft), from rating curve extended above 370 cfs on basis of records for Piney Creek at Kearney; minimum daily, 8.0 cfs Mar. 2, 1952.

Remarks.--Records good except those for period Mar. 26 to June 6, which are fair, and those for periods of ice effect, which are poor. Some regulation during spring runoff and irrigation season by Kearney Lake (capacity, 1,860 acre-ft) and Cloud Peak Reservoir (capacity, 2,720 acre-ft). Diversion for irrigation above station (for details on adjudication of diversions see Remarks for this station, in WSP 1209).

Rating tables, water year 1955-56, except periods of ice effect and indefinite stage-discharge relation (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 30 to Apr. 7, May 8-15, May 24 to June 2)

Oct. 1 to May 29

1.2	15	2.3	135
1.5	29	2.6	258
1.8	54	3.2	570
2.0	78		

May 30 to Sept. 30

1.1	19	1.9	134
1.3	38	2.2	230
1.6	76	2.6	440

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	31	17	21	b17	17	17	15	25	315	142	96	54
2	30	17	*22	18	*17	16	15	25	341	147	99	50
3	30	*27	22	17	17	17	15	25	385	142	97	49
4	29	27	22	17	17	17	15	24	412	150	97	48
5	*28	24	21	*16	17	17	15	40	407	*129	94	48
6	28	21	21	16	17	16	*16	48	434	120	92	46
7	27	22	20	15	17	b15	18	54	*325	112	*94	*43
8	26	23	19	16	17	b16	16	66	196	99	124	40
9	25	23	19	16	17	b16	17	77	*215	101	115	38
10	25	23	19	16	17	b15	19	104	245	101	108	36
11	27	21	19	16	16	b14	19	*80	290	105	157	35
12	27	b17	19	16	15	b14	19	77	295	*110	142	34
13	26	b16	19	16	15	b16	20	66	290	110	134	35
14	25	b15	19	16	15	*18	21	60	300	110	137	32
15	25	b14	b18	b15	15	18	24	60	358	99	112	31
16	25	b17	b17	b14	16	17	25	62	374	78	70	30
17	25	b22	b16	b15	16	16	26	81	280	76	*63	29
18	24	28	b17	b16	16	15	25	110	255	69	78	28
19	24	30	b18	b17	16	16	28	142	211	68	79	27
20	25	27	19	b18	16	15	32	178	*179	*63	81	27
21	25	24	19	18	*16	15	35	*244	157	60	79	27
22	25	21	*20	18	16	15	35	330	144	76	72	28
23	25	*22	20	18	15	17	31	375	132	*94	68	28
24	24	24	20	17	15	18	29	365	120	99	65	27
25	24	24	19	17	17	19	30	*365	122	97	61	26
26	23	23	b18	*18	17	21	32	350	120	97	58	25
27	24	21	b18	18	17	b17	33	360	127	97	61	25
28	20	21	b17	17	17	b15	29	564	139	101	58	25
29	23	21	b16	17	*17	b14	27	*427	139	101	55	26
30	24	21	b15	17	------	15	24	305	137	99	57	25
31	21	------	b16	17	------	15	------	295	------	97	56	------
Total	790	653	585	515	473	502	705	5,384	7,444	3,149	2,759	1,022
Mean	25.5	21.8	18.9	16.6	16.3	16.2	23.5	174	248	102	89.0	34.1
Ac-ft	1,570	1,300	1,160	1,020	938	996	1,400	10,680	14,760	6,250	5,470	2,030

Calendar year 1955: Max 400 Min 10 Mean 59.1 Ac-ft 42,830
Water year 1955-56: Max 564 Min 14 Mean 65.5 Ac-ft 47,570

Peak discharge (base, 250 cfs).--May 28 (10 a.m.) 805 cfs (3.43 ft).

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note.--Stage-discharge relation indefinite Mar. 26 to June 6; discharge computed on basis of shifting-control method.

North Piney Creek near Story, Wyo.

Location.--Lat 44°34'50", long 106°55'55", in NW¼SW¼ sec. 12, T. 53 N., R. 84 W., on left bank 2.1 miles west of Story and 3.2 miles upstream from confluence with South Piney Creek.

Drainage area.--37.7 sq mi.

Records available.--June 1951 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 5,290 ft (from topographic map). Prior to Sept. 14, 1951, staff gage at same site and datum.

Average discharge.--5 years, 33.7 cfs (24,410 acre-ft per year).

Extremes.--Maximum discharge during year, 1,230 cfs May 28 (gage height, 4.57 ft); minimum daily, 3.0 cfs Mar. 12.

1951-56: Maximum discharge, that of May 28, 1956; minimum daily, that of Mar. 12, 1956.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. No diversion above station.

Rating tables, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Nov. 19-25, Apr. 2, 3, 5)

Oct. 1 to Apr. 9		Apr. 10 to Sept. 30			
0.4	4.0	0.6	5.6	1.5	63
.5	5.1	.7	7.2	2.0	124
.7	9.1	.8	9.5	2.5	255
.9	15	.9	13	3.0	443
		1.1	27	4.0	920

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8.0	7.0	7.3	7.7	5.8	6.1	11	24	308	28	9.5	8.7
2	8.0	7.5	*7.0	7.3	*6.1	6.1	10	25	262	28	9.8	8.4
3	7.5	*8.6	6.6	7.0	6.3	6.3	10	*25	222	30	9.8	8.2
4	7.5	9.1	6.6	7.0	6.5	6.3	9.1	25	193	25	9.0	8.2
5	*7.7	8.9	6.5	*7.0	6.8	6.3	*11	37	162	*23	9.0	9.0
6	8.2	6.8	6.6	7.0	6.5	5.0	8.6	47	137	22	8.8	9.0
7	8.2	8.2	6.8	6.6	6.2	4.0	7.3	59	*114	23	*8.8	*8.5
8	8.2	8.2	6.6	6.8	6.0	5.0	7.3	75	106	20	10	7.9
9	7.7	8.2	6.8	6.6	5.8	4.5	6.8	92	99	17	9.5	7.7
10	7.7	9.1	6.6	6.6	5.9	3.5	6.9	143	92	17	9.0	7.2
11	9.4	8.0	6.6	6.8	6.0	3.2	7.0	*128	84	17	15	7.2
12	10	7.0	6.5	6.8	6.4	3.0	7.4	122	76	*17	12	7.2
13	9.7	6.5	6.3	6.8	6.0	*3.4	9.0	104	70	16	10	7.0
14	9.4	6.3	6.2	6.0	5.5	3.7	12	98	70	15	9.4	7.2
15	9.1	6.0	6.0	5.0	*4.9	4.0	15	98	65	14	9.0	7.0
16	8.9	6.5	6.4	*5.6	5.3	4.5	21	114	59	14	8.5	6.6
17	8.6	7.5	6.3	5.8	5.5	4.7	18	152	54	13	8.5	6.6
18	8.6	8.0	6.0	5.6	5.7	4.9	20	193	59	13	10	6.7
19	8.4	9.1	6.8	5.4	6.1	5.3	23	240	49	13	14	6.6
20	8.9	8.6	6.6	5.1	6.3	5.3	30	276	*45	*12	12	6.6
21	9.4	7.7	6.5	5.1	6.6	5.1	37	*312	48	12	10	6.4
22	9.4	7.5	*7.3	5.0	6.8	5.6	36	330	46	12	9.0	6.4
23	9.7	*6.8	9.4	4.8	7.0	*6.3	30	315	39	*12	8.5	6.9
24	9.7	6.8	8.6	4.9	6.7	7.3	27	304	36	12	9.0	6.9
25	10	6.6	7.7	4.9	6.5	9.4	25	312	36	11	9.0	6.7
26	9.1	6.5	7.0	*4.8	6.3	12	29	*258	35	11	9.0	6.6
27	8.0	6.4	7.0	4.8	6.2	15	32	249	32	11	10	6.4
28	6.5	6.0	6.6	4.7	6.3	15	27	*891	31	11	9.5	6.1
29	7.0	6.5	6.6	4.5	*6.5	11	25	536	28	11	9.0	6.1
30	7.5	7.0	6.0	5.0	--	9.4	24	*414	28	11	9.5	6.4
31	7.0	------	7.0	5.5	------	9.4	------	344	------	10	9.0	------
Total	263.0	222.9	210.8	182.5	178.5	200.6	542.4	6,342	2,685	501	303.1	216.4
Mean	8.48	7.43	6.80	5.89	6.16	6.47	18.1	205	89.5	16.2	9.78	7.21
Ac-ft	522	442	418	362	354	398	1,080	12,580	5,330	994	601	429

Calendar year 1955: Max 374 Min 4.0 Mean 34.3 Ac-ft 24,850
Water year 1955-56: Max 891 Min 3.0 Mean 32.4 Ac-ft 23,510

Peak discharge (base, 200 cfs).--May 28 (1 p.m.) 1,230 cfs (4.57 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 27-31, Nov. 12-18, 26-30, Dec. 12-18, 28-31, Jan. 14, 15, Jan. 28 to Feb. 16, Mar. 6-17, Apr. 4. No gage-height record Feb. 17-29, Aug. 7 to Sept. 7; discharge estimated on basis of 3 discharge measurements, weather records, recorded range in stage, and records for Piney Creek at Kearney.

Piney Creek at Kearney, Wyo.

Location.--Lat 44°32', long 106°49', in sec. 26, T. 53 N., R. 83 W., on right bank 1,000 ft south of Kearney and half a mile upstream from Little Piney Creek.

Drainage area.--106 sq mi.

Records available.--September 1902 to June 1906, May 1911 to July 1917, May 1919 to September 1923 (no winter records), November 1940 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 4,655.11 ft above mean sea level, datum of 1929. Sept. 6, 1902, to June 30, 1906, chain gage at site 50 ft upstream at different datum. May 13, 1911, to July 31, 1917, and May 1, 1919, to Sept. 30, 1923, chain gage at site 50 ft upstream at same datum.

Average discharge.--15 years (1941-56), 89.1 cfs (64,550 acre-ft per year).

Extremes.--Maximum discharge during year, 1,840 cfs May 28 (gage height, 4.95 ft); minimum daily, 10 cfs Sept. 27, 28.

1902-6, 1911-17, 1919-23, 1940-56: Maximum discharge, 2,570 cfs June 3, 1944 (gage height, 5.32 ft), from rating curve extended above 1,400 cfs; minimum daily, 5.4 cfs Sept. 28-30, 1949, Sept. 27, 28, 30, Oct. 1, 3, 1952.

Remarks.--Records good except those for periods of ice effect, which are poor. Some regulation by Cloud Peak Reservoir (capacity, 2,720 acre-ft) and Kearney Lake (capacity, 1,860 acre-ft). Diversions for irrigation above station (for details on adjudication of diversions, see Remarks for this station in WSP 1209).

Revisions (water years).--WSP 926: Drainage area. WSP 1176: 1944.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.3	8.8	2.5	180
1.4	12	3.0	333
1.5	17	3.5	565
1.7	33	4.0	910
1.9	54	5.0	1,900
2.2	105		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	16	11	30	25	21	26	39	52	614	44	23	28
2	16	13	*27	27	23	25	57	51	570	44	24	25
3	16	*13	23	30	*24	27	32	*52	570	44	22	24
4	16	19	25	32	26	26	34	51	604	38	22	24
5	16	17	20	30	26	25	*36	67	592	*33	21	28
6	*16	12	25	*27	26	20	37	83	495	31	21	*28
7	16	14	28	26	24	22	39	105	*341	36	22	23
8	14	16	30	30	23	25	36	131	225	33	*29	23
9	13	16	32	27	24	23	36	162	214	32	28	24
10	13	19	33	29	25	20	39	236	225	29	26	21
11	16	30	30	29	26	19	39	*200	230	29	42	20
12	16	28	35	28	28	21	39	202	211	36	33	18
13	15	25	30	26	26	*24	44	175	188	*32	28	19
14	14	30	25	23	23	25	46	157	162	34	29	19
15	14	25	20	21	20	26	51	151	159	36	28	16
16	14	30	23	22	18	27	53	162	144	24	18	16
17	13	33	25	24	20	28	51	211	87	24	20	15
18	12	36	28	*27	21	29	50	265	78	24	33	14
19	11	40	30	30	22	29	52	337	54	24	38	13
20	11	38	32	29	23	30	57	434	39	*23	33	12
21	12	35	34	28	*24	31	64	*540	45	18	28	12
22	12	30	*35	27	26	31	64	614	48	23	26	13
23	11	*20	32	26	28	*33	58	674	33	31	25	14
24	12	25	30	26	27	38	55	609	28	28	29	12
25	13	30	28	25	25	46	54	620	31	26	29	12
26	13	35	25	*24	23	50	58	550	*30	26	29	11
27	12	20	27	23	22	44	61	515	35	23	32	10
28	12	22	24	22	21	35	55	*1,430	36	26	31	10
29	12	25	22	21	*25	30	53	1,130	39	27	28	11
30	13	28	20	20	------	35	51	*854	44	27	31	11
31	12	------	22	19	------	35	------	694	------	26	30	------
Total	422	735	850	803	690	905	1,440	11,514	6,171	931	858	526
Mean	13.6	24.5	27.4	25.9	23.8	29.2	48.0	371	206	30.0	27.7	17.5
Ac-ft	837	1,460	1,690	1,590	1,370	1,800	2,860	22,840	12,240	1,850	1,700	1,040

Calendar year 1955: Max 539 Min 9.1 Mean 61.6 Ac-ft 44,620
Water year 1955-56: Max 1,430 Min 10 Mean 70.6 Ac-ft 51,280

Peak discharge (base, 750 cfs).--May 28 (1:30 p.m.) 1,840 cfs (4.95 ft).
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Oct. 23 to Nov. 2, Nov. 11 to Mar. 21, Mar. 28, 29, Apr. 3, 6.

Piney Creek at Ucross, Wyo.

Location.--Lat 44°33'45", long 106°32'25", in SW¼ sec. 18, T. 53 N., R. 80 W., on left bank at Ucross, 190 ft upstream from bridge on U. S. Highways 14 and 16 and half a mile upstream from mouth.

Drainage area.--267 sq mi.

Records available.--May 1917 to September 1923 (no winter records), January 1950 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 4,066.83 ft above mean sea level, datum of 1929. May 12, 1917, to Sept. 30, 1923, chain gage at approximately same site at different datum.

Average discharge.--6 years (1950-56), 69.6 cfs (50,420 acre-ft per year).

Extremes.--Maximum and minimum discharges for the water years 1953-56 are contained in the following table:

Water year	Maximum			Minimum daily	
	Date	Discharge (cfs)	Gage height (feet)	Date	Discharge (cfs)
1953	June 15, 1953	1,340	4.92	July 2, 1953	1.7
1954	May 21, 1954	587	3.98	June 1, 1954	1.7
1955	May 22, 1955	535	3.97	Sept.22, 23, 1955	1.2
1956	May 28, 1956	1,640	5.88	Oct. 12-26, 1955, Sept.28, 1956.	.6

1917-23, 1950-56: Maximum discharge observed, 2,580 cfs Sept. 28, 1923 (gage height, 6.0 ft, datum then in use), from rating curve extended above 1,500 cfs; minimum daily, 0.6 cfs Oct. 12-26, 1955, Sept. 28, 1956.

Maximum stage known, 10.9 ft June 1, 1929 (present datum), from floodmark, from information by local resident.

Revisions.--The maximum discharge for the water year 1952 has been revised to 1,240 cfs July 13, 1952 (gage height, 4.80 ft), superseding figure published in WSP 1239.

Remarks.--Records good except those for periods of ice effect, backwater from beaver dams, or no gage-height record, which are poor. Some regulation by Lake De Smet (capacity, 32,250 acre-ft), Cloud Peak Reservoir (capacity, 2,720 acre-ft), and Kearney Lake (capacity, 1,860 acre-ft). Diversions for irrigation above station (for details on adjudication of diversions, see Remarks for this station in WSP 1209).

Revisions.--WSP 1176: Drainage area. Revised figures of discharge, in cubic feet per second, for high-water periods in the water year 1952, superseding those published in WSP 1239 are given herewith:

1952		1952-Con.	
May 3	668	June 7	944
4	788	8	802
5	810	July 13	1,050
6	652	14	976

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
May 1952	11,844	810	75	382	23,490
June	7,537	944	12	251	14,950
July	5,679	1,050	47	183	11,260
Water year 1951-52	-	1,050	12	118	85,430
Calendar year 1952	-	1,050	12	113	82,000

Revised peak discharge.--1951-52: May 5 (6 a.m.) 936 cfs; June 7 (2 p.m.) 1,150 cfs; July 13 (7 p.m.) 1,240 cfs.

Piney Creek at Ucross, Wyo.--Continued

Discharge, in cubic feet per second, water year October 1952 to September 1953

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	40	25	32	34	36	29	76	a54	742	2.1	84	11
2	20	25	32	34	35	28	64	a45	735	1.7	113	11
3	19	24	32	35	35	*28	48	a39	750	8.6	180	22
4	18	23	32	35	35	29	60	*35	587	26	143	35
5	19	25	32	32	*34	30	54	33	421	8.2	118	30
6	23	28	32	34	32	30	53	32	367	9.1	113	22
7	c28	27	32	35	30	33	54	57	294	16	101	20
8	c25	27	*32	36	28	40	53	95	333	32	81	18
9	c24	26	32	37	27	50	44	140	316	*33	76	15
10	c24	21	32	38	26	60	38	137	*463	53	78	13
11	c25	21	33	39	*25	70	44	113	582	86	83	*13
12	c25	25	34	*39	30	*67	43	88	469	80	72	11
13	c23	25	35	37	34	66	42	79	438	61	72	11
14	c26	22	35	34	36	64	43	61	802	66	73	14
15	c25	*19	34	30	35	64	38	43	1,100	81	70	19
16	*c26	20	33	32	38	62	*42	43	840	97	66	19
17	25	21	33	33	40	*57	30	50	*496	99	66	18
18	24	21	33	34	40	50	24	35	445	83	60	20
19	21	21	33	34	35	58	a21	35	391	70	57	19
20	21	23	33	34	25	62	a22	66	355	67	51	18
21	25	24	32	34	28	64	a25	91	204	61	48	18
22	25	21	32	34	29	50	a28	81	123	57	48	18
23	26	26	31	34	30	44	a36	78	99	60	47	17
24	26	31	30	35	30	42	a66	116	66	62	*44	17
25	27	31	29	36	30	50	a39	240	48	64	47	18
26	27	30	30	35	*30	57	a37	227	*30	64	46	11
27	27	28	31	*32	30	57	a47	415	21	79	44	7.7
28	26	29	32	32	30	43	a66	573	11	84	43	6.9
29	25	30	33	33	-	33	a74	*880	6.9	84	39	6.2
30	25	31	34	34	------	38	a70	*788	*2.8	103	28	6.2
31	25	------	34	37	------	41	------	705	------	95	14	------
Total	765	750	1,004	1,072	893	1,496	1,381	5,474	11,537.7	1,792.7	2,205	485.0
Mean	24.7	25.0	32.4	34.6	31.9	48.3	46.0	177	385	57.8	71.1	16.2
Ac-ft	1,520	1,490	1,990	2,130	1,770	2,970	2,740	10,860	22,880	3,560	4,370	962

Calendar year 1952: Max 1,050 Min 12 Mean 113 Ac-ft 82,000
Water year 1952-53: Max 1,100 Min 1.7 Mean 79.1 Ac-ft 57,240

Peak discharge (base, 750 cfs).--May 29 (11 a.m.) 1,050 cfs (4.67 ft); June 15 (4 p.m.) 1,340 cfs (4.92 ft).

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for station at Kearney.

c Backwater from beaver dam.

Note.--Stage-discharge relation affected by ice Nov. 23 to Mar. 14.

Discharge, in cubic feet per second, water year October 1953 to September 1954

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.2	25	27	37	40	25	27	58	1.7	32	45	24
2	5.2	25	26	35	41	23	28	52	*2.7	41	52	18
3	3.7	26	*22	36	42	30	29	42	6.0	56	48	10
4	9.7	26	23	35	*43	*36	31	48	18	48	48	26
5	15	24	25	36	44	40	35	47	13	45	55	31
6	13	24	28	37	45	35	46	*57	20	37	53	3.4
7	11	23	35	*37	46	32	32	68	19	60	17	2.7
8	11	23	35	33	47	32	*30	61	*10	65	3.6	*2.5
9	11	*22	37	30	45	32	29	56	8.4	*61	3.6	2.7
10	9.6	22	38	30	40	32	30	92	28	61	4.3	3.2
11	9.1	22	35	28	35	25	28	143	28	61	6.0	2.9
12	9.6	21	37	26	40	13	28	222	30	61	6.8	2.5
13	*11	21	35	25	43	19	29	355	30	62	6.8	2.5
14	11	18	33	27	45	26	32	403	33	55	5.7	5.5
15	11	21	35	25	*47	*34	37	457	35	62	5.4	13
16	13	*20	32	15	45	32	32	451	32	66	4.1	12
17	14	21	35	17	43	33	32	457	35	64	15	14
18	15	23	37	*18	40	15	40	397	36	60	*36	13
19	15	19	37	17	30	15	47	391	28	60	38	14
20	15	17	39	13	31	20	40	451	26	*71	35	13
21	19	18	36	17	32	22	37	524	32	43	37	12
22	29	23	32	25	33	24	32	427	33	26	33	7.8
23	21	31	34	22	33	25	33	278	37	19	32	c7.2
24	21	30	35	20	36	23	33	135	50	13	30	c6.6
25	24	28	36	22	31	22	40	*81	69	27	28	c6.2
26	23	28	35	27	30	25	50	56	93	24	28	c6.0
27	23	26	35	30	24	24	53	41	84	21	24	*c5.7
28	24	30	37	32	26	22	65	22	120	24	21	c5.6
29	24	26	35	35	-	23	73	5.4	78	27	24	c6.0
30	25	24	34	37	------	24	66	2.0	46	24	24	c5.8
31	25	------	36	39	------	25	------	2.0	------	33	27	------
Total	477.1	707	1,036	863	1,077	808	1,144	5,881.4	1,081.8	1,409	796.3	284.8
Mean	15.4	23.6	33.4	27.8	38.5	26.1	38.1	190	36.1	45.5	25.7	9.49
Ac-ft	946	1,400	2,050	1,710	2,140	1,600	2,270	11,670	2,150	2,790	1,580	565

Calendar year 1953: Max 1,100 Min 1.7 Mean 78.2 Ac-ft 56,640
Water year 1953-54: Max 524 Min 1.7 Mean 42.6 Ac-ft 30,870

Peak discharge (base, 750 cfs).--No peak above base.

* Discharge measurement made on this day. c Backwater from beaver dam.

Note.--Stage-discharge relation affected by ice Dec. 4 to Feb. 22, Mar. 1-13, Mar. 18 to Apr. 3.

Piney Creek at Ucross, Wyo.--Continued

Discharge, in cubic feet per second, water year October 1954 to September 1955

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8.0	20	13	25	29	23	*80	65	95	84	73	25
2	10	*20	15	25	27	25	90	110	88	84	74	26
3	11	20	17	24	25	23	50	151	*65	62	70	29
4	10	18	19	23	22	15	10	99	56	52	60	29
5	10	18	21	22	24	9.0	3.0	65	45	42	*56	31
6	10	16	23	21	26	11	*5.0	63	68	*17	53	33
7	11	16	25	20	28	13	10	80	41	4.0	52	31
8	11	14	25	21	30	*15	30	93	35	2.1	52	30
9	11	13	23	21	25	19	50	90	42	2.1	52	31
10	11	13	20	*21	15	25	250	70	38	1.7	51	30
11	12	13	22	21	17	30	*207	*60	26	1.6	51	31
12	12	13	25	21	19	28	190	76	18	4.0	49	33
13	13	13	*27	25	21	26	*180	105	22	12	47	19
14	13	14	28	24	23	27	167	106	67	20	39	6.4
15	*13	15	27	23	25	27	*191	140	162	19	26	4.8
16	14	16	26	24	27	*28	144	257	201	20	23	3.5
17	15	16	27	25	25	27	142	300	*217	16	19	3.0
18	15	*16	28	26	20	30	155	180	214	20	18	2.5
19	15	23	29	*27	15	27	174	144	134	29	*18	2.0
20	15	23	30	26	17	25	114	162	93	37	18	*1.5
21	15	23	30	26	18	28	112	238	82	47	16	1.4
22	15	21	30	26	19	30	112	386	98	76	18	1.2
23	15	22	27	30	15	27	114	361	115	87	23	1.2
24	16	23	23	28	*17	23	108	*198	138	101	23	2.4
25	16	22	20	28	19	20	99	155	185	103	23	3.8
26	17	23	17	28	17	25	95	134	271	106	25	3.8
27	17	23	*15	28	19	30	105	132	252	*88	31	3.5
28	18	17	13	25	22	40	61	119	234	85	27	3.2
29	18	16	15	27	-	50	51	98	175	74	23	2.7
30	19	16	17	29	------	60	60	96	119	69	29	2.4
31	20	------	20	31	------	70	------	87	------	69	*29	------
Total	426.0	536	697	771	606	856.0	3,159.0	4,420	3,396	1,434.5	1,168	427.3
Mean	13.7	17.9	22.5	24.9	21.6	27.6	105	143	113	46.3	37.7	14.2
Ac-ft	845	1,060	1,380	1,530	1,200	1,700	6,270	8,770	6,740	2,850	2,320	848

Calendar year 1954:	Max 524	Min 1.7	Mean 41.1	Ac-ft 29,760
Water year 1954-55:	Max 386	Min 1.2	Mean 49.0	Ac-ft 35,510

Peak discharge (base, 750 cfs).--No peak above base. * Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Dec. 1 to Apr. 13 (no gage-height record Feb. 17-24). Backwater from beaver dam Oct. 1 to Nov. 2, Sept. 16-19.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.4	24	40	24	10	22	87	*36	636	59	8.5	15
2	2.2	13	36	25	12	22	57	34	582	54	28	14
3	2.2	*23	32	26	15	23	44	34	*576	58	38	15
4	2.1	29	30	*27	20	22	69	34	618	52	35	*14
5	1.9	30	33	27	24	20	57	32	618	42	36	18
6	*1.7	29	*36	26	23	17	40	41	515	*24	32	21
7	1.4	26	34	26	22	18	35	56	*355	14	25	18
8	1.2	27	30	27	21	20	36	66	203	6.0	*24	12
9	1.2	29	28	29	*20	18	35	120	163	6.0	32	8.1
10	1.0	31	27	30	21	15	36	187	169	5.4	30	6.3
11	.9	25	26	32	23	12	43	175	*177	18	30	6.0
12	.6	20	*29	*34	25	10	*38	173	163	35	34	6.0
13	.6	15	20	32	20	13	36	157	142	*38	31	5.1
14	.6	12	15	25	15	13	37	128	124	49	31	5.7
15	.6	10	12	20	12	14	39	122	*124	60	38	4.8
16	.6	15	13	17	10	*15	39	*111	116	60	36	3.7
17	.6	25	14	18	12	15	38	134	85	60	32	3.5
18	.6	35	12	19	15	25	34	195	73	63	36	3.1
19	.6	45	20	20	17	55	33	290	*55	60	50	2.4
20	.6	55	30	21	19	175	33	370	35	69	44	1.4
21	.6	45	40	22	*20	*315	37	510	26	62	30	1.2
22	.6	35	60	23	22	160	41	612	27	60	20	1.0
23	.6	*32	100	*24	25	*125	43	*732	18	63	7.7	1.0
24	.6	35	150	24	23	105	38	654	8.1	62	4.2	1.2
25	.6	40	110	24	21	150	35	*630	*6.0	*38	3.5	.9
26	.6	45	80	23	20	*168	35	594	5.1	35	3.7	.8
27	.9	30	50	21	21	123	37	492	44	36	6.6	.8
28	1.4	31	40	18	22	72	38	*1,050	68	37	12	.6
29	6.9	33	30	15	23	82	35	*1,180	65	15	8.5	.9
30	23	35	20	13	------	89	34	*960	56	11	7.3	.9
31	23	------	22	11	------	80	------	*750	------	9.8	12	------
Total	82.4	879	1,219	723	553	2,013	1,239	10,659	5,852.2	1,261.2	766.0	192.4
Mean	2.66	29.3	39.3	23.3	19.1	64.9	41.3	344	195	40.7	24.7	6.41
Ac-ft	163	1,740	2,420	1,430	1,100	3,990	2,460	21,140	11,610	2,500	1,520	382

Calendar year 1955:	Max 386	Min 0.6	Mean 50.5	Ac-ft 36,550
Water year 1955-56:	Max 1,180	Min 0.6	Mean 69.5	Ac-ft 50,460

Peak discharge (base, 750 cfs).--May 23 (8 a.m.) 846 cfs (4.66 ft); May 28 (7 p.m.) 1,640 cfs (5.88 ft). * Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 11 to Mar. 25, Apr. 2, 3 (no gage-height record Feb. 2-9, 16-22, Mar. 6-16; discharge estimated on basis of 3 discharge measurements and weather records).

Clear Creek near Arvada, Wyo.

Location.--Lat 44°52', long 106°05', in SE¼ sec. 36, T. 57 N., R. 77 W., on right bank 300 ft downstream from Cabin Creek, 1½ miles upstream from mouth, and 16 miles north of Arvada.

Drainage area.--1,110 sq mi, approximately.

Records available.--August 1915 to April 1919, April 1928 to May 1929, September 1939 to September 1956. No winter records prior to 1939.

Gage.--Water-stage recorder. Datum of gage is 3,506.51 ft above mean sea level, datum of 1929. Aug. 8, 1915, to Apr. 30, 1919, chain gage at about same site at different datum. Apr. 16, 1928, to May 26, 1929, chain gage at site about a quarter of a mile upstream at different datum. Sept. 13, 1939, to Jan. 14, 1951, chain gage at present site and datum.

Average discharge.--17 years (1939-56), 189 cfs (136,900 acre-ft per year).

Extremes.--Maximum discharge during year, 8,560 cfs Mar. 21 (gage height, 10.10 ft), from rating curve extended as explained below; minimum daily, 1.1 cfs July 21.

1915-19, 1928-29, 1939-56: Maximum discharge, 9,600 cfs Aug. 5, 1954 (gage height, 10.45 ft), from rating curve extended above 2,500 cfs on basis of slope-area determination at gage height 10.17 ft; no flow July 22, 1954.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Some regulation by Lake DeSmet (capacity, 32,250 acre-ft), Cloud Peak Reservoir (capacity, 2,720 acre-ft) and Kearney Lake (capacity, 1,860 acre-ft). Diversions for irrigation above station (for details on adjudication of diversions, see *Remarks* for this station in WSP 1209).

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Nov. 10, Mar. 21-27, June 5-20, Aug. 20 to Sept. 2)

0.8	0	2.0	166
.9	2.8	2.5	320
1.0	8.5	3.0	540
1.1	16	4.0	1,090
1.3	36	6.0	2,520
1.6	81		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.4	44	65	70	50	90	182	103	934	18	7.4	5.6
2	7.4	39	60	75	*56	95	174	99	874	10	2.5	5.1
3	9.2	43	55	*82	58	100	192	97	828	8.5	1.4	6.2
4	7.9	34	52	90	59	105	*131	92	856	7.9	*1.4	8.5
5	6.8	50	55	100	60	110	135	95	892	12	2.5	11
6	6.8	54	60	90	60	120	127	95	880	*14	2.2	12
7	5.6	65	65	75	60	120	105	101	*725	30	8.5	13
8	6.2	*62	65	77	*60	115	90	*144	490	11	7.4	16
9	7.4	62	62	80	58	*106	88	166	299	21	*7.4	16
10	8.5	65	66	*83	60	80	97	244	257	21	7.4	14
11	10	60	70	85	62	60	88	356	268	*16	6.2	*12
12	*14	55	*73	87	66	65	97	344	257	18	10	6.8
13	19	47	65	90	64	70	99	328	247	6.8	7.9	6.2
14	14	*42	60	80	60	76	94	306	247	4.5	7.4	5.1
15	18	35	55	65	45	*83	94	247	*217	15	6.2	4.5
16	19	40	62	60	50	90	101	214	223	5.6	2.8	5.6
17	20	50	66	65	52	100	112	*184	229	8.5	2.2	6.2
18	20	60	62	70	52	150	118	184	195	6.8	9.2	6.2
19	20	65	*74	75	54	250	107	285	164	5.1	12	6.2
20	21	67	80	74	56	500	101	432	149	2.0	18	6.8
21	20	*69	85	73	58	2,050	95	575	99	1.1	22	6.2
22	21	67	90	72	60	*1,100	101	839	78	2.0	22	5.6
23	23	60	100	71	*60	690	*122	*966	58	2.8	15	3.9
24	25	62	120	71	58	575	131	1,100	43	*3.9	11	2.8
25	25	64	180	*71	55	606	116	940	*30	2.2	11	2.8
26	*24	60	200	70	60	*545	103	988	20	2.5	7.9	2.2
27	25	50	*155	72	70	436	103	874	12	52	6.8	2.2
28	27	55	120	65	*85	320	110	1,000	7.9	36	*6.2	2.0
29	32	*58	90	57	90	209	110	*2,000	5.6	78	14	2.5
30	36	65	60	54	------	198	105	*1,530	13	59	15	3.4
31	39	------	65	52	------	203	------	1,160	------	21	7.4	------
Total	541.2	1,649	2,537	2,301	1,738	9,417	3,428	16,088	9,597.5	502.2	268.3	206.6
Mean	17.4	54.9	81.8	74.2	59.9	304	114	519	320	16.2	8.65	6.89
Ac-ft	1,070	3,270	5,030	4,560	3,450	18,680	6,800	31,910	19,040	996	532	410

Calendar year 1955: Max 1,720 Min 0.3 Mean 98.1 Ac-ft 71,010
Water year 1955-56: Max 2,050 Min 1.1 Mean 132 Ac-ft 95,750

Peak discharge (base, 1,500 cfs).--Mar. 21 (3 a.m.) 8,560 cfs (10.10 ft); May 29 (3:30 p.m.) 2,260 cfs (5.50 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 11 to Mar. 20 (no gage-height record Feb. 9-23; discharge estimated on basis of 1 discharge measurement and weather records).

Powder River at Moorhead, Mont.

Location.--Lat 45°04', long 105°51', in sec. 8, T. 9 S., R. 48 E., on left bank 500 ft downstream from post office at Moorhead and 6¼ miles upstream from Buffalo Creek. Prior to Mar. 22, 1956, at site three-quarters of a mile upstream; Mar 22 to July 24, 1956, at site a quarter of a mile downstream.

Records available.--May 1929 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 3,334.6 ft above mean sea level, datum of 1929. Prior to Aug. 28, 1931, staff gage at site a quarter of a mile upstream at different datum. Aug. 28, 1931, to Mar. 21, 1956, water-stage recorder three-quarters of a mile upstream at different datum. Mar. 22 to July 24, 1956, staff gage at site a quarter of a mile downstream at different datum. July 25, to Sept. 12, 1956, staff gage at present site and datum.

Average discharge.--22 years (1934-56), 468 cfs (338,800 acre-ft per year).

Extremes.--Maximum discharge during year not determined; maximum gage height, 17.7 ft Mar. 21, site and datum then in use (ice jam); minimum daily discharge, 4.4 cfs July 26.

1929-56: Maximum discharge, 15,300 cfs May 25, 1952 (gage height, 10.67 ft, site and datum then in use), from rating curve extended above 4,000 cfs on basis of slope-area determination of peak flow; maximum gage height, that of Mar. 21, 1956; no flow at times in 1931-34.

Flood of Sept. 30, 1923, reach a stage of 19 ft, site and datum used 1931-56, from information by local residents.

Remarks.--Records good except those above 1,500 cfs, which are fair, and those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of about 50,000 acres above station. Some regulation by three reservoirs in Wyoming with combined usable capacity of 36,800 acre-ft. Records of chemical analyses and water temperatures for the water year 1956 are given in WSP 1451.

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 26		Mar. 27 to July 24				July 25 to Sept. 30			
1.9	18	0.5	150	3.0	1,360	1.9	2.0	2.4	42
2.1	40	1.0	250	5.0	4,000	2.0	5.5	2.5	71
2.3	81	2.0	520	7.0	7,200	2.1	10	2.7	185
2.6	173	2.4	720			2.2	16	3.0	400
						2.3	25	3.5	900

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	63	55	*70	100	65	280	451	376	1,360	100	878	12
2	56	60	80	120	65	300	427	345	1,140	528	42	8.2
3	56	100	90	120	90	340	445	345	1,310	3,100	173	9.1
4	*51	110	90	140	100	360	439	340	1,070	706	224	8.2
5	39	95	85	150	120	380	445	335	1,030	200	198	9.1
6	38	125	100	140	120	370	435	320	*1,030	100	192	8.6
7	34	131	120	130	120	360	430	330	800	80	102	*12
8	29	141	130	150	120	420	418	350	596	60	*71	13
9	27	151	140	175	120	500	382	400	457	45	54	15
10	26	159	140	210	120	450	388	475	400	50	173	15
11	29	120	140	220	130	300	385	508	394	40	102	16
12	29	90	150	230	140	260	403	517	370	35	97	8.6
13	29	75	130	200	140	200	457	568	362	30	37	8.6
14	35	60	110	160	140	200	511	502	335	20	27	8.2
15	32	75	90	130	130	200	430	454	370	15	35	6.8
16	32	70	100	120	100	250	400	430	7,200	25	37	9.6
17	33	65	120	120	100	300	388	424	1,360	15	39	10
18	32	70	110	130	120	300	376	350	514	30	37	8.2
19	33	75	120	140	130	500	345	400	391	25	35	7.8
20	36	80	140	*140	*140	6,200	360	430	335	30	27	7.8
21	40	80	150	160	140	3,500	348	685	300	15	42	9.1
22	40	75	*140	160	140	3,000	342	664	238	10	22	9.1
23	40	75	140	170	140	2,000	373	1,030	236	8	22	8.2
24	44	80	140	180	200	1,500	397	1,480	178	7.5	21	8.6
25	45	95	300	190	300	1,000	391	1,430	166	*7.3	14	8.2
26	45	95	1,000	190	600	900	*394	1,310	100	4.4	12	7.3
27	*49	90	1,200	170	300	*810	355	1,170	55	5.0	14	6.0
28	51	90	300	140	280	650	355	2,040	50	82	15	4.8
29	54	80	200	120	260	520	365	2,580	40	18	8.2	7.3
30	58	70	150	90	------	499	400	2,910	35	71	14	7.3
31	70	------	100	80	------	496	------	1,790	------	198	15	------
Total	1,277	2,737	6,075	4,675	4,670	27,345	12,035	25,288	22,222	5,660.2	2,779.2	277.7
Mean	41.2	91.2	196	151	161	882	401	816	741	183	89.7	9.26
Ac-ft	2,530	5,430	12,050	9,270	9,260	54,240	23,870	50,160	44,080	11,230	5,510	551

Calendar year 1955:	Max	3,000	Min	2.8	Mean	355	Ac-ft	256,800
Water year 1955-56:	Max	7,200	Min	4.4	Mean	314	Ac-ft	228,200

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* Discharge measurement made on this day.

Note.--No gage-height record Feb. 21-25, Feb. 27 to Mar. 4, Mar. 6-26, Apr. 6, 7, May 4, 8, 9, 18, 19, June 26 to July 1, July 5-24, 27, Aug. 15, 27; discharge estimated on basis of records for Powder River at Arvada, Wyo., and Clear Creek near Arvada, Wyo. Stage-discharge relation affected by ice Nov. 1-5, Nov. 11 to Feb. 20, Feb. 26, Mar. 5. Discharge computed from staff-gage readings (recorder shelter and well destroyed Mar. 21) Mar. 27 to Sept. 12, Sept. 22-30.

Powder River near Locate, Mont.

Location.--Lat 46°26', long 105°18', in NE¼ sec. 26, T. 8 N., R. 51 E., on right bank 50 ft downstream from bridge on U. S. Highway 12 at present site of Locate (5 miles west of former site of Locate), 3 miles upstream from Locate Creek, and 25 miles east of Miles City.

Records available.--March 1938 to September 1956.

Gage.--Water-stage recorder and wire-weight gage read once daily. Altitude of gage is 2,400 ft (by barometer). Prior to July 11, 1947, wire-weight gage at bridge 50 ft upstream at same datum.

Average discharge.--18 years, 639 cfs (462,600 acre-ft per year).

Extremes.--Maximum discharge during year, 24,000 cfs Mar. 23 (float measurement); maximum gage height observed, 12.3 ft Mar. 23 (backwater from ice); minimum daily discharge, 2.6 cfs Sept. 23.

1938-56: Maximum discharge observed, 31,000 cfs Feb. 19, 1943 (gage height, 11.23 ft), from rating curve extended above 14,000 cfs; no flow Jan. 16 to Feb. 12, Feb. 22-24, 1950.

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of about 52,000 acres above station. Some regulation by three reservoirs in Wyoming with combined usable capacity of 36,800 acre-ft. Records of chemical analyses and water temperatures for the water year 1956 are given in WSP 1451.

Revisions (water years).--WSP 926: 1939.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-31, Nov. 4-10, Mar. 25, 26, July 21-26, Aug. 15 to Sept. 2, Sept. 15-30)

1.2	2	2.2	83
1.3	3	2.5	170
1.4	4	2.8	320
1.5	7	3.4	815
1.6	14	4.0	1,800
1.7	21	5.0	3,950
2.0	54		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.4	25	50	120	70	200	882	362	2,620	71	50	284
2	6.6	20	50	120	70	240	793	376	2,140	61	33	123
3	6.6	20	50	120	70	280	716	383	1,670	62	33	88
4	6.4	34	50	120	70	300	680	376	1,380	66	114	68
5	5.5	39	50	110	80	500	620	355	1,280	123	170	61
6	5.0	28	60	100	90	*900	604	341	1,200	828	194	52
7	4.7	33	60	110	90	800	572	341	1,100	502	210	39
8	4.7	34	60	130	90	900	572	320	1,080	255	186	33
9	5.5	55	60	140	90	700	548	314	1,020	178	117	34
10	5.0	92	60	140	90	600	548	612	842	178	92	31
11	6.8	70	70	140	90	550	564	458	705	141	80	30
12	12	50	80	140	100	500	540	465	588	117	65	28
13	12	40	70	140	100	450	532	518	480	83	58	23
14	13	50	70	130	90	400	525	637	405	272	58	30
15	15	50	70	110	90	300	495	662	348	327	66	20
16	15	40	70	100	80	400	572	637	334	138	62	15
17	14	20	70	100	80	500	*572	*612	327	145	64	12
18	15	*15	60	100	80	450	525	564	1,760	88	78	12
19	16	40	60	110	80	400	472	502	1,430	59	104	7.0
20	15	50	*65	120	80	350	420	465	842	34	90	3.4
21	16	40	70	120	*80	600	383	420	*572	31	69	4.7
22	16	40	80	120	80	800	376	390	458	27	62	3.0
23	15	40	90	120	100	*7,000	362	495	369	27	56	2.6
24	14	40	110	130	110	6,000	362	671	296	*27	53	*4.7
25	16	50	100	130	120	3,650	348	1,020	255	21	49	7.0
26	20	50	110	130	110	2,810	334	1,520	230	16	49	6.8
27	22	40	120	120	140	2,360	398	1,630	170	15	109	6.8
28	*26	40	120	110	160	1,820	420	1,780	145	54	1,040	8.0
29	28	40	110	90	180	1,360	398	2,220	117	76	*420	8.5
30	29	50	110	80	------	1,240	355	2,040	99	61	230	8.5
31	32	------	110	70	------	1,060	------	2,640	------	65	604	------
Total	424.2	1,235	2,365	3,620	2,760	38,420	15,488	24,126	24,262	4,148	4,665	1,054.0
Mean	13.7	41.2	76.3	117	95.2	1,239	516	778	809	134	150	35.1
Ac-ft	841	2,450	4,690	7,180	5,470	76,200	30,720	47,850	48,120	8,230	9,250	2,090

Calendar year 1955: Max 5,210 Min 4.7 Mean 425 Ac-ft 307,600
Water year 1955-56: Max 7,000 Min 2.6 Mean 335 Ac-ft 243,100

Peak discharge (base, 5,000 cfs).--Mar. 23 (9:30 a.m.) 24,000 cfs.

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 1-3, Nov. 11 to Mar. 24. Discharge computed from once-daily wire-weight-gage readings Oct. 1 to Mar. 7, Mar. 12, 13, 23, Apr. 12, May 13, 14, July 1 to Aug. 2, Aug. 6-21, 27, Aug. 31 to Sept. 30.

Yellowstone River near Sidney, Mont.

Location.--Lat 47°37', long 104°11', in NW¼NW¼ sec. 5, T. 21 N., R. 59 E., on right bank at Montana Water Conservation Board pumping plant, 2½ miles upstream from Fox Creek, 4½ miles upstream from bridge on State Highway 23, and 7 miles south of Sidney.

Drainage area.--69,450 sq mi, approximately (at highway bridge).

Records available.--April 1934 to September 1956. Monthly discharges for period October 1897 to March 1934, based on records for other Yellowstone River stations and records for Missouri River at Fort Benton, in Circular 108.

Gage.--Water-stage recorder. Altitude of gage is 1,895 ft (from topographic map). Supplemental wire-weight gage, read twice daily at bridge 4½ miles downstream. Apr. 9, 1934, to May 16, 1945, water-stage recorder at two sites within 500 ft of highway bridge 4½ miles downstream and May 17, 1945, to Apr. 3, 1952, wire-weight gage on same bridge at datum about 10 ft lower.

Average discharge.--22 years (1934-56), 11,730 cfs (8,492,000 acre-ft per year).

Extremes.--Maximum discharge during year, 64,600 cfs June 2 (gage height, 14.39 ft); maximum gage height, 15.84 ft Mar. 26 (backwater from ice); minimum daily discharge, 1,500 cfs Nov. 16-18.

1934-56: Maximum discharge, 138,000 cfs Mar. 31, 1952 (gage height, 18.1 ft, site and datum then in use, from graph based on wire-weight-gage readings); maximum gage height observed, 21.85 ft Mar. 22, 1947, site and datum then in use (backwater from ice); minimum daily discharge, 860 cfs Dec. 31, 1934.

Remarks.--Records good except those for period of ice effect, which are poor. Discharge measurements made at 5-day intervals during open water and twice a month during period of ice effect. Diversions for irrigation of about 1,250,000 acres above station. Some regulation on tributary streams. Records of chemical analyses and water temperatures for the water year 1956 are given in WSP 1451.

Rating tables, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 12-18, Apr. 9-14, May 20 to June 4, June 20, July 23-26, 31, Aug. 7-12, Aug. 26 to Sept. 6, Sept. 26-29)

Oct. 1 to Mar. 6, Apr. 9 to June 20				Mar. 7 to Apr. 8		June 20 to Sept. 30			
5.0	4,200	9.0	19,500	3.0	9,300	5.0	4,200	10.0	22,100
6.0	6,600	12.0	41,400	4.0	13,100	7.0	9,500	11.0	30,200
7.0	9,800	15.0	68,300	5.0	17,100	9.0	16,600	11.5	34,700

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5,650	5,980	3,900	10,500	6,100	10,000	12,900	9,380	61,400	25,200	8,870	8,780
2	5,300	5,800	3,500	8,900	6,000	10,500	11,300	9,450	63,500	24,600	9,230	8,630
3	5,420	6,020	4,000	7,000	5,500	10,500	10,300	9,240	57,800	24,300	9,080	8,060
4	5,550	6,050	4,500	5,800	5,500	10,500	10,600	8,920	56,300	24,000	9,110	7,760
5	5,580	5,920	5,500	5,500	5,000	10,500	10,800	8,720	59,000	22,500	8,630	7,880
6	5,620	5,780	6,000	5,500	5,000	11,000	10,300	8,750	59,700	21,000	8,570	7,610
7	5,420	6,080	6,500	5,500	4,500	11,500	9,580	8,720	58,700	20,400	8,180	7,220
8	5,650	6,280	6,000	6,000	4,100	11,000	9,300	8,540	57,000	19,300	7,790	6,950
9	5,600	6,520	5,200	6,000	4,100	10,500	9,760	8,540	54,400	18,000	7,370	6,880
10	5,300	6,520	5,000	6,000	4,600	10,000	9,590	9,420	44,500	17,500	6,750	6,750
11	5,720	6,450	5,000	6,500	5,500	10,000	9,310	11,100	37,800	17,300	6,320	6,400
12	5,620	6,280	5,000	6,500	6,400	9,000	9,240	13,400	37,900	16,700	6,020	6,120
13	5,500	5,000	5,200	6,500	7,000	8,500	9,310	14,200	39,100	15,700	5,900	5,920
14	5,080	3,000	5,500	6,500	7,200	8,000	9,380	14,200	39,800	15,300	5,900	5,480
15	5,400	2,000	5,500	6,000	7,000	7,500	9,100	13,800	40,600	15,400	6,120	5,620
16	5,100	1,500	5,500	6,100	6,700	7,000	9,340	13,600	41,800	15,600	6,200	5,920
17	5,400	1,500	5,500	6,200	6,800	7,000	9,240	12,500	40,600	14,600	5,820	5,920
18	5,650	1,500	5,000	6,200	6,800	7,500	9,380	11,500	43,500	13,800	5,420	6,180
19	5,820	2,000	4,500	6,000	6,500	8,500	9,620	10,800	45,300	13,000	5,120	6,100
20	5,800	2,500	4,300	5,500	6,200	10,000	9,800	11,800	40,600	12,000	5,100	5,880
21	5,580	3,000	4,000	5,000	6,000	12,500	10,300	15,600	34,100	11,100	5,720	5,680
22	5,320	4,000	3,500	4,500	5,500	15,000	9,800	19,800	32,300	10,400	6,480	5,450
23	5,000	4,500	3,500	5,000	5,500	17,500	9,280	23,900	32,500	9,650	6,680	5,500
24	5,120	5,500	4,000	5,500	5,500	20,000	9,200	28,800	33,400	9,080	6,480	5,120
25	4,900	6,500	4,000	5,800	5,900	23,000	9,800	34,900	33,000	8,810	6,280	4,850
26	5,050	7,000	5,000	6,500	6,000	21,500	10,900	40,200	29,500	8,750	5,900	4,620
27	5,520	7,500	6,500	7,000	6,800	21,000	10,700	45,000	27,400	8,420	6,280	4,920
28	5,500	7,500	8,500	6,900	7,500	27,500	10,200	48,300	28,200	8,540	6,180	5,080
29	5,500	7,000	10,500	6,800	8,400	20,000	10,100	51,100	27,400	8,360	7,130	5,020
30	5,450	6,000	11,000	6,500	------	14,000	9,900	52,800	25,600	8,390	8,030	4,950
31	5,920	------	11,000	6,400	------	13,500	------	55,100	------	8,690	9,080	------
Total	169,040	151,180	172,600	194,600	173,600	394,500	298,330	632,080	‡1,282.7	466,390	215,740	187,250
Mean	5,453	5,039	5,568	6,277	5,986	12,730	9,944	20,390	42,760	15,040	6,959	6,242
Ac-ft	335,300	299,900	342,300	386,000	344,300	782,500	591,700	‡1,254	‡2,544	925,100	427,900	371,400

Calendar year 1955 :	Max	38,100	Min	1,500	Mean	8,802	Ac-ft	6,373,000
Water year 1955-56 :	Max	63,500	Min	1,500	Mean	11,850	Ac-ft	8,604,000

‡ Expressed in thousands.

Note.--Stage-discharge relation affected by ice Nov. 13 to Mar. 31. Discharge computed from twice-daily wire-weight-gage readings Mar. 7 to Apr. 8.

Reservoirs in Yellowstone River basin in Wyoming

Bull Lake.--Lat 43°12'35", long 109°02'00", in sec. 30, T. 3 N., R. 2 W., at reservoir dam on Bull Lake Creek, 10 miles south of Lenore. Records available, October 1938 to September 1956 in reports of Geological Survey. December 1936 to September 1938 in files of Bureau of Reclamation. Water-stage recorder. Datum of gage is at mean sea level (Bureau of Reclamation datum). Maximum daily contents during year, 148,900 acre-ft June 30 (elevation, 5,804.05 ft); minimum daily, 51,730 acre-ft May 3, 4 (elevation, 5,767.60 ft). Maximum daily contents during period 1938-56, 152,100 acre-ft July 9, 10, 31, Aug. 6-8, 1951 (elevation, 5,805.05 ft); minimum observed, 5,470 acre-ft Mar. 15, 1950 (elevation, 5,742.56 ft).

Reservoir is formed by rock-fill dam completed by Bureau of Reclamation in December 1936. Capacity, 152,000 acre-ft between elevations 5,739.00 ft (invert of outlet gate) and 5,805.00 ft (crest of spillway). Dead storage unknown. Records given herein represent usable contents. Water used for irrigation near Riverton. Records furnished by Midvale Irrigation District.

Boysen Reservoir.--Lat 43°25'00", long 108°10'37", in NW¼NW¼ sec. 16, T. 5 N., R. 6 E., Wind River meridian, at dam on Wind River 13 miles north of Shoshoni. Records available October 1951 to September 1956. Water-stage recorder. Datum of gage is at mean sea level, datum of 1933 (levels by Bureau of Reclamation). Maximum daily contents during year, 752,700 acre-ft Aug. 5, 6 (elevation, 4,724.74 ft); minimum daily, 189,800 acre-ft Mar. 18, 19 (elevation, 4,684.18 ft). Maximum daily contents during period 1951-56, 761,700 acre-ft July 21-23, 1954 (elevation, 4,725.20 ft); minimum daily contents since normal use of water started, that of Mar. 18, 19, 1956.

Reservoir is formed by rock-fill dam completed by Bureau of Reclamation in October 1951. Capacity, 757,800 acre-ft between elevation 4,657.00 ft (invert of penstock pipe) and 4,725.00 ft (top of spillway gate). Dead storage, 62,000 acre-ft. Records given herein represent usable contents. Water is used for irrigation, flood control, and power development. Records furnished by Bureau of Reclamation.

Buffalo Bill Reservoir.--Lat 44°30'05", long 109°11'00", in sec. 12, T. 52 N., R. 103 W., at dam on Shoshone River, 5 miles upstream from Trail Creek and 6 miles southwest of Cody. Records available, October 1938 to September 1956 in reports of Geological Survey. January 1910 to September 1938 in files of Bureau of Reclamation. Prior to October 1944, published as Shoshone Reservoir near Cody, Wyo. Staff gage. Datum of gage is at mean sea level (Bureau of Reclamation datum). Maximum contents observed during year, 460,600 acre-ft June 20, 21 (elevation, 5,363.0 ft); minimum observed, 170,400 acre-ft Mar. 17-19, Apr. 9-14 (elevation, 5,304.7 ft). Maximum contents observed during period 1938-56, 490,100 acre-ft June 23, 1943 (elevation, 5,364.9 ft); minimum observed, 19,080 acre-ft Jan. 31, Feb. 1, 2, 1941 (elevation, 5,225.4 ft).

Reservoir is formed by masonry dam completed by Bureau of Reclamation in 1909. Capacity, 439,900 acre-ft between elevations 5,140.00 ft (gate sill) and 5,360.00 ft (crest of spillway). Dead storage negligible. Records given herein represent usable contents. Water used for power development and irrigation of lands east of Cody. Gage read once daily. Records furnished by Bureau of Reclamation.

Revisions (water years).--WSP 896: 1939(M).

Month-end elevation and contents, water year October 1955 to September 1956

Date	Bull Lake			Boysen Reservoir		
	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept.30	5,784.85	93,330	-	4,704.14	412,600	-
Oct. 31	5,783.75	90,430	-2,900	4,704.40	416,200	+3,600
Nov. 30	5,782.05	86,010	-4,420	4,701.92	382,700	-33,500
Dec. 31	5,779.60	79,790	-6,220	4,698.75	342,900	-39,800
Calendar year 1955	-	-	+1,750	-	-	-244,500
Jan. 31	5,776.70	72,630	-7,160	4,693.19	279,900	-63,000
Feb. 29	5,772.35	62,330	-10,300	4,686.42	211,100	-68,800
Mar. 31	5,769.25	55,330	-7,000	4,685.32	200,500	-10,600
Apr. 30	5,767.70	51,950	-3,380	4,685.00	197,500	-3,000
May 31	5,782.00	85,880	+33,930	4,699.91	357,100	+159,600
June 30	5,804.05	148,900	+63,020	4,721.59	692,700	+335,600
July 31	5,802.90	145,300	-3,600	4,724.51	748,200	+55,500
Aug. 31	5,796.00	124,400	-20,900	4,723.22	723,300	-24,900
Sept.30	5,788.20	102,400	-22,000	4,719.61	656,700	-66,600
Water year 1955-56	-	-	+9,070	-	-	+244,100
Date	Buffalo Bill Reservoir					
Sept.30	5,318.5	221,900	-			
Oct. 31	5,312.7	199,200	-22,700			
Nov. 30	5,313.5	202,300	+3,100			
Dec. 31	5,314.5	206,100	+3,800			
Calendar year 1955	-	-	-14,200			
Jan. 31	5,312.7	199,200	-6,900			
Feb. 29	5,307.9	181,600	-17,600			
Mar. 31	5,306.5	176,700	-4,900			
Apr. 30	5,310.2	189,900	+13,200			
May 31	5,336.5	301,900	+112,000			
June 30	5,362.8	459,200	+157,300			
July 31	5,360.1	440,500	-18,700			
Aug. 31	5,351.6	386,100	-54,400			
Sept.30	5,343.5	338,800	-47,300			
Water year 1955-56	-	-	+116,900			

Smaller reservoirs in Missouri River basin in Montana

Lima Reservoir on Red Rock River, 8 miles northwest of Monida, completed in 1902 for irrigation and flood control, has usable capacity of 84,000 acre-ft. Records furnished by Waters Users Irrigation Co.

Ruby River Reservoir on Ruby River, 5 miles south of Alder, completed in 1938 for irrigation, has usable capacity of 38,850 acre-ft. Records furnished by Montana Water Conservation Board. Reservoir empty Oct. 1 to Dec. 13, 1955; no other record available.

Willow Creek Reservoir on Willow Creek, 4 miles east of Harrison, completed in 1937 for irrigation, has usable capacity of 17,730 acre-ft. Records furnished by Montana Water Conservation Board.

Hebgen Lake on Madison River, 18 miles northwest of West Yellowstone, completed in 1915 for power, has usable capacity of 345,000 acre-ft. Records furnished by The Montana Power Co.

Ennis Lake on Madison River, 8 miles south of Norris, completed in 1900 for power, has usable capacity of 41,020 acre-ft. Records furnished by the Montana Power Co.

Middle Creek Reservoir on Hyalite Creek, 8 miles south of Bozeman, completed in 1951 for irrigation, has usable capacity of 8,030 acre-ft. Records furnished by Montana Water Conservation Board.

Lake Helena, since April 1945 separated from Hauser Lake by control works permitting independent regulation, has usable capacity of 10,400 acre-ft. Records furnished by The Montana Power Co.

Hauser Lake on Missouri River, 13 miles northeast of Helena, completed in 1907 for power, has usable capacity of 52,100 acre-ft. Records furnished by The Montana Power Co.

Holter Lake on Missouri River, 26 miles north of Helena, completed in 1918 for power, has usable capacity of 81,900 acre-ft. Records furnished by The Montana Power Co.

Gibson Reservoir on Sun River, 20 miles northwest of Augusta, completed in 1929 for irrigation, has usable capacity of 105,000 acre-ft (88,560 acre-ft prior to 1941). Records furnished by Bureau of Reclamation.

Pishkun Reservoir, water diverted from Sun River at point 18 miles northwest of Augusta, completed in 1925 for irrigation, has usable capacity of 32,050 acre-ft (lesser capacities prior to 1940). Records furnished by Bureau of Reclamation.

Willow Creek Reservoir on Willow Creek, 5 miles northwest of Augusta, completed in 1911 for irrigation, has usable capacity of 32,300 acre-ft (16,700 acre-ft prior to 1941). Supplemental supply diverted from Sun River at point 18 miles northwest of Augusta. Records furnished by Bureau of Reclamation.

Nilan Reservoir, water diverted from Smith and Ford Creeks at points about 10 miles southwest of Augusta, completed in 1951 for irrigation, has usable capacity of 10,090 acre-ft. Records furnished by Montana Water Conservation Board.

Morony Reservoir on Missouri River, 10 miles northeast of Great Falls, completed in 1930 for power, has usable capacity of 7,900 acre-ft. Records furnished by The Montana Power Co.

Lower Two Medicine Lake on Two Medicine River, 4 miles northwest of town of East Glacier (formerly Glacier Park), completed in 1913 for irrigation, has usable capacity of 16,620 acre-ft. Records furnished by Office of Indian Affairs.

Four Horns Lake, water diverted from Badger Creek at a point 6 miles north of Heart Butte, completed in 1932 for irrigation, has usable capacity of 19,250 acre-ft. Records furnished by Office of Indian Affairs.

Swift Reservoir on Birch Creek, 18 miles west of Dupuyer, completed in 1915 for irrigation, has usable capacity of 30,000 acre-ft. Records furnished by Pondera County Canal and Reservoir Co.

Lake Frances, water diverted from Birch and Dupuyer Creeks at points 8 miles northwest and 9 miles northeast of Dupuyer, completed about 1913 for irrigation, has usable capacity of 112,000 acre-ft (25,000 acre-ft prior to 1927). Records furnished by Pondera County Canal and Reservoir Co.

Ackley Lake, water diverted from Judith River at a point 4 miles east of Utica, completed in 1939 for irrigation, has usable capacity of 5,820 acre-ft. Records furnished by Montana Water Conservation Board.

Durand Reservoir on North Fork Musselshell River, 1 mile northwest of Delpine, completed in 1939 for irrigation, has usable capacity of 7,000 acre-ft. Some water diverted from Checkerboard Creek into Durand Reservoir. Records furnished by Montana Water Conservation Board.

Martinsdale Reservoir, water diverted from South Fork Musselshell River at a point 1 mile west of Martinsdale, completed in 1939 for irrigation, has usable capacity of 23,100 acre-ft. Records furnished by Montana Water Conservation Board.

Deadmans Basin Reservoir, water diverted from Musselshell River at a point 6 miles northwest of Shawmut, completed in 1941 for irrigation, has usable capacity of 52,500 acre-ft. Records furnished by Montana Water Conservation Board.

Smaller reservoirs in Missouri River basin in Montana--Continued

Fresno Reservoir on Milk River, 15 miles west of Havre, completed in 1939 for irrigation, has usable capacity of 127,200 acre-ft. Records furnished by Bureau of Reclamation.

Nelson Reservoir, water diverted from Milk River at a point about 6 miles west of Dodson, completed in 1922 for irrigation, has usable capacity of 66,800 acre-ft. Records furnished by Bureau of Reclamation.

Mystic Lake on West Rosebud Creek, 25 miles southwest of Absarokee, completed in 1925 for power, has usable capacity of 20,800 acre-ft. Records furnished by The Montana Power Co.

Cooney Reservoir on Red Lodge Creek, 6 miles west of Boyd, completed in 1936 for irrigation, has usable capacity of 27,400 acre-ft. Records furnished by Montana Water Conservation Board.

Tongue River Reservoir on Tongue River, 7 miles northeast of Decker, completed in 1939 for irrigation, has usable capacity of 68,000 acre-ft. Records furnished by Montana Water Conservation Board.

Other Reservoirs are operated for irrigation and municipal use.

Month-end contents, in acre-feet, water year October 1955 to September 1956

Date	Lima Reservoir	Ruby River Reservoir	Willow Creek Reservoir	Hebgen Lake	Ennis Lake	Middle Creek Reservoir	Lake Helena
Sept.30, 1955.........	7,390	0	12,600	267,700	31,800	b1,730	10,670
Oct. 31..............	10,720	0	10,100	222,600	36,280	b1,690	8,450
Nov. 30..............	13,140	0	a19,890	192,100	33,610	b1,820	11,110
Dec. 31..............	16,290	(d)	a13,900	192,900	33,760	a2,560	10,240
Jan. 31, 1956.........	a19,920	-	a15,310	184,900	31,700	a3,030	9,620
Feb. 29..............	b19,960	-	a16,030	185,200	32,530	a3,350	11,560
Mar. 31..............	25,630	-	a17,600	176,200	29,890	3,670	6,210
Apr. 30..............	46,920	-	a16,420	187,600	27,930	a4,510	8,080
May 31..............	44,720	-	a16,090	305,000	29,050	a5,760	9,820
June 30..............	26,780	-	a16,090	343,200	38,470	b6,180	9,020
July 31..............	12,470	-	a13,330	343,900	37,140	b3,420	9,220
Aug. 31..............	4,710	-	a10,140	323,200	37,140	b1,320	10,890
Sept.30..............	5,060	-	a8,750	293,800	37,170	a1,130	10,670

Date	Hauser Lake	Holter Lake	Gibson Reservoir	Pishkun Reservoir	Willow Creek Reservoir	Nilan Reservoir	Morony Reservoir
Sept.30, 1955.........	52,470	73,510	42,270	24,370	26,140	5,800	6,030
Oct. 31..............	48,300	75,810	48,000	16,970	26,410	4,600	6,750
Nov. 30..............	53,240	66,670	55,190	16,970	26,540	4,600	6,930
Dec. 31..............	51,700	65,760	62,410	16,840	26,680	4,600	6,510
Jan. 31, 1956.........	50,560	50,580	69,210	16,840	26,680	4,600	7,050
Feb. 29..............	54,020	44,240	70,690	16,580	26,680	4,600	5,530
Mar. 31..............	43,580	44,440	74,590	16,250	28,180	4,600	6,210
Apr. 30..............	47,550	73,050	77,050	23,630	28,180	b4,900	7,900
May 31..............	50,940	73,740	95,540	29,830	28,860	b4,820	7,540
June 30..............	49,420	76,740	101,300	28,060	28,990	b5,200	6,630
July 31..............	49,800	75,350	74,000	18,130	27,360	b4,700	6,990
Aug. 30..............	52,860	80,260	45,970	17,360	23,820	b4,250	7,050
Sept.30..............	52,470	80,020	28,960	22,260	23,010	b3,950	7,720

Date	Lower Two Medicine Lake	Four Horns Lake	Swift Reservoir	Lake Frances	Ackley Lake	Durand Reservoir	Martinsdale Reservoir
Sept.30, 1955.........	a5,200	a7,890	18,020	91,260	b4,580	2,140	4,160
Oct. 31..............	a0	a8,510	12,550	91,960	b4,150	1,630	4,090
Nov. 30..............	0	8,840	14,530	92,420	b4,150	1,830	4,300
Dec. 31..............	a0	a9,070	19,060	92,360	a4,150	-	-
Jan. 31, 1956.........	a0	a9,140	20,990	92,460	b4,150	-	-
Feb. 29..............	b0	b9,090	22,700	92,360	b4,150	-	-
Mar. 31..............	a0	a9,210	24,560	91,720	b4,150	3,890	5,890
Apr. 30..............	0	9,740	30,040	92,260	b4,150	a5,770	a8,700
May 31..............	b7,270	b10,900	30,270	104,900	b4,580	7,030	15,090
June 30..............	a10,530	a10,270	b30,120	b106,300	5,250	7,030	16,780
July 31..............	b9,900	b9,870	29,260	101,400	a4,140	6,490	13,150
Aug. 30..............	7,270	8,640	23,840	96,540	b3,950	a4,740	a7,960
Sept.30..............	4,310	9,090	17,800	93,680	a3,950	b4,250	b6,140

Date	Deadmans Basin Reservoir	Fresno Reservoir	Nelson Reservoir	Mystic Lake	Cooney Reservoir	Tongue River Reservoir	
Sept.30, 1955.........	a23,750	88,100	40,280	19,490	5,600	13,360	
Oct. 31..............	a25,500	76,830	46,700	16,340	-	10,400	
Nov. 30..............	-	75,060	45,160	15,040	-	9,500	
Dec. 31..............	-	72,950	42,880	11,960	-	9,500	
Jan. 31, 1956.........	-	69,550	41,390	9,480	-	-	
Feb. 29..............	a31,500	66,600	39,910	6,200	-	-	
Mar. 31..............	a41,040	93,520	38,460	4,120	-	35,770	
Apr. 30..............	a45,310	108,600	41,760	1,990	-	18,860	
May 31..............	a50,140	129,000	40,280	9,750	b20,000	29,390	
June 30..............	48,700	115,200	34,210	19,930	a20,480	40,880	
July 30..............	a38,900	99,880	34,900	21,030	b20,620	36,800	
Aug. 30..............	a28,000	82,090	39,910	20,760	b20,620	26,750	
Sept.30..............	c27,220	81,880	45,160	20,730	b19,000	20,910	

a Interpolated on basis of readings made weekly or less frequently.
b Figure of contents for first day of following month.
c Sept. 29, 1956.
d Reservoir empty Dec. 1-13; no record for remainder of month.

Missouri River near Williston, N. Dak.

Location.--Lat 48°07', long 103°44', in sec. 31, T. 154 N., R. 101 W., on left bank 10 ft downstream from Lewis and Clark Highway bridge, 5 miles southwest of Williston, 25 miles downstream from Yellowstone River, and at mile 1,650.2.

Drainage area.--164,500 sq mi, approximately.

Records available.--April 1905 to May 1907 (fragmentary, considered unreliable), September 1928 to September 1956. Monthly discharge for period October 1897 to September 1928 (including revised figures for 1905-7), based on records for station at Fort Benton, Mont., in Circular 108. Gage-height records collected in this vicinity 1908-11 and since 1913 are contained in reports of U. S. Weather Bureau.

Gage.--Water-stage recorder. Datum of gage is 1,830.20 ft above mean sea level, datum of 1929. April 1905 to May 1907 chain and staff gages at site 15 miles downstream, at different datum.

Average discharge.--28 years (1928-56), 20,560 cfs (14,880,000 acre-ft per year).

Extremes.--Maximum discharge during year, 67,800 cfs June 3 (gage height, 8.55 ft); maximum gage height, 11.65 ft Mar. 29 (affected by ice); minimum daily discharge, 6,400 cfs Nov. 17.

1928-56: Maximum discharge, 231,000 cfs Apr. 4, 1930 (gage height, 18.6 ft), from rating curve extended above 80,000 cfs; maximum gage height, 19.78 ft Mar. 28, 1943 (ice jam); minimum daily discharge, 1,320 cfs Dec. 28, 1939.

Maximum stage known, about 28 ft in April 1912 from information by local residents.

Remarks.--Records excellent except those for period of ice effect, which are fair. Many diversions above station. Flow regulated by Fort Peck Reservoir. Measurements made at about 5-day intervals Oct. 1 to Nov. 9, Apr. 6 to Sept. 30; at about 10-day intervals Dec. 21 to Mar. 13. Records of chemical analyses and water temperatures for the water year 1956 are given in WSP 1451.

Revisions (water years).--WSP 716: 1929-30.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	35,300	29,100	12,100	16,300	13,200	15,200	24,000	17,000	61,900	32,400	18,400	19,200
2	35,200	28,300	11,300	16,600	12,700	15,500	22,000	16,900	66,400	32,100	18,500	19,400
3	34,500	26,900	11,500	16,400	12,300	15,700	20,000	17,100	66,800	31,900	18,800	18,800
4	34,500	26,800	11,500	15,300	12,000	16,100	20,000	16,800	64,700	31,900	19,000	18,100
5	35,000	25,900	11,400	14,000	12,000	16,100	24,000	16,100	65,000	32,700	19,100	16,200
6	35,600	25,400	12,400	13,200	11,900	16,000	25,000	15,600	65,000	33,500	19,000	15,200
7	36,000	23,900	12,600	12,900	11,200	16,500	18,000	15,600	63,500	32,500	19,000	14,500
8	35,700	23,000	12,500	12,800	10,500	16,900	17,000	15,700	60,600	31,200	18,700	14,100
9	35,600	22,400	12,700	13,100	10,000	17,000	16,900	16,000	58,200	27,700	18,600	13,800
10	34,800	22,100	13,100	13,000	10,100	16,600	17,400	15,900	54,000	24,400	18,400	13,800
11	34,900	21,600	13,000	13,100	10,800	16,400	17,400	16,500	45,800	23,300	17,900	13,500
12	35,400	19,500	12,700	13,400	11,300	16,400	19,200	18,400	43,700	23,700	17,400	13,200
13	36,100	17,000	12,400	13,400	11,800	15,900	20,800	21,400	45,400	25,300	17,200	13,100
14	36,000	12,000	12,500	13,600	12,100	14,700	17,000	23,200	46,500	26,400	16,900	12,900
15	35,200	10,000	12,500	13,700	12,300	14,000	16,000	22,700	47,100	26,100	16,600	12,700
16	35,600	8,000	12,600	13,700	12,000	13,900	15,000	21,900	47,100	26,600	16,600	12,600
17	36,000	6,400	12,200	13,600	11,600	13,300	14,700	21,400	45,700	27,100	16,700	12,900
18	36,400	7,200	11,300	13,200	12,100	12,900	14,500	20,300	44,400	25,900	16,500	12,900
19	36,700	7,700	11,700	13,000	12,500	14,200	14,300	18,900	48,400	25,000	16,300	13,000
20	36,800	8,200	12,800	13,000	12,600	16,100	14,600	17,600	48,600	24,100	15,900	12,900
21	36,700	8,800	12,800	12,800	12,700	18,200	14,800	17,800	43,500	23,000	15,900	12,700
22	36,400	10,100	12,100	12,300	12,200	20,700	15,000	20,800	38,600	21,800	16,100	12,600
23	36,000	11,300	11,500	12,100	11,600	23,600	14,600	25,100	37,800	21,000	16,600	12,600
24	36,000	12,000	11,100	12,200	11,300	26,500	14,100	30,800	38,800	20,000	16,900	12,500
25	35,000	12,600	10,900	12,400	11,700	27,900	14,400	36,800	40,400	19,400	16,900	12,400
26	33,300	13,100	11,000	13,100	12,200	29,200	15,400	42,700	38,500	19,000	16,600	12,100
27	33,000	13,200	11,500	13,700	12,700	29,400	16,600	47,900	35,000	18,800	16,500	12,000
28	33,200	13,000	12,200	14,100	13,400	31,000	17,300	52,000	33,700	18,600	16,800	11,700
29	31,600	14,000	13,300	14,100	14,300	34,000	17,100	55,700	34,100	18,800	17,000	11,300
30	30,200	14,000	14,800	14,000	------	29,000	16,900	56,900	33,500	18,600	17,400	11,800
31	29,600	------	15,700	13,700	------	26,000	------	57,900	------	18,600	18,200	------
Total	‡1,082.3	493,500	381,700	421,800	347,100	604,900	524,000	809,400	‡1,462.7	781,400	540,400	414,500
Mean	34,910	16,450	12,310	13,610	11,970	19,510	17,470	26,110	48,760	25,210	17,430	13,820
Ac-ft	‡2,147	978,800	757,100	836,600	688,500	‡1,200	‡1,039	‡1,605	‡2,901	‡1,550	‡1,072	822,100

Calendar year 1955:	Max	68,000	Min	6,400	Mean	25,370	Ac-ft	18,360,000
Water year 1955-56:	Max	66,800	Min	6,400	Mean	21,490	Ac-ft	15,600,000

‡ Expressed in thousands.

Note.--Stage-discharge relation affected by ice Nov. 13 to Apr. 8.

Blacktail Creek near Bonetrail, N. Dak.

Location.--Lat 48°25', long 103°43', in NW¼ sec. 15, T. 157 N., R. 101 W., on right bank half a mile upstream from unnamed tributary, 5 miles east of Bonetrail, and 8 miles upstream from mouth.

Drainage area.--30 sq mi, approximately.

Records available.--October 1955 to September 1956.

Gage.--Water-stage recorder.

Extremes.--Maximum discharge during year, 100 cfs (estimated) July 14 (gage height, 4.05 ft); no flow for many days.

Remarks.--Records poor. Some storage in stock ponds.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.2	0.2	0.1			0	2.4	0.4	0.3	1.5	0.1	0.1
2	.2	.2			(*)	0	2.3	.6	.3	1.0	.1	.1
3	.2	.2				0	2.2	.5	.3	.8	.1	.1
4	.2	.2				0	2.2	.5	.3	.6	.1	.1
5	.2	.2				0	2.1	.6	.2	.5	.1	.1
6	.2	.2				0	2.0	.6	.2	.4	.1	*.1
7	.2	.2				0	1.9	.6	.2	.3	*.1	.1
8	.2	.2				0	1.8	.7	.2	.2	.1	.1
9	.2	.2				0	1.8	.7	.1	.2	.1	.1
10	.2	.2				0	*1.7	.8	.1	.2	.1	.1
11	.2	.2	0			0	1.6	1.0	.1	*.2	.2	.1
12	.2	.2	0			*0	1.4	.8	.1	.2	.5	.1
13	.2	.2	0			0	1.3	.6	*.2	.3	.4	.1
14	.2	.2	0			*0	1.2	.5	*0	20	.2	.1
15	.2		0			0	1.0	*.4	.1	1.0	.1	.1
16	.1		0			0	.8	.4	.1	.2	.1	.1
17	.1		0			2	.6	.4	.1	.1	.1	.1
18	*.2		0			10	*.5	.4	2.0	.1	.1	.1
19	.2		0			25	.4	.3	2.5	.1	.1	.1
20	.1		0			*50	.4	.3	2.2	.1	.1	*.1
21	.1	*.2	0			30	.4	.3	2.8	.1	*.1	.1
22	.1	.2	0		(*)	*10	.4	.3	4.0	.1	.1	.1
23	.2	.1	*0			9.5	.3	.3	3.0	.1	.1	.1
24	.2		0			*9	.3	.3	3.5	*.1	.1	.1
25	.4		0			15	.3	.3	5.0	.1	.1	.1
26	.3		0			20	.3	.5	5.0	.1	.1	.1
27	.2		0			10	.3	.5	4.0	.1	.1	.1
28	.2		0			5	.3	.4	3.0	.1	.1	.1
29	.2		0			*3	.3	.4	2.5	.1	.1	.1
30	.2		0		------	2.5	.3	.3	2.0	.1	.2	.1
31	.2	------	0		------	2.5	------	.3	------	.1	.2	------
Total	6.0	5.2	1.0	0	0	203.5	32.8	15.0	44.4	29.1	4.2	3.0
Mean	0.19	0.17	0.03	0	0	6.56	1.09	0.48	1.48	0.94	0.14	0.10
Ac-ft	12	10	2.0	0	0	404	65	30	88	58	8.3	6.0

Calendar year 1955: Max - Min - Mean - Ac-ft -
Water year 1955-56: Max 50 Min 0 Mean 0.94 Ac-ft 683

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* Discharge measurement or observation of no flow made on this day.

Note.--Stage-discharge relation indefinite due to beaver dams during the year; discharge determined graphically on basis of gage-height record, discharge measurements, observation of no flow, hydrographer's notes, weather records, and records for nearby stations.

Little Muddy Creek below Cow Creek, near Williston, N. Dak.

Location.--Lat 48°17', long 103°34', in NE¼NW¼ sec. 5, T. 155 N., R. 100 W., on left bank 37 ft downstream from center line of highway, 1 mile downstream from Cow Creek, 4 miles upstream from Camp Creek, 10 miles northeast of Williston, and 13 miles upstream from mouth.

Drainage area.--875 sq mi, approximately, of which about 100 sq mi is probably noncontributing.

Records available.--May 1954 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 1,863.18 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, about 400 cfs Mar. 21 (gage height, 8.28 ft, affected by ice); minimum, 2.1 cfs Feb. 3, 4 (gage height, 3.97 ft).
1954-56: Maximum discharge, 3,750 cfs Mar. 30, 1955 (gage height, 12.15 ft); minimum, that of Feb. 3, 4, 1956; minimum gage height, 2.26 ft July 26, 1954.

Remarks.--Records good except those for periods of ice effect or no gage height record, which are fair. Some small diversions for irrigation. Some regulation by Lake Zahl, Fish and Wildlife Reservoir.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.4	11	4	3.5	2.7	3.0	76	17	11	11	6.5	6.8
2	6.4	8.5	5	3.5	*2.2	3.1	60	18	11	9.5	6.5	7.3
3	6.4	8	5	3.5	2.1	3.2	54	18	11	11	6.8	7.3
4	6.8	9	5	3.5	2.1	3.3	44	18	10	12	6.0	6.8
5	6.8	10	5	3.5	2.5	3.4	41	18	10	10	5.7	7.1
6	6.8	8.9	5	3.5	2.8	3.5	*41	20	10	12	5.7	6.8
7	6.4	9	5	3.5	3.0	3.5	39	20	*10	14	5.4	*6.5
8	6.8	9	5	3.5	3.0	3.6	53	20	10	13	*7.3	6.5
9	6.8	9	5	3.5	3.2	3.8	35	19	9.6	12	6.8	6.5
10	6.8	10	5	3.5	3.2	4.0	*33	20	9.3	11	7.1	6.2
11	8.5	8.1	5	3.5	3.5	4.2	29	23	9.0	10	7.3	6.5
12	7.8	8	5	3.5	3.5	4.5	27	28	8.8	*9.2	7.1	6.8
13	7.1	7	5	3.5	3.5	5.0	*27	24	*8.6	8.6	6.5	6.8
14	6.8	7	4	3.5	3.5	5.5	26	22	8.4	9.2	6.5	7.1
15	7.1	7	4	3.5	3.5	*5.5	25	20	8.2	12	6.5	7.6
16	7.1	8	4	3.5	3.5	6.0	23	*19	8.2	19	6.5	7.9
17	7.4	8	4	3.4	3.5	8.0	21	17	7.9	19	6.2	7.6
18	*7.8	8.1	3.6	3.3	3.5	15	20	17	11	13	6.5	7.3
19	7.8	8.5	3.0	3.2	3.5	45	*20	16	16	11	6.2	7.3
20	8.1	9	2.5	3.1	3.5	*140	20	15	14	10	6.0	6.8
21	8.1	9	2.4	3.0	3.5	300	20	15	13	9.8	5.7	*6.8
22	8.5	9	2.5	3.0	*3.7	250	19	14	13	8.6	*5.7	6.8
23	8.5	*9.3	*3.0	3.0	3.5	200	18	14	14	7.6	5.4	6.8
24	8.5	7.4	3.2	3.0	3.4	*150	18	13	20	*6.8	5.4	7.3
25	8.9	7.4	3.5	3.0	3.3	90	18	13	21	6.2	5.4	7.3
26	9.3	8.5	3.5	3.0	3.2	70	17	13	22	6.5	5.4	7.1
27	9.3	7.1	3.5	3.0	3.1	80	17	12	20	6.5	5.4	7.3
28	9.3	5.1	3.5	3.0	3.0	40	17	12	20	6.8	5.7	7.9
29	9.3	3.9	3.5	3.0	3.0	90	17	12	17	7.1	6.2	8.6
30	9.7	3.6	3.5	3.0	------	100	17	12	14	7.3	7.3	8.2
31	11	------	3.5	3.0	------	95	------	12	------	7.1	8.2	------
Total	242.3	241.4	124.7	102.0	91.5	1,738.1	892	531	376.0	316.8	194.9	213.6
Mean	7.82	8.05	4.02	3.29	3.16	56.1	29.7	17.1	12.5	10.2	6.29	7.12
Ac-ft	481	479	247	202	181	3,450	1,770	1,050	746	628	387	424

Calendar year 1955: Max 2,600 Min 2.4 Mean 48.5 Ac-ft 35,140
Water year 1955-56: Max 300 Min 2.1 Mean 13.8 Ac-ft 10,040

Peak discharge (base, 250 cfs).--Mar. 21 (time unknown) about 400 cfs.
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 3-5, 7-10, 12-17, 20-22, Dec. 1-17, Dec. 25 to Jan. 24; Feb. 6 to Mar. 31. No gage-height record May 18 to June 14; discharge estimated on basis of recorded range in stage, 2 discharge measurements, and weather records.

White Earth River at White Earth, N. Dak.

Location.--Lat 48°23', long 102°46', in NE¼SW¼ sec. 36, T. 157 N., R. 94 W., near center of span on downstream side of Great Northern Railway bridge, a quarter of a mile east of White Earth.

Drainage area.--490 sq mi, approximately.

Records available.--August 1954 to September 1956.

Gage.--Wire-weight gage, read twice daily at high stages and once daily otherwise. Supplemental staff gage since Aug. 9, 1955. Datum of gage is 2,071.64 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 504 cfs Apr. 4 (gage height, 10.1 ft, from graph based on gage readings); minimum, 0.8 cfs Feb. 1-4.

1954-56: Maximum discharge, 1,270 cfs Mar. 30, 1955 (gage height, 15.2 ft, affected by ice), from rating curve extended above 700 cfs; minimum, 0.2 cfs Feb. 21 to Mar. 8, 1955.

Flood in 1929 reached a stage of 21.8 ft, from information by local residents.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor.

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 2-22, June 19-30, July 3,4, July 19 to Aug. 8)

1.7	1.4	3.0	39
1.9	3.9	4.0	80
2.1	7.4	6.0	180
2.3	12	8.0	314
2.5	19	10.0	510

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.6	4	3	1.5	0.8	1.5	380	47	16	16	4.5	3.3
2	1.5	4	3	1.5	.8	1.5	308	47	13	13	4.9	2.5
3	1.7	4	3	1.5	.8	1.5	312	45	14	21	4.7	2.1
4	1.7	4	3	1.5	*.8	1.5	448	45	16	23	5.3	2.0
5	1.8	6	2.5	1.5	1	1.5	423	45	14	18	4.9	2.1
6	2.0	5	2.5	1.5	1	1.5	304	45	14	15	9.2	*2.1
7	2.0	4	2.5	1.5	1	1.5	258	45	*12	15	*11	1.6
8	2.0	3.5	2	1.5	1	1.5	241	46	11	18	9.0	1.4
9	2.0	3.5	2	1.5	1	1.5	210	42	10	15	7.4	1.6
10	2.1	3.5	2	1.5	1	1.5	186	42	9.2	*14	6.4	1.5
11	2.0	3	2	1.5	1	1.5	175	47	8.8	13	5.3	2.2
12	1.8	3	2	1.5	1.5	1.5	*165	45	8.3	12	6.1	1.7
13	2.0	3	2	1.5	2	1.5	150	41	7.9	12	5.3	2.1
14	1.8	3	2	1.5	2	*1.8	135	37	7.0	16	5.0	1.5
15	2.1	3	2	1	2	2	125	36	6.6	12	4.1	3.8
16	2.2	3	2	1	2	2	115	*32	6.3	9.0	3.3	3.5
17	2.3	3	2	1	2	3	105	30	6.6	13	3.6	2.9
18	2.4	3	2	1	2	5	95	25	8.3	9.7	3.3	2.8
19	2.3	3.5	2	1	1.5	10	*86	24	*61	11	3.1	2.6
20	*2.4	3.5	2	1	1.5	80	80	22	23	9.0	2.8	*2.3
21	2.5	3.5	2	1	1.5	*260	75	20	28	7.2	*2.3	2.1
22	2.6	*3.5	*1.7	1	1.5	200	70	18	31	8.1	1.8	2.0
23	2.8	3.5	1.5	1	*1.5	*72	66	19	35	7.2	1.6	1.8
24	2.9	3.5	1.5	1	1.5	130	62	17	28	*6.3	1.7	2.0
25	2.8	3.5	1.5	1	1.5	400	58	16	39	6.3	1.6	2.1
26	2.9	3	1.5	1	1.5	400	*54	17	53	5.9	1.5	2.6
27	3.2	3	1.5	1	1.5	*300	51	15	31	4.9	2.4	2.4
28	3.6	3	1.5	1	1.5	170	50	14	21	4.7	2.2	2.6
29	3.8	3	1.5	1	1.5	180	48	17	20	4.5	1.5	3.2
30	3.6	3	1.5	1	------	*220	46	17	17	4.7	2.5	3.2
31	4	------	1.5	1	------	250	------	16	------	4.7	4.1	------
Total	74.4	105.0	62.7	38.0	40.2	2,705.3	4,881	974	576.0	350.2	132.4	69.6
Mean	2.40	3.50	2.02	1.23	1.39	87.3	163	31.4	19.2	11.3	4.27	2.32
Ac-ft	148	208	124	75	80	5,370	9,680	1,930	1,140	695	263	138

Calendar year 1955: Max 900 Min 0.2 Mean 31.0 Ac-ft 22,480
Water year 1955-56: Max 448 Min 0.8 Mean 27.3 Ac-ft 19,850

Peak discharge (base, 150 cfs).--Mar. 21 (time unknown) 350 cfs; Mar. 25 (time unknown) 440 cfs; Apr. 1 (time unknown) 460 cfs; Apr. 4 (7 p.m.) 504 cfs (10.1 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 30 to Apr. 1. No gage-height record Apr. 11-25; discharge estimated on basis of 3 discharge measurements and weather records.

North Creek spreader diversion near Alzada, Mont.

Location.--Lat 45°04', long 104°30', in NW$\frac{1}{4}$SW$\frac{1}{4}$ sec. 8, T. 9 S., R. 59 E., on right bank just upstream from lower end of diversion dike, 5$\frac{1}{2}$ miles northwest of Alzada.

Drainage area.--1.29 sq mi.

Records available.--May 1952 to September 1956 (no winter records), discontinued.

Gage.--Water-stage recorder. Altitude of gage is 3,470 ft (by barometer). Prior to Apr. 13, 1954, at datum 0.75 ft higher.

Extremes.--Maximum discharge during year, 130 cfs July 3 (gage height, 2.44 ft); no flow most of the time.

1952-56: Maximum discharge, 130 cfs Aug. 5, 1954, July 3, 1956 (gage height, 2.44 ft); no flow most of the time.

Remarks.--Records poor. Peak flows and total acre-feet were as follows:

Date	Duration (hours)	Peak stage (feet)	Peak flow (cfs)	Total acre-feet
June 14-15.......	5	0.62	2.3	0.28
June 15-17.......	36	1.37	28	15.4
July 2-3........	22	2.12	95	15.8
July 3-4........	19	2.44	130	22.5

Peak discharge (base, 10 cfs).--June 16 (2:20 a.m.) 28 cfs (1.37 ft); July 2 (7:40 p.m.) 95 cfs (2.12 ft); July 3 (6:20 p.m.) 130 cfs (2.44 ft).

Note.--Flow occurred only on days listed above.

Little Missouri River near Alzada, Mont.

Location.--Lat 45°05', long 104°24', in NE$\frac{1}{4}$SW$\frac{1}{4}$ sec. 6, T. 9 S., R. 60 E., on right bank 1.9 miles downstream from Thompson Creek and 4 miles north of Alzada.

Drainage area.--780 sq mi, approximately.

Records available.--June 1911 to September 1925, August 1928 to September 1932, March 1935 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 3,367 ft above mean sea level (river-profile survey). Prior to June 14, 1947, staff or chain gage at same site and datum.

Average discharge.--28 years (1915-16, 1917-19, 1923-25, 1930-32, 1935-56), 78.4 cfs (56,760 acre-ft per year).

Extremes.--Maximum daily discharge during year, 886 cfs Mar. 23; maximum gage height, 9.50 ft Mar. 22 (backwater from ice); no flow for many days.

1911-25, 1928-32, 1935-56: Maximum daily discharge, 6,000 cfs Apr. 4, 1944; no flow at times.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Several diversions of floodwaters for irrigation of hay meadows above station. Some storage in coulees.

Revisions (water years).--WSP 976: 1942.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.1	0.1	0.1	25	0.5	7	15	0.9	45	0.4	0.1	
2	.1	0	*.1	20	.5	8	7.5	.9	7	.5	.1	
3	.1	0	.1	15	.5	10	4.4	1.1	5	.9	.1	
4	*0	0	.1	12	.5	20	7.2	.9	3	.5	.1	
5	.1	.1	.1	10	.5	30	21	.9	2	21	.1	
6	.1	.1	.1	9	.5	50	52	.8	1	10	.3	(*)
7	.1	.1	.1	8	.5	45	53	.8	*.8	42	1.3	
8	.1	.1	.1	7	.5	40	34	.5	.5	30	*.5	
9	.1	.1	.1	6	.5	35	37	.5	.3	13	.2	
10	.1	.1	.1	6	.5	30	24	.8	.2	12	.1	
11	.1	.1	.1	6	.5	25	8.6	26	.1	7.8	.1	
12	.1	.1	.1	6	.5	20	6.7	9.2	.1	4.4	.1	
13	.1	.1	.1	6	.5	15	4.8	7.8	.3	2.1	0	
14	.1	.1	.1	5	.5	10	3.0	7.0	.3	.8	0	
15	.1	.1	.2	4	.5	10	1.9	4.1	303	.4	0	
16	.1	.1	.1	3	.5	10	1.5	2.3	660	9.5	0	
17	.1	.1	.1	3	.5	10	1.3	1.5	428	1.6	0	
18	.1	.1	.1	3	.5	30	1.1	1.1	165	5.2	.1	
19	.1	.1	.1	2	.5	50	1.1	.9	73	.8	.1	
20	.1	.1	.1	*2	*.5	100	.9	.8	29	.2	0	
21	0	.1	*.1	1.5	.5	300	.9	.6	14	.1	0	
22	0	.1	0	1	.5	700	.9	3.7	8.3	.1	0	
23	0	.1	0	1	.5	886	.8	21	5.0	.1	0	
24	0	.1	0	1	1	720	.8	6.2	3.2	.1	0	
25	0	.1	0	1	2	482	.8	3.0	2.1	.1	0	
26	0	.1	10	1	3	412	*.8	1.6	1.3	.1	0	
27	*0	.1	30	1	4	251	.8	1.1	5.9	.1	0	
28	0	.1	50	1	5	150	.8	1.2	2.6	.1	0	
29	0	.1	40	1	6	96	.8	1.1	1.2	.1	0	
30	0	.1	35	1	------	63	.8	402	.4	.1	0	
31	0	------	30	.5	------	33	------	175	------	.1	0	------
Total	1.9	2.7	197.2	169.0	32.5	4,648	294.2	685.3	1,767.6	164.2	3.3	0
Mean	0.06	0.09	6.36	5.45	1.12	150	9.81	22.1	58.9	5.30	0.11	0
Ac-ft	3.8	5.4	391	335	64	9,220	584	1,360	3,510	326	6.5	0

Calendar year 1955: Max 1,690 Min 0 Mean 60.5 Ac-ft 43,810
Water year 1955-56: Max 886 Min 0 Mean 21.8 Ac-ft 15,810

Peak discharge (base, 1,100 cfs).--No peak above base.

* Discharge measurement or observation of no flow made on this day.

Note.--No gage-height record May 31 to June 6; discharge estimated on basis of reconstructed gage-height graph and weather records. Stage-discharge relation affected by ice Dec. 26 to Mar. 22.

Little Beaver Creek near Marmarth, N. Dak.

Location.--Lat 46°16', long 103°58', in NE¼ sec. 7, T. 132 N., R. 106 W., on left bank 150 ft upstream from concreted ford, three-quarters of a mile downstream from Corral Creek, 3 miles southwest of Marmarth, and 5 miles upstream from mouth.

Drainage area.--615 sq mi, approximately.

Records available.--April 1938 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 2,739 ft (by barometer). Prior to Mar. 15, 1941, wire-weight gage at site half a mile upstream at datum 0.57 ft higher. Mar. 15, 1941, to May 20, 1947, staff or wire-weight gages at present site and datum. May 21, 1947, to June 27, 1951, staff and wire-weight gages at site half a mile upstream, at present datum.

Average discharge.--18 years, 46.1 cfs (33,380 acre-ft per year); median of yearly mean discharges, 38 cfs (27,500 acre-ft per year).

Extremes.--Maximum discharge during year, 1,070 cfs July 29 (gage height, 4.98 ft); no flow at times.

1938-56: Maximum discharge, 12,700 cfs Apr. 6, 1952 (gage height, 13.9 ft, from floodmark), from rating curve extended above 4,500 cfs on basis of slope-area determination of peak flow; no flow at times.

Remarks.--Records fair. No regulation. Some small diversions for irrigation.

Revisions (water years).--WSP 1279: 1939(M), 1940, 1943-44(M), 1945, 1948.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						0	15	4.2	34	0	1.6	0.8
2						*0	14	4.6	20	0	.5	.3
3						0	9.2	8.8	13	0	.1	.4
4						6.0	11	4.9	11	0	0	.4
5						*22	*8.1	4.0	8.4	4.1	0	.3
6						6	5.5	3.6	5.7	*2.6	0	.2
7						4	5.0	3.4	4.9	.8	0	.1
8						2	5.5	3.0	4.4	.4	*16	0
9						2	5.4	3.0	3.8	.2	1.4	0
10						2	3.5	30	2.5	0	.5	0
11						1	3.5	27	2.1	*0	.3	0
12						.3	3.0	11	1.5	.5	.1	0
13						*.2	3.0	8.1	.7	1.8	0	0
14					(*)	.2	2.5	5.0	.4	.2	0	0
15						.2	2.7	3.9	.3	0	0	0
16						.2	3.3	2.5	.2	*0	0	0
17	(*)					.4	2.9	1.6	.1	0	0	0
18						23	2.5	1.6	0	0	0	0
19						*75	2.5	1.6	*0	0	0	0
20			(*)			79	2.5	1.6	0	0	0	0
21		(*)				38	2.6	1.4	0	0	0	0
22						*30	2.5	*1.2	0	0	0	0
23				(*)		18	2.7	1.0	0	0	0	*0
24						18	*2.7	1.0	0	0	0	0
25						17	2.9	1.0	0	0	0	0
26						17	3.0	.9	0	0	5.9	0
27						17	3.8	.9	0	70	*14	0
28						8.6	5.0	65	0	56	7.6	0
29						5.2	4.4	122	0	214	1.0	0
30					------	11	4.2	108	0	111	.4	0
31		------			------	16	------	64	------	6.8	.6	------
Total	0	0	0	0	0	419.3	144.4	499.8	113.0	468.4	50.0	2.5
Mean	0	0	0	0	0	13.5	4.81	16.1	3.77	15.1	1.61	0.08
Ac-ft	0	0	0	0	0	832	286	991	224	929	99	5.0

Calendar year 1955:	Max	706	Min	0	Mean	15.2	Ac-ft	10,970
Water year 1955-56:	Max	214	Min	0	Mean	4.64	Ac-ft	3,370

Peak discharge (base, 600 cfs).--July 29 (10 p.m.) 1,070 cfs (4.98 ft).

* Discharge measurement or observation of no flow made on this day.

Note.--Stage-discharge relation affected by ice Mar. 6-17.

Little Missouri River at Marmarth, N. Dak.

Location.--Lat 46°18', long 103°54', in SE¼ sec. 30, T. 133 N., R. 105 W., on upstream side of highway bridge in Marmarth, 1½ miles downstream from Little Beaver Creek.

Drainage area.--4,570 sq mi, approximately.

Records available.--March 1938 to September 1956.

Gage.--Wire-weight gage read once daily, and crest-stage indicator. Datum of gage is 2,686.32 ft above mean sea level, datum of 1929. Prior to June 23, 1950, various wire-weight gages on former highway bridge 75 ft downstream, at same datum.

Average discharge.--18 years, 359 cfs (259,900 acre-ft per year); median of yearly mean discharges, 310 cfs (224,000 acre-ft per year).

Extremes.--Maximum discharge during year, 2,810 cfs Mar. 23 (gage height, 6.05 ft); no flow at times.

1938-56: Maximum discharge, 45,000 cfs Mar. 23, 1947 (gage height, 21.7 ft); maximum gage height, 23.4 ft Mar. 31, 1952 (backwater from ice); no flow for part of most years.

According to local residents the greatest known flood 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, 20.2, and 19.7 ft, respectively. (These stages are not comparable to stages during the period of record, owing to construction of levees.)

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Some small diversions above station for irrigation.

Revisions (water years).--WSP 896: 1938-39. WSP 1086: 1943-44. WSP 1279: 1943(M), 1945-46, 1948. Revised figures of discharge for the calendar year 1950, superseding those published in WSP 1209, are as follows: Maximum, 16,900 cfs; minimum, 0; mean, 615 cfs; runoff, 445,000 acre-ft.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.2	0.9				5	230	33	174	36	150	70
2	.5	a.5				*40	235	50	123	33	921	61
3	.8	a.2				40	205	50	126	63	1,200	48
4	1.0	a.2				50	190	50	117	921	716	34
5	1.0	a.5				*200	*195	48	129	308	528	34
6	1.1	a1.0				100	132	48	64	*1,110	430	36
7	1.5	.9				50	a110	48	36	2,080	348	39
8	1.7	.7				50	a90	44	26	1,180	*195	38
9	1.7	.7				40	a80	44	22	791	235	33
10	1.7	.8				30	a75	81	22	490	220	9.8
11	1.5	a.5				20	a70	64	11	*336	200	6.5
12	1.5	a.2				10	a65	50	7.8	288	190	5.2
13	1.5	a0				*10	a60	46	6.2	388	162	4.8
14	1.5	a0			(*)	10	a55	40	5.5	302	154	3.9
15	1.3	a0				20	a52	31	5.2	158	141	3.0
16	1.3	a0				100	a48	24	5.2	*117	81	3.0
17	*1.5	0				500	a46	21	3.9	93	57	3.0
18	1.5	.2				600	44	15	3.5	66	59	3.0
19	1.7	.5				*500	44	13	2.6	42	59	2.8
20	1.5	.8	(*)			450	38	15	*2.8	48	53	0
21	1.7	1.0				402	33	*20	1.2	40	51	0
22	1.7	*.8				*318	30	16	155	21	45	1.0
23	1.7	a.5		(*)		1,380	27	20	820	15	42	2.8
24	1.7	a.2				1,930	*33	13	173	21	40	*3.0
25	1.2	a0				1,760	27	12	86	20	36	1.7
26	1.2	a0				1,770	27	8.4	70	9.8	36	1.5
27	1.1	a0				868	27	7.8	45	255	*46	1.5
28	1.1	a0				684	27	186	26	341	48	1.3
29	1.1	a0				482	27	757	5.8	364	44	1.3
30	1.1	a0			------	1,080	27	468	21	513	46	1.3
31	1.1	------			------	299	------	288	------	200	64	------
Total	40.7	11.1	0	0	0	13,798	2,349	2,611.2	2,295.7	10,649.8	6,597	453.4
Mean	1.31	0.37	0	0	0	445	78.3	84.2	76.5	344	213	15.1
Ac-ft	81	22	0	0	0	27,370	4,660	5,180	4,550	21,120	13,080	899

Calendar year 1955:	Max 2,140	Min 0	Mean 155	Ac-ft 112,300
Water year 1955-56:	Max 2,080	Min 0	Mean 106	Ac-ft 76,960

Peak discharge (base, 1,500 cfs).--Mar. 23 (3 p.m.) 2,810 cfs (6.05 ft); Mar. 30 (5 p.m.) 2,360 cfs (5.65 ft); July 4 (2 p.m.) 1,720 cfs (5.09 ft) July 7 (7 p.m.) 2,550 cfs (5.82 ft); Aug. 2 (7 p.m.) 1,510 cfs (4.83 ft).

* Discharge measurement or observation of no flow made on this day.

a No gage-height record; discharge estimated from adjacent record, weather records, and records for station at Medora.

Note.--Stage-discharge relation affected by ice Nov. 2-6, Nov. 11 to Mar. 20

Little Missouri River at Medora, N. Dak.

Location.--Lat 46°55', long 103°32', in NE¼ sec. 27, T. 140 N., R. 102 W., on left bank 600 ft downstream from bridge on U. S. Highway 10 and 1 mile upstream from Andrews Creek.

Drainage area.--6,190 sq mi, approximately.

Records available.--May 1903 to October 1908, October 1921 to September 1924, August 1928 to September 1934, October 1945 to September 1956.

Gage.--Water-stage recorder and wire-weight gage on upstream side of highway bridge 600 ft above recording station, read once daily. Datum of gage is 2,246.75 ft above mean sea level, datum of 1929. Prior to Oct. 9, 1945, staff, chain, or wire-weight gages at several sites within a quarter of a mile upstream from present site at various datums. Oct. 9, 1945, to Aug. 22, 1951, wire-weight gage at site 600 ft upstream at same datum.

Average discharge.--14 years (1923-24, 1932-34, 1945-56), 469 cfs (339,500 acre-ft per year).

Extremes.--Maximum discharge during year, 2,030 cfs Mar. 27 (gage height, 4.05 ft); no flow Dec. 6 to Mar. 3.

1903-8, 1921-24, 1929-34, 1945-56: Maximum discharge, 65,000 cfs Mar. 23, 1947 (gage height, 20.5 ft); no flow at times.

Remarks.--Records good except those for period of ice effect, which are fair. Some small diversions above station for irrigation.

Revisions (water years).--WSP 546: Drainage area. WSP 1279: 1903-7, 1923-24, 1930-31, 1934(M).

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.9	1.8	0.2			0	657	60	390	150	819	104
2	2.6	1.5	.2			0	576	64	233	131	350	72
3	2.6	2.6	.1			0	429	67	183	137	222	69
4	2.6	2.9	.1			1	312	*75	141	141	518	69
5	2.2	2.9	.1			*3	240	86	116	350	1,240	69
6	2.2	2.6	0			5	192	86	98	854	1,220	67
7	1.8	2.2	0			3	165	89	82	468	998	67
8	1.8	2.9	0			3	171	84	77	*1,570	524	64
9	1.8	3.2	0			*5	153	86	87	*1,640	508	59
10	1.8	3.6	0			5	135	81	77	1,010	500	54
11	2.2	2.6	0			4	122	75	67	775	429	54
12	2.2	2.6	0			3	114	74	56	684	356	54
13	*2.2	1.8	0			*2	114	92	48	476	285	52
14	2.2	1.8	0		(*)	2	106	108	*46	468	255	49
15	2.2	1.4	0			2	100	*94	44	437	205	45
16	1.8	1.5	0			2	98	89	35	330	171	40
17	2.2	1.0	0			3	98	78	30	*259	*120	*27
18	1.8	.9	0			100	94	77	27	212	106	24
19	1.8	1.0	0			*400	*89	65	26	177	126	21
20	1.8	2.2	0			600	86	60	24	155	118	19
21	1.8	2.6	0			800	81	55	21	139	106	17
22	2.2	3.6	0			910	74	48	23	131	100	14
23	1.8	*2.9	0	(*)		*693	71	47	20	116	94	11
24	1.8	1.8	0			567	65	45	38	102	94	11
25	1.8	1.5	0			1,580	64	40	195	95	82	10
26	1.8	1.5	0			1,800	62	39	153	89	87	9.0
27	2.2	1.2	*0			*1,890	59	40	*133	87	244	*8.0
28	2.6	.4	0			1,570	56	68	110	94	126	8.5
29	2.6	.3	0			974	55	122	94	108	*94	8.0
30	2.6	.3	0		------	500	55	89	122	*1,260	97	7.0
31	2.6	------	0		------	437	------	*504	------	974	110	------
Total	66.5	59.1	0.7	0	0	12,864	4,693	2,687	2,796	13,619	10,304	1,182.5
Mean	2.15	1.97	0.02	0	0	415	156	86.7	93.2	439	332	39.4
Ac-ft	132	117	1.4	0	0	25,520	9,310	5,330	5,550	27,010	20,440	2,350

Calendar year 1955: Max 16,300 Min 0 Mean 262 Ac-ft 189,600
Water year 1955-56: Max 1,890 Min 0 Mean 132 Ac-ft 95,760

Peak discharge (base, 3,000 cfs).--No peak above base.

* Discharge measurement or observation of no flow made on this day.

Note.--Stage-discharge relation affected by ice Nov. 30 to Mar. 21. Discharge for Dec. 6 to Mar. 17, 18, June 30 to July 17, Aug. 4-16, computed from wire-weight-gage readings with some assistance by shape of recorder graph after Mar. 17.

Beaver Creek at Wibaux, Mont.

Location.--Lat 46°59', long 104°11', in NE¼ sec. 12, T. 14 N., R. 59 E., on upstream side of bridge on U. S. Highway 10 at Wibaux, 12 miles upstream from Little Beaver Creek.

Records available.--April 1938 to September 1956.

Gage.--Wire-weight gage read once daily and crest-stage indicator. Altitude of gage is 2,650 ft (by barometer). Prior to Sept. 21, 1940, staff or wire-weight gages at sites about 500 ft upstream at different datums.

Average discharge.--18 years, 25.2 cfs (18,240 acre-ft per year).

Extremes.--Maximum daily discharge during year, 44 cfs Mar. 24; no flow at times.

1938-56: Maximum discharge 3,780 cfs Mar. 21, 1939 (gage height, 10.8 ft, site and datum then in use, from graph based on gage readings), from rating curve extended above 2,400 cfs; maximum gage height observed, 13.44 ft Mar. 24, 1943 (ice jam); no flow at times.

Flood of June 7, 1929, reached a discharge of about 30,000 cfs, from the average of three indirect determinations made at different sites.

Remarks.--Records poor. A few small diversions above station for irrigation.

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

5.5	0	5.8	3.1
5.6	.6	5.9	5.4
5.7	1.6	6.1	12

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0.9	.4			0	11	1.9	1.4		0	2.6
2	0	.8	.4			*0	11	2.0	1.2		0	1.1
3	0	.8	.4			0	9.6	2.0	1.2		0	.7
4	0	.8	.4	(*)		0	7.9	2.0	1.1		0	.5
5	*0	1.0	*.4			0	6.3	2.0	.6		0	.5
6	0	1.0	.4			0	4.9	2.2	.3		0	.2
7	0	.9	.4			0	6.6	2.2	.3		0	.1
8	0	.8	.4			0	5.5	2.2	.3		0	0
9	0	.6	.4		(*)	0	4.9	2.2	.3		0	0
10	0	.8	.4			0	5.2	2.4	.2		0	0
11	0	.6	.3			0	5.2	2.0	.2		0	0
12	0	.5	.3			0	4.2	1.8	.2		0	0
13	0	.4	.3			0	4.0	1.4	.2		0	0
14	0	.4	.2			0	3.8	1.5	**.2		0	0
15	0	.3	.2			0	3.6	1.4	.2		0	0
16	.1	*.3	.2			0	3.3	1.4	.1		0	0
17	.1	.3	.1			.4	2.8	*1.4	.1		0	0
18	.2	.3	.1			.7	2.5	1.4	**.1	(*)	0	*0
19	.1	.3	0			1.5	2.2	1.3	.1		0	.2
20	.1	.3	0			*25	2.0	.5	0		0	.5
21	.1	.3	0			38	1.8	.5	0		*0	.7
22	.1	.3	0			36	1.9	.5	0		0	0
23	.1	.2	0			38	2.0	.5	0		0	0
24	.1	.2	0			44	2.0	.5	0		0	0
25	.1	.3	0			26	2.2	.5	0		0	0
26	.2	.3	0			15	2.0	.5	*0		0	0
27	.5	.4	0			13	*1.9	.6	0		4.2	0
28	.6	.4	0		(*)	11	1.9	.6	0		12	0
29	.7	.4	0			*10	1.8	.9	0		4.7	0
30	.8	.4	0		------	10	1.9	1.6	0		4.2	0
31	.9	------	0		------	10	------	1.4	------		3.8	------
Total	4.8	15.3	5.7	0	0	278.6	125.9	43.3	8.3	0	28.9	7.1
Mean	0.15	0.51	0.18	0	0	8.99	4.20	1.40	0.28	0	0.93	0.24
Ac-ft	9.5	30	11	0	0	553	250	86	16	0	57	14

Calendar year 1955: Max 1,000 Min 0 Mean 14.5 Ac-ft 10,490
Water year 1955-56: Max 44 Min 0 Mean 1.42 Ac-ft 1,030

* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
Note.--Stage-discharge relation affected by ice Nov. 12 to Mar. 31.

Little Missouri River near Watford City, N. Dak.

Location.--Lat 47°36', long 103°16', in NW¼ sec. 35, T. 148 N., R. 99 W., on left bank at downstream side of bridge on U. S. Highway 85, 17½ miles south of Watford City and 18 miles upstream from Cherry Creek.

Drainage area.--8,490 sq mi, approximately.

Records available.--October 1934 to September 1956.

Gage.--Water-stage recorder and supplemental wire-weight gage read one or more times daily. Datum of gage is 1,929.03 ft above mean sea level, datum of 1929. Prior to June 9, 1939, water-stage recorder at present site and datum. June 9, 1939, to Apr. 15, 1943, water-stage recorder at site 700 ft upstream at present datum.

Average discharge.--22 years, 613 cfs (443,800 acre-ft per year); median of yearly mean discharges, 510 cfs (369,000 acre-ft per year).

Extremes.--Maximum discharge during year, 2,770 cfs July 30 (gage height, 6.00 ft); no flow at times.

1934-56: Maximum discharge, 110,000 cfs Mar. 25, 1947 (gage height, 24.0 ft, from floodmark); no flow at times.

Remarks.--Records fair. Some diversions above station for irrigation.

Revisions (water years).--WSP 926: 1935. WSP 1279: 1943.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.7	6	1	0.1		0	852	72	161	89	998	470
2	6.9	6	1	.1		0	733	78	157	80	836	230
3	5.7	6	1	.1		5	940	74	398	129	*572	172
4	5.7	6	1	.1		1	740	74	350	250	380	145
5	4.2	6	1	.1		0	635	83	238	175	265	122
6	3.2	6	.8	.1		0	512	89	196	192	629	104
7	4.2	5	.8	.1		0	410	91	167	487	1,060	98
8	4.2	5	.8	.1		0	330	94	129	820	*1,140	94
9	3.7	5	.8	.1		0	275	100	114	908	884	89
10	4.2	5	.8	.1		0	*230	114	106	*1,340	663	85
11	3.2	5	.6	.1		0	218	136	89	1,270	628	78
12	3.2	4	.6	.1		0	189	106	94	1,120	712	67
13	3.2	3	.6	.1		0	164	102	76	1,020	452	*59
14	3.7	2	.6	.1		0	138	104	67	812	340	54
15	3.2	2	.6	.1		*0	126	83	62	593	250	53
16	4.2	2	.4	0		5	124	*69	62	621	255	51
17	3.7	1.5	.4	0		100	116	96	47	780	242	51
18	4.2	1.5	.4	0		500	112	96	321	670	196	50
19	3.7	1.5	.4	0		*900	106	87	224	386	150	47
20	3.7	1.5	.4	0		1,200	*102	78	*83	315	131	40
21	*4.2	1.5	.2	0		1,450	96	69	56	250	114	36
22	2.8	1.5	.2	0		*1,500	100	59	65	192	*114	33
23	2.8	*1.2	.2	0	(*)	1,300	85	56	89	153	106	30
24	3.2	1	.2	0		1,200	85	56	69	133	98	27
25	3.2	1	.2	0		1,000	80	44	72	*116	104	27
26	3.2	1	.1	0		1,200	76	38	56	102	140	25
27	3.2	1	*.1	0		*2,000	74	36	41	94	833	23
28	5.2	1	.1	0		2,000	76	50	48	350	593	24
29	5.2	1	.1	0		*1,700	71	87	96	288	482	24
30	6.3	1	.1	0	------	*1,300	72	93	98	1,470	476	24
31	7	------	.1	*0	------	1,000	------	169	------	1,120	828	------
Total	129.0	91.2	15.6	1.5	0	18,361	7,867	2,583	3,831	16,325	14,671	2,432
Mean	4.16	3.04	0.50	0.05	0	592	262	83.3	128	527	473	81.1
Ac-ft	256	181	31	3.0	0	36,420	15,600	5,120	7,600	32,380	29,100	4,820

Calendar year 1955: Max 13,000 Min 0 Mean 397 Ac-ft 287,100
Water year 1955-56: Max 2,000 Min 0 Mean 181 Ac-ft 131,500

Peak discharge (base, 8,000 cfs).--No peak above base.

* Discharge measurement or observation of no flow made on this day.

Note.--Stage-discharge relation affected by ice Oct. 31 to Mar. 31 (wire-weight-gage readings used Nov. 12 to Mar. 21, June 8-15).

Garrison Reservoir near Riverdale, N. Dak.

Location.--Lat 47°30'10", long 101°25'50", in S½ sec. 31, T. 147 N., R. 84 W., in control structure of Garrison Dam 2½ miles west of Riverdale and 14 miles upstream from Knife River.

Drainage area.--181,400 sq mi, approximately.

Records available.--October 1953 to September 1956.

Gage.--Water-stage recorder. Datum of gage is at mean sea level, datum of 1929.

Extremes.--Maximum contents during year, 6,948,000 acre-ft July 9 (elevation, 1,788.89 ft); minimum, 4,800,000 acre-ft Nov. 24, 25 (elevation, 1,774.38 ft).
1953-56: Maximum contents, that of July 9, 1956.

Remarks.--Reservoir is formed by earth-fill dam; storage began in November 1953; dam incomplete. Capacity, 23,000,000 acre-ft, of which 4,250,000 acre-ft is designated for flood control, and 13,850,000 for other uses. Elevation of crest of spillway, 1,825 ft, surmounted by taintor gates. Figures given herein represent total contents.

Cooperation.--Elevations and capacity table furnished by Corps of Engineers.

Month-end elevations and contents, water year October 1955 to September 1956

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept.30	1,774.41	4,803,000	-
Oct. 31	1,775.13	4,898,000	+95,000
Nov. 30	1,774.71	4,843,000	-55,000
Dec. 31	1,776.11	5,029,000	+186,000
Calendar year 1955	-	-	3,558,000
Jan. 31	1,778.80	5,400,000	+371,000
Feb. 29	1,781.20	5,745,000	+345,000
Mar. 31	1,785.20	6,352,000	+607,000
Apr. 30	1,783.91	6,152,000	-200,000
May 31	1,782.79	5,982,000	-170,000
June 30	1,788.51	6,885,000	+903,000
July 31	1,787.24	6,677,000	-208,000
Aug. 31	1,783.72	6,123,000	-554,000
Sept.30	1,781.23	5,750,000	-373,000
Water year 1955-56	-	-	+947,000

Missouri River below Garrison Dam, N. Dak.

Location.--Lat 47°23'08", long 101°23'36", in NW¼ sec. 16, T. 145 N., R. 84 W., on right bank 4.3 miles north of Stanton, 5 miles upstream from Knife River, 9 miles downstream from Garrison Dam, and at mile 1,445.9.

Drainage area.--181,400 sq mi, approximately.

Records available.--April 1948 to September 1956.

Gage.--Water-stage recorder. Datum of gage is at mean sea level, datum of 1929. Apr. 27, 1948, to July 4, 1949, May 1, 1951, to June 24, 1952, wire-weight gage at site 8¾ miles upstream at same datum; July 5, 1949, to Apr. 30, 1951, water-stage recorder 0.6 mile upstream, at same datum.

Average discharge.--8 years, 23,920 cfs (17,320,000 acre-ft per year).

Extremes.--Maximum discharge during year about 55,000 cfs Dec. 13 (elevation, 1,679.20 ft); minimum, 3,500 cfs Feb. 3 (elevation, 1,669.27 ft).

1948-56: Maximum discharge, 348,000 cfs Apr. 5, 1952; maximum elevation, 1,701.90 ft Apr. 5, 1952, backwater from ice, at site then in use; minimum daily discharge, 3,000 cfs Nov. 24, 1950.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Many diversions above station. Flow regulated by Garrison Reservoir (see preceding page). Measurements generally made at 5-day intervals.

Revisions (water years).--WSP 1176: 1948 (maximum elevation only).

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	31,800	31,900	8,000	9,000	8,500	6,000	22,300	29,000	30,600	30,200	29,900	20,500
2	31,800	31,700	9,600	8,800	6,700	6,900	21,000	28,200	30,100	30,100	31,000	19,900
3	31,900	30,200	9,200	9,200	6,500	7,000	24,000	27,800	28,800	30,700	30,600	20,100
4	31,900	28,400	8,700	9,500	5,600	6,900	24,400	27,600	30,700	29,600	32,400	21,000
5	31,900	25,900	8,800	9,400	5,500	6,700	a25,000	28,100	29,800	30,200	29,200	22,500
6	31,800	24,000	8,400	9,000	6,000	6,300	a25,400	27,900	31,000	31,900	30,200	22,200
7	32,000	22,200	8,300	9,000	5,600	5,800	a25,600	28,100	30,500	30,300	30,400	22,100
8	31,900	20,500	8,700	9,000	5,700	5,700	a25,600	28,500	29,800	30,200	30,400	22,400
9	32,000	18,700	10,000	6,200	5,700	5,800	a25,000	28,200	30,000	30,100	30,100	22,400
10	32,000	18,100	9,200	6,500	5,700	6,900	a25,500	28,600	32,900	29,100	30,300	22,700
11	31,900	17,900	9,400	8,500	5,800	7,200	a26,000	28,000	34,900	30,300	30,600	22,400
12	32,000	18,000	9,200	7,400	6,000	7,200	a25,800	28,400	34,900	30,100	29,400	22,400
13	32,000	18,000	9,700	7,200	5,600	7,000	a25,600	28,200	34,500	30,100	30,300	22,300
14	32,100	17,300	9,500	6,800	4,500	7,000	a25,400	28,400	33,600	30,100	30,400	21,600
15	32,100	15,000	10,000	7,000	5,000	7,400	25,200	28,400	34,600	29,800	29,800	23,800
16	32,200	13,800	9,500	7,400	5,300	7,500	25,400	27,600	36,300	30,000	26,400	22,700
17	32,100	13,500	9,500	7,400	5,600	7,200	25,100	27,100	34,900	29,900	24,700	21,900
18	32,300	12,900	9,400	7,300	5,400	7,800	24,400	26,700	34,000	29,900	25,300	19,700
19	32,200	11,000	9,500	7,100	5,000	7,800	24,200	27,800	34,700	30,200	26,400	18,500
20	32,300	9,500	9,400	7,000	5,000	7,200	24,400	27,200	35,100	30,200	25,200	18,600
21	32,300	9,500	9,300	7,000	5,300	6,600	23,900	27,600	35,300	30,200	26,300	18,800
22	32,100	9,900	9,200	7,000	6,000	6,200	23,800	27,600	35,100	29,200	25,600	17,700
23	32,100	9,900	9,200	7,200	6,800	6,000	24,700	28,200	35,800	29,900	24,800	17,500
24	32,100	9,900	9,200	7,000	6,000	6,500	25,300	29,400	34,400	30,400	25,000	19,500
25	31,900	9,100	9,100	7,000	5,800	10,000	25,000	30,900	34,700	29,200	24,500	17,800
26	31,900	8,500	8,100	6,800	5,800	13,000	25,000	30,800	35,400	29,600	25,100	18,900
27	31,900	6,000	7,000	7,100	5,800	a16,000	25,400	29,600	32,900	24,500	25,800	18,300
28	31,900	8,500	8,000	6,800	5,900	a19,000	25,300	30,800	30,300	30,600	22,700	19,200
29	31,900	7,500	10,000	7,100	6,000	a20,000	26,100	31,100	31,400	30,200	20,700	16,800
30	32,000	8,000	9,000	7,400	------	a20,500	28,300	29,600	30,900	29,900	20,500	15,400
31	32,000	------	9,000	6,600	------	20,200	------	29,900	------	29,400	20,400	------
Total	992,300	485,300	281,100	235,700	168,100	281,300	748,100	885,300	987,900	926,100	844,400	609,600
Mean	32,010	16,180	9,068	7,603	5,797	9,074	24,940	28,560	32,930	29,870	27,240	20,320
Ac-ft	‡1,968	962,600	557,600	467,500	333,400	558,000	‡1,484	‡1,756	‡1,959	‡1,837	‡1,675	‡1,209

Calendar year 1955: Max 47,000 Min 4,700 Mean 19,960 Ac-ft 14,450,000
Water year 1955-56: Max 36,300 Min 4,500 Mean 20,340 Ac-ft 14,770,000

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‡ Expressed in thousands.

a No gage-height record; discharge estimated on basis of 5 discharge measurements, records of release from Garrison Reservoir, record for station at Bismarck, and weather records.

Note.--Stage-discharge relation affected by ice Nov. 16 to Mar. 26.

Knife River near Golden Valley, N. Dak.

Location.--Lat 47°09', long 102°03', in SE¼ sec. 34, T. 143 N., R. 90 W., on left bank 6 ft downstream from highway bridge, 4½ miles downstream from Elm Creek, and 9 miles south of Golden Valley.

Drainage area.--1,230 sq mi, approximately.

Records available.--May 1903 to November 1904 (published as "at Broncho"), March 1905 to October 1919 and October 1921 to September 1924 (published as "near Broncho"), and April 1943 to September 1956 in reports of Geological Survey. May 1903 to December 1919, October 1921 to September 1925, March to September 1927 and April 1943 to September 1956 in reports of State engineer.

Gage.--Water-stage recorder. Datum of gage is 1,847.13 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). May 1903 to Mar. 23, 1905, chain gage at site 4 miles downstream at different datum. Mar. 24, 1905, to Oct. 31, 1919, and Oct. 10, 1921, to Sept. 20, 1924, chain gage at site 3 miles upstream at different datum. Apr. 24 to Oct. 27, 1943, staff gage and Oct. 28, 1943, to May 1, 1946, wire-weight gage, at present site and datum.

Average discharge.--19 years (1909-11, 1921-25, 1943-56), 103 cfs (74,570 acre-ft per year).

Extremes.--Maximum discharge during year, about 2,300 cfs Mar. 20; maximum gage height, 19.55 ft, Mar. 20 (backwater from ice); minimum discharge, 0.3 cfs Jan. 31 to Feb. 29, minimum gage height, 2.12 ft Feb. 28 to Mar. 1, July 26, Sept. 27.

1903-19, 1921-25, 1943-56: Maximum discharge, 10,900 cfs Apr. 16, 1950 (gage height, 26.37 ft, from floodmarks in well); no flow Sept. 6-8, 1905, Sept. 18, 19, 1908.

Flood of Mar. 26, 27, 1943, reached a stage of 26.7 ft, from floodmark (discharge 11,500 cfs). The flood of 1943 was the only major flood in period 1903-49, according to local residents.

Remarks.--Records good except those for period of ice effect, which are fair.

Revisions (water years).--WSP 1006: Drainage area. WSP 1279: 1904, 1914-19(M), 1922-24(M), 1944.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.2	3.3	3	0.6	0.3	0.5	160	13	58	10	7.8	9.3
2	4.6	2.3	2.5	.6	.3	1	130	13	45	12	31	9.6
3	4.2	2.8	2.5	.6	.3	20	125	13	34	25	92	18
4	4.6	2.6	2.5	.6	.3	100	*107	*12	25	18	64	24
5	5.8	3.3	2.5	.6	.3	70	97	12	20	22	42	13
6	5.8	2.3	2.5	.6	.3	*120	70	13	286	18	51	9.0
7	4.8	2.8	2.5	.6	.3	90	67	12	325	19	28	6.4
8	4.0	3.0	3	.6	.3	70	66	12	44	32	18	4.6
9	3.5	3.5	3	.6	.3	90	*60	12	26	28	14	3.6
10	3.0	3.5	3	.6	.3	30	55	13	23	27	12	3.8
11	3.0	2.6	3	.6	.3	30	50	13	22	21	10	3.6
12	3.0	2.8	3	.6	.3	30	45	13	15	17	10	3.2
13	3.2	2.9	3	.6	.3	30	41	12	12	119	9.3	2.9
14	3.2	2.9	3.5	.6	.3	35	37	12	11	34	9.0	2.6
15	3.0	2.8	4.5	.6	*.3	40	33	12	9.6	22	7.8	2.3
16	3.0	3.5	5	.6	.3	*45	30	11	8.4	16	*6.8	1.8
17	3.0	2.9	5	.6	.3	80	27	11	7.8	13	5.8	1.5
18	2.8	3.2	4.5	.6	.3	700	25	10	16	*14	6.6	1.4
19	3.0	2.9	3.5	.6	.3	900	24	9.8	11	12	5.8	1.3
20	3.0	2.9	2	.6	.3	*1,950	22	9.3	6.6	10	5.6	*1.6
21	2.9	3.3	1	.6	.3	1,500	21	9.0	9.8	9.0	6.8	1.9
22	2.9	3.6	.7	.6	.3	*1,000	20	*8.7	72	7.4	8.4	1.8
23	2.9	4.4	.6	.6	.3	*700	18	8.4	22	6.4	9.8	1.4
24	2.9	4.6	.6	*.6	.3	620	17	8.4	19	5.4	10	1.2
25	2.8	*4.4	.6	.6	.3	600	16	8.1	15	4.8	11	1.2
26	2.8	4.5	.6	.6	.3	510	16	7.6	*11	4.8	11	1.3
27	2.9	5.5	.6	.5	.3	420	16	7.4	8.1	5.4	11	1.3
28	*3.0	5.5	.6	.5	.3	220	14	68	6.6	6.1	11	1.5
29	3.0	4	*.6	.5	.3	100	14	96	5.8	7.1	8.4	1.9
30	3.0	3	.6	.4	------	150	13	92	18	12	12	1.9
31	3.3	------	.6	.3	------	*140	------	76	------	8.1	16	------
Total	108.1	101.6	71.1	17.8	8.7	10,391.5	1,436	627.7	1,192.7	565.5	551.9	138.9
Mean	3.49	3.39	2.29	0.57	0.30	335	47.9	20.2	39.8	18.2	17.8	4.63
Ac-ft	214	202	141	35	17	20,610	2,850	1,250	2,370	1,120	1,090	276

Calendar year 1955: Max 680 **Min** 0.6 **Mean** 30.9 **Ac-ft** 22,340
Water year 1955-56: Max 1,950 **Min** 0.3 **Mean** 41.6 **Ac-ft** 30,180

Peak discharge (base, 1,500 cfs).--Mar. 20 (time unknown) about 2,300 cfs.
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 26 to Apr. 3.

Spring Creek at Zap, N. Dak.

Location.--Lat 47°17', long 101°55', in SW¼ sec. 14, T. 144 N., R. 89 W., on right bank 250 ft downstream from Northern Pacific Railway bridge in Zap and 9 miles upstream from mouth.

Drainage area.--545 sq mi.

Records available.--March to September 1924 and October 1945 to September 1956 in reports of Geological Survey. January to December 1924, August to December 1925, and October 1945 to September 1956 in reports of State engineer. March to December 1924, July 1925 to December 1927 in House Document 238, 73d Congress, 2d session.

Gage.--Water-stage recorder and wire-weight gage read once daily. Datum of gage is 1,819.39 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Mar. 4 to Sept. 30, 1924, staff gage at site 250 ft upstream at different datum. Oct. 1, 1945, to Sept. 30, 1947, staff gage 250 ft upstream at datum 1.12 ft higher than present datum.

Average discharge.--11 years (1945-56), 47.8 cfs (34,610 acre-ft per year).

Extremes.--Maximum discharge during year, 1,650 cfs Mar. 19 (gage height, 13.57 ft, backwater from ice); minimum, 0.5 cfs Jan. 17 to Feb. 7.

1924, 1945-56: Maximum discharge, 6,130 cfs Apr. 7, 1952 (gage height, 20.03 ft); no flow at times.

Maximum stage known occurred in about 1902, from ice jam. Floods in February 1913 and March 1943 reached stages of about 20 ft and 19.5 ft, respectively, from information by local residents.

Remarks.--Records good except those for period of ice effect, which are poor. Flow regulated by Ilo Lake (capacity, 7,130 acre-ft).

Rating tables, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 24

2.0	0.7	4.0	107
2.1	1.6	6.0	285
2.2	3.1	8.0	530
2.3	5.4	10.0	910
2.5	13	12.5	1,520
3.0	40		

Mar. 25 to Sept. 30

2.1	2.1	3.0	45
2.2	4.3	4.0	114
2.3	7.5	5.5	244
2.5	16		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.4	5.4	3.2	1.0	0.5	10	56	13	16	10.0	13	9.0
2	4.4	4.4	3.0	1.0	.5	20	47	14	13	8.6	17	8.2
3	4.4	4.9	2.8	1.0	.5	30	44	14	12	16	14	9.4
4	4.4	5.1	2.6	1.0	.5	25	*39	*12	10	11	11	11
5	4.6	16	2.4	1.0	.5	22	41	12	9.0	7.9	9.4	9.0
6	5.1	13	2.2	1.0	.5	*25	36	13	14	8.2	8.2	7.5
7	4.9	4.9	2.0	1.0	.5	60	32	13	13	8.6	7.9	6.5
8	4.9	4.9	1.9	1.0	.6	50	37	12	9.4	9.0	6.8	5.8
9	4.6	4.9	1.8	1.0	.6	45	*34	12	7.5	9.0	6.1	5.2
10	4.9	4.9	1.6	1.0	.7	70	30	12	6.8	8.2	5.2	4.6
11	5.1	4.4	1.5	1.0	.7	50	30	14	6.8	8.6	5.2	4.6
12	4.6	3.7	1.5	1.0	.8	30	29	13	6.5	12	5.8	4.9
13	5.1	3.1	1.5	1.0	.8	25	26	12	5.8	9.8	5.2	5.2
14	4.9	2.6	1.5	1.0	1.0	25	26	13	5.2	6.8	4.6	5.5
15	4.9	2.5	1.5	.9	*1.0	20	23	12	5.2	6.8	4.1	5.2
16	4.9	2.6	*1.5	.7	1.0	45	21	12	5.2	6.8	*3.8	4.9
17	4.9	2.6	1.5	.5	1.0	450	19	10	4.9	6.1	3.8	4.6
18	4.6	2.6	1.4	.5	1.0	900	18	10	5.2	*5.5	3.8	4.3
19	4.6	2.8	1.2	.5	1.0	*1,150	17	10	4.9	5.2	4.1	4.3
20	4.9	3.3	1.0	.5	1.0	*1,500	16	9.0	4.6	4.9	4.1	*4.1
21	4.9	3.9	1.0	.5	1.0	1,100	16	8.2	6.1	4.6	3.6	3.8
22	4.9	4.4	1.0	.5	1.0	420	14	*8.2	63	4.3	3.1	4.3
23	4.9	4.4	1.0	.5	1.0	*180	13	8.2	101	3.8	3.1	4.6
24	4.9	4.4	1.0	*.5	1.0	110	13	10	29	3.3	3.1	4.1
25	4.9	*4.4	1.0	.5	1.0	220	13	12	17	3.1	2.9	3.8
26	4.9	4.1	1.0	.5	1.0	180	13	10	*12	2.9	7.5	3.8
27	4.6	4.0	1.0	.5	1.0	120	13	9.8	9.8	2.9	7.5	3.8
28	*4.6	3.8	1.0	.5	1.0	68	12	18	7.9	3.8	6.5	4.1
29	4.6	3.6	1.0	.5	5.0	75	13	30	7.1	5.2	5.5	5.2
30	4.6	3.4	1.0	.5	------	56	13	24	9.8	15	6.5	5.2
31	4.9	------	1.0	.5	------	*52	------	21	------	15	9.8	------
Total	147.8	139.0	48.6	23.1	27.7	7,133	754	401.4	427.7	232.9	202.2	166.5
Mean	4.77	4.63	1.57	0.75	0.96	230	25.1	12.9	14.3	7.51	6.52	5.55
Ac-ft	293	276	96	46	55	14,150	1,500	796	848	462	401	330

Calendar year 1955:	Max	408	Min	1.0	Mean	16.1	Ac-ft	11,650
Water year 1955-56:	Max	1,500	Min	0.5	Mean	26.5	Ac-ft	19,250

Peak discharge (base, 1,000 cfs).--Mar. 19 (11 p.m.) 1,650 cfs (13.57 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 27 to Mar. 27 (no gage-height record Dec. 29-31, Jan. 1-13, 15-23; discharge estimated on basis of weather records and records for Knife River stations).

Knife River at Hazen, N. Dak.

Location.--Lat 47°17', long 101°37', in SE¼ sec. 18, T. 144 N., R. 86 W., on right bank at upstream side of highway bridge, half a mile south of Hazen and 2 miles upstream from Antelope Creek.

Drainage area.--2,350 sq mi, approximately.

Records available.--October 1928 to August 1933 (fragmentary), August 1937 to September 1956.

Gage.--Water-stage recorder and wire-weight gage read once daily. Datum of gage is 1,712.35 ft above mean sea level, datum of 1929. Prior to Sept. 25, 1947, wire-weight or chain gages at same site and datum.

Average discharge.--19 years (1937-56), 208 cfs (150,600 acre-ft per year).

Extremes.--Maximum discharge during year, 6,630 cfs Mar. 21 (gage height, 23.76 ft, affected by ice); minimum, 4 cfs Jan. 22 to Mar. 4; minimum gage height, 3.14 ft Sept. 27, 28.

1928-33, 1937-56: Maximum discharge, 26,500 cfs Mar. 26 or 27, 1943 (gage height, 26.3 ft, from floodmarks); no flow (estimated) Jan. 21 to Feb. 5, 1933.

Floods in 1943, 1950, and 1952 are the only major floods known since 1884.

Remarks.--Records good except those for period of ice effect, which are fair.

Revisions (water years).--WSP 1146: 1943. WSP 1279: 1930-31, 1932-33(M).

Rating tables, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 17 to Nov. 1, Apr. 30 to May 29)

Oct. 1 to Mar. 30		Mar. 31 to Sept. 30			
3.2	8.0	3.1	8.0	5.0	195
3.3	12	3.5	29	6.0	346
3.4	17	4.0	67	7.0	520

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	15	16	14	8	4	4	484	51	153	61	42	28
2	14	16	14	8	4	4	381	52	128	51	33	30
3	11	16	14	8	4	4	*332	52	104	50	35	24
4	11	16	13	8	4	4	314	*49	92	85	100	23
5	12	14	12	8	4	45	319	48	84	67	87	39
6	12	14	11	7	4	*135	*317	50	297	55	74	39
7	13	16	11	7	4	170	228	50	477	69	66	33
8	16	16	10	7	4	220	224	48	444	105	60	28
9	16	16	10	7	4	210	209	47	149	107	42	24
10	14	16	10	7	4	210	202	48	94	80	36	22
11	14	14	10	7	4	190	*220	49	75	67	33	20
12	16	14	9	7	4	190	209	53	69	102	31	19
13	11	14	9	6	4	180	181	51	55	90	28	20
14	9.6	14	9	6	4	180	163	48	47	116	27	20
15	12	16	9	6	*4	170	150	44	43	82	24	20
16	9.6	16	*9	6	4	170	128	42	41	55	*23	18
17	11	16	9	6	4	200	112	40	40	44	21	18
18	11	16	9	5	4	1,000	99	39	40	38	20	17
19	11	16	8	5	4	*3,100	90	37	149	*34	20	16
20	11	16	8	5	4	4,900	85	36	65	33	19	*14
21	12	16	9	5	4	*6,200	79	34	40	31	18	14
22	12	16	9	4	4	3,300	75	*32	71	28	18	13
23	12	16	10	4	4	1,600	70	31	187	25	15	12
24	13	16	10	4	4	*1,000	65	34	139	23	14	12
25	12	*16	10	*4	4	1,500	61	34	82	22	13	12
26	12	16	10	4	4	1,650	57	34	*61	20	12	11
27	13	16	9	4	4	1,200	55	33	49	20	14	10
28	*15	14	9	4	4	620	54	44	40	21	18	10
29	14	14	9	4	4	*280	51	229	36	24	16	12
30	16	14	9	4	------	240	51	234	41	39	18	14
31	16	------	8	4	------	335	------	185	------	59	25	------
Total	397.2	462	310	179	116	29,211	5,065	1,858	3,392	1,703	1,002	592
Mean	12.8	15.4	10.0	5.8	4.0	942	169	59.9	113	54.9	32.3	19.7
Ac-ft	788	916	615	355	230	57,940	10,050	3,690	6,730	3,380	1,990	1,170

Calendar year 1955:	Max 1,100	Min 8.0	Mean 68.1	Ac-ft 49,310
Water year 1955-56:	Max 6,200	Min 4	Mean 121	Ac-ft 87,850

Peak discharge (base, 1,500 cfs).--Mar. 21 (8:35 a.m.) 6,630 cfs (23.76 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 2 to Mar. 30.

Missouri River at Bismarck, N. Dak.

Location.--Lat 46°48'51", long 100°49'12", in SE¼ sec. 31, T. 139 N., R. 80 W., on left bank 40 ft upstream from Bismarck city water filter plant, 2,100 ft downstream from Northern Pacific Railway bridge, 1.6 miles northwest of Bismarck Post Office, 3.6 miles upstream from Heart River, and at mile 1,377.8.

Drainage area.--186,400 sq mi, approximately.

Records available.--September 1904 to December 1905 (records considered unreliable), October 1927 to September 1956. Gage-height records collected in this vicinity February 1881 to October 1882 and May 1886 to December 1899 are contained in reports of Missouri River Commission. Gage-height records collected in this vicinity since June 1891 are contained in reports of U. S. Weather Bureau.

Gage.--Water-stage recorder. Datum of gage is 1,618.38 ft above mean sea level, datum of 1929. Prior to Oct. 17, 1928, chain gage at site 2,100 ft upstream at datum 4.24 ft higher. Oct. 17, 1928, to Apr. 9, 1936, water-stage recorder at present site, at datum 4.24 ft higher prior to Oct. 1, 1934, and at present datum thereafter. Apr. 10, 1936, to Sept. 30, 1937, at site 2,000 ft downstream at datum 0.47 ft lower, water-stage recorder Apr. 5 to July 23, 1937, and wire-weight gage remainder of period.

Average discharge.--28 years (1928-56), 21,440 cfs (15,520,000 acre-ft per year).

Extremes.--Maximum discharge during year, 38,200 cfs June 17 (gage height, 9.46 ft); maximum gage height, 10.70 ft Apr. 2 (affected by ice); minimum discharge, 3,980 cfs Feb. 15 (gage height, 4.03 ft).

1904-5, 1927-56: Maximum discharge, 500,000 cfs Apr. 6, 1952 (gage height, 27.90 ft); minimum, about 1,800 cfs Jan. 3, 1940; minimum gage height, 1.35 ft Sept. 4, 1934, present site and datum.

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

Remarks.--Records excellent except those for period of ice effect, which are fair. Measurements made at about 5-day intervals. Many diversions from tributaries. Regulated by Garrison Reservoir (see p. 250).

Revisions (water years).--WSP 716: 1929, 1930. WSP 1279: 1929(M).

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	31,700	33,100	8,040	9,480	6,630	5,740	23,000	28,600	29,600	31,600	28,900	20,000
2	31,700	32,400	7,920	9,480	8,640	5,920	26,000	28,800	30,800	30,500	29,200	19,900
3	32,200	31,300	7,980	9,270	6,470	7,000	28,000	27,900	30,600	30,600	30,700	19,600
4	32,200	29,800	9,060	9,360	7,470	7,330	26,000	27,500	30,500	31,600	30,500	19,500
5	32,600	28,600	9,210	9,450	5,350	7,580	26,000	27,400	31,500	29,800	32,100	20,200
6	32,000	25,600	8,820	9,420	5,710	7,640	26,200	28,000	30,700	30,100	29,600	22,000
7	31,600	23,900	9,060	8,790	5,920	7,300	25,400	27,700	30,400	32,400	29,400	22,200
8	32,000	22,400	8,460	8,550	5,640	5,710	25,500	28,000	30,600	31,500	29,600	21,900
9	31,900	21,000	9,090	8,940	5,770	5,790	25,700	28,200	30,000	30,300	30,200	22,200
10	31,900	19,300	9,360	7,360	5,770	6,520	25,100	27,800	30,200	29,600	30,000	22,500
11	32,500	18,700	9,180	5,790	6,080	6,770	25,200	29,000	32,900	28,500	30,300	22,400
12	31,300	18,400	9,600	8,100	6,180	6,030	26,000	28,000	35,600	30,200	31,000	22,400
13	31,900	18,000	9,600	8,100	6,050	6,910	25,900	28,500	35,700	30,100	29,800	22,400
14	31,600	17,500	9,270	7,640	5,510	7,840	25,900	28,500	34,600	30,100	29,600	22,100
15	32,400	17,000	8,970	7,390	4,410	8,040	25,700	28,500	33,700	30,600	30,500	22,000
16	32,200	16,000	9,060	6,030	5,400	7,980	25,300	28,700	35,100	30,000	30,100	23,500
17	32,500	14,000	9,660	6,230	5,220	7,950	25,500	27,400	37,400	29,600	26,900	22,700
18	32,400	10,000	9,510	7,500	5,400	8,160	25,100	27,600	34,900	29,700	24,600	22,000
19	32,500	10,000	9,330	7,920	6,000	8,490	24,500	27,200	33,700	29,800	25,000	19,800
20	32,200	13,000	9,240	7,750	6,050	9,400	24,600	28,100	34,600	29,800	26,600	18,300
21	32,400	11,500	9,300	7,500	5,870	12,000	24,500	27,700	34,500	30,000	25,100	18,200
22	32,500	8,500	9,420	7,420	5,560	14,000	24,000	27,800	35,500	30,000	25,700	18,300
23	32,000	9,500	9,330	7,360	5,090	15,500	23,700	27,800	35,200	29,200	25,700	17,600
24	31,700	8,000	9,330	7,280	5,450	14,000	24,500	28,200	35,400	29,300	24,800	17,100
25	31,900	8,000	9,150	7,670	6,260	11,500	25,400	29,500	34,400	30,100	25,100	18,100
26	31,900	8,500	9,420	7,720	5,820	12,500	25,100	30,500	34,300	29,700	24,800	17,700
27	32,500	9,000	9,420	7,420	5,610	16,000	25,000	30,500	35,400	28,000	25,500	18,700
28	32,000	7,000	8,820	7,190	5,640	18,200	25,400	30,000	33,200	24,700	25,900	18,000
29	32,000	6,000	7,860	7,330	5,640	18,500	25,600	30,700	30,300	28,800	23,300	18,400
30	32,200	7,500	10,200	6,580	------	18,500	26,400	31,500	32,000	30,600	20,700	17,100
31	32,600	------	9,330	6,970	------	19,000	------	29,300	------	30,500	20,600	------
Total	995,000	503,500	282,000	242,990	170,610	313,800	760,200	884,900	993,300	927,300	851,800	606,800
Mean	32,100	16,780	9,097	7,838	5,883	10,120	25,340	28,550	33,110	29,910	27,480	20,230
Ac-ft	‡1,974	998,700	559,300	482,000	338,400	622,400	‡1,508	‡1,755	‡1,970	‡1,839	‡1,690	‡1,204

Calendar year 1955: Max 46,700 Min 4,000 Mean 20,010 Ac-ft 14,490,000
Water year 1955-56: Max 37,400 Min 4,410 Mean 20,580 Ac-ft 14,940,000

‡ Expressed in thousands.

Note.--Stage-discharge relation affected by ice Nov. 13 to Apr. 5.

Heart River near South Heart, N. Dak.

Location.--Lat 46°52', long 102°57', in SW¼ sec. 8, T. 139 N., R. 97 W., on left bank half a mile downstream from North Creek and 2 miles east of South Heart.

Drainage area.--315 sq mi.

Records available.--June 1946 to September 1956. Prior to June 1947, published as "near Dickinson."

Gage.--Water-stage recorder. Datum of gage is 2,429.45 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). June 21, 1946, to May 31, 1947, wire-weight gage at site 6 miles downstream at different datum.

Average discharge.--10 years, 33.1 cfs (23,960 acre-ft per year).

Extremes.--Maximum discharge during year, 251 cfs July 31 (gage height, 6.38 ft); minimum, less than 0.05 cfs part of Aug. 22.

1946-56: Maximum discharge, 5,030 cfs Apr. 6, 1954 (gage height, 21.73 ft); minimum, that of Aug. 22, 1956.

Remarks.--Records good except those for period of no gage-height record, which are poor.

Revisions (water years).--WSP 1389: 1950, 1954(M).

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used July 10-29)

1.9	0	2.5	7.3
2.0	.6	3.0	24
2.1	1.4	4.0	70
2.3	3.6	6.0	215

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.4	0.7	0.6	0.3		*0.3	8	1.0	2.0	27	90	2.0
2	.3	.6	.8	.6		1	6	1.1	1.3	23	26	1.5
3	.4	*.6	.9	.7		*2	4.1	1.0	1.0	16	14	1.0
4	.5	.8	.9	.4		20	3.4	*1.0	.8	24	7.1	.8
5	.3	.8	.9	.5		*10	3.2	1.0	.6	6.5	4.9	.6
6	.5	.6	.8	.7		5	2.5	1.0	.5	3.1	3.0	.5
7	.4	.6	.8	.4	*0.4	2	2.0	1.0	.3	21	3.0	.3
8	.3	.6	.8	.4		1	1.9	.9	.3	20	2.1	.3
9	.3	.6	.8	.3		1	1.7	1.0	.3	15	1.5	.3
10	.3	.6	.9	.3		1	1.5	1.1	.2	5.0	1.2	.3
11	.3	.6	.9	.3		.8	1.4	1.0	.2	3.1	1.0	.3
12	.3	.6	.8	.3		.8	1.3	2.3	.3	7.4	.6	.3
13	*.4	.6	1.0	.3		*.6	1.1	1.8	.3	13	.6	.5
14	.6	.6	1.0	.4	(*)	.5	1.0	1.0	*.3	5.0	.5	.5
15	.6	.8	*.8	.4		.5	1.0	*.8	.3	2.9	.4	.5
16	.7	.7	.6	.3		1	1.0	.6	.3	2.1	.3	.4
17	.7	.8	.6	.4		10	.9	.6	.2	*5.6	*.3	*.5
18	.6	.8	.6			30	.8	.5	.2	3.5	.3	.4
19	.6	.7	.4			50	*.8	.4	.2	2.6	.3	.4
20	.6	.8	.4			100	.9	.3	.3	1.8	.3	.3
21	.6	.9	.3		.3	170	.9	.3	.3	1.4	.2	.2
22	.6	.9	.4			110	.9	.3	.2	1.3	.1	.1
23	.6	.8	.3	(*)		*80	.8	.2	.2	1.0	.1	.1
24	.6	.7	.3			60	.8	.2	.3	.8	.1	.2
25	.6	.6	.3	.5		40	.8	.2	.3	.6	.2	.2
26	.6	.7	.7			30	.8	.2	.3	.6	.3	.3
27	.6	.7	*.9			*20	.8	.3	.2	.6	.9	*.3
28	.6	.6	.6			15	.8	1.3	.2	.9	29	.3
29	.7	*.6	.3			10	.8	*18	*.3	7.5	*17	.3
30	.7	.5	.2		------	10	.8	9.8	10	12	5.6	.4
31	.7	------	.3		------	10	------	*3.0	------	*199	3.6	------
Total	16.0	20.5	19.9	14.0	9.9	792.5	52.7	53.2	22.2	433.3	214.5	14.1
Mean	0.52	0.68	0.64	0.45	0.34	25.6	1.76	1.72	0.74	14.0	6.92	0.47
Ac-ft	32	41	39	28	20	1,570	105	106	44	859	425	28

Calendar year 1955: Max	1,750	Min	0.1	Mean	14.5	Ac-ft	10,460
Water year 1955-56: Max	199	Min	0.1	Mean	4.54	Ac-ft	3,300

Peak discharge (base, 200 cfs).--Mar. 21 (time unknown) about 200 cfs; July 31 (4:30 p.m.) 251 cfs (6.38 ft).

* Discharge measurement made on this day.

Note.--No gage-height record Jan. 17 to Apr. 2 (stage-discharge relation affected by ice most of period); discharge estimated on basis of 9 discharge measurements, weather records, and records for nearby stations.

Dickinson Reservoir near Dickinson, N. Dak.

Location.--Lat 46°52', long 102°50', near west line of sec. 8, T. 139 N., R. 96 W., 2 miles southwest of Dickinson.

Drainage area.--400 sq mi, approximately.

Records available.--May 1950 to September 1956.

Gage.--Staff gage read once daily. Datum of gage is at mean sea level, datum of 1929 (levels by Bureau of Reclamation).

Extremes.--Maximum contents observed during year, 6,030 acre-ft Mar. 29 to Apr. 10 (elevation, 2,415.5 ft); minimum, 3,630 acre-ft Mar. 3-7 (elevation, 2,411.8 ft).

1950-56: Maximum contents, 9,920 acre-ft Apr. 7, 1954 (elevation, 2,419.6 ft); minimum since initial filling of reservoir, 3,630 acre-ft Dec. 16, 1954, to Mar. 9, 1955, Mar. 3-7, 1956 (elevation, 2,411.8 ft).

Remarks.--Reservoir is formed by earth-fill dam; storage began May 23, 1950; dam completed Aug. 9, 1950. Total capacity is 25,700 acre-ft at maximum pool, elevation, 2,429.3 ft. Dead storage is 1,100 acre-ft below lowest point of outlet, elevation, 2,404.7 ft. Conservation storage is 5,900 acre-ft between elevation 2,404.7 ft and crest of spillway, elevation 2,416.5 ft. Figures given herein represent total contents. The reservoir is for flood control, irrigation, and municipal supply.

Cooperation.--Record of gage heights and contents furnished by Bureau of Reclamation.

Month-end elevations and contents, water year October 1955 to September 1956

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	2,413.0	4,310	-
Oct. 31	2,412.8	4,190	-120
Nov. 30	2,412.7	4,140	-50
Dec. 31	2,412.7	4,140	0
Calendar year 1955	-	-	+509
Jan. 31	2,412.6	4,080	-60
Feb. 29	2,411.9	3,680	-400
Mar. 31	2,415.5	6,030	+2,350
Apr. 30	2,415.25	5,840	-190
May 31	2,414.9	5,570	-270
June 30	2,414.4	5,220	-350
July 31	2,414.4	5,220	0
Aug. 31	2,413.8	4,820	-400
Sept. 30	2,413.6	4,690	-130
Water year 1955-56	-	-	+380

Heart River below Dickinson Dam, near Dickinson, N. Dak.

Location.--Lat 46°52', long 102°49', in SE¼ sec. 8, T. 139 N., R. 96 W., on left bank 1 mile downstream from Dickinson Dam and 1¾ miles southwest of Dickinson.

Drainage area.--404 sq mi.

Records available.--October 1951 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 2,378 ft (by barometer).

Average discharge.--5 years, 22.8 cfs.

Extremes.--Maximum discharge during year, 9.5 cfs Sept. 12 (gage height, 3.20 ft); minimum, 0.1 cfs at times.

1951-56: Maximum discharge, 4,050 cfs Apr. 7, 1954 (gage height, 13.64 ft); minimum, 0.1 cfs at times in most years.

Flood in April 1950 reached a stage of 14.5 ft from drift marks.

Remarks.--Records good. Low flow regulated by one 24-inch gate in Dickinson Dam (see preceding page). Some diversions above station by city of Dickinson, and for irrigation.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.2	*1.1	0.2	0.2	0.2	*4.0	0.8	0.3	0.4	1.3	6.8	0.2
2	.2	.3	.3	.2	.2	3.8	*.7	.4	.8	1.2	6.5	.1
3	.2	.2	.3	.2	.3	3.7	.6	.4	.9	1.7	6.5	.1
4	.1	.2	.3	.2	.3	3.7	.6	.4	1.0	.9	6.5	.1
5	.1	.3	.3	.2	.5	3.7	.5	.4	1.4	.4	6.5	.1
6	.1	.3	.3	.2	*1.2	3.5	.5	.4	2.3	.5	6.3	.1
7	.1	.3	.3	.2	2.2	3.5	.4	.4	2.3	1.9	6.3	.1
8	.1	.3	.3	.2	2.9	3.5	.4	.4	2.4	3.5	6.1	.1
9	.1	.3	.3	.2	3.2	3.5	.3	.4	2.4	3.7	6.1	**.1
10	.1	.3	.3	.2	3.8	3.5	.3	.4	2.5	4.0	6.1	.3
11	.1	.4	.3	.2	3.5	3.3	.3	.4	2.8	2.4	6.1	8.0
12	.1	.2	.3	.2	3.3	3.2	.2	.4	2.8	3.2	6.1	5.0
13	.1	.2	.3	.2	3.3	*3.3	.1	.4	2.9	5.5	6.1	.5
14	*.1	.2	.3	.2	*3.2	3.2	.2	.4	*3.0	6.1	6.1	.3
15	.1	.2	*.3	.2	3.2	3.3	.2	.4	3.3	6.2	5.8	.3
16	.1	.2	.3	.2	3.2	3.5	.3	*.4	3.5	6.3	5.8	.3
17	.1	.2	.2	.2	3.7	3.3	.3	2.8	3.3	*6.5	*5.8	*.3
18	.1	.2	.2	.2	4.4	3.2	*.5	3.5	3.5	7.0	5.6	.3
19	.1	.5	.2	*.2	2.4	3.2	.2	3.1	3.5	6.5	5.2	.3
20	.2	.5	.2	.2	2.3	3.2	.2	1.8	5.1	5.9	4.9	.3
21	.1	.3	.2	.2	2.8	2.8	.3	3.3	3.3	6.3	4.7	.4
22	.1	.3	.3	.3	3.3	2.2	.2	3.5	3.0	6.4	4.9	.4
23	.1	.2	.3	.3	3.5	1.6	.2	3.5	2.9	6.4	4.7	.4
24	.1	.2	.3	.3	3.5	*1.4	.2	3.5	2.9	6.4	4.5	.4
25	.1	.2	.2	.2	3.5	1.3	.2	3.7	3.0	6.3	4.4	.3
26	.1	.3	.2	.2	3.5	1.2	.2	3.7	1.8	6.5	4.4	.3
27	.6	.3	.2	.2	3.5	1.0	.2	4.2	.9	6.7	4.5	.3
28	.9	.2	.2	.3	3.5	.9	.2	3.7	.9	6.8	4.7	.3
29	.9	*.2	*.2	.2	3.7	.9	.2	.7	*.6	6.8	4.9	.3
30	.9	.2	.2	.2	------	.8	*.2	.6	1.0	6.8	5.6	.3
31	.9	------	.2	*.2	------	.7	------	*.4	------	*6.8	*3.2	------
Total	7.2	8.8	8.0	6.6	78.1	83.9	9.7	48.3	70.4	146.9	171.7	20.3
Mean	0.23	0.29	0.26	0.21	2.69	2.71	0.32	1.56	2.35	4.74	5.54	0.68
Ac-ft	14	16	16	13	155	166	19	96	140	291	341	40

Calendar year 1955:	Max	1,050	Min	0.1	Mean	10.9	Ac-ft	8,030
Water year 1955-56:	Max	8.0	Min	0.1	Mean	1.80	Ac-ft	1,310

* Discharge measurement made on this day.
** Field estimate made on this day.

Green River near Gladstone, N. Dak.

Location.--Lat 46°53', long 102°37', in SW¼ sec. 36, T. 140 N., R. 95 W., on right bank half a mile upstream from bridge on U. S. Highway 10, 3½ miles northwest of Gladstone, 3½ miles upstream from mouth, and 8 miles downstream from Spring Creek.

Drainage area.--356 sq mi.

Records available.--October 1945 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 2,320 ft (by barometer). Prior to June 27, 1953, wire-weight gages at datum 4.15 ft lower; Oct. 1, 1945, to July 5, 1949, on former Highway 10 bridge over former channel 700 ft east of present bridge, and July 6, 1949, to June 26, 1953, on Highway 10 bridge half a mile downstream from present site.

Average discharge.--11 years, 39.1 cfs (28,310 acre-ft per year).

Extremes.--Maximum discharge during year, about 250 cfs Mar. 19 or 20; no flow at times.
1945-56: Maximum discharge, 5,260 cfs Apr. 15, 1950 (gage height, 18.3 ft, from floodmark); no flow at times in 1946, 1955-56.
Maximum stage known, about 20 ft March 1943.

Remarks.--Records good except those for period of ice effect, which are poor. A few diversions above the station for irrigation of hay meadows, and washing of sand and gravel.

Rating tables, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Sept. 22-30)

Oct. 1 to Apr. 21				Apr. 22 to Sept. 30			
1.8	0	2.1	3.7	1.8	0	2.1	4.7
1.9	.1	2.2	6.7	1.9	.6	2.3	13
2.0	1.2	2.4	16	2.0	2.1	2.5	26

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.1	0.6	0.6	0.1	0.2	10	28	2.1	7.0	1.6	0	7.0
2	.1	.6	.4	.1	.2	50	**25	3.5	7.0	1.9	0	4.1
3	.1	*.6	.4	.2	.2	*30	22	3.5	8.3	1.9	0	3.0
4	.1	.6	.4	.2	.2	30	20	*3.2	8.3	1.7	.7	2.5
5	.1	.8	.4	.2	.2	*14	18	3.8	*7.0	1.9	5.8	2.5
6	.1	.8	.4	.3	.2	12	16	4.1	5.4	2.3	5.8	2.1
7	.1	.7	.3	.3	.3	10	14	3.2	3.2	2.1	4.4	1.7
8	.1	.7	.3	.4	.3	8	13	3.2	2.5	7.4	3.2	1.6
9	.1	.8	.3	.4	.3	6	12	3.2	2.1	5.8	2.1	1.2
10	.1	1.0	.3	.4	.3	6	11	3.2	1.6	9.1	1.4	1.1
11	.1	1.0	.3	.4	.3	4	10	4.1	1.2	7.4	1.1	1.0
12	.1	.5	.3	.4	.3	2	9.5	3.5	1.1	4.7	.7	1.0
13	*.1	.5	.3	.4	.3	1	8.7	2.7	.9	3.0	.5	1.1
14	.1	.5	.2	.4	.2	.5	7.9	3.5	*.7	1.7	.4	1.1
15	.1	.5	.2	.4	.2	.2	7.1	3.2	.7	1.1	.2	1.0
16	.1	.5	.2	.4	.1	**.1	6.7	3.0	.5	.9	.2	.9
17	.2	.5	.2	.4	*.1	20	6.1	*1.9	.5	.7	*.2	.7
18	.1	.5	.1	.4	.1	100	*5.5	1.9	.5	.5	.2	.6
19	.1	.5	0	.4	.1	200	5.2	1.9	.4	.3	.2	.5
20	.2	.6	0	.4	.1	200	3.0	2.1	.4	*.2	.1	.4
21	.2	.7	0	.4	.1	120	1.7	2.3	.7	.1	.1	.4
22	.2	.7	0	*.4	.1	*90	3.2	1.7	.9	.1	0	.3
23	.2	.7	0	.4	.1	**100	3.5	1.4	.7	0	0	.2
24	.2	.7	0	.4	.1	*90	3.5	1.1	.6	0	0	.2
25	.2	.6	0	.4	.1	75	3.8	1.0	.5	0	0	.2
26	.3	.6	0	.4	.1	60	3.8	.9	.4	0	0	.1
27	.4	.8	*0	.2	.1	*47	3.8	.6	.3	0	.1	*.1
28	.4	1.0	0	.2	.1	40	3.5	3.9	.2	.1	.3	.1
29	.4	*.9	0	.2	.1	35	3.5	15	*.2	.1	20	.1
30	.4	.6	0	.2	------	32	3.2	9.6	.2	.1	14	.1
31	.4	------	0	.2	------	30	------	7.8	------	*.1	*10	------
Total	5.5	20.1	5.6	10.0	5.1	1,422.8	282.2	106.1	64.0	56.8	71.7	36.9
Mean	0.18	0.67	0.18	0.32	0.18	45.9	9.41	3.42	2.13	1.83	2.31	1.23
Ac-ft	11	40	11	20	10	2,820	560	210	127	113	142	73

Calendar year 1955: Max 175 Min 0 Mean 10.0 Ac-ft 7,240
Water year 1955-56: Max 200 Min 0 Mean 5.70 Ac-ft 4,140

Peak discharge (base, 500 cfs).--No peak above base.
* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
Note.--Stage-discharge relation affected by ice Nov. 2 to Apr. 10 (no gage-height record Feb. 2 to Mar. 15, Mar. 18-20, 25-31, Apr. 1-10; discharge estimated on basis of 4 discharge measurements, 3 field estimates, weather records, and records for stations on Heart River).

Heart River near Richardton, N. Dak.

Location.--Lat 46°44'46", long 102°18'27", in NE¼ sec. 29, T. 138 N., R. 92 W., on right bank 10 ft upstream from bridge on State Highway 8, half a mile downstream from Blacktail Creek, and 9½ miles south of Richardton.

Drainage area.--1,240 sq mi, approximately.

Records available.--May 1903 to September 1922 (few winter records), April 1943 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 2,153.67 ft above mean sea level, datum of 1929. May 18, 1903, to Sept. 30, 1922, staff or chain gage at 3 sites in 1-mile reach below present site at different datums. Apr. 14, 1943, to July 7, 1947, wire-weight gage at present site and datum.

Average discharge.--14 years (1920-21, 1943-56), 122 cfs (88,320 acre-ft per year).

Extremes.--Maximum discharge during year, about 500 cfs Mar. 20 (gage height, 11.55 ft, backwater from ice); maximum gage height, 12.92 ft Mar. 19 (ice jam); no flow for many days during winter.

1903-22, 1943-56: Maximum discharge, 23,400 cfs Apr. 16, 1950 (gage height, 28.05 ft, from high-water mark in gage house); no flow at times.

Flood of July 5, 1938, reached a stage of about 26 ft, from information of local resident (discharge, 16,000 cfs). Flood of Mar. 25, 1943, reached a stage of 24.2 ft, from floodmarks (discharge, 11,700 cfs).

Remarks.--Records fair except those for periods of ice effect or backwater from bank slides, which are poor. Flow regulated by Dickinson Reservoir (see p. 257).

Revisions (water years).--WSP 1209: Drainage area. WSP 1239: 1906, 1918(M), 1947(M).

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.0	3.5	1.5	0.4		0	60	16	28	16	82	24
2	2.5	3.0	1.5	.4		100	*40	17	21	30	36	18
3	1.9	3	1.7	.4		*250	40	18	18	172	23	16
4	2.1	3	1.7	.4		220	40	16	15	85	17	10
5	3.2	3	1.7	.5		*130	35	14	14	45	13	9.5
6	3.6	1	1.9	.5		100	35	13	16	35	11	9.0
7	3.2	2.5	1.9	.4		70	35	14	16	55	10	7.0
8	2.5	3	1.9	.3		80	35	14	16	40	10	6.8
9	1.9	3	2.0	.3		80	35	14	10	23	10	6.8
10	1.8	3	2.0	.2		70	36	15	6.8	19	9.5	6.4
11	1.8	3	2.0	.2		70	34	15	3.5	21	7.7	6.4
12	1.8	3	2.0	.2		50	33	14	3.5	19	7.2	6.4
13	1.4	3	2.0	.2		40	26	16	3.2	20	5.7	6.8
14	*1.9	2.5	2.0	.2		30	21	16	*4.1	16	5.0	6.4
15	5.0	2.5	2.0	.2	(*)	20	22	15	5.7	10	4.4	6.4
16	4.4	2.5	*2.0	.2		*50	23	*12	5.7	7.2	3.5	6.9
17	1.2	2.5	2.0	.1		200	*21	10	5.0	*5.7	*4.4	7.7
18	1.6	2	2.0	.1		250	18	10	6.0	3.5	4.7	*5.3
19	1.9	2	1.5	*.1		300	21	15	6.4	3.2	4.4	4.1
20	2.3	2	1.5	.1		400	20	16	6.4	c4	6.0	2.8
21	2.5	2	1.0	.1		360	17	13	6.0	c4	8.6	1.3
22	2.3	2	.5	.1		**330	16	10	7.7	c4	10	1.3
23	2.1	2	.5	.1		300	10	14	28	c5	12	1.2
24	1.8	2	.4	.1		*270	7.2	15	18	c5	13	1.3
25	1.9	2	.4	.1		220	12	14	12	c4	14	1.2
26	1.9	2	.4	0		180	13	14	6.4	c7	16	1.1
27	2.5	2	.4	0		150	12	15	4.7	c5	19	1.1
28	3.2	2	.4	0		120	16	27	4.4	c4	20	*1.0
29	3.8	2	.4	0	(*)	100	14	31	*3.2	c7	24	1.0
30	3.8	*1.5	*.4	0	------	*90	*13	42	11	c10	31	1.0
31	*4.1	------	.4	*0	------	80	------	*41	------	*16	*28	------
Total	78.9	72.5	42.0	5.9	0	4,710	760.2	526	311.7	703.6	470.1	184.2
Mean	2.55	2.42	1.35	0.19	0	152	25.3	17.0	10.4	22.8	15.2	6.14
Ac-ft	156	144	83	12	0	9,340	1,510	1,040	618	1,400	932	365

Calendar year 1955: Max 1,050 Min 0.4 Mean 34.7 Ac-ft 25,150
Water year 1955-56: Max 400 Min 0 Mean 21.5 Ac-ft 15,600

Peak discharge (base, 1,500 cfs).--No peak above base.
* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
c Stage-discharge relation affected by bank slides.

Note.--Stage-discharge relation affected by ice Nov. 3 to Apr. 7. Discharge Dec. 18 to Feb. 29 estimated on basis of once-weekly wire-weight-gage readings, weather records, and records for upstream stations. Discharge Mar. 14-15, Apr. 2 to May 5 computed from once-daily wire-weight-gage readings.

Heart Butte Reservoir near Glen Ullin, N. Dak.

Location.--Lat 46°35'48", long 101°48'34", in SW¼NE¼ sec. 13, T. 136 N., R. 89 W., 10 miles upstream from Heart Butte Creek, 14 miles south of Glen Ullin, and 14 miles north of Elgin.

Drainage area.--1,710 sq mi, approximately.

Records available.--August 1949 to September 1956.

Gage.--Staff gage read once daily. Datum of gage is at mean sea level, datum of 1929 (levels by Bureau of Reclamation).

Extremes.--Maximum contents during year, 77,600 acre-ft Apr. 6 (elevation, 2,065.05 ft); minimum, 51,760 acre-ft Mar. 1-4 (elevation, 2,056.71 ft).
1949-56: Maximum contents, 174,000 acre-ft Apr. 9, 1952 (elevation, 2,036.23 ft); minimum since first reaching spillway level, that of Mar. 1-4, 1956.

Remarks.--Reservoir is formed by earth-fill dam; storage began Sept. 29, 1949; dam completed Dec. 9, 1949. Total capacity is 428,000 acre-ft at maximum pool, elevation, 2,118.2 ft. Dead storage is 6,750 acre-ft below lowest point of outlet, elevation, 2,030.0 ft. Active conservation storage is 69,040 acre-ft between elevation 2,030.0 ft and crest of spillway, elevation, 2,064.5 ft. Figures given herein represent total contents. Controlled releases are through 4- by 5-foot slide gate. The spillway is uncontrolled "glory hole" type and discharges through a conduit 14 ft in diameter. The reservoir is for flood control, irrigation, and incidental water supply.

Cooperation.--Record of gage heights and contents furnished by Bureau of Reclamation.

Month-end elevations and contents, water year October 1955 to September 1956

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept.30	2,062.84	70,390	-
Oct. 31	e2,061.50	66,030	-4,360
Nov. 30	e2,060.25	61,960	-4,070
Dec. 31	2,058.75	57,570	-4,390
Calendar year 1955	-	-	-1,890
Jan. 31	e2,057.40	53,710	-3,860
Feb. 29	2,056.72	51,760	-1,950
Mar. 31	2,064.69	76,410	+24,650
Apr. 30	2,063.92	73,910	-2,500
May 31	2,062.4	68,960	-4,950
June 30	2,061.5	66,030	-2,930
July 31	2,061.3	65,380	-650
Aug. 31	2,061.0	64,400	-980
Sept.30	2,060.2	61,800	-2,600
Water year 1955-56	-	-	-8,590

e Estimated.

Heart River below Heart Butte Dam, near Glen Ullin, N. Dak.

Location.--Lat 46°35'50", long 101°48'05", in NE¼ sec. 13, T. 136 N., R. 89 W., on right bank 0.5 mile downstream from Heart Butte Dam, 10 miles upstream from Heart Butte Creek, 14 miles south of Glen Ullin, and 14 miles north of Elgin.

Drainage area.--1,710 sq mi, approximately.

Records available.--April 1943 to September 1956. Prior to October 1948, published as "near Glen Ullin".

Gage.--Water-stage recorder. Datum of gage is 1,998.87 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Aug. 24, 1943, wire-weight gage and Aug. 24, 1943, to May 31, 1947, water-stage recorder, at site 4 miles upstream at different datum.

Average discharge.--13 years, 163 cfs (118,000 acre-ft per year).

Extremes.--Maximum discharge during year, 228 cfs May 4 (gage height, 2.23 ft); minimum, 0.2 cfs Mar. 24 (gage height, 1.21 ft).

1943-56: Maximum discharge, 25,000 cfs Mar. 24, 1947 (gage height, 21.5 ft, site and datum then in use, from floodmark, backwater from ice); no flow at times.

Flood of Mar. 25, 1943, reached a stage of 18.77 ft, former site and datum (discharge, 20,000 cfs, by slope-area determination).

Remarks.--Records good. Flow regulated by Heart Butte Reservoir (see preceding page).

Rating table, water year 1955-56 (gage height, in feet, and discharge, in cubic feet per second)

1.2	0	1.7	24
1.3	.4	1.8	48
1.4	2.1	2.0	110
1.5	5.0	2.1	150
1.6	10		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	54	54	76	73	17	29	46	126	65	70	36	31
2	54	54	76	73	17	29	*62	126	62	70	36	31
3	54	54	76	73	34	29	65	126	62	70	36	31
4	54	54	76	73	48	29	68	125	62	70	36	31
5	54	56	76	73	48	29	70	126	65	45	36	29
6	54	56	76	73	48	29	70	126	65	31	36	26
7	54	56	76	73	48	29	68	126	65	32	36	26
8	54	66	76	73	48	29	68	126	65	31	38	26
9	54	79	76	73	48	29	76	126	65	31	38	26
10	54	79	76	73	41	29	83	126	68	34	38	26
11	54	79	76	73	29	31	83	126	68	36	38	26
12	54	79	76	73	29	34	110	126	68	34	38	26
13	54	79	79	73	29	21	118	126	68	34	21	26
14	*54	79	79	73	29	14	110	122	*68	34	11	26
15	54	79	79	73	*29	14	107	90	58	34	11	26
16	54	79	*79	73	29	*15	100	*90	36	34	11	26
17	54	79	79	70	29	14	*93	90	36	*34	*29	29
18	54	76	76	54	29	13	103	90	34	36	34	*29
19	54	76	76	54	29	11	130	90	34	36	34	29
20	54	76	76	54	29	9.0	126	90	34	36	34	29
21	54	76	76	54	29	.5	126	90	34	36	34	29
22	54	76	73	54	29	*.3	126	90	31	36	34	29
23	54	76	73	54	29	.3	126	90	31	36	34	29
24	54	76	73	54	29	.2	126	86	35	36	34	29
25	54	76	73	54	29	.3	126	70	70	36	34	29
26	54	76	73	54	29	.5	126	70	70	36	34	29
27	54	76	73	54	29	.5	104	70	70	38	31	29
28	54	76	73	54	29	2.8	126	70	70	38	31	*29
29	54	73	73	54	*29	4.6	126	70	*70	38	21	29
30	54	*73	*73	54	------	6.5	*126	70	70	38	31	29
31	*54	------	73	*40	------	22	------	*65	------	*38	*31	------
Total	1,674	2,143	2,341	1,980	948	504.5	2,994	3,140	1,719	1,238	986	845
Mean	54.0	71.4	75.5	63.9	32.7	16.3	99.8	101	57.3	39.9	31.8	28.2
Ac-ft	3,320	4,250	4,640	3,930	1,880	1,000	5,940	6,230	3,410	2,460	1,960	1,680

Calendar year 1955: Max 172 Min 8.0 Mean 41.4 Ac-ft 29,930
Water year 1955-56: Max 130 Min 0.2 Mean 56.0 Ac-ft 40,700

* Discharge measurement made on this day.

Antelope Creek near Carson, N. Dak.

Location.--Lat 46°32', long 101°39', in NW¼NE¼ sec. 8, T. 135 N., R. 87 W., near center of span on upstream side of county road bridge, 4 miles upstream from mouth and 8 miles northwest of Carson.

Drainage area.--221 sq mi.

Records available.--June 1948 to September 1956.

Gage.--Wire-weight and staff gages and crest-stage indicator. Gage read once weekly during winter and once daily at other times. Altitude of gage is 1,974 ft (by barometer).

Average discharge.--8 years, 20.5 cfs (14,840 acre-ft per year).

Extremes.--Maximum discharge during year, 870 cfs Mar. 20 (gage height 11.50 ft, affected by ice); maximum gage height, 12.03 ft Mar. 20 (affected by ice); no flow for many days during winter; minimum observed gage height, 1.29 ft July 26.

1948-56: Maximum discharge, 11,100 cfs Apr. 16, 1950 (gage height, 17.95 ft, from floodmark), from rating curve extended above 1,100 cfs on basis of slope-area determination of peak flow; no flow at times.

The flood of Mar. 25, 1943, reached a stage of 17.1 ft, the highest known prior to 1950.

Remarks.--Records fair except those for periods of ice effect, which are poor.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.0	1.4	1.4	0.8	0	0.1	15	6.4	4.7	a3.0	1.2	2.4
2	2.8	1.4	1.4	.8	0	*.4	15	7.0	3.0	*1.4	1.2	a2.2
3	2.5	1.4	1.4	.8	0	2	20	6.4	a3.0	5.6	.8	1.7
4	2.2	1.4	1.4	.8	0	10	25	6.4	3.1	a10	6.6	2.1
5	1.7	1.9	1.4	.8	.1	8	a20	6.4	*3.2	3.6	a4.0	2.2
6	1.1	1.4	1.2	.8	.2	6	*17	a6.5	3.8	4.4	1.6	2.4
7	1.0	1.2	1.2	.6	.2	30	15	6.6	3.8	6.2	3.7	2.4
8	.9	1.2	1.2	.4	.2	35	16	6.4	3.1	a6.0	2.8	1.3
9	1.0	1.2	1.2	.4	.2	20	15	*6.2	3.1	4.5	2.4	a1.2
10	.8	1.3	1.2	.4	**.1	60	11	a6.5	a2.5	3.8	5.1	1.1
11	.4	1.2	1.2	**.2	.1	50	12	8.9	2.1	1.3	6.0	.5
12	*.5	1.3	1.2	.2	.1	45	10	7.0	1.9	*1.6	26	.8
13	.5	1.7	1.2	.2	0	*40	11	7.0	1.2	1.2	a20	.8
14	.5	1.8	1.2	.2	0	20	9.6	a8.0	.8	1.2	16	.4
15	.5	*1.4	1.2	.2	0	25	8.7	a5.0	2.6	a.8	4.2	.9
16	.3	1.4	1.2	.1	0	*50	7.6	3.6	3.8	.5	1.8	a1.0
17	.6	1.2	1.2	.1	0	200	7.4	3.1	a3.0	.5	1.1	.7
18	.5	1.2	1.0	.1	0	300	7.6	2.2	2.2	1.0	.5	1.1
19	.5	1.4	*1.0	.1	0	600	6.4	2.5	1.8	.9	a1.5	.6
20	.6	1.4	1.0	.1	0	*700	a6.0	a3.0	.9	.5	a2.0	.5
21	.6	1.4	1.0	0	0	*650	5.8	3.6	*.3	.2	1.9	.5
22	.7	1.4	1.0	0	0	*340	5.4	3.4	.2	a.2	1.8	*.2
23	.5	1.4	1.0	0	0	130	5.1	3.2	.2	.1	1.1	a.2
24	.4	1.4	1.0	0	0	*75	5.1	3.0	a.2	.1	.4	a.2
25	.5	1.4	1.0	0	0	80	6.0	*2.5	.1	.1	.7	a.2
26	.5	1.4	1.0	0	0	75	4.9	a2.0	.1	.1	a.8	.3
27	.9	1.4	1.0	0	0	70	5.3	a1.5	.1	.1	.5	.2
28	1.3	1.4	1.0	0	0	50	5.1	4.5	.1	a3.0	*1.0	.2
29	1.3	1.4	1.0	0	0	30	6.0	5.1	a.1	a8.0	.9	a.2
30	1.4	*1.4	.8	0	------	*20	6.0	a5.0	6.0	5.3	.3	a.2
31	1.4	------	.8	0	------	15	------	4.9	------	*3.1	3.2	------
Total	31.4	41.8	35.0	8.1	1.2	3,736.5	310.0	153.8	61.0	78.3	121.1	28.7
Mean	1.01	1.39	1.13	0.26	0.04	121	10.3	4.96	2.03	2.53	3.91	0.96
Ac-ft	62	83	69	16	2.4	7,410	615	305	121	155	240	57

Calendar year 1955:	Max 155	Min 0	Mean 5.44	Ac-ft 3,940
Water year 1955-56:	Max 700	Min 0	Mean 12.6	Ac-ft 9,140

Peak discharge (base, 200 cfs).--Mar. 20, 870 cfs.

* Discharge measurement made on this day.

** Field estimate made on this day.

a No gage-height record; discharge estimated on basis of adjacent record, weather records, and records for other Heart River tributaries.

Note.--Stage-discharge relation affected by ice Nov. 1, Nov. 16 to Apr. 4 (gage read about once weekly Nov. 27 to Mar. 6; discharge estimated on basis of 12 discharge measurements, 2 field estimates, existing gage-height record, weather records, and records for other Heart River tributaries).

Muddy Creek near Almont, N. Dak.

Location.--Lat 46°42', long 101°28', in SW¼ sec. 7, T. 137 N., R. 85 W., on right bank 450 ft downstream from highway bridge, 2 miles downstream from Hailstone Creek, 3 miles southeast of Almont, and 12 miles upstream from mouth.

Drainage area.--456 sq mi.

Records available.--October 1945 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 1,864 ft (by barometer). Prior to Sept. 5, 1952, wire-weight gage or staff gage at same site and datum.

Average discharge.--11 years, 43.7 cfs (31,640 acre-ft per year); median of yearly mean discharges, 36 cfs (26,100 acre-ft per year).

Extremes.--Maximum discharge during year, 2,190 cfs Mar. 21 (gage height, 18.87 ft, affected by ice); no flow Oct. 1, 2, 4, 5; minimum gage height, 2.76 ft Sept. 28, 29.
1945-56: Maximum discharge, 20,200 cfs Apr. 17, 1950 (gage height, 30.7 ft, from floodmarks), from rating curve extended above 2,300 cfs on basis of slope-area determination of peak flow; no flow at times.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	1.1	1.7	1.1	0.5	1.0	127	6.6	19	110	2.2	7.0
2	0	1.3	1.8	1.1	.5	*1.6	*193	*6.8	13	32	1.7	5.7
3	.2	1.1	1.8	1.1	*.5	10	192	5.7	11	*40	1.7	11
4	0	1.0	1.8	1.4	.5	20	138	4.7	8.5	70	3.0	9.8
5	0	1.3	1.8	1.4	.6	18	130	4.5	7.0	50	3.0	7.5
6	.1	1.4	1.7	1.5	.6	15	132	4.3	12	30	2.2	5.3
7	.1	1.3	1.7	1.4	.6	5	115	3.9	13	25	1.5	3.5
8	.2	1.1	1.7	1.0	.8	4	89	3.3	13	25	1.5	2.6
9	.2	1.3	1.5	1.1	1.0	6	70	3.1	10	20	1.1	2.3
10	.2	1.3	1.5	1.3	*1.4	20	55	*2.6	9.5	20	1.3	1.7
11	.2	1.4	1.5	*1.3	1.4	40	45	4.7	11	20	1.3	1.4
12	**.2	1.5	1.5	1.3	1.2	35	40	4.7	6.8	*80	1.4	1.4
13	.6	1.4	1.7	1.3	1.2	*30	35	3.1	4.7	52	2.5	*1.5
14	.7	1.5	1.8	1.3	1.0	20	32	4.1	3.5	35	2.0	3.1
15	.7	2.0	1.8	1.3	1.0	20	30	3.5	3.0	28	1.4	2.2
16	.6	*1.7	1.8	1.2	1.0	*30	27	2.2	2.8	21	1.7	1.8
17	.7	1.7	1.7	1.0	.8	*85	*25	1.4	2.5	15	1.4	1.7
18	.9	1.5	1.7	1.0	.8	300	23	.8	2.0	11	1.4	1.5
19	1.0	1.5	1.1	.8	.8	*850	21	.8	1.8	9.0	1.4	1.3
20	1.1	1.7	*.8	.8	.8	*1,570	19	.8	1.7	9.0	1.3	1.3
21	1.3	1.8	.8	.8	.8	*2,080	18	.9	*1.3	6.4	1.3	1.1
22	1.3	1.8	1.0	.6	.8	*1,570	16	1.0	.9	4.7	1.0	1.0
23	1.0	1.8	2.2	.6	.8	*680	14	.9	.9	3.9	.8	.8
24	.9	1.7	2.2	.6	.8	380	12	.9	.9	3.0	.7	.8
25	.8	1.7	1.4	.6	.8	*470	11	1.0	.9	2.5	.9	.8
26	.8	1.7	1.3	.6	.6	715	10	1.1	1.7	2.0	1.1	.8
27	.9	1.5	1.4	.6	.6	670	9.8	1.4	1.4	2.0	2.0	*.8
28	1.0	1.5	1.5	.6	.6	300	9.0	3.5	.9	2.2	*3.7	.7
29	1.1	1.4	1.4	.6	.6	110	8.0	6.4	.9	2.2	8.0	.7
30	1.3	*1.4	1.1	.5	------	*85	7.0	*9.5	434	2.5	6.8	1.0
31	1.3	------	1.1	.5	------	100	------	23	------	*2.3	11	------
Total	19.4	44.4	47.8	30.3	23.4	10,240.6	1,652.8	121.2	599.6	735.7	72.3	82.1
Mean	0.63	1.48	1.54	0.98	0.81	330	55.1	3.91	20.0	23.7	2.33	2.74
Ac-ft	38	88	95	60	46	20,310	3,280	240	1,190	1,460	143	163

Calendar year 1955: Max 448 Min 0 Mean 13.2 Ac-ft 9,590
Water year 1955-56: Max 2,080 Min 0 Mean 37.3 Ac-ft 27,110

Peak discharge (base, 200 cfs).--Mar. 21 (1 p.m.) 2,190 cfs (18.87 ft); Mar. 27 (7 a.m.) 790 cfs (12.15 ft); June 30 (2 a.m.) 956 cfs (12.98 ft).

* Discharge measurement made on this day.

** Field estimate made on this day.

Note.--Stage-discharge relation affected by ice Jan. 15 to Mar. 30. No gage-height record Apr. 9-20, July 3-12; discharge estimated on basis of 3 discharge measurements, adjacent record, a few outside gage readings, weather records, and records for other Heart River tributaries.

Heart River near Lark, N. Dak.

Location.--Lat 46°36'00", long 101°22'30", in S½ sec. 9, T. 136 N., R. 85 W., on right bank 20 ft downstream from bridge on State Highway 31, 1 mile downstream from Muddy Creek, and 10 miles north of Lark.

Drainage area.--2,750 sq mi, approximately.

Records available.--June 1946 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 1,802.83 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Nov. 16, 1948, wire-weight gage at same site and datum.

Average discharge.--10 years, 259 cfs (187,500 acre-ft per year).

Extremes.--Maximum discharge during year, about 12,000 cfs Mar. 20 (result of sudden breaking of ice jam downstream); maximum gage height, 16.27 ft Mar. 20 (affected by ice); minimum discharge, 20 cfs Feb. 4-6; minimum gage height, 2.98 ft Sept. 28.

1946-56: Maximum discharge, 29,200 cfs Apr. 17, 1950 (gage height, 20.70 ft), from rating curve extended above 11,000 cfs on basis of contracted-opening determination of peak flow; no flow Jan. 16 to Mar. 4, 1950.

Remarks.--Records good except those for period of ice effect, which are fair. Flow regulated by Heart Butte Reservoir (see p. 261).

Rating tables, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 27		Mar. 28 to Sept. 30			
3.4	34	2.9	23	4.5	262
3.6	55	3.2	44	5.0	410
3.8	82	3.5	78	6.0	835
		4.0	154		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	52	60	65	75	45	30	322	154	109	276	44	65
2	53	33	65	75	40	30	*337	*158	100	132	42	53
3	52	68	60	75	*30	35	353	152	96	*127	42	48
4	55	79	60	70	20	35	297	151	93	169	93	50
5	54	74	60	75	20	35	308	149	93	147	73	50
6	54	39	60	70	20	35	281	149	100	132	55	47
7	53	50	60	70	25	35	244	147	100	102	46	43
8	54	50	60	60	30	40	223	147	89	92	42	36
9	55	50	60	65	*30	60	223	*146	86	85	43	35
10	54	60	55	65	35	50	216	151	85	68	43	34
11	54	60	55	*65	40	60	232	167	82	61	48	32
12	*54	60	60	65	40	70	*205	154	82	*85	61	32
13	53	60	60	65	40	*80	209	149	78	108	75	*32
14	55	60	60	65	35	90	216	146	77	85	77	31
15	55	60	55	60	30	110	198	144	77	69	54	33
16	56	*60	55	50	30	*130	181	124	79	69	38	32
17	57	60	55	50	30	200	*165	118	61	92	32	31
18	57	60	55	50	30	1,200	156	116	44	79	30	30
19	57	60	55	50	30	*2,000	152	115	41	63	33	30
20	59	60	*55	40	30	*4,500	173	114	36	57	42	30
21	59	65	60	40	30	*4,000	167	114	*35	53	42	29
22	59	65	60	40	30	*2,800	162	112	31	46	39	29
23	59	65	60	40	30	*1,400	160	112	32	42	38	28
24	57	60	65	45	30	800	158	109	32	40	37	28
25	59	60	65	45	30	*700	158	112	33	39	39	29
26	59	65	65	45	30	1,100	158	102	56	40	38	29
27	60	65	70	50	30	1,200	154	92	62	38	40	*28
28	61	60	75	50	30	745	144	103	61	40	*47	28
29	60	60	*75	50	*30	331	146	110	58	46	63	29
30	60	*65	65	40	------	*274	154	*116	565	52	52	30
31	*60	------	70	40	------	269	------	110	------	*50	55	------
Total	1,746	1,793	1,900	1,745	900	22,444	6,252	4,043	2,573	2,584	1,503	1,061
Mean	56.3	59.8	61.3	56.3	31.0	724	208	130	85.8	83.4	48.5	35.4
Ac-ft	3,460	3,560	3,770	3,460	1,790	44,520	12,400	8,020	5,100	5,130	2,980	2,100

Calendar year 1955:	Max 850	Min 7	Mean 65.6	Ac-ft 47,490
Water year 1955-56:	Max 4,500	Min 20	Mean 133	Ac-ft 96,290

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 7 to Mar. 27.

Sweetbriar Creek near Judson, N. Dak.

Location.--Lat 46°51', long 101°15', in SW¼ sec. 14, T. 139 N., R. 84 W., on right bank 80 ft downstream from bridge on U. S. Highway 10, 2 miles northeast of Judson, and 16 miles upstream from mouth.

Drainage area.--157 sq mi.

Records available.--July 1951 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 1,886 ft (by barometer). Prior to July 20, 1955, wire-weight gage 80 ft upstream at same datum.

Average discharge.--5 years, 14.2 cfs (10,280 acre-ft).

Extremes.--Maximum discharge during year, about 1,300 cfs Mar. 21 (gage height, 8.10 ft, affected by ice); no flow at times during winter; minimum gage height, 2.06 ft Aug. 10.

1951-56: Maximum discharge, 3,400 cfs (revised) June 2, 1955 (gage height, 11.11 ft, at present site); no flow at times.

Maximum stage known, 12.5 ft Apr. 17, 1950, from floodmarks at present site (discharge, 5,910 cfs, from rating curve extended above 2,000 cfs on basis of contracted-opening determination of peak flow).

Revisions.--The maximum discharge for the water year 1955 has been revised to 3,400 cfs June 2, 1955 (gage height, 11.11 ft, at present site), superseding figure published in WSP 1389.

Remarks.--Records fair. No regulation or diversion.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.1	0.6	0.7	0.6	0	0	34	3.8	1.9	24	1.3	1.5
2	.1	.2	.8	.7	0	*.1	43	3.8	1.9	25	*1.1	1.7
3	.2	.4	.7	.7	0	.7	57	*3.8	3.4	18	1.0	1.8
4	.3	.5	.7	.7	0	.9	54	3.4	4.4	49	.9	2.0
5	.4	.5	.7	.7	.1	.8	55	3.4	3.8	*35	.7	2.0
6	.3	.3	.6	.7	.4	.7	*51	3.4	5.6	16	.6	1.9
7	.3	.4	.7	.6	.3	.5	44	3.4	5.0	9.5	.5	1.6
8	.3	.4	.7	.6	**.2	.5	44	3.2	7.7	6.9	.4	1.4
9	.3	.6	.7	.6	.3	.6	33	3.2	10	5.6	.2	1.3
10	.3	*.6	.7	.6	.3	.7	27	4.0	5.3	8.5	.2	1.1
11	.4	.6	.7	*.6	.4	.7	28	5.3	3.4	16	.3	*1.2
12	*.5	.6	.7	.6	.2	*.5	*25	*4.7	2.2	14	.7	1.1
13	.6	.6	.8	.6	*.2	.5	25	3.8	1.6	7.3	.4	1.1
14	.6	.7	.7	.6	.1	.6	22	3.4	1.1	7.3	.5	1.1
15	.6	.8	.7	.5	0	.6	18	3.2	.8	6.5	.5	1.0
16	.6	*.8	.8	.4	0	*2	14	2.8	.9	4.7	.4	1.1
17	.4	.7	.7	.4	0	*25	12	2.6	1.2	3.2	.2	.9
18	.1	.6	.8	.4	0	50	10	2.4	.8	2.1	.2	.8
19	.1	.6	.7	.3	0	*250	9.0	2.0	.9	1.8	.2	.7
20	.2	.7	*.6	.2	0	840	6.9	1.8	.7	1.4	.1	.5
21	.2	.7	.6	.2	0	*1,020	6.5	1.7	*.7	1.2	.1	.3
22	.2	.7	.7	.1	0	*400	5.9	1.7	163	1.2	.1	.4
23	.2	.7	.7	.1	0	*160	5.3	1.5	97	1.1	.1	.2
24	.3	.7	.7	.1	0	110	*5.0	1.9	43	.9	.1	.3
25	.3	.7	.8	.1	0	*250	4.7	2.0	23	.9	.2	*.2
26	.3	.7	.8	.1	0	400	4.2	1.8	14	.8	.4	.1
27	.4	.7	.8	.1	0	250	4.0	1.9	8.5	.8	.5	.1
28	.5	.6	.8	.1	0	110	3.8	2.8	5.6	1.1	.7	.1
29	.5	.7	.7	.1	0	*40	3.8	*2.8	4.4	1.2	.7	.2
30	.5	*.7	.7	0	------	38	3.6	2.8	30	1.5	*.9	.2
31	.6	------	.7	0	------	33	------	2.2	------	1.3	1.2	------
Total	10.7	18.1	22.2	12.1	2.5	3,986.4	658.7	90.5	451.8	273.8	15.4	27.9
Mean	0.35	0.60	0.72	0.39	0.09	129	22.0	2.92	15.1	8.83	0.50	0.93
Ac-ft	21	36	44	24	5.0	7,910	1,310	180	896	543	31	55

Calendar year 1955: Max 840 Min 0 Mean 7.11 Ac-ft 5,150
Water year 1955-56: Max 1,020 Min 0 Mean 15.2 Ac-ft 11,060

Peak discharge (base, 200 cfs).--Mar. 21 about 1,300 cfs; Mar. 26 about 580 cfs; June 22 (5 a.m.) 349 cfs (5.08 ft).

* Discharge measurement made on this day.

** Field estimate made on this day.

Note.--Stage-discharge relation affected by ice Jan. 15 to Mar. 28.

Heart River near Mandan, N. Dak.

Location.--Lat 46°50'01", long 100°58'22", in NW¼NE½ sec. 25, T. 139 N., R. 82 W., on right bank 25 ft downstream from bridge on U. S. Highway 10, 3 miles west of Mandan, and 4 miles downstream from Sweetbriar Creek.

Drainage area.--3,310 sq mi, approximately

Records available.--April to September 1924, March 1928 to June 1933, August 1937 to September 1956. Published as "at Sunny" 1924, 1928-33.

Gage.--Water stage recorder and wire-weight gage read once or twice daily. Datum of gage is 1,638.70 ft above mean sea level, datum of 1929, and 1,632.03 ft above Northern Pacific Railway datum. Apr. 6 to Sept. 30, 1924, staff gage on old highway bridge, close to present site, at datum 2.79 ft lower. Mar. 26, 1929, to Mar. 27, 1943, chain or wire-weight gages on old highway bridge at present datum. Apr. 9, 1943, to Mar. 16, 1948, wire-weight gage on Northern Pacific Railway bridge 300 ft upstream at same datum. Mar. 17 to Sept. 12, 1948, wire-weight gage on present highway bridge, at same datum.

Average discharge.--23 years (1928-32, 1937-56), 276 cfs (199,800 acre-ft per year).

Extremes.--Maximum discharge during year, about 12,000 cfs Mar. 21 (ice jam moved); maximum gage height, 21.6 ft Mar. 22 (affected by ice); minimum daily discharge, 17 cfs Feb. 28, 29, Mar. 1; minimum gage height, 3.64 ft Sept. 23.

1924, 1928-33, 1937-56: Maximum discharge, about 30,500 cfs Apr. 19, 1950 (gage height, 23.64 ft); maximum gage height, 25.75 ft Apr. 4, 1952 (ice jam); no flow for many days.

Remarks.--Records good except those for period of ice effect, which are fair. Flow regulated by Heart Butte Reservoir (see p. 261). Some diversions above station.

Revisions (water years).--WSP 926: 1938. WSP 1209: Drainage area. WSP 1239: 1924, 1928-29, 1948.

Rating tables, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 18		Mar. 19 to Sept. 30			
4.1	26	3.6	29	7.0	862
4.5	77	4.0	66	8.0	1,390
5.0	160	4.5	125	9.0	2,200
		5.0	218	11.0	4,510
		6.0	493	13.0	7,290

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	28	58	53	45	*31	17	500	184	125	467	59	67
2	42	54	53	45	30	18	*470	188	116	536	*56	60
3	50	49	53	44	30	20	480	*188	113	295	55	63
4	51	51	53	44	30	20	520	184	108	223	57	59
5	49	55	53	43	29	20	490	176	*107	*234	53	58
6	40	62	53	43	29	20	500	178	117	232	70	57
7	30	60	53	42	29	20	470	176	116	194	76	57
8	28	64	*53	42	*29	20	440	172	116	163	61	54
9	33	*66	53	41	30	20	412	166	107	131	54	51
10	37	74	53	41	30	20	400	176	104	117	52	46
11	45	71	52	40	30	20	394	200	99	107	51	*43
12	*54	63	52	*40	30	*20	*380	*200	93	108	62	40
13	55	50	52	39	30	20	365	188	87	104	54	42
14	54	40	52	39	29	22	343	174	88	111	57	46
15	54	40	52	38	28	25	332	161	86	116	66	43
16	54	40	52	38	26	30	308	157	88	102	75	39
17	54	40	52	37	24	**160	265	147	88	93	60	38
18	55	42	50	37	22	200	241	132	87	90	50	38
19	55	44	*46	36	20	500	220	126	80	100	45	37
20	55	50	45	36	18	*2,300	207	124	65	90	42	35
21	55	51	45	35	18	**6,200	207	120	*63	78	38	33
22	56	52	45	35	18	*6,100	211	118	62	70	41	33
23	55	52	45	34	18	*3,550	203	117	161	65	44	32
24	54	52	46	34	18	*1,880	*203	*120	113	59	42	32
25	55	52	46	33	18	*1,550	194	118	84	54	44	*32
26	56	52	46	33	18	*2,000	194	117	69	51	43	32
27	60	52	47	32	18	1,600	192	117	61	50	45	32
28	59	52	47	32	17	1,400	190	120	65	53	51	32
29	59	*52	*47	32	*17	1,300	186	122	74	55	51	32
30	56	52	46	31	------	*1,000	168	124	*550	55	*53	33
31	*58	------	46	31	------	720	------	122	------	59	69	------
Total	1,546	1,592	1,541	1,172	714	30,792	9,685	4,712	3,292	4,262	1,676	1,296
Mean	49.9	53.1	49.7	37.8	24.6	993	323	152	110	137	54.1	43.2
Ac-ft	3,070	3,160	3,060	2,320	1,420	61,080	19,210	9,350	6,530	8,450	3,320	2,570

Calendar year 1955: Max 1,250 Min 4 Mean 76.6 Ac-ft 55,450
Water year 1955-56: Max 6,200 Min 17 Mean 170 Ac-ft 123,500

* Discharge measurement made on this day.
** Field estimate made on this day.
Note.--Stage-discharge relation affected by ice Nov. 13 to Apr. 8.

Apple Creek near Menoken, N. Dak.

Location.--Lat 46°47'40", long 100°39'25", in NW¼NE¼ sec. 9, T. 138 N., R. 79 W., on left bank 75 ft downstream from bridge on former U. S. Highway 10, 4 miles upstream from Hay Creek, 6.3 miles west of Menoken, and 6.4 miles east of Bismarck.

Drainage area.--1,680 sq mi, approximately, of which about 500 sq mi is probably noncontributing.

Records available.--March to June 1905, October 1945 to September 1956. Published as "near Bismarck" 1905.

Gage.--Water-stage recorder. Datum of gage is 1,638.61 ft above mean sea level, datum of 1929. Mar. 1 to June 21, 1905, at site 2 miles upstream at different datum. October 1945, to Mar. 31, 1950, staff gage and Apr. 1, 1950, to Sept. 30, 1953, wire-weight gage, at site 75 ft upstream at present datum.

Average discharge.--11 years, 62.3 cfs (45,100 acre-ft per year); median of yearly mean discharges, 37 cfs (26,800 acre-ft per year).

Extremes.--Maximum discharge during year, 665 cfs Apr. 8 (gage height, 10.82 ft); minimum, 0.2 cfs many days; minimum gage height, 0.55 ft Oct. 10-12.

1945-56: Maximum discharge, 6,750 cfs Apr. 18, 1950 (gage height, 17.07 ft); no flow Aug. 25 to Sept. 17, 1946.

Remarks.--Records good except those for periods of ice effect, which are fair.

Revisions.--WSP 1209: Drainage area.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 11-17)

0.5	0	2.5	34
.6	.3	3.0	50
.7	8	4.0	94
.8	1.6	5.0	148
.9	2.6	7.0	288
1.0	3.9	9.0	475
1.5	12	11.0	685
2.0	22		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.4	1.0	1.5	0.8	0.2	0.2	240	44	40	33	12	5.0
2	1.4	.8	1.5	.8	.2	.2	240	43	41	32	11	5.4
3	1.2	.9	1.5	.8	.2	.2	*210	41	37	37	11	5.4
4	1.1	.9	1.5	.8	.2	.2	220	39	32	120	11	5.1
5	.6	.8	1.5	.8	.2	.2	250	*38	32	84	8.9	5.0
6	.4	.8	1.0	.5	.2	**.2	415	37	116	55	8.3	*4.6
7	.2	1.0	1.0	.5	.2	.2	*569	36	180	49	*7.3	4.0
8	.2	1.3	1.0	.5	.2	.2	646	34	204	56	6.8	4.2
9	.2	*1.2	1.0	.5	.2	.2	*611	34	110	59	6.8	4.4
10	.2	1.2	1.0	.5	.2	.2	547	34	76	*66	7.8	4.0
11	.2	1.0	1.0	.5	.2	.2	*512	36	61	65	7.6	3.8
12	.2	1.0	1.0	.5	.2	.2	498	*33	50	52	10	3.4
13	*.3	1.0	*1.0	*.5	*.2	.2	447	39	40	45	9.8	3.2
14	.6	1.0	.8	.5	.2	.2	329	42	35	42	8.9	3.1
15	.7	1.0	.8	.5	.2	.2	240	41	32	37	6.8	3.0
16	.7	1.0	.8	.2	.4	**.5	194	36	30	33	5.2	2.7
17	.6	1.0	.8	.2	.4	3	160	32	29	30	4.2	2.5
18	.7	1.0	.8	.2	.4	8	129	28	28	28	3.6	2.3
19	.7	1.0	.6	.2	.4	10	*110	26	*28	26	3.2	2.1
20	.9	1.0	.6	.2	.4	*20	99	24	29	25	3.0	1.9
21	1.0	1.5	.8	.2	.4	120	90	*22	28	24	2.6	1.7
22	1.1	1.5	.8	.2	**.4	*130	80	20	28	22	2.2	1.5
23	1.0	1.5	1.0	.2	.4	80	71	19	27	23	1.8	1.4
24	1.0	1.5	1.0	.2	.4	*60	*66	20	28	15	1.6	1.4
25	.9	1.5	1.0	.2	.4	*100	64	19	42	14	1.4	*1.4
26	.9	1.5	1.0	.2	.4	*290	59	18	50	16	1.4	1.4
27	1.0	1.5	1.0	.2	.2	350	54	18	41	15	1.4	1.4
28	1.0	1.5	1.0	.2	.2	*350	50	22	34	14	1.3	1.2
29	1.0	1.5	.8	.2	.2	430	47	24	31	14	1.3	1.1
30	1.1	*1.5	.8	.2	------	420	44	29	34	14	1.5	1.4
31	1.1	------	.8	.2	------	*310	------	37	------	13	3.4	------
Total	23.6	34.9	30.7	12.2	8.0	2,684.5	7,291	965	1,573	1,158	173.1	89.0
Mean	0.76	1.16	0.99	0.39	0.28	86.6	243	31.1	52.4	37.4	5.58	2.97
Ac-ft	47	69	61	24	16	5,320	14,460	1,910	3,120	2,300	343	177

Calendar year 1955: Max 200 Min 0.2 Mean 10.8 Ac-ft 7,790
Water year 1955-56: Max 646 Min 0.2 Mean 38.4 Ac-ft 27,850

Peak discharge (base, 200 cfs).--Mar. 30 (9 a.m.) 440 cfs (10.6 ft); Apr. 8 (9 a.m.) 665 cfs (10.82 ft); June 7 (11 p.m.) 260 cfs (6.67 ft).

* Discharge measurement made on this day.

** Field estimate made on this day.

Note.--Stage-discharge relation affected by ice Nov. 1, 2, 5-7, Nov. 11 to Apr. 6.

Cannonball River at Regent, N. Dak.

Location.--Lat 46°26', long 102°33', in NE¼NE¼ sec. 13, T. 134 N., R. 95 W., on right bank 400 ft upstream from bridge on county highway and 0.3 mile north of Regent.

Drainage area.--580 sq mi, approximately.

Records available.--September 1950 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 2,422.90 ft above mean sea level, datum of 1929.

Average discharge.--6 years, 33.5 cfs (24,250 acre-ft per year).

Extremes.--Maximum discharge during year, 453 cfs Aug. 28 (gage height, 5.93 ft); maximum gage height observed, 7.85 ft Mar. 20 (backwater from ice); minimum discharge, 0.1 cfs June 25 (gage height, 1.87 ft).

1950-56: Maximum discharge, 5,420 cfs Apr. 7, 1952 (gage height, 15.77 ft); no flow at times.

Maximum stage known, 26.1 ft Apr. 16, 1950, from floodmarks discharge, 20,300 cfs, on basis of slope-area determination at site 4 miles downstream).

Remarks.--Records good except those for period of ice effect, which are poor.

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 8 to May 7)

1.9	0.4	3.0	49
2.0	2.0	3.5	84
2.1	4.4	4.0	131
2.2	7.6	5.0	268
2.5	21	6.0	468

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.4	2.2	1.5	1.2		20	60	6.9	6.9	99	17	14
2	2.2	2.4	1.5	1.4		*30	55	6.9	5.3	61	10	9.5
3	2.2	2	1.5	1.4		100	50	6.6	4.4	78	8.0	7.3
4	2.2	2	1.5	1.4		250	42	6.2	3.8	131	182	5.9
5	2.0	2	1.5	1.4	0.3	*220	37	5.9	3.8	94	57	5.0
6	1.8	2	1.5	1.4		220	34	5.6	4.7	*69	*26	4.4
7	1.6	2	1.5	1.4		210	30	5.3	4.7	82	15	3.6
8	1.4	2	1.5	1.8		200	28	5.0	4.4	58	9.1	3.3
9	1.4	2	1.5	2.0		180	25	4.7	3.8	46	6.2	2.4
10	1.4	2	1.5	2.0		140	23	5.3	3.3	34	5.3	2.4
11	1.6	2	1.5	2.5		80	19	5.0	3.3	25	4.7	2.2
12	1.6	2	1.5	3.0		60	17	5.0	3.0	20	4.1	2.2
13	1.4	2	1.5	3.0		40	15	4.7	2.8	15	3.3	2.2
14	1.4	2	1.5	3.5	(*)	*12	14	4.7	2.6	12	2.6	2.0
15	1.4	2	1.5	4.0		8	12	4.7	5.0	9.1	2.2	2.0
16	1.8	2	1.5	4.0		10	11	4.1	3.3	6.9	2.0	1.8
17	1.8	2.5	1.5	4.0		20	10	4.1	2.8	5.9	2.0	1.6
18	1.8	2.5	1.5	3.0	.4	140	9.9	4.1	2.4	5.0	2.2	1.4
19	1.6	2.5	1.4	2.0		210	9.1	3.8	2.2	4.7	2.2	1.4
20	1.8	2	1.4	1.0		360	8.7	3.8	2.2	3.8	2.2	*1.4
21	*1.8	2	1.2	.8		*270	8.0	3.8	1.8	3.6	*1.8	1.4
22	2.0	2	1.2	.6		160	7.3	3.6	1.8	3.3	1.6	1.4
23	2.0	2.5	1.2	.5		100	7.3	*3.3	1.4	2.6	1.4	1.2
24	1.8	3	1.0	.4		*60	*6.9	3.6	1.1	2.6	1.2	1.4
25	2.0	3	1.1	(*)		60	6.9	3.0	*1.1	*2.6	1.1	1.4
26	2.0	2	1.1			60	6.9	3.0	3.0	2.8	1.2	1.4
27	2.4	2	1.1			45	6.9	3.0	3.3	3.0	9.5	1.4
28	2.4	*1.5	*1.1	.3	1	40	6.9	11	2.2	4.4	273	1.2
29	2.4	1.5	1.1		5	50	6.6	14	1.6	5.0	83	1.4
30	2.4	1.5	1.1		------	*50	6.2	12	9.1	33	35	1.6
31	2.6	------	1.2		------	55	------	9.1	------	30	32	------
Total	58.6	63.1	42.2	49.8	16.0	3,460	579.6	171.8	101.1	952.3	803.9	89.8
Mean	1.89	2.10	1.36	1.61	0.55	112	19.3	5.54	3.37	30.7	25.9	2.99
Ac-ft	116	125	84	99	32	6,860	1,150	341	201	1,890	1,590	178

Calendar year 1955:	Max 828	Min	0.4	Mean	11.9	Ac-ft	8,650
Water year 1955-56:	Max 360	Min	-	Mean	17.5	Ac-ft	12,670

Peak discharge (base, 400 cfs).--Aug. 28 (8 a.m.) 453 cfs (5.93 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 2 to Apr. 7 (no gage-height record Nov. 14-18, Jan. 17 to Mar. 3, Apr. 1-7; discharge estimated on basis of 3 discharge measurements, weather records, and records for nearby stations).

Cannonball River below Bentley, N. Dak.

Location.--Lat 46°21'30", long 102°02'30", in SW¼SW¼ sec. 6, T. 133 N., R. 90 W., on left bank a quarter of a mile downstream from Thirty Mile Creek and 2 miles northeast of Bentley.

Drainage area.--1,140 sq mi, approximately.

Records available.--April 1943 to September 1956. Published as "near New Leipzig" April 1943 to June 1952. Records published for both sites October 1951 to June 1952.

Gage.--Water-stage recorder at present site and datum since Oct. 1, 1951. Altitude of gage is 2,250 ft (by barometer). Prior to Nov. 7, 1947, wire-weight gage and Nov. 7, 1947, to June 16, 1952, water-stage recorder, at site 8 miles downstream at different datum.

Average discharge.--13 years, 102 cfs (73,840 acre-ft per year); median of annual mean discharges, 76 cfs (55,000 acre-ft per year).

Extremes.--Maximum discharge during year, about 1,400 cfs Mar. 20 (gage height, 12.29 ft, backwater from ice); minimum daily, 0.8 cfs Feb. 4-8; minimum gage height, 1.53 ft Aug. 25.

1943-56: Maximum discharge, 51,800 cfs Apr. 17, 1950 (gage height, 34.0 ft, from floodmark in well, site and datum then in use), from rating curve extended above 12,000 cfs on basis of slope-area determination at gage height 26.9 ft and slope-area and contracted-opening determinations at gage height 34.0 ft; no flow at times.

Maximum stage known since at least 1889, that of Apr. 17, 1950. Flood of Mar. 25 or 26, 1943, reached a stage of 26.9 ft, site and datum then in use (discharge, 15,000 cfs by slope-area determination).

Remarks.--Records fair except those for period of ice effect, which are poor. Some diversions and some storage in small lakes above station.

Revisions.--WSP 1116: Drainage area.

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 5 to Nov. 4, Apr. 6-15, June 1-30, July 5-9, Aug. 6, 7, 29-31, Sept. 9-30)

1.3	1.7	2.2	48
1.4	2.9	2.5	74
1.6	6.7	3.0	109
1.8	14	4.0	194
2.0	26	5.0	328

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	10	2.3	2.5	4.5	1.5	4.5	50	15	17	9.7	74	48
2	8.8	2.1	3.5	4.5	1.2	*3	80	16	15	9.7	103	28
3	8.8	2.1	3.5	4.5	1.0	5	80	15	12	28	67	20
4	8.8	2.2	3	4.5	.8	100	65	15	10	79	45	17
5	7.6	3	3	4.5	.8	*360	65	15	8.8	78	58	18
6	7.6	4	2.5	4.5	.8	550	81	14	8.8	*147	179	15
7	7.6	5.5	2.5	4.5	.8	360	61	14	7.9	131	90	12
8	6.5	4	2.5	4	.8	320	34	13	7.3	128	40	11
9	5.9	6	2.5	4	1.0	280	29	13	6.1	119	24	9.1
10	5.9	5.5	2.5	4	1.5	280	29	13	5.6	84	61	7.3
11	5.2	2	2.5	4	2	220	26	11	5.0	66	78	6.1
12	4.4	2.5	2.5	4	2	180	26	10	4.8	59	32	5.0
13	4.4	2.5	2	3	2	160	23	9.7	5.4	39	17	4.6
14	4.3	2	2	3	*2	**120	23	9.7	5.4	29	13	4.6
15	4.3	2	1.5	5	2.5	100	21	9.4	6.3	24	11	4.1
16	3.8	2	1.5	6	3	120	22	8.2	6.7	19	9.4	3.6
17	3.4	2	1.5	5	3	400	20	7.9	7.0	16	8.5	3.2
18	3.1	3	1.5	3	3.5	620	20	7.9	5.9	14	8.5	2.9
19	2.5	3	1.5	2.5	3.5	850	20	7.6	5.0	13	7.9	3.2
20	2.5	3.5	1.5	2.5	4	*1,250	18	7.6	5.0	11	7.6	*3.8
21	*2.5	4	2	2.5	6	1,200	18	7.0	4.6	10	*7.0	3.6
22	2.4	4	2	2	8	*900	18	7.0	4.3	8.8	6.7	3.6
23	2.3	3.5	2.5	1.5	10	600	18	*7.0	4.1	*8.5	6.5	3.8
24	2.2	3	3	*1.5	8	350	*17	6.7	4.3	7.9	6.1	3.9
25	2.3	3	3.5	1.5	6	200	16	6.7	*4.3	7.3	5.4	4.1
26	2.3	3	4	1.5	5	150	16	7.3	4.1	7.6	6.1	4.3
27	2.5	3	4	1.5	5	120	16	7.0	4.1	8.8	6.7	4.6
28	2.5	*2	*4.5	1.5	6	150	15	10	4.3	10	8.5	4.3
29	2.5	2	5.5	1.5	5	140	15	18	4.3	10	17	4.8
30	2.5	2	5	1.5	------	*130	15	25	8.8	30	201	5.0
31	2.5	------	4.5	1.5	------	80	------	20	------	40	100	------
Total	141.9	90.7	86.5	99.5	96.7	10,302.5	957	353.7	202.2	1,252.3	1,304.9	268.5
Mean	4.58	3.02	2.79	3.21	3.33	332	31.9	11.4	6.74	40.4	42.1	8.95
Ac-ft	281	180	172	197	192	20,430	1,900	702	401	2,480	2,590	533

Calendar year 1955:	Max	805	Min	2	Mean	21.0	Ac-ft	15,200
Water year 1955-56:	Max	1,250	Min	0.8	Mean	41.4	Ac-ft	30,060

Peak discharge (base, 500 cfs).--Mar. 6 (10 p.m.) about 900 cfs; Mar. 20 (10 p.m.) about 1,400 cfs.
* Discharge measurement made on this day.
**Field estimate made on this day.
Note.--Stage-discharge relation affected by ice Nov. 5 to Apr. 5.

Cedar Creek near Haynes, N. Dak.

Location.--Lat 46°09', long 102°26', in W½ sec. 20, T. 131 N., R. 94 W., on left bank 30 ft downstream from bridge on State Highway 8 and 12½ miles north of Haynes.

Drainage area.--553 sq mi.

Records available.--October 1950 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 2,470 ft (by barometer). Prior to May 20, 1951, wire-weight gage on former bridge, 400 ft upstream at same datum.

Average discharge.--6 years, 30.2 cfs (21,860 acre-ft per year).

Extremes.--Maximum discharge during year, 350 cfs Mar. 18 (gage height, 9.60 ft, backwater from ice); minimum, 0.1 cfs June 13, 24, 25, 28, 29; minimum gage height, 2.71 ft June 25.

1950-56: Maximum discharge, 7,870 cfs Apr. 7, 1952 (gage height, 21.25 ft); minimum, 0.1 cfs in some years; minimum gage height, 2.38 ft Aug. 8, 1951.

Flood of Apr. 17, 1950, reached stage of about 23 ft (discharge 26,900 cfs, by slope-area determination at site 9 miles upstream).

Remarks.--Records good except those for periods of ice effect, which are fair.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Dec. 14-21, Mar. 26 to Apr. 9, Aug. 1, 5-10, Aug. 29 to Sept. 4)

2.7	0.1	4.5	34
2.8	.4	5.0	54
2.9	1.1	6.0	112
3.0	2.4	7.0	192
3.2	5.3	8.0	292
3.5	10		
4.0	20		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.3	1.8	2.4	1.9	0.5	9	32	4.0	2.5	0.2	9.7	20
2	1.9	1.4	2.4	2.5	.5	10	23	4.4	2.1	.3	9.2	14
3	1.6	1.5	2.5	2.7	.5	*30	17	4.4	1.9	1.6	5.8	9.9
4	1.2	1.5	2.5	2.3	.5	80	19	4.2	1.6	2.1	5.3	8.2
5	1.2	1.6	2.4	2.4	.8	*100	16	4.1	1.4	2.7	166	7.1
6	1.6	2.1	2.1	3.0	1.0	105	14	4.0	2.0	4.4	*143	5.8
7	1.2	1.4	2.1	1.5	1.0	95	11	3.8	1.9	14	221	4.7
8	1.0	1.4	2.0	1.4	1.0	70	11	3.8	1.2	13	182	4.6
9	.9	1.6	1.9	2.3	1.0	70	10	3.5	1.1	8.1	88	4.2
10	.8	1.5	1.8	3.0	1.2	75	9.4	3.4	.9	6.0	49	4.2
11	.8	1.4	1.8	1.9	2.0	65	9.1	4.0	.6	5.3	33	4.0
12	.7	1.8	1.6	2.7	2.5	45	8.4	3.8	.3	4.7	23	3.4
13	.7	1.5	1.5	3.2	3.0	30	7.3	3.7	.3	4.0	17	3.0
14	.6	2.3	1.2	3.4	*1.2	*18	6.6	4.0	.3	10	14	2.5
15	.6	3.0	1.0	2.1	.8	10	6.0	3.5	.4	7.8	11	2.4
16	.7	3.4	1.1	2.3	1.0	20	5.6	3.5	.4	5.8	8.7	2.4
17	.7	3.8	1.1	1.8	.8	120	5.2	3.1	.5	4.6	7.6	2.0
18	.7	2.7	1.0	1.6	1.0	300	4.8	2.5	.5	3.5	7.1	1.6
19	.8	2.1	.8	1.4	1.8	310	4.7	2.3	.5	3.0	6.4	1.1
20	.8	2.0	.6	1.2	3.0	*290	4.4	2.3	.5	2.7	5.6	*1.2
21	*.9	2.1	.6	1.0	3.5	300	4.0	2.5	.4	2.5	*4.8	.9
22	1.0	*2.4	.8	.8	5.5	270	3.8	2.0	.2	2.0	4.1	.8
23	1.0	2.8	*1.2	.6	7.0	220	3.7	*1.5	.2	1.6	3.8	.8
24	1.0	2.8	1.5	*.5	6.5	*190	*3.4	1.4	.1	*1.2	2.3	.7
25	1.0	2.8	1.2	.5	4.0	155	3.4	1.2	*.1	1.0	2.3	.8
26	1.0	2.0	1.2	.5	2.5	113	3.5	1.8	.2	.9	2.4	.8
27	1.1	1.2	1.6	.5	8.0	87	3.4	1.8	.2	1.8	2.1	.7
28	1.1	1.2	2.1	.5	8.5	51	3.5	2.4	.1	2.1	3.1	.6
29	1.2	1.2	1.6	.5	8.5	52	3.5	3.2	.1	2.1	86	.8
30	1.1	1.8	1.4	.5	------	68	3.5	2.7	.5	2.4	53	.8
31	1.4	------	1.5	.5	------	*48	------	2.4	------	1.9	*30	------
Total	32.6	60.1	48.5	51.0	79.1	3,406	260.2	95.2	23.0	123.3	1,206.3	114.0
Mean	1.05	2.00	1.56	1.65	2.73	110	8.67	3.07	0.77	3.98	38.9	3.80
Ac-ft	65	119	96	101	157	6,760	516	189	46	245	2,390	226

Calendar year 1955: Max 284 Min 0.1 Mean 4.59 Ac-ft 3,320
Water year 1955-56: Max 310 Min 0.1 Mean 15.0 Ac-ft 10,910

Peak discharge (base, 400 cfs).--No peak above base.

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 26 to Dec. 3, Jan. 17 to Mar. 23.

Cedar Creek near Pretty Rock, N. Dak.

Location.--Lat 46°02', long 101°49', in S½ sec. 33, T. 130 N., R. 89 W., on left bank on downstream side of highway bridge 7 miles north of Keldron, S. Dak., 10½ miles south of abandoned town site of Pretty Rock, and 15 miles downstream from Timber Creek.

Drainage area.--1,340 sq mi, approximately.

Records available.--April 1943 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 2,155.17 ft above mean sea level (levels by Corps of Engineers). Prior to Oct. 17, 1947, wire-weight gage at same site and datum.

Average discharge.--13 years, 95.2 cfs (68,920 acre-ft per year); median of yearly mean discharges, 72 cfs (52,100 acre-ft per year).

Extremes.--Maximum discharge during year, 1,400 cfs Mar. 20 (gage height, 10.79 ft, backwater from ice); minimum, 0.2 cfs June 28, 29; minimum gage height, 2.71 ft June 29.

1943-56: Maximum discharge, 48,000 cfs Apr. 17, 1950 (gage height, 26.5 ft, from floodmark in gage house), from rating curve extended above 7,800 cfs on basis of slope-area determination of peak flow; no flow at times.

Maximum stage known, that of Apr. 17, 1950. Flood of Mar. 24, 1943, reached a stage of 21.8 ft, from floodmarks (discharge, 14,300 cfs).

Remarks.--Records good except those for period of ice effect, which are poor.

Revisions (water years).--WSP 1146: 1944, 1947. WSP 1209: Drainage area. WSP 1389: 1951.

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Mar. 4)

2.7	0.1	3.2	26
2.8	.8	3.6	78
2.9	3.0	4.0	146
3.0	8.0	4.5	251

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.6	1.4	1.1	1.4	0.8	1.9	102	12	13	0.3	8.0	5.1
2	.5	1.0	1.6	1.6	.7	2.2	86	13	11	3.0	6.8	6.3
3	.5	1.1	1.9	1.9	.7	*2.2	72	13	8.7	5.1	5.7	38
4	2.2	1.3	2.2	1.9	.7	3.4	56	13	6.8	3.4	5.7	28
5	3.0	1.4	2.2	1.9	.7	15	55	13	6.3	1.9	5.1	23
6	3.8	1.4	2.2	2.2	.7	50	49	13	5.7	2.7	3.8	19
7	3.8	1.6	2.2	1.6	.7	**150	43	12	4.7	3.4	*3.0	15
8	3.8	1.4	2.4	1.6	.7	250	39	12	4.3	2.7	2.7	12
9	3.4	1.4	2.2	1.6	.8	230	37	12	3.8	2.2	97	9.4
10	3.8	1.4	2.2	1.6	1.0	260	35	12	3.0	2.2	169	6.8
11	3.4	1.4	2.2	1.6	1.3	230	31	14	3.4	1.9	133	5.7
12	2.4	1.6	2.2	1.6	1.3	120	28	14	2.7	1.4	92	4.7
13	1.6	1.6	2.4	1.6	1.3	180	28	14	2.2	1.3	68	4.3
14	1.4	2.4	1.9	1.9	1.3	**100	27	14	1.6	1.3	50	3.4
15	1.4	2.7	1.3	1.6	1.1	**100	25	13	1.6	12	39	3.0
16	1.4	3.0	1.4	1.4	1.1	80	23	13	1.6	9.4	32	2.4
17	1.4	2.7	1.3	1.4	*1.1	400	22	11	1.4	8.7	26	2.2
18	1.1	2.7	1.3	1.3	1.1	900	19	10	1.1	*6.3	23	1.6
19	1.3	3.0	.8	1.1	1.1	1,200	17	9.4	1.1	5.1	19	1.4
20	*1.1	3.0	.6	1.1	1.1	1,350	17	9.4	.7	4.3	16	1.3
21	1.1	3.4	.5	1.0	1.1	*1,150	17	8.0	.7	3.4	13	1.0
22	1.3	2.7	.7	.8	1.0	1,000	15	7.4	.6	5.7	12	1.0
23	1.1	2.7	*.8	.7	1.0	*670	14	*6.8	.4	5.7	8.7	1.1
24	1.0	3.0	1.1	.8	1.3	500	14	6.8	.5	4.7	6.8	1.1
25	1.1	2.7	1.4	*.8	1.3	340	15	5.7	*.6	3.4	5.7	1.0
26	1.3	*2.7	1.3	.8	1.3	270	*12	5.1	.4	3.0	5.1	*1.0
27	1.1	1.9	1.4	.8	1.3	200	12	5.7	.3	5.1	5.1	1.3
28	1.1	1.0	1.9	1.0	1.1	170	11	8.0	.2	7.4	6.8	1.4
29	1.1	1.1	1.4	1.0	1.3	109	10	11	.2	10	5.7	1.6
30	1.4	1.1	1.3	1.0	------	*91	11	17	.3	13	4.3	1.9
31	1.4	------	1.3	1.0	------	114	------	13	------	11	*5.7	------
Total	54.9	59.8	48.7	41.6	30.0	10,238.7	942	341.3	88.9	151.0	883.7	205.0
Mean	1.77	1.99	1.57	1.34	1.03	330	31.4	11.0	2.96	4.87	28.5	6.83
Ac-ft	109	119	97	82	60	20,310	1,870	677	176	300	1,750	407

Calendar year 1955: Max 142 Min 0 Mean 9.63 Ac-ft 6,980
Water year 1955-56: Max 1,350 Min 0.2 Mean 35.8 Ac-ft 25,960

Peak discharge (base, 500 cfs).--Mar. 20 (time unknown) 1,400 cfs.
* Discharge measurement made on this day.
** Field estimate made on this day.
Note.--Stage-discharge relation affected by ice Mar. 5-28.

Cannonball River at Breien, N. Dak.

Location.--Lat 46°23' long 100°56', in sec. 36, T. 134 N., R. 82 W., on right bank 600 ft upstream from bridge on State Highway 6, 950 ft downstream from Louise Creek, and 0.5 miles south of Breien.

Drainage area.--4,100 sq mi, approximately.

Records available.--August 1934 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 1,676.54 ft above mean sea level, datum of 1929.

Average discharge.--22 years, 273 cfs (197,600 acre-ft per year); median of yearly mean discharges, 210 cfs (152,000 acre-ft per year).

Extremes.--Maximum discharge during year, 9,000 cfs Mar. 21 (gage height, 11.1 ft, affected by ice); no flow Feb. 13 to Mar. 3.

1934-56: Maximum discharge, 94,800 cfs Apr. 19, 1950 (gage height 22.30 ft, from floodmark), from rating curve extended above 16,000 cfs on basis of slope-area and contracted-opening determinations of peak flow; no flow at times.

Remarks.--Records good except those for periods of ice effect, which are fair. Some diversions above station. Some regulation in several small lakes above station.

Revisions (water years).--WSP 786: 1934. WSP 1146: 1943. WSP 1279: 1936-37(M), 1947(M).

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.6	3.2	2.5	480
.7	5.4	3.0	745
.8	12	4.0	1,360
1.0	42	5.0	2,130
1.5	141	6.0	3,070
2.0	283		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	23	6.5	1.0	0.4	0.1	0	600	*77	108	66	40	101
2	19	5.7	.9	.4	.1	0	658	81	83	68	40	73
3	16	4.5	.8	.4	.1	0	*591	85	64	70	35	105
4	13	5.4	.8	.4	.1	.1	458	81	56	61	31	127
5	11	6.1	.8	.4	.1	.1	415	75	*59	54	50	105
6	8.3	5.7	.8	.3	.1	.1	407	73	194	148	130	89
7	7.6	4.5	.7	.3	.1	.1	333	72	332	193	110	80
8	7.6	4.8	.7	.3	.1	.1	308	70	123	325	*105	70
9	7.6	5.7	.6	.3	**.1	.1	258	*87	87	220	85	56
10	7.6	5.7	.6	*.3	.1	.1	239	132	66	178	127	50
11	7.6	4.1	.6	.3	.1	.1	*220	209	56	143	103	45
12	*8.3	3.0	.5	.2	.1	10	209	155	*47	*139	110	40
13	8.3	2.8	.5	.2	0	150	193	108	39	120	143	*39
14	7.6	2.5	.5	.2	0	*380	175	93	32	103	170	36
15	6.5	*2.5	.5	.2	0	*420	165	85	29	85	163	32
16	6.1	2.5	.5	.2	0	520	155	73	26	75	134	28
17	6.1	2.5	.5	.2	*0	*800	146	66	23	70	101	26
18	6.1	2.0	.5	.1	0	1,750	139	59	19	63	85	24
19	5.7	1.5	*.5	.1	0	*3,300	*132	52	16	56	72	23
20	5.7	1.5	.5	*.1	0	*6,500	123	47	12	49	61	19
21	5.7	1.5	.5	.1	0	*8,100	112	44	20	42	52	16
22	5.7	1.5	.5	.1	0	*5,300	105	39	34	36	44	13
23	5.4	1.5	.5	.1	0	3,500	97	36	15	29	*36	11
24	5.4	1.5	.4	.1	0	*2,670	93	*34	10	23	28	11
25	5.4	1.5	.4	.1	0	2,520	*89	31	10	19	29	9.1
26	5.4	1.5	.4	.1	0	*3,050	87	29	8.3	*16	23	8.3
27	5.7	1.4	.4	.1	0	2,540	83	31	6.5	42	22	*8.3
28	6.5	1.4	*.4	.1	*0	1,620	83	57	9.1	73	*22	7.6
29	7.0	*1.2	.4	.1	0	*730	81	194	6.5	64	37	7.6
30	7.0	1.2	.4	**.1	------	650	79	120	*28	54	42	7.6
31	*6.5	------	.4	.1	------	610	------	120	------	*42	66	------
Total	254.4	93.7	17.5	6.4	1.2	45,120.8	6,833	2,515	1,618.4	2,726	2,296	1,267.5
Mean	8.21	3.12	0.56	0.21	0.04	1,456	228	81.1	53.9	87.9	74.1	42.2
Ac-ft	505	186	35	13	2.4	89,500	13,550	4,990	3,210	5,410	4,550	2,510

Calendar year 1955:	Max 690	Min 0.4	Mean 57.8	Ac-ft 41,840
Water year 1955-56:	Max 8,100	Min 0	Mean 171	Ac-ft 124,500

Peak discharge (base, 1,000 cfs).--Mar. 21 (3 p.m.) 9,000 cfs (11.1 ft).

* Discharge measurement or observation of no flow made on this day.

** Field estimate made on this day.

Note.--Stage-discharge relation affected by ice Nov. 12 to Mar. 25, Mar. 28-30 (fragmertary gage-height record Nov. 27 to Mar. 13; discharge estimated on basis of 7 discharge measurements, or observations of no flow, 2 field estimates, existing gage-height record, and weather records).

Beaver Creek at Linton, N. Dak.

Location.--Lat 46°16', long 100°14', on line between secs. 17 and 18, T. 132 N., R. 76 W., near center of span on downstream side of bridge on U. S. Highway 83, 0.7 mile south of railway station in Linton and 1 mile upstream from Spring Creek.

Drainage area.--717 sq mi, of which about 100 sq mi is probably noncontributing.

Records available.--August 1949 to September 1956.

Gage.--Wire-weight gage read once daily. Datum of gage is 1,690.55 ft above mean sea level, datum of 1929.

Average discharge.--7 years, 72.1 cfs (52,170 acre-ft per year).

Extremes.--Maximum discharge during year, 1,520 cfs June 22 (gage height, 13.40 ft); minimum, 0.02 cfs Jan. 15 to Feb. 6; minimum gage height observed, 1.86 ft Mar. 14-15.
1949-56: Maximum discharge, 9,800 cfs Apr. 8, 1952 (gage height, 17.50 ft); no flow Jan. 10-31, 1950.

Remarks.--Records good except those for period of ice effect or no gage-height record, which are fair. Small diversions above station for irrigation.

Revisions (water years).--WSP 1209: Drainage area. WSP 1239: 1950(M).

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 3-9, June 6, 7, 21-27)

2.2	1.4	4.0	65
2.3	2.2	5.0	118
2.5	5.8	7.0	270
2.7	11	9.0	518
3.0	22	11.0	940

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.9	2.7	1	0.2	0.02	0.06	100	29	a30	25	11	12
2	2.9	2.9	1	.1	.02	.06	70	31	28	*22	8.8	8.0
3	2.5	2.7	1	.1	.02	.06	*50	31	28	a25	8.0	12
4	2.9	2.5	1	.1	.02	.06	46	30	*25	a50	8.8	24
5	1.8	2.7	1	.05	.02	.06	70	31	40	a35	8.0	20
6	2.0	2.2	.8	.05	.02	.06	82	32	*748	*28	7.6	*15
7	2.1	*2.0	.8	.04	.03	*.06	92	*30	*501	a35	*7.3	11
8	2.0	2.2	.8	.04	**.03	.06	82	28	387	a50	7.1	9.4
9	2.0	2.5	.8	*.04	.05	.06	*107	29	*144	a60	6.7	8.5
10	*1.7	2.5	.8	.04	.05	.06	158	29	94	a50	6.2	6.0
11	2.2	2.2	.8	.03	.1	.05	144	36	68	*45	5.8	5.4
12	2.0	2.2	.8	.03	.1	.05	145	41	50	a40	5.8	5.0
13	*2.0	2	.8	.03	.1	.05	*133	58	39	a36	4.7	5.2
14	1.7	2	.8	.03	.1	.04	106	a45	32	a33	4.5	4.7
15	1.4	1.5	.8	.03	.1	.04	87	a35	33	a30	4.5	5.2
16	1.6	1.5	*.8	.02	*.1	.1	81	*31	32	28	4.7	3.9
17	1.7	1.5	.8	.02	.08	.1	68	27	28	a24	4.3	3.0
18	1.8	1.5	.8	.02	.08	.5	*60	26	*25	a21	4.1	*3.9
19	1.7	2	.6	*.02	.06	1	55	24	a23	a18	3.9	3.9
20	1.8	2.5	.6	.02	.06	*30	50	22	20	16	3.9	3.9
21	1.8	*3	.6	.02	.06	*110	44	*20	110	a12	*3.6	4.1
22	1.9	2.5	.6	.02	.05	60	43	20	*878	a10	3.0	4.1
23	2.0	2.5	.6	.02	.05	45	*41	18	370	a8.5	2.9	3.9
24	*2.4	2	.6	.02	.05	*65	38	17	288	*7.1	2.9	3.4
25	3.0	2	.6	.02	.05	*110	36	15	a150	5.8	2.7	3.0
26	2.7	2	.5	.02	.05	*160	35	14	66	11	2.5	2.4
27	2.5	1.5	.5	.02	*.05	250	33	14	46	8.0	3.2	2.2
28	2.5	1.5	*.5	.02	.05	290	32	15	40	12	3.0	2.2
29	2.7	1	.4	.02	.05	110	32	14	32	11	3.4	2.7
30	2.9	*1	.4	**.02	------	*55	30	18	29	10	3.4	2.4
31	2.7	------	.3	.02	------	85	------	*24	------	11	4.3	------
Total	67.8	62.8	22.2	1.23	1.62	1,372.53	2,150	834	4,384	777.4	160.6	200.4
Mean	2.19	2.09	0.72	0.040	0.056	44.3	71.7	26.9	146	25.1	5.18	6.68
Ac-ft	134	125	44	2.4	3.2	2,720	4,260	1,650	8,700	1,540	319	397

Calendar year 1955: Max 534 Min 0.3 Mean 34.0 Ac-ft 24,600
Water year 1955-56: Max 878 Min 0.02 Mean 27.4 Ac-ft 19,890

Peak discharge (base, 500 cfs).--June 6 (12 m.) 1,350 cfs (12.70 ft); June 7 (5 p.m.) 740 cfs (10.15 ft); June 22 (6 a.m.) 1,520 cfs (13.40 ft).

* Discharge measurement made on this day.

** Field estimate made on this day.

a No gage-height record; discharge estimated on basis of adjacent record, weather records, and records for Apple Creek near Menoken.

Note.--Stage-discharge relation affected by ice Nov. 13 to Apr. 2.

North Fork Grand River at Haley, N. Dak.

Location.--Lat 45°57', long 103°07', at southwest corner of sec. 30, T. 129 N., R. 99 W., on left bank 10 ft downstream from highway bridge, about 300 ft south of post office at Haley, and 1 mile north of South Dakota State line.

Drainage area.--509 sq mi.

Records available.--May 1908 to December 1910, March 1912 to September 1917 (no winter records), October 1945 to September 1956. May 1908 to October 1920 in House Document 76, 73d Congress, first session.

Gage.--Water-stage recorder. Altitude of gage is 2,664 ft (by barometer). Prior to Mar. 29, 1912, staff gage at site 100 ft upstream at different datum. Mar. 29, 1912, to September 1917 reference mark on highway bridge at same datum as staff gage. Oct. 23, 1945, to June 18, 1951, wire-weight gage on downstream side of bridge near left abutment at present datum.

Average discharge.--11 years (1945-56), 42.7 cfs (30,910 acre-ft per year); median of yearly mean discharges, 22 cfs (15,900 acre-ft per year).

Extremes.--Maximum discharge during year, 60 cfs Aug. 27 (gage height, 5.57 ft); maximum gage height, 6.18 ft Mar. 16 (affected by ice); minimum discharge, 0.1 cfs on many days.

1908-10, 1912-17, 1945-56: Maximum discharge, 14,100 cfs Apr. 7, 1952 (gage height, 17.03 ft), from rating curve extended above 4,500 cfs on basis of discharge measurement at gage height 15.09 ft, half of which was indirect determination of flow over roadway outside of main channel; maximum gage height, 17.10 ft Apr. 15, 1950; no flow at times.

Maximum discharge known, that of Apr. 7, 1952.

Remarks.--Records good except those for periods of ice effect, which are fair.

Revisions (water years).--WSP 1239: 1908-10, 1913-15(M), 1917(M).

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Aug. 8, 27, 28)

4.2	0.1	4.6	8.1
4.3	.9	4.8	18
4.4	2.5	5.0	31
4.5	4.8	5.5	72

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.2	0.3	0.5	0.2	0.1	3	12	1.9	2.0	0.2	1.1	3.6
2	.2	.5	.5	.2	.1	*4	9.4	2.0	2.0	.4	.8	2.5
3	.2	.4	.4	.2	.1	5	7.8	2.0	1.9	1.9	.8	1.9
4	.2	.6	.4	.2	.1	6	7.8	2.0	1.2	1.4	1.1	1.7
5	.2	.7	.4	.2	.1	8	*6.8	1.9	.9	.9	1.1	1.5
6	.3	.4	.4	.2	.1	*15	5.8	1.9	1.1	.7	1.7	1.2
7	.3	.5	.4	.2	.1	8	4.6	2.0	.8	.7	1.2	.9
8	.3	.6	.3	.2	.1	5	3.9	2.0	.7	.6	34	.8
9	.3	.6	.3	.2	.1	3	3.6	1.9	.5	.6	*17	.7
10	.3	.6	.3	.2	.1	2	3.4	2.2	.3	.4	9.9	.6
11	.3	.4	.3	.2	.1	2	3.2	2.0	.3	.3	7.4	.5
12	.2	.6	.3	.2	.1	2	2.7	1.9	.3	.5	5.8	.5
13	.2	.6	.3	.2	.1	*2	2.3	1.7	.3	.4	4.1	.5
14	.2	.6	.2	.2	*.1	2	2.2	1.9	.3	.3	3.0	.4
15	.3	.5	.2	.2	.1	6	1.9	1.7	.7	.2	2.3	.4
16	.3	.5	.2	.1	.1	20	1.9	1.5	.6	*.1	1.9	.3
17	.3	.4	.2	.1	.1	20	1.7	1.5	.8	2.4	1.4	.3
18	.3	.4	.2	.1	.1	15	1.7	1.4	*.4	5.1	1.9	.3
19	.3	.5	.2	.1	.1	*20	1.5	1.2	.3	3.4	1.9	.3
20	.3	.6	*.2	.1	.1	25	1.5	1.1	.3	2.2	1.4	.2
21	*.3	.7	.2	.1	.1	35	1.5	*1.1	.2	1.7	1.1	.2
22	.3	*.8	.2	.1	.2	45	1.4	.9	.2	1.1	.8	.1
23	.3	.7	.2	*.1	.2	40	1.2	1.1	.1	.7	.7	.1
24	.3	.6	.2	.1	.4	50	*1.2	.9	.1	.6	.6	*.1
25	.3	.6	.2	.1	.7	44	1.2	.9	.1	.4	.4	.2
26	.3	.6	.2	.1	1	37	1.2	1.1	.1	.3	.3	.1
27	.4	.6	.2	.1	1	30	1.5	1.2	.1	1.4	10	.1
28	.5	.5	.2	.1	1.5	12	1.5	2.2	.1	1.9	*20	.2
29	.5	.5	.2	.1	2	10	1.5	2.5	.1	1.7	9.4	.3
30	.5	.5	.2	.1	------	12	1.5	2.5	.1	1.5	4.3	.3
31	.4	------	.2	.1	------	16	------	2.2	------	1.4	6.1	------
Total	9.3	16.4	8.4	4.6	9.1	504	99.4	52.3	16.9	35.4	153.5	20.8
Mean	0.30	0.55	0.27	0.15	0.31	16.3	3.31	1.69	0.56	1.14	4.95	0.69
Ac-ft	18	33	17	9.1	18	1,000	197	104	34	70	304	41

Calendar year 1955:	Max	139	Min	0	Mean	1.97	Ac-ft	1,430
Water year 1955-56:	Max	50	Min	0.1	Mean	2.54	Ac-ft	1,850

Peak discharge (base, 400 cfs).--No peak above base.
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 16 to Mar. 24, Mar. 28-30.

North Fork Grand River near White Butte, S. Dak.

Location.--Lat 45°48'10", long 102°21'35", at line between secs. 10 and 11, T. 21 N., R. 14 E., on left bank 100 ft upstream from highway bridge, a quarter of a mile upstream from nearest tributary, and 9¾ miles south of White Butte.

Drainage area.--1,190 sq mi, approximately.

Records available.--November 1945 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 2,275 ft (by barometer). Prior to Oct. 27, 1946, chain gage; Oct. 27, 1946, to Aug. 28, 1947, wire-weight gage; Aug. 29, 1947, to Apr. 16, 1950, water-stage recorder; and Apr. 17, 1950, to June 11, 1951, wire-weight gage; all at site 100 ft downstream at same datum.

Average discharge.--10 years (1946-56), 93.2 cfs (67,470 acre-ft per year); median of yearly mean discharges, 52 cfs (37,600 acre-ft per year).

Extremes.--Maximum discharge during year, 310 cfs Mar. 20 (gage height, 5.67 ft, affected by ice); no flow at times.

1945-56: Maximum discharge, 30,900 cfs Apr. 16, 1950 (gage height, 20.0 ft, from floodmark), from rating curve extended above 4,300 cfs on basis of logarithmic plotting and slope-area determination of peak flow; no flow at times in some years.

Remarks.--Records good except those for period of ice effect, which are poor.

Revisions (water years).--WSP 1279: 1947, 1950.

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 3 to Nov. 22, Mar. 27 to Apr. 13, May 29-30)

3.0	0	3.6	17
3.1	.4	4.0	42
3.2	1.8	4.4	86
3.3	4.0	4.8	155
3.4	7.4		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.2	0.7	1	0.5	0.5	1	50	12	8.8	0	0	21
2	2.0	.7				1	40	12	6.6	0	0	19
3	1.8	.7				*1.5	34	12	4.5	0	0	16
4	1.7	.6				5	32	12	3.5	.1	0	14
5	1.5	.7				40	29	11	3.5	.1	0	13
6	1.4	.8				*80	28	11	3.2	.4	0	9.6
7	1.2	.7				50	25	10	2.8	.3	0	8.8
8	1.1	.8				40	22	10	2.4	.2	0	7.4
9	1.1	.9				40	22	9.2	2.2	.1	*0	6.6
10	.9	.9	.5			40	21	8.8	1.7	0	0	6.2
11	.8	.8				35	20	8.8	1.4	0	0	5.5
12	.6	.8				30	18	8.3	1.4	0	0	4.8
13	.4	.9				35	18	8.3	1.1	0	0	4.8
14	.4	1.1				*30	17	8.3	.9	0	0	4.2
15	.4	1.1				30	16	7.4	8.3	0	0	4.0
16	.3	1.1				30	14	7.4	3.2	0	0	3.5
17	.3	.9			(*)	60	13	6.6	2.4	0	0	2.4
18	.2	.9				120	12	5.8	1.8	0	0	2.0
19	*.2	1.1				180	12	5.5	1.4	*0	0	1.8
20	.4	1.2				**230	12	4.8	.9	0	0	1.4
21	.4	1.4				**250	11	4.5	1.2	0	0	.9
22	.4	1.5				250	9.2	4.0	.9	0	0	.4
23	.4	1.5	(*)			*220	8.8	*3.7	.4	0	0	.2
24	.4	1.5				200	8.8	3.2	.2	0	0	.1
25	.4	*1.5				175	*8.8	3.0	*.1	0	0	*0
26	.4	1.5		(*)		150	9.2	2.8	0	0	0	0
27	.4	1				*133	9.6	3.0	0	0	0	0
28	.4	1				63	9.6	5.8	0	0	0	0
29	.6	1			1	57	9.6	8.1	0	0	0	0
30	.6	1			------	49	11	21	0	0	*0	0
31	.7	------			------	58	------	14	------	0	25	------
Total	24.0	30.3	20.0	15.5	15.0	2,683.5	550.6	252.3	64.8	1.2	25	157.6
Mean	0.77	1.01	0.65	0.5	0.52	86.6	18.4	8.14	2.16	0.04	0.8	5.25
Ac-ft	48	60	40	31	30	5,320	1,090	500	129	2.4	50	313

Calendar year 1955: Max 36 Min 0 Mean 3.64 Ac-ft 2,640
Water year 1955-56: Max 250 Min 0 Mean 10.5 Ac-ft 7,610

Peak discharge (base, 400 cfs).--No peak above base.

* Discharge measurement or observation of no flow made on this day.

** Field estimate made on this day.

Note.--Stage-discharge relation affected by ice Nov. 23 to Mar. 26.

South Fork Grand River near Cash, S. Dak.

Location.--Lat 45°38'55", long 102°38'45", in NE¼SW¼SE¼ sec. 33, T. 20 N., R. 12 E., on downstream end of left pier of highway bridge, 1 mile upstream from Little Nasty Creek, 4 miles north of Cash, 10 miles south of Lodgepole, 12 miles northwest of Bison, and 16 miles downstream from Big Nasty Creek.

Drainage area.--1,350 sq mi, approximately.

Records available.--November 1945 to September 1956.

Gage.--Water-stage recorder and wire-weight gage read once daily. Altitude of gage is 2,416 ft (by barometer). Prior to Oct. 25, 1946, chain gage at same site and datum.

Average discharge.--10 years (1946-56), 79.3 cfs (57,410 acre-ft per year); median of yearly mean discharges, 45 cfs (32,600 acre-ft per year).

Extremes.--Maximum discharge during year, 1,040 cfs Mar. 19 (gage height, 5.75 ft); no flow during most of winter.

1945-56: Maximum discharge, 27,000 cfs Apr. 15, 1950 (gage height, 15.40 ft), from rating curve extended above 14,000 cfs on basis of slope-area determination of peak flow; no flow at times.

Remarks.--Records fair except those for period of ice effect, which are poor.

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-31)

2.7	0	3.4	37
2.8	.6	3.7	88
2.9	2.1	4.0	151
3.0	5.0	4.5	286
3.1	9.8	5.0	495
3.2	16	5.5	830

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.8	7				0	60	20	48	a4.0	10	16
2	a9	7				0	60	22	34	5.0	23	a17
3	8.4	7				*4	26	30	a32	99	28	a18
4	10	7				15	64	34	31	375	67	19
5	8.4	7				100	71	32	16	339	a50	16
6	8.4	7				*90	27	a30	18	149	37	14
7	7.4	7				70	52	27	13	73	22	14
8	7.9	7				50	a60	26	12	43	14	12
9	a7.5	7				30	54	22	11	29	*14	a11
10	7.4	7				25	43	18	a10	28	16	10
11	6.9	6				20	35	20	7.2	31	16	8.7
12	4.0	5				15	30	21	7.7	*27	a30	12
13	4.0	4				15	30	a24	5.0	75	103	8.7
14	5.0	4				*15	27	26	6.7	118	160	8.7
15	4.7	3			(*)	15	a25	27	17	86	66	7.7
16	a6	3				20	22	28	31	52	31	a7
17	7.4	2				25	20	26	46	*55	21	6.3
18	*8.4	2				50	19	14	55	92	16	7.2
19	7.4	1				500	19	11	31	82	a15	6.7
20	6.4	1				*528	19	a10	22	35	13	6.3
21	8.4	1	(*)			645	20	11	14	23	28	5.8
22	8.4	1				*432	a20	12	11	a15	24	5.0
23	a6	*1				350	17	12	9.8	9.8	16	a5.5
24	4.0	1		(*)		238	17	*10	a8.5	9.8	10	5.8
25	7.9	1				226	*16	9.3	7.2	7.2	10	*5.4
26	6.9	1				215	18	8.2	*5.8	6.7	a10	6.3
27	6.4	0				*194	18	a10	5.4	8.7	9.8	5.4
28	7.4	0				196	18	18	5.0	9.8	10	5.8
29	7.9	0				176	a18	36	5.0	a15	*7.2	6.3
30	a7.5	0			------	90	18	215	3.3	21	9.8	a6.0
31	7.4	------			------	67	------	100	------	16	12	------
Total	222.6	107	0	0	0	4,416	943	909.5	528.6	1,939.0	898.8	283.6
Mean	7.18	3.6	0	0	0	142	31.4	29.3	17.6	62.5	29.0	9.45
Ac-ft	442	212	0	0	0	8,760	1,870	1,800	1,050	3,850	1,780	563

Calendar year 1955:	Max 200	Min 0	Mean 14.0	Ac-ft 10,140
Water year 1955-56:	Max 645	Min 0	Mean 28.0	Ac-ft 20,330

Peak discharge (base, 500 cfs).--Mar. 19 (2 p.m.) 1,040 cfs (5.75 ft); July 4 (5 a.m.) 512 cfs (5.03 ft).

* Discharge measurement or observation of no flow made on this day.
a No gage-height record; discharge interpolated.
Note.--Stage-discharge relation affected by ice Nov. 1 to Mar. 19.

Shadehill Reservoir at Shadehill, S. Dak.

Location.--Lat 45°46', long 102°12', in NW¼ sec. 30, T. 21 N., R. 16 E., three-quarters of a mile west of Shadehill and 4 miles downstream from confluence of North and South Forks of Grand River.

Drainage area.--3,120 sq mi, approximately.

Records available.--June 1950 to September 1956.

Gage.--Stevens contact type gage read once daily. Prior to Apr. 3, 1952, occasional elevations obtained by level circuits.

Extremes.--Maximum contents during year, 142,765 acre-ft Mar. 28 (elevation, 2,272.63 ft); minimum, 128,026 acre-ft Mar. 3 (elevation, 2,269.55 ft).
1950-56: Maximum contents, 318,101 acre-ft Apr. 10, 1952 (elevation, 2,297.36 ft); minimum since first filling to spillway level, that of Mar. 3, 1956.

Remarks.--Reservoir is formed by earth-fill dam; storage began July 1, 1950; dam completed Aug. 15, 1951. Total capacity is 409,000 acre-ft at maximum pool, elevation, 2,312 ft. Dead storage is 58,231 acre-ft below lowest point of canal outlet, elevation, 2,250.8 ft. Conservation storage is 84,000 acre-ft between elevation 2,250.8 ft and crest of spillway, elevation, 2,272 ft. Figures given herein represent total contents. The reservoir is for irrigation supply and flood control.

Cooperation.--Record of elevations and contents furnished by Bureau of Reclamation.

Month-end elevation and contents, water year October 1955 to September 1956

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept.30	2,270.81	133,941	-
Oct. 31	2,270.38	131,904	-2,037
Nov. 30	2,270.08	130,494	-1,410
Dec. 31	2,269.88	129,560	-934
Calendar year 1955	-	-	-4,619
Jan. 31	2,269.75	128,955	-605
Feb. 29	2,269.56	128,072	-883
Mar. 31	2,272.54	142,321	+14,249
Apr. 30	2,272.20	140,651	-1,670
May 31	2,272.18	140,553	-98
June 30	2,271.81	138,749	-1,804
July 31	2,271.97	139,528	+779
Aug. 31	2,271.81	138,749	-779
Sept.30	2,271.47	137,103	-1,646
Water year 1955-56	-	-	+3,162

Grand River at Shadehill, S. Dak.

Location.--Lat 45°46', long 102°11', in SE¼ sec. 19, T. 21 N., R. 16 E., near left bank on downstream side of pier of bridge on State Highway 73 at Shadehill, 1 mile downstream from Shadehill Dam, 5 miles downstream from confluence of North and South Forks, and 12 miles south of Lemmon.

Drainage area.--3,120 sq mi, approximately.

Records available.--February 1943 to September 1956. Records for July 1904 to October 1906 collected at site 5 miles 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 2,186.46 ft above mean sea level, datum of 1929. Feb. 23, 1943, to June 12, 1946, wire-weight gage on old highway bridge 50 ft upstream at present datum. June 13, 1946, to Aug. 30, 1947, wire-weight gage at present site and datum.

Extremes.--Maximum discharge during year, 169 cfs Mar. 29 (gage height, 4.02 ft); minimum, 5.2 cfs June 27 (gage height, 2.88 ft).

1943-56: Maximum discharge, 58,000 cfs Apr. 16, 1950 (gage height, 21.0 ft, from floodmarks upstream from bridge; 19.06 ft, from floodmark in gage well, unreliable); no flow for many days in most years.

Remarks.--Records good except those for periods of ice effect, which are fair. Small diversion above station. Flow completely regulated by Shadehill Reservoir (see preceding page) since July 1, 1950. Records of chemical analyses and water temperatures for the water year 1956 are given in WSP 1451.

Revisions (water years).--WSP 1279: 1943(M). See also Records available.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	13	13	15	14	14	16	160	42	42	6.7	13	13
2	13	13	15	14	14	16	160	43	52	7.8	13	13
3	13	16	15	14	14	16	162	44	70	12	12	14
4	13	16	15	14	15	16	153	42	54	13	13	14
5	13	15	15	14	15	16	143	42	37	14	14	14
6	13	16	15	14	15	16	132	41	37	22	14	14
7	13	16	15	14	15	*16	125	42	32	33	*14	14
8	13	16	15	14	15	16	118	43	27	33	14	14
9	14	15	15	14	15	16	111	57	24	30	13	12
10	14	16	15	14	15	16	106	65	21	29	13	9.3
11	14	15	15	14	15	16	104	64	18	27	13	9.6
12	15	16	15	14	15	16	94	59	13	28	13	9.3
13	14	16	15	14	15	16	82	57	11	26	13	9.3
14	14	14	15	14	15	16	70	55	10	25	12	8.9
15	14	16	15	14	15	16	65	48	21	26	14	9.3
16	13	16	15	14	15	16	61	51	19	28	14	8.9
17	13	16	15	14	*15	16	59	42	16	28	14	8.9
18	15	16	15	14	15	16	52	38	14	29	14	8.9
19	13	16	15	14	15	17	48	37	13	*24	14	8.9
20	*14	15	15	14	15	18	45	33	12	*21	14	9.6
21	14	15	15	14	15	18	48	29	15	20	14	9.3
22	13	16	*15	14	15	20	42	27	23	19	13	9.3
23	14	16	15	14	15	*20	37	*26	11	18	12	9.3
24	13	16	15	14	15	50	41	23	7.8	16	13	8.9
25	13	*16	15	14	15	100	31	20	*9.6	16	13	9.3
26	13	16	15	*14	15	150	*33	19	7.4	15	12	*9.3
27	13	16	15	14	15	*155	34	15	6.7	15	14	9.6
28	13	16	14	14	15	160	33	25	5.8	15	14	10
29	13	16	14	14	15	169	34	29	6.7	14	13	10
30	14	16	14	14	------	166	34	33	7.0	13	*13	10
31	13	-------	14	14	------	160	------	32	------	12	*14	------
Total	417	467	461	434	432	1,491	2,417	1,223	643.0	635.5	413	317.9
Mean	13.5	15.6	14.9	14.0	14.9	48.1	80.6	39.5	21.4	20.5	13.3	10.6
Ac-ft	827	926	914	861	857	2,960	4,790	2,430	1,280	1,260	819	631

Calendar year 1955: Max 22 Min 0 Mean 10.4 Ac-ft 7,530
Water year 1955-56: Max 169 Min 5.8 Mean 25.6 Ac-ft 18,560

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 2, 6, 7, Nov. 23 to Mar. 26. Discharge computed from wire-weight-gage readings Nov. 21 to Apr. 25.

Grand River near Wakpala, S. Dak.

Location.--Lat 45°39'55", long 100°38'20", in NW¼SE¼ sec. 26, T. 20 N., R. 28 E., on downstream side of left pier of bridge on U. S. Highway 12, 5 miles west of Wakpala, 8 miles upstream from Deep Bank Creek, and 21 miles upstream from mouth.

Drainage area.--5,510 sq mi, approximately.

Records available.--April 1912 to March 1918, August 1928 to September 1956 (no winter records prior to March 1930).

Gage.--Water-stage recorder and supplemental wire-weight gage read once daily. Altitude of gage is 1,584 ft (by barometer). Prior to Mar. 18, 1918, chain gage at site 12 miles downstream at different datum. Aug. 26, 1928, to Mar. 11, 1937, chain or wire-weight gage at site 17 miles downstream at different datums. Mar. 12, 1937, to Mar. 30, 1944, water-stage recorder at site 17 miles downstream at different datum (this gage destroyed by flood of April 1944). Mar. 31, 1944, to June 29, 1948, wire-weight gage at present site and datum.

Average discharge.--26 years (1930-56), 304 cfs (220,100 acre-ft per year); median of yearly mean discharges, 225 cfs (163,000 acre-ft per year).

Extremes.--Maximum discharge during year, 6,260 cfs Mar. 20 (gage height, 9.94 ft); maximum gage height, 10.95 ft Mar. 18, affected by ice; no flow Nov. 28 to Mar. 10.

1912-18, 1928-56: Maximum discharge, 82,200 cfs Apr. 18, 1950 (gage height, 22.75 ft); no flow during long periods of most years.

Remarks.--Records good except those for period of ice effect, which are fair. Flow regulated by Shadehill Reservoir (see p. 278). One small diversion above gage for irrigation.

Revisions (water years).--WSP 786: Drainage area (site 17 miles downstream). WSP 1116: Drainage area (site 12 miles downstream). WSP 1279: 1914-15(M), 1928-30, 1932, 1933(M), 1935(M).

Rating tables, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 21-23, Aug. 19 to Sept. 2)

Oct. 1 to Mar. 10		Mar. 11 to Sept. 30					
5.0	2.6	4.6	0.7	5.5	39	7.5	1,430
5.1	4.9	4.7	1.7	5.8	81	8.0	2,190
5.2	8.0	4.8	3.1	6.1	143	9.0	4,120
5.3	12	4.9	5.2	6.4	252	10.0	6,400
5.5	23	5.0	7.8	6.7	470		
		5.2	15	7.0	790		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	23	8.0				0	550	78	54	29	49	8.1
2	21	4.9	(*)			0	520	86	67	20	33	7.0
3	19	3.8				0	*453	92	51	21	45	23
4	16	4.3				0	348	90	43	17	30	36
5	15	5.2				0	312	95	37	170	93	27
6	12	3.4				0	327	113	55	234	173	22
7	11	3.6				*0	282	97	44	152	78	17
8	9.9	*3.0				0	234	83	107	182	172	14
9	9.1	3.4			(*)	0	212	*75	105	107	196	20
10	8.4	7.3		(*)		0	*186	79	67	78	225	21
11	*7.7	7.0				50	176	97	44	57	160	14
12	7.0	5				150	163	105	*35	43	99	10
13	6.4	4				300	155	117	28	35	59	9.1
14	5.8	3				400	149	121	25	30	43	8.1
15	5.8	3				*250	141	107	65	25	30	6.8
16	5.8	2				500	133	105	83	21	22	5.7
17	5.8	2		(*)	(*)	*1,000	117	86	303	22	17	4.5
18	5.5	2				3,500	111	76	207	*21	15	3.8
19	5.8	2				*4,500	*103	67	124	18	13	*3.3
20	5.8	2		(*)		*5,640	99	61	86	17	10	2.6
21	6.1	2				4,690	92	57	62	14	8.1	2.8
22	6.1	2				*3,080	83	51	44	13	6.8	2.1
23	4.9	1				*1,860	79	44	31	11	*5.5	2.0
24	4.9	1				*1,110	76	*38	24	9.7	4.0	1.8
25	4.9	1				702	*75	35	31	8.8	3.5	1.8
26	4.9	1				862	75	33	24	*9.1	3.3	1.7
27	5.8	1				994	76	35	23	11	3.1	1.7
28	6.7	0	(*)		(*)	874	78	41	*24	13	4.5	1.3
29	7.7	0				394	78	55	39	13	3.8	1.0
30	7.3	0		(*)	------	370	75	51	35	*45	3.8	1.0
31	7.3	------			------	394	------	50	------	52	9.4	- -
Total	272.4	87.9	0	0	0	31,620	5,558	2,320	1,967	1,498.6	1,617.8	280.2
Mean	8.79	2.93	0	0	0	1,020	185	74.8	65.6	48.3	52.2	9.34
Ac-ft	540	174	0	0	0	62,720	11,020	4,600	3,900	2,970	3,210	556

Calendar year 1955:	Max	542	Min	0	Mean	23.6	Ac-ft	17,110
Water year 1955-56:	Max	5,640	Min	0	Mean	124	Ac-ft	89,690

* Discharge measurement or observation of no flow made on this day.

Note.--Stage-discharge relation affected by ice Nov. 12 to Mar. 19. Discharge Nov. 7 to Mar. 17, Sept. 20-30 computed on basis of wire-weight-gage readings.

Missouri River near Mobridge, S. Dak.

Location.--Lat 45°32', long 100°29', in sec. 7, T. 18 N., R. 30 E., on downstream end of second pier from right bank of bridge on U. S. Highway 12, 3 miles west of Mobridge, 3 miles downstream from Grand River, and at mile 1,250.6.

Drainage area.--208,700 sq mi, approximately.

Records available.--August 1928 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 1,527.19 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Mar. 28, 1929, chain gage at site 3 miles upstream (above Grand River, but including flow thereof) at datum about 3 ft higher. Mar. 28, 1929, to Sept. 30, 1931, chain and wire-weight gages at present site at datum 0.80 ft higher. Oct. 1, 1931, to Feb. 18, 1934, and Nov. 26, 1942, to May 12, 1944, wire-weight gage at present site and datum. Feb. 19, 1934, to Nov. 25, 1942, water-stage recorder at present site and datum.

Average discharge.--28 years, 22,430 cfs (16,240,000 acre-ft per year).

Extremes.--Maximum discharge during year, 41,200 cfs Apr. 5 (gage height, 7.83 ft); maximum gage height, 10.16 ft Mar. 25 (affected by ice); minimum daily discharge, 4,800 cfs Feb. 18; minimum gage height, 3.6 ft Nov. 17.

1929-56: Maximum discharge, 443,000 cfs Apr. 9, 1952 (gage height, 25.07 ft); minimum daily, 2,600 cfs Jan. 8, 9, 1940; minimum gage height, 1.00 ft Sept. 6, 7, 1934.

Remarks.--Records excellent except those for period of ice effect, which are fair. Discharge measurements made at about 5-day intervals during open water and three times a month during ice period. Flow regulated by Garrison Reservoir. Many diversions above station.

Revisions (water years).--WSP 716: 1929-30. WSP 761: Drainage area.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	32,000	32,400	7,570	9,130	7,190	5,860	30,000	25,800	31,800	31,800	30,400	22,000
2	31,800	32,500	6,900	9,690	7,060	5,860	28,000	26,600	30,400	31,800	30,300	21,000
3	31,800	32,700	6,960	9,620	7,040	5,900	27,000	28,300	30,100	31,800	29,700	20,300
4	32,000	32,100	7,610	9,600	7,270	6,000	32,000	28,500	30,600	31,300	30,000	20,000
5	32,000	31,300	8,150	9,580	7,370	6,190	35,200	28,100	30,600	31,800	30,700	19,700
6	32,200	29,200	8,420	9,530	7,150	6,470	32,000	27,700	31,000	31,700	31,100	19,600
7	32,100	27,100	8,740	9,580	6,750	6,660	30,100	27,800	32,500	30,700	31,600	20,200
8	32,000	25,600	9,130	9,600	6,200	6,750	31,200	28,100	32,500	30,600	30,700	21,400
9	32,200	24,300	8,820	9,390	6,170	6,770	32,100	28,200	31,600	31,500	30,200	21,800
10	32,300	23,000	8,590	9,020	6,150	6,540	36,300	29,100	31,400	30,900	30,300	21,800
11	32,200	21,600	8,480	8,930	6,100	6,030	27,100	29,100	31,400	30,200	30,200	21,900
12	32,200	20,400	8,480	8,760	6,100	6,000	25,300	29,400	31,700	29,500	30,100	22,200
13	32,000	18,500	8,530	7,810	6,100	6,220	26,400	29,300	33,600	29,300	30,000	22,200
14	31,800	17,500	8,630	7,410	5,960	6,290	26,400	28,600	35,200	29,900	30,100	22,200
15	31,700	15,500	8,980	8,020	5,720	6,400	26,700	28,500	35,700	30,100	29,600	22,000
16	31,800	13,500	9,420	8,020	5,420	7,000	26,400	28,100	34,700	30,200	29,500	22,000
17	31,900	12,000	9,400	7,750	5,050	9,000	26,100	28,400	34,300	30,300	30,000	22,100
18	31,800	12,000	9,220	7,370	4,800	10,500	25,900	28,400	35,700	30,000	29,300	22,900
19	32,100	12,000	9,060	6,770	4,980	15,000	26,000	27,300	37,000	29,900	27,200	22,800
20	32,500	12,500	9,060	6,850	5,220	19,000	25,600	27,000	36,000	29,800	25,500	22,000
21	32,700	12,500	9,200	7,230	5,500	22,000	25,100	27,000	35,700	29,800	25,800	20,200
22	32,900	12,200	9,350	7,410	5,750	24,000	25,000	27,600	35,200	29,800	26,100	18,900
23	32,900	11,600	9,280	7,430	5,900	28,000	24,600	27,600	35,200	29,900	25,500	18,500
24	33,000	10,400	9,080	7,350	5,950	28,500	24,500	27,800	35,500	29,800	25,500	18,400
25	33,000	9,700	9,440	7,330	5,900	29,000	24,400	28,100	36,000	29,400	25,300	18,000
26	33,100	8,800	9,670	7,330	5,860	27,000	25,300	29,100	35,500	29,300	24,900	17,600
27	32,900	7,600	9,580	7,410	5,900	25,000	25,800	30,400	34,900	30,200	24,800	18,100
28	32,500	6,500	9,510	7,490	5,880	23,000	25,500	31,500	34,600	29,900	24,600	18,300
29	32,500	6,800	9,530	7,530	5,860	22,500	25,400	31,800	34,500	27,900	25,000	18,200
30	32,500	7,500	9,510	7,430	------	23,000	25,500	31,600	32,900	26,700	25,000	18,100
31	32,400	------	9,170	7,350	------	24,000	------	32,500	------	28,800	23,800	------
Total	‡1,000.8	539,300	273,470	253,720	176,300	430,440	826,900	887,300	‡1,007.8	934,600	872,800	614,400
Mean	32,280	17,980	8,822	8,185	6,079	13,890	27,560	28,620	33,590	30,150	28,150	20,480
Ac-ft	‡1,985	‡1,070	542,400	503,200	349,700	853,800	‡1,640	‡1,760	‡1,999	‡1,854	‡1,731	‡1,219

Calendar year 1955: Max 47,700 Min 4,990 Mean 20,230 Ac-ft 14,650,000
Water year 1955-56: Max 37,000 Min 4,800 Mean 21,360 Ac-ft 15,510,000

‡ Expressed in thousands.
Note.--Stage-discharge relation affected by ice Nov. 12 to Apr. 4.

Moreau River at Bixby, S. Dak.

Location.--Lat 45°08'35", long 102°33'35", in SE¼SW¼ sec. 29, T. 14 N., R. 13 E., on right bank a quarter of a mile downstream from county highway bridge, about half a mile south of Bixby, and 3½ miles downstream from proposed Bixby dam site.

Drainage area.--1,570 sq mi, approximately.

Records available.--June 1904 to November 1906 (no winter records), April 1948 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 2,431.02 ft above mean sea level, datum of 1929 (Bureau of Reclamation benchmark). June 1904 to November 1906 staff gage within a quarter of a mile of present site at different datum. Apr. 17 to June 24, 1948, and Oct. 1, 1950, to Sept. 9, 1952, reference points or wire-weight or staff gage, all at or on old county highway bridge a quarter of a mile upstream from present site at same datum. June 25, 1948, to Sept. 30, 1950, water-stage recorder at site 300 ft downstream from old bridge at same datum (recorder operated to Mar. 31, 1952; record of little value after Sept. 30, 1950). Sept. 10 to Oct. 11, 1952, staff gage at present site and datum.

Average discharge.--8 years (1948-56), 91.1 cfs (65,950 acre-ft per year).

Extremes.--Maximum discharge during year, 1,840 cfs July 5 (gage height, 6.60 ft); maximum gage height, 7.39 ft Mar. 21 (affected by ice); no flow Feb. 18-29.

1904-6, 1948-56: Maximum discharge, 15,300 cfs Apr. 1, 1952 (gage height, 17.8 ft, from floodmark), from rating curve extended above 12,000 cfs on basis of slope-area determination of peak flow; no flow at times.

Revisions.--The maximum discharge for the water year 1953 has been revised to 2,980 cfs June 17, 1953 (gage height, 8.03 ft), superseding figure published in WSP 1279.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair.

Revisions.--Revised figures of discharge, in cubic feet per second, for high-water period in the water year 1953, superseding those published in WSP 1279, are given herewith:

1953		1953-Con.		1953-Con.	
June 15	874	June 18	1,220	June 21	1,040
16	860	19	190	22	1,040
17	2,480	20	705	23	785

Month	Maximum	Minimum	Mean	Runoff in acre-feet
June 1953	2,480	14	366	21,750
Water year 1952-53	2,480	1.9	74.6	53,980
Calendar year 1953	2,480	1.9	74.8	54,170

Revised peak discharge (base, 500 cfs).--1952-53: June 15 (12:30 p.m.) 1,670 cfs (6.36 ft); June 17 (8 p.m.) 2,980 cfs (8.03 ft); June 21 (7 p.m.) 1,100 cfs (5.47 ft).

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.3	1.5				0.1	65	9.3	59	14	135	4.3
2	4.6	1.5				.2	49	11	33	12	52	3.7
3	3.4	2				*10	44	11	20	267	30	3.0
4	3.2	3				80	36	10	15	1,140	77	2.2
5	2.4	3				180	36	9	12	1,190	455	2.2
6	2.1	2				*380	*25	8	9.7	405	131	2.1
7	1.9	1.5			0.2	270	30	8	7.5	182	48	2.2
8	1.6	1.5				180	32	8	5.9	135	*54	1.9
9	1.5	2				180	51	8	7.9	82	39	1.4
10	1.3	3				180	39	8	7.5	58	38	1.2
11	1.2	3				140	28	7	4.6	40	107	1.2
12	1.3	2				100	22	6	3.0	32	281	1.2
13	1.2	2				80	18	5	1.9	22	487	1.1
14	1.3	1			*.1	60	14	5	1.8	31	131	1.1
15	1.2	1	0.2	0.2	.1	*50	13	4	1.0	26	77	1.0
16	1.4	1			.1	60	11	4	1.8	18	44	.8
17	1.6	1			.1	100	9.7	4	1.5	16	27	.7
18	1.6	1			0	150	8.4	4	.9	*12	21	.6
19	*1.5	1			0	400	7.9	3	135	8.8	23	.6
20	1.6	2			0	500	6.6	3	74	7.0	18	.4
21	1.8	2			0	*600	5.9	2.5	31	5.9	20	.3
22	1.8	2	(*)		0	550	5.6	2.5	22	4.6	15	.2
23	1.8	*2			0	*450	4.9	2.5	8.8	3.0	11	.2
24	2	1			0	302	5.2	*2.1	16	2.2	8.4	.2
25	2	.5		(*)	0	234	5.2	1.8	9.7	1.5	6.3	.2
26	2	.5			0	195	*4.9	1.8	*7.5	1.2	5.6	*.2
27	2	.5			0	169	5.2	2.2	4.6	1.0	4.3	.2
28	3	.2			0	150	7.0	4.6	2.8	.9	7.5	.1
29	3	.2			0	120	8.4	12	3.4	1.8	5.6	.2
30	2.5	.2			------	100	7.5	52	4.0	12	*6.6	.2
31	2	------			------	80	------	83	------	138	6.6	------
Total	66.1	45.1	6.2	6.2	3.0	6,050.3	605.4	302.3	512.8	3,869.9	2,371.9	34.8
Mean	2.13	1.50	0.2	0.2	0.10	195	20.2	9.75	17.1	125	76.5	1.16
Ac-ft	131	89	12	12	6.0	12,000	1,200	600	1,020	7,680	4,700	69

Calendar year 1955: Max 217 Min 0 Mean 6.69 Ac-ft 4,840
Water year 1955-56: Max 1,190 Min 0 Mean 37.9 Ac-ft 27,520

Peak discharge (base, 500 cfs).--Mar. 21 (time unknown) 650 cfs; July 5 (1 a.m.) 1,840 cfs (6.60 ft); Aug. 5 (2 a.m.) 1,160 cfs (5.62 ft); Aug. 13 (2 a.m.) 935 cfs (5.17 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 23 to Mar. 23, May 28-31. No gage-height record Oct. 24 to Nov. 22, May 3-23; discharge estimated on basis of recorded range in stage (for first period), weather records, and records for other stations on Moreau River.

Moreau River near Faith, S. Dak.

Location.--Lat 45°11'50", long 102°09'10", in N½NW¼ sec. 10, T. 14 N., R. 16 E., on upstream side of bridge on State Highway 73, 2¾ miles downstream from Rabbit Creek and 13½ miles northwest of Faith.

Drainage area.--2,660 sq mi, approximately.

Records available.--March 1943 to September 1956.

Gage.--Wire-weight gage read once daily and crest stage indicator. Altitude of gage is 2,235 ft (by barometer). Prior to Oct. 5, 1949, at bridge a quarter of a mile upstream at same datum.

Average discharge.--13 years, 190 cfs (137,600 acre-ft per year); median of yearly mean discharges, 140 cfs (101,000 acre-ft per year).

Extremes.--Maximum discharge during year, 2,520 cfs July 5 (gage height, 6.28 ft); no flow for many days.

1943-56: Maximum discharge, 26,000 cfs Apr. 9, 1944 (gage height, 20.9 ft at former site, from floodmarks), from rating curve extended above 12,000 cfs on basis of slope-area determination of peak flow; no flow during long periods.

Remarks.--Records fair.

Revisions (water years).--WSP 1176: 1944. WSP 1279: 1946(M).

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 20-29, Sept. 14-30)

1.4	0	1.9	14	3.5	460
1.5	.1	2.0	23	4.0	770
1.6	.5	2.3	62	5.0	1,500
1.7	2.0	2.6	115	6.0	2,300
1.8	8.0	3.0	230		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	19	2				1	142	24	42	49	13	18
2	23	1.5				5	84	31	83	83	183	17
3	19	2				*35	68	28	62	128	80	13
4	11	3				140	*70	30	45	420	111	9.3
5	*8.0	4				190	61	24	*25	2,110	274	9.3
6	6.8	3				190	*51	20	35	1,160	728	8.6
7	5.0	2				*340	30	20	22	471	*238	7.4
8	3.8	2				340	31	18	21	238	*180	5.0
9	2.0	3				430	38	20	15	155	254	5.0
10	1.6	3				320	33	21	9.3	102	160	2.0
11	1.4	3				180	54	20	3.8	73	73	1.6
12	1.2	3				*160	49	18	1.7	62	115	1.6
13	.5	2			(*)	120	37	14	2.6	54	385	3.8
14	.4	2				100	31	14	6.2	35	460	2.6
15	.4	1				*80	24	*11	1.7	27	158	1.6
16	.4	1			(*)	100	23	11	1.6	38	92	1.6
17	.4	1				120	21	10	9.3	38	65	*1.4
18	.5	1				150	20	11	3.8	*27	49	1.2
19	.5	1		(*)		200	20	11	1.1	*25	34	1.2
20	*1.8	2	(*)			750	19	6.2	23	20	30	1.2
21	2.0	2				*940	18	6.2	80	17	28	1.0
22	2.0	*2	(*)			875	17	8.0	45	13	22	.4
23	2.0	1				*861	*13	*6.2	27	9.3	20	.4
24	2.0	*1				756	14	6.2	23	6.8	20	.4
25	*2.0	1		(*)		445	14	5.0	*76	2.6	14	.4
26	2.0	.5				338	*11	3.8	*51	1.8	13	*.4
27	2.0	.5				279	10	2.0	26	1.4	11	.4
28	3.2	.5				200	13	8.6	13	1.2	11	.3
29	4.4	.2				150	28	34	8.6	1.0	*6.8	.4
30	3	.2			------	140	17	30	2.0	34	*5.6	.4
31	2	------			------	160	------	25	------	14	11	------
Total	133.3	51.4	0	0	0	9,095	1,061	497.2	765.7	5,417.1	3,844.4	116.9
Mean	4.30	1.71	0	0	0	293	35.4	16.0	25.5	175	124	3.90
Ac-ft	264	102	0	0	0	18,040	2,110	986	1,520	10,740	7,630	232

Calendar year 1955:	Max 454	Min 0	Mean 11.3	Ac-ft 8,170
Water year 1955-56:	Max 2,110	Min 0	Mean 57.3	Ac-ft 41,610

Peak discharge (base, 700 cfs).--Mar. 21 (1 a.m.) 1,200 cfs (4.70 ft); July 5 (1 p.m.) 2,520 cfs (6.28 ft); Aug. 6 (9 a.m.) 1,340 cfs (4.83 ft); Aug. 13 (8 p.m.) 1,220 cfs (4.64 ft).

* Discharge measurement or observation of no flow made on this day.

Note.--Stage-discharge relation affected by ice Oct. 30 to Mar. 21, Mar. 28-31.

Moreau River near Eagle Butte, S. Dak.

Location.--Lat 45°11'20", long 101°13'05", in NW¼NW¼SW¼ sec. 8, T. 14 N., R. 24 E., on right bank at downstream side of bridge on State Highway 63, 4 miles downstream from Meadow Creek and 13 miles north of Eagle Butte.

Drainage area.--4,320 sq mi, approximately.

Records available.--March 1943 to September 1956.

Gage.--Water-stage recorder and wire-weight gage read once daily above 2 ft gage height and 2 or 3 times a week during period of low flow. Altitude of gage is 1,792 ft (by barometer). Prior to June 19, 1946, wire-weight gage at same site and datum.

Average discharge.--13 years, 319 cfs (230,900 acre-ft per year); median of yearly mean discharges, 250 cfs (181,000 acre-ft per year).

Extremes.--Maximum discharge during year, about 4,500 cfs Mar. 20; maximum gage height, about 9.2 ft Mar. 18 (backwater from ice); no flow at times.

1943-56: Maximum discharge, 30,300 cfs June 15, 1953 (gage height, 22.01 ft, from floodmark); maximum gage height, 23.0 ft Apr. 9, 1944, from floodmarks; no flow for many days during most years.

Remarks.--Records fair above 30 cfs and poor below except those for the period of ice effect, which are poor.

Revisions (water years).--WSP 1146: 1944. The figures of peak discharge for the water year 1951 have been revised as shown below, superseding those published in WSP 1209.

Revised peak discharge.--1950-51: Aug. 14 (2:30 a.m.) 3,040 cfs (7.50 ft); Aug. 31 (2 a.m.) 2,920 cfs (7.40 ft).

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 21 to May 5, July 10 to Aug. 6)

1.2	0	2.6	114
1.3	.4	3.0	206
1.4	1.5	3.5	364
1.5	4.0	4.0	575
1.6	7.0	5.0	1,220
1.8	16	6.0	2,080
2.0	30	8.0	4,310
2.3	64		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	23		(*)			0	223	28	128	28	*1.1	13
2	20					*0	220	31	59	18	1	12
3	17					0	209	30	39	14	1	12
4	15					0	*196	28	31	9.4	1	11
5	13					0	143	27	25	28	8.8	9.8
6	11					10	109	27	34	441	70	9
7	9	(*)				50	91	23	36	1,580	214	7.8
8	7.0					500	79	*21	56	846	416	7.0
9	6					500	72	21	63	452	237	6
10	5.5			(*)		400	*60	23	43	264	237	6
11	*5.2					300	55	32	25	183	161	5.5
12	3.5					300	51	30	*14	141	152	5
13	2.5					250	44	28	10	103	128	4.5
14	2					250	40	29	7	81	103	4.3
15	1.8					200	46	25	5	67	211	4
16	2.0					*200	46	15	3	49	476	3.5
17	1.5					2,000	37	11	2	41	252	3
18	1.5					*3,800	31	8	1	40	168	2
19	1.2					*3,800	28	6	.5	35	116	1.5
20	1					4,000	24	5	.2	30	84	*2.0
21	1.0					*3,890	24	4	0	20	60	1
22	.8					2,800	24	3.5	0	15	*42	.5
23	.7					*1,720	24	*3.0	0	12	35	.4
24	.6					1,480	*20	2.5	0	9	28	.3
25	.6					1,180	21	2	0	*6.7	22	.2
26	.5					1,010	20	1.5	0	5	21	.1
27	.4					*865	21	1.5	0	4	18	0
28	.3					450	20	1.5	*0	3	16	0
29	.4					286	24	1.8	6.7	2.5	15	0
30	.3				------	237	24	23	36	2	14	0
31	.1	------			------	226	------	193	------	1.5	13	------
Total	154.4	0	0	0	0	30,704	2,026	685.3	624.4	4,531.1	3,321.9	131.4
Mean	4.98	0	0	0	0	990	67.5	22.1	20.8	146	107	4.38
Ac-ft	306	0	0	0	0	60,900	4,020	1,360	1,240	8,990	6,590	261

Calendar year 1955: Max 310 Min 0 Mean 12.7 Ac-ft 9,190
Water year 1955-56: Max 4,000 Min 0 Mean 115 Ac-ft 83,670

Peak discharge (base, 1,100 cfs).--Mar. 20 (time unknown) about 4,500 cfs; July 6 (12 p.m.) 1,980 cfs (5.95 ft).

* Discharge measurement or observation of no flow made on this day.

Note.--Stage-discharge relation affected by ice Mar. 6-19. No gage-height record May 15-28, June 13-28, July 18 to Aug. 4; discharge estimated on the basis of 3 discharge measurements, 1 observation of no flow, weather records, and records for other Moreau River stations.

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., on left bank 30 ft downstream from bridge, 2½ miles southeast of Whitehorse, 8 miles downstream from Little Moreau River, and 17 miles southeast of Timber Lake.

Records available.--June 1954 to September 1956.

Gage.--Water-stage recorder. Prior to Nov. 23, 1954, wire-weight gage at same site and datum.

Extremes.--Maximum discharge during year, 5,000 cfs Mar. 21 (gage height, 10.90 ft, affected by ice); maximum gage height, 12.67 ft Mar. 18 (ice jam); no flow for many days.
1954-56: Maximum discharge, that of Mar. 21, 1956; maximum gage height, that of Mar. 18, 1956; no flow for many days each year.
Flood in June 1953 reached a stage of about 26.2 ft. Flood in March 1947 was probably higher.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair.

Rating tables, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 14 to Nov. 6, Apr. 9 to May 10, June 6-21, July 3-7)

Oct. 1 to Mar. 7		Mar. 8 to Sept. 30			
3.1	0	2.8	0	4.0	79
3.2	1.5	2.9	1.0	4.5	150
3.3	4.5	3.0	2.9	5.0	275
3.4	9.5	3.1	5.4	6.0	720
3.6	25	3.2	8.4	8.0	2,110
4.0	67	3.3	13	10.0	4,350
		3.5	28	10.5	5,050

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	63	0.1				0	334	22	98	0	4.8	11
2	55	.1	(*)			0	370	27	96	0	4.3	9.8
3	45	.2				0	326	27	56	1.5	4.3	6.6
4	37	.2				0	*282	27	36	8.4	8.4	8.1
5	33	.2				0	229	29	25	10	11	9.8
6	a25	.2				0	172	27	17	8.1	7.8	8.1
7	a20	**.1				0	124	26	12	905	44	6.6
8	a15	.1				300	115	*26	20	815	227	5.4
9	a11	.1			(*)	500	101	25	29	408	310	4.3
10	8.5	.2		(*)		400	*91	52	53	232	188	3.6
11	*6.5	.2				350	77	268	39	148	176	3.1
12	2.7	.1				300	70	74	*28	122	152	2.5
13	2.4	0				300	63	38	16	110	121	2.1
14	2.4	0				250	55	31	11	103	118	1.9
15	1.5	0				200	48	26	8.1	96	96	1.9
16	1.2	0				*200	50	22	6.3	91	234	1.4
17	.6	0				*300	51	16	4.3	87	261	.9
18	.4	0				*1,400	45	12	3.1	85	163	.3
19	.3	0				*4,300	40	8.4	2.3	48	132	.2
20	.2	0				*4,600	34	6.9	1.5	35	96	**.1
21	.3	0				*4,600	31	5.7	1.0	27	76	0
22	.2	0				*3,400	27	4.8	.4	21	*56	0
23	.2	0				*2,020	25	*3.8	.1	19	42	0
24	.2	0				*1,430	*22	2.9	.1	16	32	0
25	.1	0				1,240	19	2.5	.3	*11	25	0
26	.1	0				1,190	18	2.3	.2	10	20	0
27	.1	0				*1,040	18	2.9	.1	7.2	16	0
28	.1	0			(*)	750	18	3.6	*0	6.0	12	0
29	.1	0				500	19	4.8	0	5.1	10	0
30	.1	0			------	300	19	4.6	0	6.6	8.4	0
31	.1	------			------	250	------	5.4	------	*6.0	9.8	------
Total	332.3	1.8	0	0	0	30,120	2,893	833.6	563.8	3,447.9	2,665.8	87.7
Mean	10.7	0.06	0	0	0	972	96.4	26.9	18.8	111	86.0	2.92
Ac-ft	659	3.6	0	0	0	59,740	5,740	1,650	1,120	6,840	5,290	174

Calendar year 1955:	Max 380	Min 0	Mean 15.7	Ac-ft 11,380
Water year 1955-56:	Max 4,600	Min 0	Mean 112	Ac-ft 81,220

Peak discharge (base, 1,000 cfs).--Mar. 21 (10 a.m.) 5,000 cfs; July 7 (1 p.m.) 1,800 cfs (7.63 ft).

* Discharge measurement or observation of no flow made on this day.

** Field estimate made on this day.

a No gage-height record; discharge interpolated.

Note.--Stage-discharge relation affected by ice Nov. 7 to Mar. 21, Mar. 28-31.

Moreau River at Promise, S. Dak.

Location.--Lat 45°20', long 100°36', in sec. 17, T. 16 N., R. 29 E., on upstream side of highway bridge, 170 ft downstream from Chicago, Milwaukee, St. Paul and Pacific Railroad bridge, 0.5 mile downstream from Virgin Creek, and three-quarters of a mile north of Promise.

Drainage area.--5,223 sq mi.

Records available.--August 1928 to September 1956 (no winter records prior to April 1930).

Gage.--Wire-weight gage read once daily. Datum of gage is 1,587.01 ft above mean sea level, datum of 1929. Prior to Nov. 8, 1934, chain gage at same site and datum. Nov. 8, 1934, to July 20, 1944, water-stage recorder at site 150 ft upstream at same datum. July 21, 1944, to July 11, 1948, wire-weight gage at present site and datum. July 12, 1948, to May 20, 1953, water-stage recorder on left bank at downstream side of bridge at same datum.

Average discharge.--26 years (1930-56), 294 cfs (212,800 acre-ft per year); median of yearly mean discharges, 205 cfs (148,000 acre-ft per year).

Extremes.--Maximum discharge during year, 5,540 cfs Mar. 21 (gage height, 10.85 ft); no flow for many days; minimum gage height observed, 1.63 ft Nov. 1, 2.

1928-56: Maximum discharge, 36,900 cfs Apr. 5, 1952; maximum gage height, 24.4 ft Mar. 25, 1947; no flow for many days during most years.

Remarks.--Records fair.

Revisions (water years).--WSP 926: 1928-30, 1933. WSP 1279: 1935, 1945.

Rating tables, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 7				Mar. 8 to Sept. 30			
1.6	0	2.2	11	1.9	0.8	4.0	203
1.7	.2	2.5	27	2.0	1.8	5.0	510
1.8	1.2	3.0	62	2.2	6.2	6.0	1,060
1.9	3.0	3.5	116	2.4	12	7.0	1,850
2.0	5.0			2.7	27	9.0	3,750
				3.0	51	11.0	5,810
				3.5	109		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	112	0				0	398	28	64	0.2	8.2	13
2	91	0	(*)			0	402	28	62	.2	7.3	11
3	55	0				0	*360	28	59	.4	7.0	10
4	40	0				0	324	27	55	.7	7.9	8.4
5	28	0				0	240	27	52	.9	7.6	7.6
6	24	0				0	166	28	49	2.8	7.3	6.5
7	21	*0				*0	110	28	46	54	6.8	5.7
8	18	.1			(*)	50	110	*26	46	2,570	19	5.2
9	13	.1				500	106	25	43	1,220	196	4.5
10	11	.1		(*)		400	108	30	41	519	210	3.6
11	*8.4	.2				350	90	26	41	250	164	3.2
12	5.8	.1				320	81	149	36	160	143	2.6
13	3.8	0				300	79	76	*28	99	139	2.4
14	2.7	0				*300	74	44	27	90	139	2.2
15	2.0	0				250	68	36	25	74	129	1.7
16	2.1	0				250	59	30	23	68	127	1.5
17	2.1	0				400	53	22	18	65	152	1.1
18	2.2	0				**3,200	47	21	14	61	196	.7
19	2.0	0				4,000	42	17	9.7	62	190	.4
20	2.0	0				3,800	38	14	7.3	43	139	*.4
21	1.2	0				*5,270	34	11	5.7	25	79	.2
22	.7	0				4,250	37	8.2	3.4	19	*68	.2
23	.3	0				2,740	33	*7.6	1.6	17	51	.1
24	.2	0				*1,620	*27	6.8	1.0	14	38	.1
25	.1	0				1,130	23	6.5	.6	*13	30	0
26	.1	0				1,400	23	6.0	.4	12	24	0
27	.1	0				*1,210	22	6.0	.4	11	22	0
28	0	0			(*)	665	22	7.3	*.4	9.4	19	0
29	0	0				374	21	8.2	.2	8.7	17	0
30	0	0			------	336	22	9.7	.2	9.4	16	0
31	0	------			------	252	------	51	------	*8.2	14	------
Total	448.8	0.6	0	0	0	33,367	3,219	838.3	759.9	5,486.9	2,373.1	92.3
Mean	14.5	0.02	0	0	0	1,076	107	27.0	25.3	177	76.6	3.08
Ac-ft	890	1.2	0	0	0	66,180	6,380	1,660	1,510	10,880	4,710	183

Calendar year 1955: Max 450 Min 0 Mean 18.7 Ac-ft 13,540
Water year 1955-56: Max 5,270 Min. 0 Mean 127 Ac-ft 92,390

Peak discharge (base, 1,300 cfs).--Mar. 21 (8 a.m.) 5,540 cfs (10.85 ft); July 8 (4 a.m.) 3,160 cfs (8.4 ft).

* Discharge measurement or observation of no flow made on this day.

** Field estimate made on this day.

Note.--Stage-discharge relation affected by ice Nov. 12 to Mar. 20.

Lance Creek at Spencer, Wyo.

Location.--Lat 43°22', long 104°16', in sec. 14, T. 39 N., R. 62 W., on right bank three-eighths of a mile south of Spencer, 1 mile upstream from mouth, and 34 miles south of Newcastle.

Drainage area.--2,070 sq mi, approximately.

Records available.--April 1948 to September 1954, August to September 1956.

Gage.--Water-stage recorder. Prior to Aug. 14, 1948, chain gage at same site and datum.

Average discharge.--6 years, 24.0 cfs (17,390 acre-ft per year).

Extremes.--Maximum discharge during period August to September 1956, 134 cfs Aug. 11 (gage height, 2.79 ft); no flow for many days.

1948-54, 1956: Maximum discharge, 5,250 cfs June 28, 1952 (gage height, 8.3 ft, from floodmarks); no flow for many days each year.

Remarks.--Records fair. Diversions for irrigation above station (for details on adjudication of diversions, see Remarks for this station in WSP 1209). There are 2,120 small reservoirs above the station used for storage of stock and irrigation water (total capacity, about 12,800 acre-ft).

Revisions (water years).--WSP 1209: 1948(P), 1950.

Rating table, Aug. 11 to Sept. 30, 1956 (gage height, in feet, and discharge, in cubic feet per second)

1.9	0	2.3	19
2.0	.8	2.4	31
2.1	3.2	2.5	47
2.2	9.5		

Discharge, in cubic feet per second, August to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1											-	
2											-	
3											-	
4											-	
5											-	
6											-	
7											-	
8											-	
9											-	
10											†55.8	(*)
11											47	
12											23	
13											12	
14											*6.4	
15											2.2	
16											.6	
17											.4	
18											.2	
19											.3	
20											0	
21											0	
22											0	
23											0	
24											0	
25											0	(*)
26											0	
27											*0	
28											0	
29											0	
30					------						0	
31		------			------		------		------		0	------
Total											-	0
Mean											-	0
Ac-ft											-	0

Calendar year : Max Min Mean Ac-ft
Water year : Max Min Mean Ac-ft

Peak discharge (base, 750 cfs).--No peak above base.

* Discharge measurement or observation of no flow made on this day.

† Result of discharge measurement.

Cheyenne River near Spencer, Wyo.

Location.--Lat 43°25', long 104°07', in sec. 24, T. 40 N., R. 61 W., on right bank about 1½ miles downstream from Robbers Roost Creek, 7½ miles northeast of Spencer, and 30 miles south of Newcastle. Prior to Oct. 18, 1955, at site 2,100 ft downstream.

Drainage area.--5,270 sq mi, approximately.

Records available.--October 1948 to September 1956. Published as South Fork Cheyenne River near Spencer October 1949 to September 1951.

Gage.--Water-stage recorder. Prior to Aug. 22, 1948, wire-weight gage at bridge 2,500 ft downstream at datum 4.04 ft lower. Aug. 22, 1948, to Oct. 17, 1955, at site 2,100 ft downstream at datum 4.04 ft lower.

Average discharge.--8 years, 50.4 cfs (36,510 acre-ft per year).

Extremes.--Maximum discharge during year, 3,030 cfs June 18 (gage height, 4.85 ft); no flow for many days.

1948-56: Maximum discharge, 9,840 cfs June 28, 1952 (gage height, 8.6 ft, from floodmark); no flow for many days each year.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation above station (for details on adjudication of diversions, see Remarks for this station in WSP 1209). There are 5,400 small reservoirs above station used for storage of stock and irrigation water (total capacity, about 33,900 acre-ft).

Rating tables, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 31, June 21-25, June 29 to July 3, July 5)

Oct. 1 to Nov. 9		Nov. 10 to Sept. 30			
1.1	0	1.6	0	2.6	120
1.2	.3	1.7	.9	2.8	215
1.3	2.2	1.8	3.3	3.0	335
1.4	6.2	1.9	7.7	3.5	800
1.5	11	2.0	17	4.0	1,400
		2.5	92	4.5	2,250

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.1	0	0		0	8.0	1.9	*4.2	95	0	89	
2	9.1	0	0		0	9.0	2.6	3.3	72	*0	*500	
3	a7.0	0	0	(*)	0	10	3.3	3.3	*50	14	*112	
4	a5.5	*0	0		0	12	*4.6	3.1	40	26	31	
5	*4.2	0	0		0	15	*2.1	2.3	36	2.8	11	
6	a2.5	0	0		0	14	4.2	3.7	24	0	5.5	
7	1.2	*0	0		0	*12	2.8	4.6	*10	0	3.7	
8	1.6	0	0		0	14	3.3	3.1	11	0	*19	
9	1.4	*0	0		*0	10	4.6	*1.9	6.8	0	65	
10	1.2	.9	0		0	5.0	3.1	.9	4.6	0	62	(*)
11	.9	.8	0	(*)	0	2.2	2.6	.8	*3.3	0	33	
12	.7	.7	0		0	1.0	*2.1	.9	2.8	0	31	
13	*.3	.6	0		0	.5	1.6	4.2	2.1	0	*11	
14	.3	.5	*0		0	.3	.8	5.5	1.6	*0	11	
15	.3	.5	0		0	*.1	.9	4.2	1.1	0	*5.5	
16	.2	.5	0		0	.4	.9	5.1	*.7	4.4	2.8	
17	.2	.4	0		0	1.5	.9	3.3	59	*0	.8	
18	.1	.4	0	(*)	0	5.0	.7	*2.1	*1,840	0	.7	
19	*.1	.4	0		0	18.0	.7	2.6	1,220	2.0	.7	
20	0	.3	0		0	*16	*.7	3.7	*363	1.2	.4	
21	0	.3	0		0	15	.6	3.3	180	0	.2	
22	0	*.3	2.1		0	*11	.8	*4.2	90	0	0	
23	.2	.2	3.6		0	*27	1.6	3.7	*43	*0	0	
24	.3	.2	2.1		*0	18	1.6	3.3	27	0	0	
25	.2	.2	10		0	13	*1.4	3.1	16	0	0	(*)
26	.1	.2	9.6		0	6.8	1.4	7.7	12	0	0	
27	.1	.1	8.6		*8.0	1.5	1.6	113	*7.7	0	*0	
28	0	.1	*2.2		7.9	.3	4.2	592	4.2	0	0	
29	.2	0	1.0		*7.8	*.4	4.6	1,020	1.4	0	0	
30	.1	0	.5	(*)	------	2.0	5.1	*446	.4	0	0	
31	.1	------	.2		------	1.9	------	*290	------	7.5	0	------
Total	47.2	7.6	39.9	0	23.7	250.9	67.3	2,549.1	4,224.7	57.9	995.3	0
Mean	1.52	0.25	1.29	0	0.82	8.09	2.24	82.2	141	1.87	32.1	0
Ac-ft	94	15	79	0	47	498	133	5,060	8,380	115	1,970	0

Calendar year 1955: Max 5,630 Min 0 Mean 125 Ac-ft 90,560
Water year 1955-56: Max 1,840 Min 0 Mean 22.6 Ac-ft 16,390

Peak discharge (base, 2,000 cfs).--June 18 (7 p.m.) 3,030 cfs (4.85 ft).
* Discharge measurement or observation of no flow made on this day.
a No gage-height record; discharge estimated on basis of typical recession.
Note.--Stage-discharge relation affected by ice Nov. 11-28, Dec. 28-31, Feb. 27 to Mar. 19, Mar. 27-30. Discharge computed from twice-daily wire-weight-gage readings Oct. 1, 2, 5, 7-31.

Beaver Creek near Newcastle, Wyo.

Location.--Lat 43°32'05", long 104°06'35", in NW¼ sec. 18, T. 41 N., R. 60 W., on right bank 1 mile downstream from Sheep Creek and 23 miles south of Newcastle.

Drainage area.--1,320 sq mi, approximately.

Records available.--February to September 1943, October 1944 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 3,650 ft (from topographic map). Prior to Nov. 1, 1945, wire-weight gage at same site and datum.

Average discharge.--12 years (1944-56), 25.7 cfs (18,610 acre-ft per year).

Extremes.--Maximum discharge during year, 653 cfs Feb. 25 (gage height, 9.67 ft, backwater from ice); no flow July 15, Aug. 22 to Sept. 30.

1943, 1944-56: Maximum discharge observed, 1,840 cfs Mar. 27, 1943 (gage height, 14.0 ft, from floodmark); no flow at times in 1943, 1945, 1950, 1952-56.

Remarks.--Records good except those for period of ice effect, which are poor. Diversions above station for irrigation (for details on adjudication of diversions, see Remarks for this station in WSP 1209). There are 1,350 small reservoirs above station used for storage of stock and irrigation water (total capacity, about 11,000 acre-ft). Records of water temperatures and suspended sediment loads for water year 1956 are given in WSP 1451.

Revisions (water years).--WSP 1209: 1943, 1946, 1948-49.

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 28)

1.5	0	2.5	34
1.6	.3	3.0	72
1.7	1.2	3.5	126
1.8	3.1	4.0	194
2.0	9.1	4.5	265
2.2	17		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8.5	1.3	6.3	13	8.0	80	12	*4.3	53	2.0	1.8	
2	4.3	1.2	5.5	14	10	90	7.9	1.8	15	1.5	8.2	
3	3.1	*1.1	5.0	*15	12	100	7.6	1.3	*7.6	*1.2	3.7	
4	1.8	1.0	5.3	15	14	110	5.7	1.1	4.8	1.8	*2.0	
5	*1.6	1.1	5.7	16	16	100	*1.5	1.0	2.6	111	.9	
6	1.8	1.1	6.0	15	18	95	*1.6	2.0	3.7	50	.4	
7	1.6	1.1	*6.3	14	20	*85	1.8	1.8	*3.7	15	.3	
8	1.5	1.0	6.2	12	22	90	25	.9	3.7	7.2	*8.6	
9	1.3	*.9	6.0	11	*23	*40	17	*.8	3.4	2.2	1.2	
10	1.3	3.0	6.2	9.5	25	25	11	.8	2.6	.9	.7	(*)
11	1.3	7.2	6.0	*8.7	25	10	6.6	.7	*2.0	.2	.5	
12	1.3	6.0	6.5	8.5	25	4.0	*5.4	1.0	*1.5	.3	49	
13	*1.5	5.5	6.2	8.0	24	4.5	5.4	32	1.3	.1	*62	
14	1.6	4.5	*5.9	7.5	20	5.0	4.8	6.9	1.1	*.1	11	
15	1.8	4.0	5.6	6.0	17	*5.2	3.4	1.5	.8	0	*3.4	
16	1.8	4.5	5.9	5.0	*15	*15	3.1	.9	*1.8	15	.9	
17	1.8	5.0	5.5	7.0	13	15	2.4	1.6	*2.9	*18	.6	
18	2.0	5.5	5.0	*8.3	15	20	1.8	*1.2	4.6	126	.7	
19	2.0	5.7	4.5	9.0	20	*190	1.8	1.2	5.7	42	.4	
20	2.2	6.0	5.0	10	25	*380	*1.3	.8	4.3	11	.2	
21	2.2	*6.2	6.0	11	30	175	1.1	.6	19	4.6	.1	
22	2.2	6.1	10	12	38	*140	.9	*4.5	14	1.1	0	
23	2.6	6.0	20	13	50	*150	1.0	10	5.7	*1.0	0	
24	2.6	5.8	40	14	*250	100	.9	2.0	2.4	.6	0	
25	2.9	6.1	100	15	*370	71	*.9	.7	1.6	.6	0	
26	3.1	5.5	200	16	480	63	.8	1.5	1.3	.8	0	
27	2.2	5.0	100	17	*450	56	.7	15	*54	.5	*0	(*)
28	3.7	5.4	*35	16	200	34	1.0	232	32	.2	0	
29	4.3	5.8	11	15	*125	*18	1.2	*87	12	.3	0	
30	2.2	6.0	10	*13	------	18	2.4	25	5.4	*.3	0	
31	1.5	------	11	11	------	15	------	38	------	.7	0	------
Total	73.6	124.6	657.6	365.5	2,360.0	2,303.7	138.0	479.9	273.5	416.2	156.6	0
Mean	2.37	4.15	21.2	11.8	81.4	74.3	4.60	15.5	9.12	13.4	5.05	0
Ac-ft	146	247	1,300	725	4,680	4,570	274	952	542	826	311	0

Calendar year 1955:	Max	1,260	Min	0.3	Mean	35.3	Ac-ft	25,530
Water year 1955-56:	Max	480	Min	0	Mean	20.1	Ac-ft	14,570

Peak discharge (base, 500 cfs).--Feb. 25 (8:30 a.m.) 653 cfs (9.67 ft); Mar. 20 (5 a.m.) 532 cfs (8.88 ft); May 28 (5 a.m.) 586 cfs (6.90 ft).

* Discharge measurement or observation of no flow made on this day.

Note.--Stage-discharge relation affected by ice Nov. 13 to Mar. 24.

Cheyenne River at Edgemont, S. Dak.

Location.--Lat 43°18'20", long 103°49'15", in SW¼SE¼SE¼ sec. 36, T. 8 S., R. 2 E., near right bank on downstream side of pier of bridge on U. S. Highway 18 at Edgemont, 300 ft downstream from Chicago, Burlington & Quincy Railroad bridge and 600 ft upstream from Cottonwood Creek.

Drainage area.--7,143 sq mi.

Records available.--June 1903 to November 1906 (no winter records), April 1928 to February 1933, October 1946 to September 1956.

Gage.--Water-stage recorder supplementary wire-weight gage read once daily. Datum of gage is 3,416.56 ft above mean sea level, datum of 1929. June 7, 1903, to May 16, 1905, staff gage and May 17, 1905, to Nov. 30, 1906, chain gage attached to former highway bridge, about 20 ft upstream at datum 2.7 ft lower. Apr. 11, 1928, to Feb. 28, 1933, chain gage and Oct. 4, 1946, to Oct. 23, 1947, wire-weight gage, at present site and datum.

Average discharge.--14 years (1928-32, 1946-56), 113 cfs (81,810 acre-ft per year); median of yearly mean discharges, 95 cfs (68,800 acre-ft per year).

Extremes.--Maximum discharge during year, 2,820 cfs June 19 (gage height, 4.12 ft); no flow for many days.

1903-6, 1928-33, 1946-56: Maximum discharge, 13,000 cfs July 30, 1905 (gage height, 8.5 ft, present datum); no flow for many days.

Maximum stage known, 12.0 ft May 1, 1922 (present datum), from floodmarks at railroad bridge. Flood of May 12, 1920, reached a stage of 11.0 ft (present datum), from floodmarks at railroad bridge.

Remarks.--Records fair except those for periods of ice effect, which are poor. A few small diversions above station for irrigation.

Revisions (water years).--WSP 1086: Drainage area. WSP 1116: 1947.

Rating tables, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 18, 19)

Oct. 1 to May 29

0.64	0	1.2	26
.7	.4	1.4	59
.8	1.6	1.6	111
.9	4.5	2.0	270
1.0	9	2.5	540
1.1	15		

Note.--Same as following table above 2.5 ft.

May 30 to Sept. 30

0.94	0	1.6	65
1.0	.3	1.8	150
1.1	1.8	2.0	242
1.2	4.4	2.5	540
1.3	8	3.0	950
1.4	16	4.0	2,100
1.5	32		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	25	0.9	0.2	16	3	200	18	7	233	1.5	13	
2	18	1.0	.2	14	4	100	14	8	218	.2	268	
3	9	1.0	.2	14	5	80	16	*8	137	*.7	309	
4	7	1.0	.2	*14	10	279	17	7	90	.7	79	
5	4.5	1.0	.2	16	15	540	16	7	65	4.7	6	
6	3.8	1.0	.2	14	20	167	9	14	45	40	2.0	(*)
7	3.5	1.0	*.2	12	20	73	9	16	20	26	.5	
8	4.2	1.0	.2	10	15	172	12	15	11	4.4	1.1	
9	3.2	*1.0	.2	10	10	*204	*20	13	11	2.8	1.8	
10	2.1	1.6	.2	10	9	125	26	6	6	1.6	46	
11	1.2	2.6	.2	10	10	35	15	3.2	*6	1.4	24	
12	.9	1.2	.2	12	20	25	12	2.4	2.8	1.0	24	
13	.6	1	.2	10	25	20	10	16	2.6	1.0	19	
14	.4	1	.2	9	20	20	6	57	2.8	.1	*53	
15	.4	1	.1	8	15	20	2.4	24	2.6	0	10	
16	.3	.5	.1	5	15	25	2.9	20	5	23	5	
17	*.4	.5	.1	6	10	26	4.2	10	4.8	21	3.0	
18	.3	.5	.1	6	10	40	3.2	8	*1,180	14	2.0	
19	.3	1	.1	6	10	*77	2.6	4.5	*1,860	73	1.8	
20	.3	3	.2	6	10	182	2.9	4.5	537	13	1.2	
21	.4	5	.5	6	15	340	3.2	*4.2	242	6	.5	
22	.8	5	2	6	20	200	3.2	6	141	1.4	.2	
23	.6	4	50	5	25	142	3.2	4.8	86	.3	0	
24	1.0	3.5	80	5	30	128	4.2	6	32	0	0	(*)
25	1.0	3	90	5	40	96	3.5	3.8	16	*.2	0	
26	.6	2	120	5	100	66	3.2	3.5	8	.1	0	
27	.6	1	270	5	*750	54	3.2	13	5	0	0	
28	.6	.5	130	5	400	52	3.8	422	12	0	0	
29	.8	.3	50	4	300	101	3.8	*1,270	6	0	0	
30	1.4	.2	20	4	------	28	4.8	*487	6	0	*0	
31	1.4	------	14	*4	------	23	------	345	------	.2	0	------
Total	94.6	47.3	830.0	262	1,936	3,640	254.3	2,815.9	4,993.6	243.3	870.1	0
Mean	3.05	1.58	26.8	8.5	66.8	117	8.48	90.8	166	7.85	28.1	0
Ac-ft	188	94	1,650	520	3,840	7,220	504	5,590	9,900	483	1,730	0

Calendar year 1955: Max 4,380	Min 0	Mean 147	Ac-ft 106,500
Water year 1955-56: Max 1,860	Min 0	Mean 43.7	Ac-ft 31,720

Peak discharge (base, 1,500 cfs).--May 29 (8:30 a.m.) 1,560 cfs (3.56 ft); June 19 (3 a.m.) 2,820 cfs (4.12 ft).

* Discharge measurement or observation of no flow made on this day.

Note.--Stage-discharge relation affected by ice Nov. 13 to Mar. 3, Mar. 12-16. Discharge computed from water-stage recorder record Oct. 26-29, Nov. 3-9, 12, 16-18, Mar. 21, 24-27, Mar. 30 to Apr. 3, Apr. 10, 30, May 11-15, 26, July 26 to Sept. 30; discharge for remainder of the year computed from once-daily wire-weight-gage readings and partial recorder record.

Hat Creek near Edgemont, S. Dak.

Location.--Lat 43°14'46", long 103°35'14", in SW¼SE¼SE¼ sec. 24, T. 9 S., R. 4 E., on left bank at downstream side of bridge on State Highway 87, 2 miles upstream from mouth, 2 miles west of Heppner, and 12½ miles southeast of Edgemont.

Drainage area.--1,044 sq mi.

Records available.--April 1905 to July 1906, October 1950 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 3,295.71 ft above mean sea level, datum of 1929. Apr. 8, 1905, to May 2, 1906, staff gage at site about 1,000 ft downstream at different datum. May 3 to July 7, 1906, staff gage at site three-quarters of a mile upstream at different datum. Nov. 6, 1950, to May 1, 1951, wire-weight gage at present site and datum.

Average discharge.--6 years (1950-56), 19.6 cfs (14,190 acre-ft per year).

Extremes.--Maximum discharge during year, 628 cfs June 18 (gage height, 5.84 ft); maximum gage height, 6.64 ft Dec. 24 (backwater from ice); no flow for many days.

1905-6, 1950-56: Maximum discharge, 9,430 cfs May 23, 1954 (gage height, 11.98 ft), from rating curve extended above 2,600 cfs on basis of slope-area determination of peak flow; no flow for many days each year.

Revisions.--The maximum discharge for the water year 1955 has been revised to 3,170 cfs Aug. 12, 1955 (gage height, 9.68 ft), superseding figure published in WSP 1389.

Remarks.--Records poor prior to May 30, good thereafter. A few small diversions above station for irrigation.

Revisions.--Revised figures of discharge, in cubic feet per second, for high-water periods in the water year 1955, superseding those published in WSP 1389, are given herewith:

1955	
Aug. 12	1,330
13	646
Sept. 21	1,320

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
August 1955	2,121.0	1,330	0	68.4	4,210
September	2,103	1,320	0	70.1	4,170
Water year 1954-55	11,125.9	1,330	0	30.5	22,080

Revised peak discharge.--1954-55: Aug. 12 (4 p.m.) 3,170 cfs (9.68 ft); Sept. 21 (6 a.m.) 1,720 cfs (8.25 ft).

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	17	0.5	0.6	25	2.5	35	3	1	38	0.2	0.1	
2	14	.5	.4	25	2.5	30	2	26	22	.3	.1	
3	10	.5	.3	10	2.5	25	2	*15	16	*.3	58	
4	6	.5	.4	*6	2.5	15	2	*8	8	8	113	
5	4	.5	.7	4.0	2.8	12	1	*4	*2.4	6	.4	
6	3	.5	.9	4	3.4	10	1	8	3.5	2.2	.8	(*)
7	3	.5	*1.3	4	3.7	10	1	7	2.0	.4	.6	
8	3	.5	1.6	4	2.8	10	.8	3	1.4	186	23	
9	2	*.5	1.6	3	2.5	*10	*.6	2	.7	72	1.0	
10	2	.6	.9	3.1	2.5	8	.6	2	.4	1.4	.3	
11	1.5	.7	1.3	3.1	2.8	5	.6	2	*4.6	.2	.2	
12	1.5	.7	1.0	2.5	2.8	5	.5	2	3.8	.2	.2	
13	1.2	.8	.9	1.6	2.8	5	.5	2	2.9	.2	.2	
14	.8	.8	1.0	1.0	2.5	5	.5	2	2.6	.1	*.1	
15	.5	.8	1	.8	3.7	5	.5	2	2.0	.1	.1	
16	.3	.6	1	.9	3.1	5	.4	2	33	.2	.1	
17	*.2	.6	1	1	3.1	6	.4	2	99	.2	.1	(*)
18	.2	.6	.8	1	3.1	6	.4	2	*241	.2	.1	
19	.2	.7	.8	1	3.1	*6	.4	1	42	.2	.1	
20	.2	.9	1.5	1	3.4	6	.4	1	22	30	.1	
21	.3	.9	2.2	1.0	3.7	7	.4	*.5	14	.7	.1	
22	.3	.9	2.5	1.3	4.0	10	.4	.5	8	.2	.1	
23	.4	.7	10	1.0	4.6	30	.6	.5	5	.1	.1	
24	.4	1.0	190	1.0	4.3	20	.5	.5	3.5	.1	.1	
25	.4	1.0	100	.9	4.0	10	.5	.5	2.6	*.1	0	
26	.4	.9	40	1.6	4.0	8	.4	.7	2.2	.1	.1	
27	.4	1.0	35	1.0	*3.7	6	.4	145	1.1	.1	.1	
28	.4	.5	29	1.0	3.5	5	.5	150	.5	.1	.1	
29	.4	1.0	24	.6	5	5	.8	85	.2	0	.1	
30	.4	.9	22	.7	------	4	.8	*59	.2	.1	0	
31	.4	------	21	*1.6	------	4	------	95	------	.1	0	------
Total	74.8	21.1	494.7	113.7	94.9	328	23.9	631.2	584.6	310.1	199.4	0
Mean	2.41	0.70	16.0	3.67	3.27	10.6	0.80	20.4	19.5	10.0	6.43	0
Ac-ft	148	42	981	226	188	651	47	1,250	1,160	615	396	0

Calendar year 1955: Max 1,330 Min 0 Mean 32.1 Ac-ft 23,240
Water year 1955-56: Max 241 Min 0 Mean 7.86 Ac-ft 5,700

Peak discharge (base, 1,000 cfs).--No peak above base.

* Discharge measurement or observation of no flow made on this day.

Note.--Stage-discharge relation indefinite due to temporary dams and/or ice effect Oct. 2-16, Oct. 25 to Nov. 8, Dec. 15-20, 24, Jan. 3, 6-9, 17-20, Feb. 1-3, Feb. 28 to May 29; discharge computed on basis of 14 discharge measurements, gage heights, weather records, observer's and engineers' notes, and records for nearby stations (once-daily wire-weight-gage readings used Dec. 27-31, Jan. 3, 4, May 27-29).

Cheyenne River near Hot Springs, S. Dak.

Location.--Lat 43°18'19", long 103°33'43", in SE¼SE¼ sec. 31, T. 8 S., R. 5 E., near right bank on downstream side of bridge on State Highway 87, a quarter of a mile downstream from Cascade Creek and 10 miles southwest of Hot Springs.

Drainage area.--8,710 sq mi, approximately.

Records available.--September 1914 to September 1920, March 1943 to September 1956. Published as "near Cascade Springs" 1914-15.

Gage.--Water-stage recorder. Datum of gage is 3,190.89 ft above mean sea level, datum of 1929. Sept. 11, 1914, to Apr. 1, 1915, water-stage recorder and Apr. 2, 1915, to Sept. 30, 1920, staff gage, at site 3 miles downstream at different datum. Mar. 1, 1943, to June 17, 1954, wire-weight gage at present site and datum.

Average discharge.--19 years, 308 cfs (223,000 acre-ft per year); median of yearly mean discharges, 160 cfs (116,000 acre-ft per year).

Extremes.--Maximum discharge during year, 2,870 cfs June 19 (gage height, 8.59 ft); minimum, 10 cfs July 24 to Aug. 2; minimum gage height, 4.83 ft Sept. 6-8.

1914-20, 1943-56: Maximum discharge, 114,000 cfs May 12, 1920 (gage height, 29.2 ft, from floodmarks, site and datum then in use), from rating curve extended above 19,000 cfs on basis of slope-area determination of peak flow; minimum observed, 2.8 cfs May 25, 26, 1947.

Remarks.--Records good. Some diversion above station for irrigation during summer months. Records of water temperatures and suspended sediment loads for the water year 1956 are given in WSP 1451.

Revisions (water years).--WSP 976: 1920, drainage area. WSP 1339: 1953.

Rating tables, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Dec. 24, Feb. 27 to Mar. 1, Mar. 21, 22, May 31, June 19, Sept. 2-9)

Oct. 1 to Dec. 24, June 1-19

5.0	9	6.5	535
5.2	30	7.0	925
5.5	79	8.0	1,920
5.8	157	9.0	3,260
6.1	285		

Dec. 25 to May 31, June 19 to Sept. 30

4.8	6	5.8	191
4.9	11	6.1	335
5.0	20	6.5	640
5.2	47	7.0	1,090
5.5	104	9.0	3,390

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	81	26	26	59	24	221	56	36	413	35	10	16
2	62	26	26	61	24	197	49	*38	240	*31	11	15
3	58	24	24	57	24	151	50	56	151	27	419	15
4	50	26	24	*54	22	198	46	42	103	24	221	15
5	40	21	26	56	24	283	46	36	87	25	76	15
6	36	18	26	52	25	203	42	38	68	25	36	*14
7	34	19	*26	52	27	113	34	42	52	40	30	14
8	36	*20	26	52	28	152	34	40	36	52	27	15
9	31	21	26	47	28	265	*35	31	28	47	25	16
10	30	23	26	44	30	122	41	27	22	28	16	15
11	29	24	26	41	38	41	59	22	*20	18	74	16
12	29	22	24	41	44	b40	49	19	23	16	50	17
13	28	27	26	44	44	b40	41	30	21	14	*42	17
14	28	26	24	42	44	b45	35	40	22	12	36	17
15	27	26	24	40	35	b55	31	76	24	11	53	17
16	24	24	23	42	44	83	27	55	34	12	24	21
17	*24	22	23	35	44	85	25	36	50	24	20	21
18	24	23	23	32	44	79	25	27	567	22	26	21
19	24	26	23	26	36	*75	24	19	*2,320	13	24	20
20	24	27	23	26	38	113	22	15	1,090	43	20	17
21	23	30	23	26	36	385	19	*15	498	38	18	14
22	23	31	24	26	36	*390	20	17	225	22	16	13
23	26	26	28	26	41	272	25	16	133	16	14	15
24	26	24	250	25	47	218	27	14	102	12	14	*15
25	26	24	351	24	49	166	24	12	77	*10	15	15
26	26	27	127	24	49	130	22	18	74	10	15	16
27	26	26	175	24	*193	89	21	66	59	10	14	16
28	27	24	248	24	*555	41	24	609	47	10	15	16
29	27	24	85	25	273	67	31	1,240	41	10	16	17
30	27	24	42	25	------	106	35	*1,120	54	10	15	18
31	26	------	58	*25	------	74	------	618	------	10	15	------
Total	1,002	731	1,906	1,177	1,946	4,499	1,019	4,470	6,681	677	1,407	489
Mean	32.3	24.4	61.5	38.0	67.1	145	34.0	144	223	21.8	45.4	16.3
Ac-ft	1,990	1,450	3,780	2,330	3,860	8,920	2,020	8,870	13,250	1,340	2,790	970

Calendar year 1955:	Max	4,260	Min	7	Mean	225	Ac-ft	163,000
Water year 1955-56:	Max	2,320	Min	10	Mean	71.0	Ac-ft	51,570

Peak discharge (base, 2,000 cfs).--June 19 (11 a.m.) 2,870 cfs (8.59 ft).
* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.
Note.--Discharge computed from graph based on once- or twice-daily wire-weight-gage readings Oct. 1, Nov. 12-30, Dec. 14, 15, 26-30, Jan. 16-18, Feb. 15-20, Feb. 28 to Mar. 20, Mar. 25 to Apr. 9, May 28-30, June 3-11, 22-25, Aug. 9, 10, Aug. 16 to Sept. 5.

Angostura Reservoir near Hot Springs, S. Dak.

Location.--Lat 43°20'35", long 103°26'15", at dam on Cheyenne River in SW¼NW¼ sec. 20, T. 8 S., R. 6 E., and 6½ miles southeast of Hot Springs.

Drainage area.--9,100 sq mi, approximately.

Records available.--October 1949 to September 1956.

Gage.--Reference point read once daily. Datum of gage is at mean sea level, datum of 1929.

Extremes.--Maximum contents observed during year, 136,100 acre-ft Oct. 1 (elevation, 3,187.14 ft); minimum observed, 71,110 acre-ft Sept. 30 (elevation, 3,171.40 ft). 1949-56: Maximum contents observed, 137,200 acre-ft May 20, 1955 (elevation, 3,187.37 ft); minimum observed since normal operating level was reached, that of Sept. 30, 1956.

Remarks.--Reservoir is formed by a rolled earth-fill dam with concrete overflow section; dam completed Dec. 7, 1949; storage began Oct. 3, 1949. Conservation capacity, 136,300 acre-ft between elevations 3,139.75 ft (bottom of power outlet) and 3,187.2 ft (top of outlet gates). Dead storage below elevation 3,139.75 ft, 23,830 acre-ft. Maximum pool elevation, 3,198.1 ft (capacity, 194,200 acre-ft). Figures given herein represent usable contents above elevation 3,139.75 ft. Water is stored for flood control, irrigation, and power generation. Diversions from reservoir for Angostura irrigation project (see table below).

Cooperation.--Elevations, capacity table, and records of diversion to Angostura project furnished by Bureau of Reclamation.

Month-end elevation and usable contents, and diversions, water year October 1955 to September 1956

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)	Diversions (acre-feet)
Sept. 30	3,187.17	136,200	-	-
Oct. 31	3,186.22	131,600	-4,600	1,353
Nov. 30	3,185.20	126,800	-4,800	-
Dec. 31	3,184.98	125,800	-1,000	-
Calendar year 1955	-	-	+48,880	-
Jan. 31	3,184.45	123,300	-2,500	-
Feb. 29	3,183.96	121,100	-2,200	-
Mar. 31	3,184.71	124,500	+3,400	-
Apr. 30	3,183.85	120,600	-3,900	607
May 31	3,182.54	114,700	-5,900	5,614
June 30	3,183.00	116,700	+2,000	11,197
July 31	3,178.49	97,490	-19,210	17,389
Aug. 31	3,174.78	83,080	-14,410	14,845
Sept. 30	3,171.40	71,110	-11,970	10,683
Water year 1955-56	-	-	-65,090	61,688

Cheyenne River below Angostura Dam, S. Dak.

Location.--Lat 43°20'45", long 103°26'10, in NE¼NW¼NW¼ sec. 20, T. 8 S., R. 6 E., on right bank 800 ft downstream from Angostura Dam, 4¾ miles upstream from Fall River, and 6½ miles southeast of Hot Springs.

Drainage area.--9,100 sq mi, approximately.

Records available.--October 1945 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 3,058.02 ft above mean sea level (Bureau of Reclamation benchmark). Nov. 8, 1945, to Oct. 16, 1946, wire-weight gage and Oct. 17, 1946, to July 7, 1953, water-stage recorder, at site 4¾ miles downstream at different datum.

Extremes.--Maximum discharge during year, 186 cfs Sept. 4 (gage height, 5.38 ft); maximum gage height, 5.45 ft Nov. 28 (backwater from ice); minimum daily discharge, 0.5 cfs Sept. 16, 29, 30.

1945-56: Maximum discharge, 9,520 cfs June 22, 1947 (gage height, 9.45 ft, site and datum then in use), from rating curve extended above 3,100 cfs by logarithmic plotting; maximum gage height, 10.4 ft June 20, 1947, site and datum then in use (backwater from Fall River); no flow Oct. 9, 1949, to Feb. 5, 1950, Apr. 28, Aug. 26, 30, 1951.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Flow regulated by Angostura Reservoir (see preceding page). Diversion of 61,690 acre-ft for the water year 1956 at Angostura Dam 800 ft upstream, for use on Angostura irrigation project (see preceding page). Records of suspended sediment loads for the water years 1956 are given in WSP 1451.

Rating tables, water year 1955-56 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Dec. 19, May 15 to Aug. 2				Dec. 20 to May 14, Aug. 3 to Sept. 30			
4.0	1.0	4.5	31	3.95	0.4	4.5	31
4.1	3.7	5.0	98	4.0	.8	4.7	54
4.2	8	5.1	115	4.1	3.6	5.0	99
4.3	14			4.2	8	5.1	118
				4.3	14		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	68	102	102	2	98	102	1.6	108	54	2.0	32	1.9
2	10	102	102	2	106	102	104	*110	1.8	*53	34	2.2
3	66	103	101	*102	106	102	105	112	1.6	55	33	2.2
4	67	93	3	102	107	1.9	103	110	52	1.8	1.3	33
5	66	105	101	102	2.2	103	105	112	55	57	1.6	*31
6	64	3.2	*101	105	104	103	107	2.2	55	54	33	31
7	65	105	101	104	102	101	107	109	53	2.0	31	31
8	69	*105	100	1.6	107	102	1.9	110	52	2.0	32	.7
9	2.0	101	98	105	104	105	102	106	1.4	59	31	.6
10	63	103	100	104	104	103	*111	109	1.4	54	32	30
11	64	103	2.3	105	104	1.9	108	108	52	55	3.6	30
12	67	100	95	103	1.9	98	107	107	*55	55	3.2	33
13	66	2.9	102	102	107	103	107	1.9	53	55	*31	32
14	67	102	102	104	105	101	105	106	54	1.4	34	30
15	63	102	102	1.9	104	100	1.6	107	53	2.3	33	.6
16	2.6	102	102	105	104	101	107	107	2.3	54	32	.5
17	65	102	102	102	104	102	106	106	2.0	57	32	32
18	*66	103	2	104	106	1.9	107	106	54	56	1.1	30
19	66	103	102	105	2.2	98	106	105	54	58	1.1	31
20	65	3	102	101	102	*96	107	2.3	54	55	33	33
21	68	103	102	101	105	103	106	105	55	2.3	33	30
22	66	103	102	2.2	103	102	1.1	*105	54	2.0	34	.6
23	3.2	103	102	106	103	100	109	108	2.0	54	33	.6
24	69	102	102	105	100	100	106	106	2.0	58	32	30
25	65	100	2	104	103	1.3	107	100	54	54	1.9	*32
26	66	103	2	105	1.9	100	109	109	57	*52	1.9	31
27	64	2.6	102	106	*105	102	110	3.4	53	52	32	29
28	67	102	102	105	102	102	109	112	51	2.6	31	30
29	69	102	95	2.2	102	102	1.6	107	55	2.9	31	.5
30	2.6	102	102	*105	------	100	109	2.0	1.8	58	32	.5
31	67	------	102	105	------	103	------	106	------	57	33	------
Total	1,738.4	2,667.7	2,637.3	2,608.9	2,605.2	2,743.0	2,676.8	2,807.8	1,145.3	1,183.3	759.7	599.9
Mean	56.1	88.9	85.1	84.2	89.8	88.5	89.2	90.6	38.2	38.2	24.5	20.0
Ac-ft	3,450	5,290	5,230	5,170	5,170	5,440	5,310	5,570	2,270	2,350	1,510	1,190

Calendar year 1955:	Max	1,440	Min	0.8	Mean	84.8	Ac-ft	61,400
Water year 1955-56:	Max	112	Min	0.5	Mean	66.0	Ac-ft	48,000

* Discharge measurement made on this day.

Note.--No gage-height record Nov. 14-23, Nov. 28 to Dec. 6, Dec. 13 to Jan. 3; discharge estimated on basis of 2 discharge measurements, recorded range in stage, and powerplant records.

Fall River at Hot Springs, S. Dak.

Location.--Lat 43°25'50", long 103°28'35", in NW¼ sec. 24, T. 7 S., R. 5 E., on left bank 30 ft downstream from Seventh Street Bridge in Hot Springs and 6 miles upstream from mouth.

Drainage area.--137 sq mi.

Records available.--November 1937 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 3,413.20 ft above mean sea level, datum of 1929. Prior to June 2, 1939, wire-weight gage at site one block upstream at datum 3.00 ft higher.

Average discharge.--18 years (1938-56), 28.0 cfs (20,270 acre-ft per year).

Extremes.--Maximum discharge during year, 46 cfs May 26 (gage height, 2.25 ft); maximum gage height, 2.27 ft June 17; minimum discharge, 14 cfs July 6 (gage height, 2.07 ft); minimum gage height, 1.79 ft Jan. 4.

1937-56: Maximum discharge, 13,100 cfs Sept. 4, 1938 (gage height, 18.4 ft, site and datum then in use), from rating curve extended above 51 cfs on basis of weir formula and slope-area determination of peak flow; minimum, 4 cfs Sept. 23, 1940.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Diversions above station for water supply of town of Hot Springs. Slight regulation caused by hydroelectric plant, bath houses, and sanitariums in Hot Springs.

Revisions (water years).--WSP 1279: 1938, 1941(M), 1947(M).

Rating tables, water year 1955-56 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Dec. 23 to Jan. 16, June 22 to July 4)

May 18 to Sept. 30, Oct. 1 to Nov. 18		Nov. 19 to May 18	
2.0	16	1.9	20
2.1	28	2.0	34
2.2	44		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	25	24	26	26	24	26	21	23	17	21	24	24
2	25	25	24	27	23	24	23	23	18	*21	21	21
3	25	25	24	*26	23	23	21	*23	22	20	21	22
4	26	26	26	27	24	23	20	23	24	20	20	24
5	27	26	24	26	24	21	21	23	25	20	18	*24
6	27	24	*23	26	24	23	20	27	25	17	21	25
7	27	24	23	26	26	23	20	26	24	16	21	24
8	27	*24	24	27	26	23	23	26	22	16	22	24
9	26	24	23	30	24	23	*23	26	22	16	21	24
10	26	22	23	32	24	21	24	26	18	17	22	24
11	26	22	23	29	24	21	23	26	*22	20	24	24
12	27	22	23	30	24	24	23	26	21	20	24	22
13	27	22	21	30	26	24	21	26	22	22	*24	25
14	26	22	23	29	26	24	21	24	22	22	22	25
15	26	22	23	29	26	24	23	21	24	22	24	26
16	26	21	23	30	26	23	21	20	22	24	24	26
17	*25	21	24	30	26	26	21	20	21	24	25	26
18	25	21	24	30	26	24	21	20	21	24	26	26
19	24	21	24	30	26	23	21	21	22	22	26	26
20	24	22	26	29	26	*24	20	22	22	22	26	25
21	24	23	26	29	24	24	21	*21	22	24	26	26
22	22	23	26	29	24	24	23	22	21	24	26	25
23	22	23	27	28	24	24	21	24	21	24	26	25
24	21	23	26	28	24	23	23	24	22	22	26	25
25	22	21	26	28	24	21	24	25	22	*22	27	*24
26	24	23	26	27	24	23	23	26	20	22	27	24
27	24	24	26	27	*24	23	23	26	20	24	27	24
28	24	23	26	27	26	23	23	25	20	24	27	25
29	24	23	26	26	24	21	23	18	20	24	27	25
30	24	24	26	*25	------	23	23	18	20	24	27	25
31	24	------	27	26	------	23	------	18	------	22	27	------
Total	772	690	762	869	716	719	658	719	644	662	749	735
Mean	24.9	23.0	24.6	28.0	24.7	23.2	21.9	23.2	21.5	21.4	24.2	24.5
Ac-ft	1,530	1,370	1,510	1,720	1,420	1,430	1,310	1,430	1,280	1,310	1,490	1,460

Calendar year 1955:	**Max** 64	Min	20	Mean	24.4	Ac-ft	17,640
Water year 1955-56:	**Max** 32	Min	16	Mean	23.8	Ac-ft	17,260

Peak discharge (base, 135 cfs).--No peak above base.

* Discharge measurement made on this day.

Note.--No gage-height record Nov. 13-22, Jan. 18-30, Apr. 27 to May 1; discharge estimated on basis of 1 discharge measurement, fragmentary gage heights, weather records, and engineers' and observers' notes.

Beaver Creek near Buffalo Gap, S. Dak.

Location.--Lat 43°28'00", long 103°18'20", in NE¼SE¼ sec. 5, T. 7 S., R. 7 E., on left bank 1½ miles south of Buffalo Gap and 4½ miles upstream from mouth.

Drainage area.--130 sq mi, approximately.

Records available.--November 1937 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 3,150 ft (from topographic map). Prior to June 20, 1939, staff or wire-weight gage at site three-quarters of a mile downstream at different datum.

Average discharge.--18 years (1938-56), 7.01 cfs (5,080 acre-ft per year).

Extremes.--Maximum discharge during year, 13 cfs Dec. 23 (gage height, 3.39 ft); maximum gage height, 3.73 ft Feb. 1 (backwater from ice); minimum discharge, 0.2 cfs July 28, 29, Aug. 6; minimum gage height, 2.60 ft Sept. 27.

1937-56: Maximum discharge, 11,700 cfs Sept. 4, 1938 (gage height, 16.46 ft, site and datum then in use), from rating curve extended above 11 cfs on basis of slope-area determination of peak flow; no flow at times during 1950, 1952, 1954-55.

Maximum stage known, 18.0 ft in 1927 (former site and datum), from information by local residents.

Remarks.--Records good except those for periods of ice effect, which are poor. Nearly all flow is diverted above station during irrigation season.

Revisions (water years).--WSP 956: 1941.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12	5	10	12	10	11	8	2.2	4.7	0.7	0.4	0.3
2	12	5	10	12	11	11	8	*3.9	3.9	*.8	.6	.3
3	12	5	9	*12	12	11	8	2.3	3.4	.8	.4	.4
4	12	5	9	12	12	11	7	1.0	3.5	1.0	.3	.4
5	12	6	9	12	12	10	10	.8	1.9	1.4	.3	*.5
6	12	7	*10	11	12	10	9	1.3	1.8	1.0	.2	.5
7	11	9	10	11	11	10	8	3.6	1.8	.7	.3	.4
8	11	*9	10	11	11	10	7	3.8	2.0	.4	.5	.4
9	11	9	10	11	11	*11	8	1.8	2.1	.5	.6	.4
10	10	9	10	11	11	10	*10	1.0	2.7	.7	.4	.4
11	6	9	10	11	11	10	10	.8	3.5	1.1	.7	.4
12	4.8	11	10	11	11	10	10	.8	*1.8	2.6	.6	.6
13	5	10	10	11	11	10	10	1.1	1.9	2.5	*.4	.5
14	3.7	10	10	12	11	11	10	1.0	1.9	2.6	.4	.5
15	3.7	10	10	11	11	11	10	.8	1.4	2.1	.3	.5
16	3.8	9	10	10	11	11	10	.7	1.8	2.6	.4	.5
17	2.7	9	10	10	10	11	9	.7	2.6	3.2	.4	.6
18	*2.3	10	9	11	11	12	7	.7	2.1	2.8	.6	.5
19	2.3	11	9	11	11	11	6	.7	2.1	1.5	.7	.6
20	1.9	12	10	11	11	*12	6	.7	2.3	1.3	.6	.6
21	2.4	12	11	11	11	12	4.8	.7	2.0	1.6	.6	.6
22	3.6	12	12	11	11	11	4.2	*.7	1.8	2.0	.5	.6
23	3.7	12	13	11	12	11	1.9	.6	1.9	2.6	.4	.6
24	3.8	12	12	11	12	11	2.0	.6	2.1	1.8	.4	.5
25	4.0	11	12	11	11	11	1.4	1.1	2.4	1.3	.4	*.4
26	4.8	10	12	11	11	11	1.2	1.3	1.8	*1.2	.3	.4
27	4.7	9	11	11	11	10	1.3	1.4	1.6	.4	.3	.4
28	4.7	9	12	11	*11	9	1.4	4.4	2.6	.2	.4	.4
29	4.5	9	11	11	11	9	1.8	4.7	1.7	.2	.3	.5
30	4.7	10	10	11	------	8	2.0	4.7	1.0	.3	.3	.5
31	4.7	------	10	*11	------	8	------	4.7	------	.3	.3	------
Total	196.8	276	321	345	323	325	193.0	54.6	68.1	42.2	13.3	14.2
Mean	6.35	9.2	10.4	11.1	11.1	10.5	6.43	1.76	2.27	1.36	0.43	0.47
Ac-ft	390	547	637	684	641	645	383	108	135	84	26	28

Calendar year 1955:	Max 313	Min 0.2	Mean 7.51	Ac-ft 5,430
Water year 1955-56:	Max 13	Min 0.2	Mean 5.93	Ac-ft 4,310

Peak discharge (base, 24 cfs).--No peak above base.

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 16-19, Nov. 27 to Dec. 6, Dec. 8-21, 30, 31, Jan. 16-19, Jan. 30 to Feb. 4, Feb. 16-19, Mar. 11-13.

Battle Creek at Hermosa, S. Dak.

Location.--Lat 43°49'45", long 103°11'15", in SW¼SW¼ sec. 32, T. 2 S., R. 8 E., on right bank 250 ft downstream from Chicago and North Western Railway bridge, three-quarters of a mile south of Hermosa, and 2½ miles downstream from Squaw Creek.

Drainage area.--178 sq mi.

Records available.--August to December 1903 (gage heights only), July 1949 to September 1956.

Gage.--Wire-weight gage read once daily; crest-stage indicator since Sept. 17, 1954. Altitude of gage is 3,290 ft (from topographic map). August to December 1903 staff gage at site 250 ft upstream at different datum. July 7, 1949, to Nov. 2, 1950, wire-weight gage at site half a mile upstream at different datum.

Average discharge.--7 years, 5.10 cfs (3,690 acre-ft per year).

Extremes.--Maximum discharge during year, 869 cfs July 2 (gage height, 7.90 ft); no flow Sept. 25-30.

1903, 1949-56: Maximum discharge, 2,950 cfs May 22, 1952 (gage height, 14.00 ft); no flow at times during 1954-56.

Remarks.--Records fair except those for period of ice effect, which are poor.

Rating tables, water year 1955-56 except period of ice effect (gage height, in feet, and discharge, in cubic feet per second) (Shifting-control method used Oct. 1 to Nov. 10, July 3, Aug. 26 to Sept. 30)

Oct. 1 to Mar. 15

0.75	0.1
.8	.2
.9	.7
1.0	1.9

Mar. 16 to Sept. 30

0.8	0	1.5	7
.9	.2	1.6	13
1.0	.4	1.8	33
1.1	.6	2.0	57
1.2	1.0	3.0	186
1.3	1.8	4.0	316
1.4	3.7		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.1	0.2	0.3	0.5	1.0	1.4	0.9	0.9	29	0.2	0.6	0.3
2	.1	.2	.3	.6	1.1	1.4	.9	*.9	21	*148	.8	.3
3	.1	.2	.2	.7	1.2	1.5	1.0	.9	20	*18	.8	.3
4	.1	.3	.3	*.8	1.3	1.5	1.0	.9	17	.6	14	.3
5	.1	.3	.3	.8	1.4	1.4	1.1	.9	4.3	.5	1.2	*.3
6	.1	.3	*.4	.7	1.4	1.3	1.0	.9	.9	.5	.7	.3
7	.1	.3	.4	.7	1.4	1.3	1.0	.9	.9	.5	28	.3
8	.1	.3	.3	.8	1.3	1.4	1.0	.9	.7	.5	14	.3
9	.1	*.3	.3	.9	1.2	1.4	1.0	.9	.7	.5	29	.3
10	.1	.3	.2	.9	1.3	1.3	*1.2	.9	.7	.5	2.0	.2
11	.1	.2	.2	.9	1.3	1.2	.9	1.9	.7	.5	1.0	.2
12	.1	.2	.3	.9	1.2	1.1	.9	1.0	*.7	.7	.9	.2
13	.1	.2	.3	1.0	1.1	1.1	.8	.9	.9	.6	.8	.2
14	.1	.2	.3	.9	1.1	1.0	.8	.8	1.0	.6	*.6	.2
15	.1	.2	.2	.8	1.1	1.0	.8	.8	1.1	.5	.7	.2
16	.1	.2	.3	.7	1.0	1.1	.9	.8	1.1	.5	.7	.1
17	.1	.2	.3	.8	1.0	1.2	.8	.8	.4	.5	.7	.1
18	*.1	.3	.2	.9	1.0	1.7	.8	.8	.4	.4	.7	.1
19	.1	.4	.2	1.0	1.1	2.8	.8	.8	.2	.4	.7	.1
20	.1	.4	.2	.9	1.2	2.8	.8	.9	.2	.4	.6	.1
21	.1	.4	.3	.9	1.1	2.6	.8	198	.2	.4	.6	.1
22	.1	.3	.4	1.0	1.2	2.8	.8	*47	.2	.4	.5	.1
23	.1	.1	.5	1.0	1.3	*2.4	.9	*6	.1	.4	.4	.1
24	.1	.1	.5	1.1	1.3	2.4	.8	8	.1	.4	.3	.1
25	.1	.2	.4	1.2	1.2	1.8	.9	4.5	.2	.4	.3	*0
26	.1	.2	.4	1.1	1.2	1.7	.9	4.3	.2	*.3	.3	0
27	.1	.1	.4	1.1	1.3	1.2	1.2	3.7	.2	1.6	.3	0
28	.1	.1	.3	1.1	*1.3	.9	1.4	67	.2	.7	.3	0
29	.1	.1	.3	1.0	1.4	.9	1.2	45	.3	.7	.3	0
30	.1	.1	.3	1.0	------	1.0	1.0	34	.3	.6	.3	0
31	.1	------	.4	*1.0	------	.9	------	32	------	.6	.3	------
Total	3.1	6.9	9.7	27.7	35.0	47.5	28.3	467.1	103.9	181.4	102.4	4.8
Mean	0.10	0.23	0.31	0.89	1.21	1.53	0.94	15.1	3.46	5.85	3.30	0.16
Ac-ft	6.1	14	19	55	69	94	56	926	206	360	203	9.5

Calendar year 1955: Max	13	Min	0	Mean	0.79	Ac-ft	575
Water year 1955-56: Max	198	Min	0	Mean	2.78	Ac-ft	2,020

* Discharge measurement or observation of no flow made on this day.

Note.--Stage-discharge relation affected by ice Nov. 11 to Mar. 15 (no gage-height record Nov. 15-22, Nov. 28 to Dec. 20, Jan. 15 to Feb. 9; discharge estimated on basis of 2 discharge measurements, weather records, engineers' and observers' notes).

Spring Creek near Hermosa, S. Dak.

Location.--Lat 43°56'35", long 103°09'10", in SE¼SE¼SE¼ sec. 21, T. 1 S., R. 8 E., on right bank 150 ft upstream from highway bridge, a quarter of a mile upstream from Chicago and North Western Railway bridge, and 7½ miles north of Hermosa.

Drainage area.--199 sq mi.

Records available.--July 1949 to September 1956.

Gage.--Staff gage read once daily; crest-stage indicator since Sept. 17, 1954. Altitude of gage is 3,275 ft (from topographic map).

Average discharge.--7 years, 1.68 cfs (1,220 acre-ft per year).

Extremes.--Maximum discharge during year, 3.8 cfs July 3 (gage height, 0.80 ft, from graph based on gage readings); no flow for many days.
1949-56: Maximum discharge, 580 cfs May 23, 1952 (gage height, 4.56 ft), from rating curve extended above 110 cfs by logarithmic plotting; no flow for many days during most years.

Remarks.--Records fair except those for period of ice effect, which are poor. Considerable loss in sinkholes in reach 10 to 15 miles above station. Flow regulated by Lake Sheridan (capacity, 12,657 acre-ft), 24 miles above station.

Revisions (water years).--WSP 1279: 1950.

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used July 2-4)

0.25	0	0.7	3.8
.3	.1	.8	6
.4	.6	.9	9
.5	1.4	1.0	14
.6	2.4		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			0	0	0	0.1	0	0.3		0		
2			0	0	0	.1	0	*.1		.2		
3			0	*0	0	.1	0	.3		*1.3		
4			0	.1	0	.1	0	.3		.2		
5			0	.1	0	0	0	.3		0		
6			*0	0	0	0	0	.1		0		
7			0	0	0	0	0	.1		0		
8			0	0	0	0	0	0		0		
9		(*)	0	0	0	0	0	0		0		
10			0	0	.1	0	*0	0		0		
11			0	0	.1	0	0	0		0		
12			0	0	.1	0	0	0		0		
13			0	0	.1	0	0	.1		0		
14			0	0	.2	0	0	.3		0	(*)	
15			0	0	.2	0	0	.3		0		
16			0	0	.1	0	0	.1		0		
17			0	0	0	0	0	0		0		
18	(*)		0	0	0	0	0	0		0		
19			0	0	0	.1	0	0		0		
20			0	0	0	.1	0	0		0		
21			0	0	0	.1	0	0		0		
22			.1	0	0	.1	0	*0		0		
23			.1	0	.1	*.1	0	0		0		
24			.1	0	0	.2	0	0		0		
25			.1	0	0	.2	0	0		0		(*)
26			0	0	0	.1	0	0		0		
27			0	0	*.1	0	0	.1		0		
28			0	0	.1	0	.1	.3		0		
29			0	0	.1	0	.2	.3		0		
30			0	0	------	0	.2	.3		0		
31		------	0	*0	------	0	------	.1	------	0		------
Total	0	0	0.4	0.2	1.3	1.4	0.5	3.4	0	1.7	0	0
Mean	0	0	0.01	0.01	0.04	0.05	0.02	0.11	0	0.05	0	0
Ac-ft	0	0	0.8	0.4	2.6	2.8	1.0	6.7	0	3.4	0	0

Calendar year 1955:	Max	0.5	Min	0	Mean	0.09	Ac-ft	63
Water year 1955-56:	Max	1.3	Min	0	Mean	0.02	Ac-ft	18

* Discharge measurement or observation of no flow made on this day.

Note.--Stage-discharge relation affected by ice Dec. 6 to Mar. 26 (no gage-height record Feb. 19 to Mar. 26; discharge estimated on the basis of 2 discharge measurements, weather records, and records for nearby stations).

Castle Creek above Deerfield Reservoir, near Hill City, S. Dak.

Location.--Lat 44°00'50", long 103°49'25", in SW¼ sec. 25, T. 1 N., R. 2 E., on right bank 50 ft downstream from highway bridge, 250 ft downstream from South Fork Castle Creek, 600 ft upstream from high-water line of Deerfield Reservoir, 2½ miles southwest of Deerfield Dam, and 14 miles northwest of Hill City.

Drainage area.--83 sq mi, approximately.

Records available.--June 1948 to September 1956. 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 (from reservoir elevation). Prior to Aug. 31, 1948, staff gage at site 50 ft upstream at datum 2.05 ft higher.

Average discharge.--8 years, 8.96 cfs (6,490 acre-ft per year).

Extremes.--Maximum discharge during year, 32 cfs May 28 (gage height, 2.30 ft); maximum gage height, 3.25 ft Mar. 24 (backwater from ice); minimum daily discharge, 4 cfs for many days; minimum gage height, 1.41 ft Jan. 14.

1948-56: Maximum discharge, 615 cfs May 22, 1952 (gage height, 5.81 ft); minimum, 3.1 cfs Feb. 19, 1954; minimum gage height, 1.35 ft Nov. 12, 1949, Feb. 19, 1954.

Remarks.--Records excellent except those for periods of ice effect, which are fair.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.4	3.2	2.2	27
1.5	4.8	2.5	41
1.7	9.0	3.0	70
1.9	15		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.9	*6	5	7	4	5	12	13	13	7.9	6.9	6.7
2	6.9	6	5	7	5	5	11	13	13	9.9	6.9	6.5
3	6.9	7	5	7	5	5	11	13	12	9.8	6.7	6.5
4	6.9	7.6	5	7	6	5.0	10	15	12	7.8	6.5	6.5
5	6.9	7.4	4	7	6	4.8	9	14	12	7.6	6.1	6.5
6	7.2	7	5	6	7	4.6	8	13	10	*7.2	5.9	6.5
7	6.9	7	5	7	7	4.5	8	13	8.8	9.2	6.1	6.5
8	6.9	7	5	7	6	5.2	9	*14	8.3	7.6	6.3	6.5
9	6.9	7	5	6	6	5.0	10	14	8.3	7.4	6.1	6.3
10	*6.7	7	5	6	6	4.8	11	14	8.5	7.2	6.1	6.1
11	6.7	6	5	6	6	4.8	12	13	8.5	6.7	6.7	*5.9
12	6.7	5	6	7	6	4.8	12	14	8.3	7.2	6.7	5.9
13	6.7	5	6	7	6	5.0	14	16	8.3	6.5	6.3	5.9
14	6.7	5	5	6	5	5.0	14	16	9.0	6.5	6.1	5.9
15	6.7	4	5	5	5	5.0	16	14	8.3	6.5	6.1	5.8
16	6.7	4	6	5	5	4.8	*15	13	9.9	8.5	6.3	5.8
17	6.7	4	6	5	5	5.0	13	12	9.0	7.4	7.4	5.8
18	6.7	5	6	6	5	5.2	13	12	12	6.9	7.8	5.8
19	6.7	6	6	6	5	6	12	12	9.3	6.7	7.2	5.8
20	6.7	7	7	6	*6	7	12	12	8.3	6.5	6.9	5.8
21	6.7	7	7	5	7	8	12	13	*6.9	6.3	*6.3	5.8
22	6.9	7	7	5	8	9	12	12	6.5	6.7	6.1	5.6
23	7.2	6	13	*5	8	*9	12	11	6.5	6.3	6.1	5.6
24	6.9	6	16	5	7	10	12	10	6.7	6.1	6.1	5.6
25	7.2	6	11	5	6	10	12	9.6	7.2	6.1	6.3	5.6
26	6.9	7	7	5	5	10	12	10	6.9	6.1	6.3	5.6
27	6.9	6	7	5	5	11	15	12	6.3	7.2	6.3	5.6
28	6.5	5	6	5	5	10	13	22	6.1	7.2	6.3	5.4
29	6.7	*4	5	4	5	9	13	16	6.1	7.6	6.3	5.8
30	7	4	*6	4	------	10	13	15	6.1	*8.1	6.5	5.8
31	6.9	------	7	4	------	10	------	*13	------	7.2	7.2	------
Total	211.9	178.0	199	178	168	207.5	358	413.6	262.1	225.9	200.9	179.4
Mean	6.84	5.93	6.4	5.7	5.8	6.69	11.9	13.3	8.74	7.29	6.48	5.98
Ac-ft	420	353	395	353	333	412	710	820	520	448	398	356

Calendar year 1955: Max 40 Min 4 Mean 8.49 Ac-ft 6,150
Water year 1955-56: Max 22 Min 4 Mean 7.60 Ac-ft 5,520

Peak discharge (base, 50 cfs).--No peak above base.

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 30, Nov. 1-3, Nov. 6 to Mar. 3, Mar. 19 to Apr. 10.

Deerfield Reservoir near Hill City, S. Dak.

Location.--Lat 44°01'50", long 103°46'50", at dam on Castle Creek in NE¼SW¼ sec. 20, T. 1 N., R. 3 E., 1,300 ft upstream from Dutchman Creek and 12½ miles northwest of Hill City.

Drainage area.--95 sq mi, approximately.

Records available.--June 1947 to September 1956. Five elevations were obtained during period December 1945 to March 1946. Prior to October 1953, published as "near Deerfield."

Gage.--Staff gage read once daily May 1 to Nov. 1 and about once weekly during other periods. Datum of gage is at mean sea level, datum of 1929 (levels by Bureau of Reclamation).

Extremes.--Maximum contents observed during year, 11,940 acre-ft May 24 (elevation, 5,899.50 ft); minimum observed, 7,880 acre-ft Sept. 30 (elevation, 5,887.12 ft).
1947-56: Maximum contents observed, 15,340 acre-ft May 22, 1952 (elevation, 5,908.50 ft), from capacity table extended above elevation 5,908.00 ft (crest of spillway); minimum observed, that of Sept. 30, 1956.

Remarks.--Reservoir is formed by earth-fill dam; dam completed Nov. 1, 1945; storage began Dec. 3, 1945. Usable capacity, 15,143 acre-ft between elevations 5,839 ft (lowest outlet) and 5,908 ft (crest of spillway) above mean sea level. Dead storage below elevation 5,839 ft, 575 acre-ft. Figures given herein represent contents above elevation 5,839 ft. Water is used to supplement city water for Rapid City, S. Dak., and supply for irrigation in Rapid Creek basin below Rapid City.

Cooperation.--Records of elevations and capacity table furnished by Bureau of Reclamation.

Revisions (water years).--WSP 1176: 1949 (maximum contents).

Month-end elevation and usable contents, water year October 1955 to September 1956

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept.30	5,889.38	8,600	-
Oct. 31	5,889.80	8,740	+140
Nov. 30	5,890.72	9,030	+290
Dec. 31	5,891.74	9,350	+320
Calendar year 1955	-	-	-610
Jan. 31	5,892.92	9,720	+370
Feb. 29	5,893.72	9,970	+250
Mar. 31	5,895.70	10,620	+650
Apr. 30	5,897.86	11,370	+750
May 31	5,899.36	11,900	+530
June 30	5,896.46	10,880	-1,020
July 31	5,892.42	9,560	-1,320
Aug. 31	5,888.52	8,330	-1,230
Sept.30	5,887.12	7,880	-450
Water year 1955-56	-	-	-720

Castle Creek below Deerfield Dam, S. Dak.

Location.--Lat 44°01'50", long 103°46'35", in NW¼SE¼ sec. 20, T. 1 N., R. 3 E., on right bank at downstream side of highway bridge, 500 ft upstream from Dutchman Creek, 800 ft downstream from Deerfield Dam, and 12½ miles northwest of Hill City.

Drainage area.--96 sq mi, approximately.

Records available.--July 1946 to September 1956.

Gage.--Water-stage recorder and grouted rock control. Altitude of gage is 5,805 ft (from topographic map). Prior to Oct. 15, 1947, water-stage recorder at site 700 ft downstream at datum 3.77 ft lower. Oct. 15, 1947, to Sept. 1, 1948, water-stage recorder at site 850 ft downstream at datum 5.77 ft lower.

Average discharge.--10 years, 9.56 cfs (6,920 acre-ft per year).

Extremes.--Maximum discharge during year, 53 cfs Aug. 3 (gage height, 2.68 ft); minimum daily, 1.8 cfs Nov. 29 to Dec. 1.

1946-56: Maximum daily discharge, 200 cfs May 22, 1952; maximum gage height, 3.87 ft May 23, 1952 (backwater from spillway overflow); no flow Sept. 9, 1948.

Remarks.--Records excellent except those for period of no gage-height record, which are good. Flow regulated by Deerfield Reservoir (see preceding page).

Rating tables, water year 1955-56 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 20				Mar. 21 to Sept. 30			
1.1	1.1	1.7	10	1.2	1.5	1.7	10
1.2	1.9	2.0	20	1.3	2.5	2.0	20
1.4	4.2			1.5	5.7	3.0	70

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.8	*2.6	1.8	2.3	2.6	3.3	2.9	2.3	2.1	34	37	7.8
2	7.8	2.6	1.9	2.3	2.6	3.3	3.1	2.3	2.1	34	40	7.8
3	7.8	2.6	1.9	2.3	2.6	3.3	3.1	2.3	2.1	37	47	7.8
4	7.8	2.5	1.9	2.3	2.7	3.4	3.1	2.2	2.2	40	52	7.6
5	7.8	2.5	1.9	2.3	2.8	3.3	3.2	2.2	2.2	40	52	7.2
6	4.7	2.5	1.9	2.3	2.8	3.3	3.2	2.2	13	*31	50	7.2
7	2.7	2.5	1.9	2.4	3.0	3.3	3.3	2.2	20	24	34	6.8
8	2.7	2.4	2.0	2.4	3.0	3.3	3.3	*2.2	22	24	20	6.3
9	2.8	2.4	2.0	2.4	3.0	3.3	3.3	2.2	35	24	20	6.3
10	*2.7	2.4	2.0	2.4	3.0	3.3	3.3	2.2	45	24	13	6.5
11	2.7	2.4	2.0	2.4	3.0	3.2	3.3	2.2	*44	25	7.2	*6.5
12	2.7	2.3	2.0	2.4	3.0	3.2	3.3	2.2	44	25	7.2	*6.8
13	2.7	2.3	2.0	2.4	3.2	3.2	3.3	2.2	45	34	7.2	6.8
14	2.7	2.3	2.1	2.4	a3	3.3	3.3	2.2	45	41	7.2	6.8
15	2.7	2.3	2.0	2.5	a3	3.2	3.3	2.2	45	41	7.2	6.8
16	2.7	2.2	2.0	2.5	a3	3.0	*2.7	2.2	38	41	7.2	6.8
17	2.6	2.2	2.0	2.5	a3	3.0	2.4	2.2	27	37	7.2	6.8
18	2.5	2.2	2.0	2.5	a3	3.0	2.4	2.1	27	37	7.2	6.8
19	2.5	2.2	2.0	2.5	a3	3.0	2.4	2.1	27	30	7.2	11
20	2.5	2.1	2.1	2.5	*3.3	3.0	2.4	2.1	26	25	7.2	15
21	2.5	2.1	2.1	2.5	3.3	2.8	2.4	2.1	*25	25	*22	15
22	2.6	2.1	2.2	2.5	3.3	2.8	2.3	2.1	23	25	49	15
23	2.6	2.1	2.2	*2.4	3.3	*2.5	2.3	2.1	23	23	49	15
24	2.6	2.0	2.2	2.4	3.2	2.4	2.3	12	23	21	49	15
25	2.6	2.0	2.2	2.4	3.2	2.6	2.3	21	22	21	49	15
26	2.6	2.0	2.2	2.5	3.2	2.9	2.3	21	22	21	49	15
27	2.6	2.0	2.3	2.5	3.2	2.9	2.3	21	23	28	27	15
28	2.6	1.9	2.3	2.5	3.3	2.9	2.3	21	23	34	8.0	15
29	2.6	*1.8	2.3	2.5	3.3	2.9	2.3	21	28	34	8.0	15
30	2.6	1.8	*2.3	2.5	--	2.9	2.3	21	34	*34	8.0	15
31	2.6	------	2.3	2.5	------	2.9	------	*10	------	34	8.0	------
Total	109.4	67.3	64.0	75.2	87.9	94.7	83.7	198.3	759.7	948	763.0	301.4
Mean	3.53	2.24	2.06	2.43	3.03	3.05	2.79	6.40	25.3	30.6	24.6	10.0
Ac-ft	217	133	127	149	174	188	166	393	1,510	1,880	1,510	598

Calendar year 1955: Max 57 Min 1.8 Mean 10.1 Ac-ft 7,280
Water year 1955-56: Max 52 Min 1.8 Mean 9.71 Ac-ft 7,040

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* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of recorded range in stage and engineer's notes.

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

Location.--Lat 44°05'05", long 103°34'45", in SW¼SE¼ sec. 36, T. 2 N., R. 4 E., on right bank 0.8 mile west of Silver City and 3 miles downstream from Slate Creek.

Drainage area.--292 sq mi.

Records available.--October 1953 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 4,620.00 ft above mean sea level (Bureau of Reclamation benchmark).

Extremes.--Maximum discharge during year, 175 cfs Mar. 24; maximum gage height, 7.32 ft Mar. 21 (backwater from ice); minimum daily discharge, 6 cfs Dec. 30; minimum gage height, 4.69 ft Sept. 19, 20.

1953-56: Maximum discharge, 1,520 cfs July 28, 1955 (gage height, 8.90 ft, from floodmark); minimum daily, that of Dec. 30, 1955; minimum gage height, 4.52 ft Dec. 26, 1954.

Remarks.--Records fair except those for periods of ice effect or indefinite stage-discharge relation, which are poor. Flow regulated by Deerfield Reservoir (see p. 300).

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	e27	*14	12	18	12	12	45	30	68	e43	38	20
2	e26	12	12	16	13	12	40	29	57	e46	e40	18
3	e23	13	12	15	15	12	35	30	52	e48	e42	16
4	e21	17	12	15	15	12	30	30	50	e51	e44	17
5	e20	18	12	15	15	12	30	33	54	e49	e46	17
6	e19	18	12	15	15	11	25	32	48	e45	e48	16
7	e20	18	12	15	15	11	25	30	49	e40	e48	16
8	e17	17	12	15	14	11	30	*30	49	e36	44	16
9	e16	20	12	15	14	11	30	28	49	e35	e40	15
10	*15	19	12	15	13	10	35	29	58	*33	e38	14
11	e16	18	12	15	13	10	35	29	e58	32	e32	*14
12	e16	14	12	15	13	10	30	30	e58	32	e33	14
13	e16	13	11	15	13	10	30	46	e58	31	e30	*16
14	*16	12	10	13	12	10	33	43	e58	64	e18	16
15	17	12	10	10	12	10	32	38	e58	56	13	15
16	16	10	10	10	11	10	30	34	e58	56	20	15
17	16	10	10	11	11	10	26	30	54	53	31	15
18	16	11	10	12	12	12	*26	29	53	50	24	14
19	17	12	10	13	13	25	26	28	49	47	23	14
20	16	14	10	15	*15	50	24	27	43	e44	22	17
21	17	16	12	15	15	*90	25	29	*42	e38	18	20
22	17	16	15	15	15	110	26	32	39	e36	*41	21
23	18	13	20	*15	15	120	26	29	37	e37	64	21
24	18	13	35	15	14	120	25	26	34	e33	65	21
25	18	13	25	15	13	100	26	44	39	e32	65	21
26	18	13	15	15	12	80	26	65	37	e32	68	21
27	18	12	13	15	12	60	32	68	34	e33	65	22
28	17	11	10	15	12	40	32	102	31	e36	30	23
29	18	*11	8	14	12	30	34	100	30	37	21	23
30	16	12	*6	13	--	50	32	94	e38	40	19	24
31	15	---	7	12	----	50	------	*80	------	*38	20	----
Total	556	422	391	442	386	1,121	901	1,304	1,442	1,283	1,150	532
Mean	17.9	14.1	12.6	14.3	13.3	36.2	30.0	42.1	48.1	41.4	37.1	17.7
Ac-ft	1,100	837	776	877	766	2,220	1,790	2,590	2,860	2,540	2,280	1,060

Calendar year 1955: Max 228 Min 6 Mean 32.5 Ac-ft 23,540
Water year 1955-56: Max 120 Min 6 Mean 27.1 Ac-ft 19,700

Peak discharge (base, 120 cfs).--Mar. 24 (1 a.m.) 175 cfs (6.85 ft); May 28 (8:30 p.m.) 146 cfs (6.48 ft).

* Discharge measurement made on this day.

e Stage-discharge relation indefinite; discharge estimated on basis of 3 discharge measurements and records for nearby stations.

Note.--Stage-discharge relation affected by ice Oct. 31 to Apr. 11 (no gage-height record Jan. 30 to Feb. 21; discharge estimated on basis of 2 discharge measurements, weather records, and records for nearby stations).

Rapid Creek below Pactola Dam, S. Dak.

Location.--Lat 44°04'35", long 103°28'55", in SW¼NE¼ sec. 2, T. 1 N., R. 5 E., on right bank 2,000 ft downstream from Pactola Dam, 4 miles upstream from Deer Creek, and 13 miles west of Rapid City.

Drainage area.--320 sq mi, approximately.

Records available.--April 1929 to June 1932 (combined records of creek and Dakota Power and Light Co. flume), July 1946 to September 1956. Prior to October 1953, published as "near Pactola."

Gage.--Water-stage recorder. Datum of gage is 4,406.00 ft above mean sea level (Bureau of Reclamation benchmark). Apr. 19, 1929, to June 30, 1932, staff gage at site 3,500 ft upstream at different datum. July 24, 1946, to Aug. 24, 1947, wire-weight gage and Aug. 25, 1947, to Nov. 18, 1953, water-stage recorder at site 2 miles upstream at different datum.

Average discharge.--12 years (1929-31, 1946-56), 43.1 cfs (31,200 acre-ft per year).

Extremes.--Maximum discharge during year, 178 cfs Mar. 25 (gage height, 6.87 ft); maximum gage height, 7.36 ft Dec. 25 (backwater from ice); minimum daily discharge, 8 cfs Dec. 30, 31, Sept. 11, 12; minimum gage height, 3.31 ft Jan. 15.

1929-32, 1946-56: Maximum discharge, 2,170 cfs May 22, 1952 (gage height, 6.74 ft, site and datum then in use); minimum, 1.4 cfs Oct. 27, 1954; minimum gage height, 1.56 ft Nov. 23, 1950, site and datum then in use.

Remarks.--Records good except those for periods of ice effect, which are poor. Flow regulated by Deerfield Reservoir (see p. 300), and by Pactola Reservoir since Aug. 22, 1956 (capacity, 55,700 acre-ft).

Rating tables, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 30 to May 16, June 8 to July 26, Aug. 17 to Sept. 22)

Oct. 1 to Feb. 19, July 26 to Sept. 30			
3.4	8	4.5	37
4.0	23	5.0	53

Feb. 20 to July 26			
4.4	24	6.0	77
5.0	41	6.4	104
5.5	58	6.7	144

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	24	*16	12	14	12	13	49	35	70	42	42	19
2	23	14	12	16	13	13	44	33	60	45	44	19
3	22	12	12	20	14	13	35	34	54	48	47	18
4	22	15	12	16	15	14	30	35	50	50	50	18
5	21	17	12	14	15	14	35	36	52	50	51	14
6	22	16	13	14	15	14	30	36	48	50	52	14
7	22	16	12	16	14	13	25	34	47	47	53	16
8	20	14	11	16	13	13	29	*33	53	41	48	18
9	19	16	12	16	13	13	26	32	53	37	42	16
10	*18	17	11	16	13	11	31	33	58	*36	*41	9
11	17	18	10	16	13	10	38	33	62	34	37	*8
12	17	17	12	15	13	10	32	33	62	34	36	8
13	16	15	10	13	13	10	32	49	61	34	33	11
14	16	14	10	10	12	10	35	51	64	47	29	11
15	17	13	10	9	10	10	34	45	64	52	15	12
16	16	12	10	10	10	10	32	41	65	54	21	14
17	16	11	10	11	10	11	30	36	61	53	30	14
18	16	12	10	13	10	13	*27	33	56	52	27	14
19	16	13	10	13	12	15	27	30	53	51	26	15
20	16	14	10	13	*12	20	25	29	49	46	25	16
21	16	16	10	13	13	*60	25	32	*45	40	23	19
22	16	17	10	13	13	85	26	37	42	39	*20	20
23	16	16	12	*13	13	110	27	33	38	40	20	20
24	16	16	20	13	12	130	27	29	35	35	20	21
25	16	15	35	13	12	133	28	35	38	34	20	21
26	16	13	25	13	12	95	30	67	38	38	20	21
27	16	11	18	13	12	76	36	70	35	38	21	21
28	16	11	16	13	12	40	39	100	32	40	20	21
29	16	*12	13	12	12	25	32	110	30	42	20	21
30	16	13	*8	12		40	39	91	35	43	20	22
31	17	- -	8	12	- - - - -	45	- - - - - -	*80	- - - - - -	*43	20	- - - - -
Total	553	432	396	421	363	1,089	955	1,405	1,510	1,335	973	491
Mean	17.8	14.4	12.8	13.6	12.5	35.1	31.8	45.3	50.3	43.1	31.4	16.4
Ac-ft	1,100	857	785	835	720	2,160	1,890	2,790	3,000	2,650	1,930	974

Calendar year 1955 : Max 225 Min 8 Mean 32.0 Ac-ft 23,200
Water year 1955-56 : Max 133 Min 8 Mean 27.1 Ac-ft 19,690

Peak discharge (base, 120 cfs).--Mar. 25 (8:30 a.m.) 178 cfs (6.87 ft); May 28 (11:30 p.m.) 133 cfs (6.63 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 2, 3, Nov. 13 to Mar. 24, Mar. 28-31, Apr. 3-7, 29.

Rapid Creek above Canyon Lake, near Rapid City, S. Dak.

Location.--Lat 44°03'05", long 103°18'50", in NE¼NE¼ sec. 18, T. 1 N., R. 7 E., on right bank at bridge on Rapid Canyon Road, 1 mile southwest of city limits of Rapid City and 2¾ miles downstream from Victoria Creek.

Drainage area.--371 sq mi.

Records available.--July 1946 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 3,407.39 ft above mean sea level (levels by Corps of Engineers). Prior to Oct. 6, 1947, wire-weight gage at same site and datum.

Average discharge.--10 years, 38.4 cfs (27,800 acre-ft per year).

Extremes.--Maximum discharge during year, 130 cfs May 29 (gage height, 2.49 ft); maximum gage height, 3.04 ft Jan. 20 (backwater from ice); minimum daily discharge, 2 cfs Dec. 4-19, Jan. 16; minimum gage height, 0.85 ft Jan. 16.

1946-56: Maximum discharge, 2,600 cfs May 23, 1952 (gage height, 8.08 ft); no flow for part of Nov. 24, 1950, and Dec. 8, 1951; minimum gage height, 0.58 ft Dec. 28, 1954.

Remarks.--Records good except those for periods of ice effect, which are poor. Flow regulated by Deerfield Reservoir (see p. 300), and by Pactola Reservoir since Aug. 22, 1956 (capacity, 55,700 acre-ft).

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Sept. 27-30)

1.1	3.6	1.9	46
1.2	6	2.2	78
1.3	8	2.5	125
1.5	17		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	23	11	2.5	8	4	5	36	29	76	36	36	20
2	21	10	2.5	8	4	6	36	27	60	41	38	18
3	19	9	2.5	8	4	6	32	27	53	45	46	19
4	18	9	2	8	5	5	27	27	47	46	49	20
5	17	11	2	8	6	5	27	27	45	47	54	16
6	18	13	2	8	7	5	27	29	46	46	59	11
7	20	10	2	8	8	4	21	*27	41	45	62	11
8	19	10	2	8	9	4	22	27	46	38	59	15
9	15	9	2	8	10	3	24	26	47	*34	43	21
10	*13	12	2	7	9	3	23	27	47	32	38	*15
11	11	14	2	7	9	3	26	27	58	30	34	5
12	11	8	2	7	8	3	30	27	59	29	28	4.0
13	11	5	2	7	8	3	25	33	59	29	27	4.6
14	11	4	2	6	7	3	26	39	62	29	22	6
15	10	3	2	4	7	4	27	36	64	46	17	4.6
16	11	*3	2	2	7	6	*25	33	65	45	7	5
17	10	3	2	3	7	10	25	30	66	46	15	7
18	10	4	2	7	7	15	23	27	*56	43	30	7
19	10	5	2	6	7	20	23	25	54	41	26	7
20	10	6	3	6	*7	30	22	25	49	40	23	7
21	9	6	8	6	7	*g40	21	26	46	32	*21	8
22	9	5	20	6	8	g60	21	27	41	29	17	12
23	10	4	30	*7	8	85	21	28	38	28	14	13
24	11	3	20	6	7	110	22	25	35	28	15	14
25	11	3	25	6	6	*g118	22	24	34	24	16	13
26	11	3	25	6	5	g92	23	38	37	21	16	13
27	10	3	20	5	g5	g66	26	56	36	21	18	13
28	10	*3	15	5	5	g49	30	78	32	24	20	12
29	10	2.5	*10	4	5	g30	29	*123	30	32	20	12
30	10	2.5	7	4	------	25	29	106	30	*35	20	12
31	*11	------	7	4	------	38	------	89	------	37	20	------
Total	400	194.0	229.5	193	196	856	771	1,195	1,459	1,099	910	345.2
Mean	12.9	6.47	7.40	6.23	6.76	27.6	25.7	38.5	48.6	35.5	29.4	11.5
Ac-ft	793	385	455	383	389	1,700	1,530	2,370	2,890	2,180	1,800	685

Calendar year 1955:	Max 185	Min 2	Mean 25.7	Ac-ft 18,590
Water year 1955-56:	Max 123	Min 2	Mean 21.4	Ac-ft 15,560

Peak discharge (base, 230 cfs).--No peak above base.
* Discharge measurement made on this day.
g Computed from graph based on wire-weight-gage readings.
Note.--Stage-discharge relation affected by ice Nov. 2, 3, 7, 8, Nov. 12 to Mar. 20.

Rapid Creek at Rapid City, S. Dak.

Location.--Lat 44°05'10", long 103°14'25", in SW¼SE¼ sec. 35, T. 2 N., R. 7 E., on right bank 200 ft downstream from Oskosh Street Bridge in Rapid City and 3.7 miles downstream from Canyon Lake.

Drainage area.--410 sq mi, approximately.

Records available.--June 1903 to November 1906, July 1942 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 3,230.8 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). June 10, 1903, to November 30, 1906, staff gage at site 1 mile downstream at different datum.

Average discharge.--14 years (1942-56), 63.2 cfs (45,750 acre-ft per year).

Extremes.--Maximum discharge during year, 182 cfs Oct. 15 (gage height, 2.32 ft), release from Canyon Lake; maximum gage height, 2.48 ft Feb. 2 (backwater from ice); minimum discharge, 16 cfs Sept. 7, 16, 17; minimum gage height, 1.19 ft Sept. 7.

1942-56: Maximum discharge, 2,560 cfs May 23, 1952 (gage height, 6.20 ft); minimum recorded, 14 cfs Jan. 20, 1954; minimum gage height, 0.86 ft Oct. 13, 1950.

Flood of May 12, 13, 1920, reached a stage of 13.6 ft, from floodmark.

Remarks.--Records good except those for periods of ice effect, which are fair. Several small diversions above station for irrigation of about 320 acres and to municipal park pools. Flow regulated by Deerfield Reservoir (see p. 300), Pactolo Reservoir since Aug. 22, 1956 (capacity, 55,700 acre-ft), and by Canyon Lake (occasionally, for recreational purposes).

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.1	13	1.8	73
1.3	20	2.0	109
1.4	26	2.5	230
1.6	46	3.0	387

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	38	28	24	30	b24	24	51	45	87	37	43	27
2	36	28	24	30	b25	25	54	44	69	45	47	27
3	34	28	25	32	26	25	52	44	58	52	54	26
4	30	27	24	31	25	26	46	42	50	56	58	28
5	30	26	25	33	25	27	45	43	47	59	63	29
6	30	27	24	35	25	28	47	43	47	59	67	25
7	34	27	24	34	25	29	43	*43	43	58	78	22
8	35	26	25	34	*25	26	43	42	45	51	75	22
9	31	26	25	34	24	25	44	38	47	*46	62	25
10	*30	26	25	34	24	b24	43	40	47	42	54	*25
11	29	26	25	31	24	b24	39	42	54	38	49	21
12	28	28	25	31	24	b24	42	40	58	36	47	20
13	29	27	24	33	25	b24	44	49	59	36	39	19
14	49	26	b24	34	*b24	b25	43	52	65	34	35	17
15	63	b25	b24	b33	b23	b26	44	52	67	47	32	17
16	39	b23	24	b30	b22	27	*43	49	72	54	30	16
17	37	b22	24	b27	b22	27	42	45	76	55	26	16
18	35	23	b24	25	b23	27	39	42	*66	54	36	18
19	32	23	b24	25	b23	29	36	37	62	51	40	18
20	27	23	24	27	23	38	34	35	59	49	*39	18
21	27	24	24	27	23	39	30	36	55	43	36	19
22	28	25	24	28	23	*45	30	36	50	38	32	21
23	31	26	25	28	23	56	32	37	46	36	30	24
24	31	26	29	*28	*24	86	32	36	42	34	25	24
25	31	26	30	29	24	*115	32	32	39	32	25	24
26	30	b25	34	29	24	107	33	36	40	30	25	24
27	29	b25	*35	28	24	88	37	62	40	30	25	24
28	29	*b26	36	28	24	72	43	100	36	30	25	24
29	28	b24	36	b28	25	51	45	*124	34	35	23	25
30	29	24	33	b27	------	40	43	120	33	*40	23	25
31	*28	------	30	b25	------	43	------	100	------	43	27	------
Total	1,017	766	823	928	695	1,272	1,231	1,586	1,593	1,350	1,273	670
Mean	32.8	25.5	26.5	29.9	24.0	41.0	41.0	51.2	53.1	43.5	41.2	22.3
Ac-ft	2,020	1,520	1,630	1,840	1,380	2,520	2,440	3,150	3,160	2,680	2,530	1,330

Calendar year 1955:	Max 162	Min 21	Mean 42.2	Ac-ft 30,540
Water year 1955-56:	Max 124	Min 16	Mean 36.1	Ac-ft 26,200

Peak discharge (base, 260 cfs).--No peak above base.

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Rapid Creek near Farmingdale, S. Dak.

Location.--Lat 43°56'35", long 102°51'15", in SW¼SW¼SW¼ sec. 19, T. 1 S., R. 11 E., on right bank at downstream side of highway bridge, 2 miles southeast of Farmingdale and 3¼ miles downstream from Antelope Creek.

Drainage area.--602 sq mi.

Records available.--July 1946 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is about 2,740 ft (from Bureau of Reclamation topographic map). Prior to Sept. 19, 1947, wire-weight gage at same site and datum.

Average discharge.--10 years, 50.7 cfs (36,710 acre-ft per year).

Extremes.--Maximum discharge during year, 449 cfs July 4 (gage height, 4.88 ft); no flow for many days.
1946-56: Maximum discharge, 2,640 cfs June 21, 1947 (gage height, 8.4 ft, from floodmarks); no flow at times in 1949, 1952-56.

Remarks.--Records good except those for period of ice effect, which are poor. Diversions for irrigation of about 10,000 acres above station. Flow regulated by Pactola Reservoir since Aug. 22, 1956 (capacity, 55,700 acre-ft). Records for chemical analyses and water temperatures for the water year 1956 are given in WSP 1451.

Rating tables, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Nov. 27)

Oct. 1 to Mar. 10		Mar. 11 to Sept. 30			
2.4	15	1.65	0	2.3	13
2.6	27	1.7	.2	2.6	30
3.0	60	1.8	.9	3.0	64
		1.9	2.0	3.5	134
		2.0	3.6	4.5	350
		2.1	5.7		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	32	*22	34	38	32	40	49	36	35	1.0	0	7.7
2	29	26	32	40	31	41	53	34	29	2.7	0	5.3
3	26	28	30	39	33	41	60	28	23	167	0	2.4
4	26	30	30	38	34	37	62	24	16	256	0	2.4
5	24	30	32	43	35	35	61	20	11	49	0	3.4
6	21	31	35	42	38	34	66	18	9.4	20	0	5.3
7	22	30	35	40	40	35	60	*16	5.1	14	g15	7.0
8	26	31	35	40	40	32	55	16	2.2	9.8	g28	7.0
9	30	35	35	40	38	28	51	17	2.0	7.7	g44	4.4
10	30	35	34	40	37	25	50	16	2.0	*6.4	*g97	*3.2
11	*26	36	34	40	36	27	50	16	2.0	4.6	g67	2.5
12	27	38	34	40	35	29	50	17	1.7	3.0	g42	5.7
13	26	36	34	39	32	32	50	19	1.7	2.7	g58	5.7
14	23	38	34	39	32	33	50	30	1.7	1.8	g31	4.9
15	21	34	30	38	32	36	49	27	1.2	1.8	g29	3.0
16	44	33	33	37	32	38	49	29	1.2	2.0	g24	1.7
17	40	38	35	37	30	51	*49	25	5.1	.9	g23	.4
18	29	38	35	38	35	77	50	22	18	1.5	g25	0
19	22	44	34	38	38	131	45	16	12	1.2	g29	.5
20	20	42	33	38	42	107	35	12	24	1.7	*32	0
21	20	47	31	37	*46	*89	33	10	20	1.6	29	0
22	17	*38	32	37	43	70	29	9.4	*10	1.6	29	0
23	15	33	34	37	43	67	26	8.0	8.3	1.0	25	0
24	18	33	37	35	42	71	26	4.2	7.0	2.2	23	0
25	26	31	43	*35	40	89	27	2.8	4.6	4.2	19	0
26	26	30	42	33	38	132	20	2.5	7.4	1.8	16	.9
27	22	19	*42	33	37	*126	18	2.8	7.7	1.5	15	.6
28	17	30	42	32	37	101	16	5.5	5.7	1.4	11	0
29	19	35	41	33	38	80	24	*10	4.0	.2	9.4	0
30	23	35	38	32	------	76	35	44	1.7	0	8.7	.4
31	23	------	36	32	------	52	------	51	------	*0	7.0	------
Total	770	1,006	1,086	1,160	1,066	1,862	1,298	588.2	279.7	570.3	736.1	74.4
Mean	24.8	33.5	35.0	37.4	36.8	60.1	43.3	19.0	9.32	18.4	23.7	2.48
Ac-ft	1,530	2,000	2,150	2,300	2,110	3,690	2,570	1,170	555	1,130	1,460	148

Calendar year 1955: Max 131 Min 0 Mean 26.5 Ac-ft 19,210
Water year 1955-56: Max 256 Min 0 Mean 28.7 Ac-ft 20,810

* Discharge measurement or observation of no flow made on this day.
g Computed from once-daily wire-weight-gage readings.
Note.--Stage-discharge relation affected by ice Nov. 28 to Mar. 16.

Cheyenne River near Wasta, S. Dak.

Location.--Lat 44°04'48", long 102°24'00", in NE¼NE¼NW¼ sec. 2, T. 1 N., R. 14 E., on downstream side of third pier from left bank of bridge on U. S. Highway 16, 200 ft downstream from Chicago and North Western Railway bridge, 3 miles east of Wasta, and 7 miles downstream from Box Elder Creek.

Drainage area.--12,800 sq mi, approximately.

Records available.--July 1914 to June 1915, August 1928 to June 1932, March 1934 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 2,262.78 ft above mean sea level, datum of 1929. July 16, 1914, to June 30, 1915, and Aug. 17, 1928, to July 31, 1940, chain gage at site 50 ft upstream at same datum. Aug. 1 to Dec. 3, 1940, wire-weight gage at present site and datum.

Average discharge.--25 years (1928-31, 1934-56), 387 cfs (280,200 acre-ft per year); median of yearly mean discharges, 335 cfs (243,000 acre-ft per year).

Extremes.--Maximum discharge during year, about 5,000 cfs Dec. 24 (gage height, 9.55 ft, backwater from ice); minimum, 43 cfs June 15 (gage height, 1.02 ft).

1914-15, 1928-32, 1934-56: Maximum discharge observed, 46,300 cfs May 6, 1932 (gage height, 11.28 ft), from rating curve extended above 11,000 cfs on basis of an incomplete discharge measurement at gage height 8.65 ft; maximum gage height observed, 12.5 ft June 13, 1915; minimum discharge, 0.8 cfs July 17, 1954 (gage height, 0.59 ft).

Flood of May 1920 reached a stage of 16 ft, from information by local residents.

Remarks.--Records good except those for periods of ice effect, which are poor. Discharge measurements generally made once a week. Flow regulated by Angostura Reservoir (see p. 293).

Revisions (water years).--WSP 786: Drainage area. WSP 1279: 1930(M), 1931, 1937. Records of chemical analyses and water temperatures for the water year 1956 are given in WSP 1451.

Rating tables, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 23-26, May 1, 29, Sept. 11-30)

Oct. 1 to Mar. 19

1.3	76	2.3	535
1.5	121	2.7	990
1.7	188	3.0	1,450
2.0	333		

Mar. 20 to Sept. 30

1.0	42	2.4	671
1.3	86	3.0	1,450
1.6	171	4.0	3,090
2.0	350		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	177	121	80	160	85	200	239	1,340	g295	81	g84	97
2	170	85	75	180	85	200	239	g1,040	g223	79	g84	90
3	166	82	75	200	85	220	248	g227	g227	478	g88	82
4	163	159	75	240	85	240	190	g252	g179	305	g97	74
5	121	156	80	240	90	280	298	g223	g117	g421	g179	g79
6	149	152	90	200	100	300	450	g206	g91	g151	175	g78
7	152	140	85	210	120	280	359	496	106	79	1,210	g88
8	156	159	80	220	140	250	261	g251	97	134	g341	114
9	156	106	75	210	160	200	235	g131	86	g79	536	106
10	156	146	75	200	170	150	218	g194	75	63	g480	99
11	154	120	80	200	170	120	157	g164	67	55	g572	79
12	114	90	100	200	170	100	239	g183	g54	61	g613	84
13	136	75	140	210	160	100	227	g209	g69	55	g171	104
14	133	60	120	190	160	100	214	g730	58	g74	g137	88
15	130	55	100	170	120	120	210	g235	57	62	g111	79
16	130	55	90	120	100	150	194	g210	74	62	g274	83
17	143	60	85	90	100	200	g183	g210	102	g136	g179	83
18	146	70	75	90	100	500	g122	g206	360	g154	g190	68
19	104	80	80	90	110	800	183	g175	216	g101	g168	65
20	118	90	85	90	120	g1,060	190	g161	g114	101	161	76
21	130	90	90	85	140	g913	179	g164	g127	96	147	79
22	118	85	100	85	160	g489	171	g168	g132	95	g147	87
23	121	80	600	85	190	g324	175	g125	g114	g97	g144	81
24	124	80	1,600	85	190	g292	179	g142	g122	g74	g131	83
25	124	85	g371	85	180	g284	120	g147	g101	g69	g117	71
26	94	75	g306	85	160	g274	164	g136	g69	g66	g114	72
27	118	70	g536	85	160	250	187	g151	g62	g73	g108	88
28	124	65	300	85	190	230	190	1,690	g95	g77	g99	90
29	121	70	750	80	190	230	198	794	83	g74	g99	97
30	121	75	130	80	------	240	537	388	83	g173	97	90
31	121	------	140	80	------	274	------	334	------	g140	99	------
Total	4,190	2,836	6,668	4,430	3,990	9,370	6,756	11,082	3,655	3,765	7,152	2,554
Mean	135	94.5	215	143	138	302	225	357	122	121	231	85.1
Ac-ft	8,310	5,630	13,230	8,790	7,910	18,590	13,400	21,980	7,250	7,470	14,190	5,070

Calendar year 1955:	Max 9,890	Min 25	Mean 274	Ac-ft 198,000
Water year 1955-56:	Max 1,690	Min 54	Mean 182	Ac-ft 131,800

Peak discharge (base, 3,300 cfs).--Dec. 24 (time unknown) about 5,000 cfs; May 28 (10:30 a.m.) 3,740 cfs (4.34 ft); Aug. 7 (5 a.m.) 3,320 cfs (4.17 ft).

g Computed from once-daily wire-weight-gage readings.

Note.--Stage-discharge relation affected by ice Nov. 11 to Dec. 24, Dec. 28 to Mar. 19, Mar. 27-30 (once-daily wire-weight-gage readings used Nov. 14 to Dec. 24, Dec. 28 to Mar. 19, Mar. 27-29).

Elk Creek near Elm Springs, S. Dak.

Location.--Lat 44°14'50", long 102°29'55", in NE¼SW¼ sec. 1, T. 3 N., R. 13 E., near center of span on downstream side of highway bridge, 2 miles downstream from small tributary, 5 miles southeast of Elm Springs, and 7 miles upstream from mouth.

Drainage area.--540 sq mi, approximately.

Records available.--July 1949 to September 1956.

Gage.--Wire-weight gage read once daily; crest-stage indicator since Sept. 29, 1954. Datum of gage is 2,304.49 ft above mean sea level, datum of 1929. Prior to Sept. 16, 1954, on upstream side of bridge at same datum.

Average discharge.--7 years, 16.0 cfs (11,580 acre-ft per year).

Extremes.--Maximum discharge during year, 48 cfs July 3 (gage height, 4.00 ft); no flow for many days.

1949-56: Maximum discharge 8,540 cfs Mar. 29, 1952 (gage height, 10.61 ft, from floodmark), from rating curve extended above 5,100 cfs; no flow for long periods during each year.

Maximum stage known, about 17 ft in May 1920, from information by local residents.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. Considerable loss in limestone sinkholes above station.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

3.0	0	3.5	13
3.1	.2	3.7	24
3.2	2.0	4.0	48
3.3	5		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1					0	3	a4	4.1		0		
2					0	7	a2	a4.5		0		
3					0	11	a1	4.7		25		
4					0	10	a.5	3.2		23		
5	(*)				0	8	*.2	3.2		1.5		
6					0	*6	a.2	a2.5		0		
7					0	3.0	a.2	1.8		0		
8					0	2.5	a.2	.6		0		
9					0	2.0	a.2	.1		0		
10					0	1.5	a.2	.1		0		
11					0	1.0	a.2	.1		0		
12					0	.5	.2	.1		0		
13					0	.1	.1	a.1		0		
14					*0	.1	.1	*.2		0		
15					0	.1	.1	.9		0		
16					0	.1	.1	1.5		0		
17					0	10	.1	.9		0		
18					0	10	.1	.6		*0		(*)
19					0	12	.1	.2		0		
20				(*)	0	*14	.1	.2		0		
21		(*)	(*)		0	14	.1	.2		0		
22					0	14	a.1	.1		0		
23					0	14	.1	0		0		
24					0	14	.1	0		0		
25					0	14	.1	0	(*)	0		
26					0	11	.1	0		0		
27					0	11	.1	0		0		
28					0	8	.2	.1		0		
29					a1.5	8	a.3	*.1		0	(*)	
30					------	8	.4	.1		0		
31		------			------	7	------	0	------	0		------
Total	0	0	0	0	1.5	224.9	11.5	30.2	0	49.5	0	0
Mean	0	0	0	0	0.05	7.25	0.38	0.97	0	1.60	0	0
Ac-ft	0	0	0	0	3.0	446	23	60	0	98	0	0

Calendar year 1955: Max	55	Min	0	Mean	0.53	Ac-ft	386
Water year 1955-56: Max	25	Min	0	Mean	0.87	Ac-ft	630

Peak discharge (base, 400 cfs).--No peak above base.

* Discharge measurement or observation of no flow made on this day.

a No gage-height record; discharge interpolated or estimated on basis of 1 discharge measurement, weather records, and engineer's notes.

Note.--Stage-discharge relation affected by ice Feb. 29 to Mar. 19, Mar. 28, 29.

Belle Fourche River below Moorcroft, Wyo.

Location.--Lat 44°18', long 104°58', in SW¼ sec. 24, T. 50 N., R. 68 W., on left bank 100 ft upstream from Trail Creek, three-quarters of a mile downstream from Donkey Creek, and 2.8 miles northwest of Moorcroft.

Drainage area.--1,670 sq mi, approximately.

Records available.--May 1943 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 4,118.4 ft above mean sea level, datum of 1929 (Bureau of Reclamation benchmark). Prior to Mar. 28, 1947, wire-weight gage and Mar. 28, 1947, to Jan. 16, 1951, water-stage recorder, at site 5½ miles downstream at different datum.

Average discharge.--13 years, 20.0 cfs (14,490 acre-ft per year).

Extremes.--Maximum discharge during year, 717 cfs Aug. 12 (gage height, 9.09 ft); no flow for many days.

1943-56: Maximum discharge, 1,800 cfs May 23, 1952 (gage height, 12.30 ft); no flow at times each year.

Flood of Apr. 7, 1924, reached a stage of 12.6 ft at site of a former gaging station 2 miles upstream at different datum (discharge, 12,500 cfs). Flood in June 1908 reached a stage about 2.5 ft higher than that of Apr. 7, 1924.

Remarks.--Records good except those for periods of ice effect, backwater from beaver dam, or no gage-height record, which are poor. Diversions for irrigation above station (for details on adjudication of diversions, see Remarks for this station in WSP 1209). Numerous small stockwater and soil conservation reservoirs above station. Records of chemical analyses for the water year 1956 are given in WSP 1451.

Rating table, water year 1955-56, except periods of ice effect and backwater from beaver dam (gage height in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 29, 30, July 9)

1.2	0	1.7	3.9	4.0	128
1.3	.3	2.0	9.5	6.0	330
1.4	.8	2.5	23	8.0	575
1.5	1.5	3.0	47		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.8	0	1.2	3.0	0.6	33	3.0	*1.0	3.2	0.3	0	0
2	.6	0	1.1	2.5	.6	26	3.0	1.0	*1.5	.1	0	0
3	.4	0	1.0	2.0	*.5	22	3.1	.8	.6	*.2	0	0
4	.3	0	.9	*1.6	.4	16	3.1	.9	.3	13	*0	0
5	.2	0	.8	1.7	.4	14	*3.2	.8	.3	9.3	0	0
6	.2	0	.8	1.7	.5	21	4.5	.8	.2	3.8	0	0
7	.1	0	.7	1.6	.6	22	6.0	.8	.1	1.7	0	0
8	.1	0	.6	1.7	.6	*25	6.2	.7	.1	.6	*0	0
9	.1	*0	.6	1.8	*.8	13	5.0	*.4	.1	.2	0	0
10	.1	0	.6	1.8	.9	15	6.0	.4	.1	0	0	*0
11	0	0	.5	1.6	1.1	15	16	.3	*0	0	8.4	0
12	0	0	.5	*1.4	1.3	3.7	*24	.6	0	0	*519	0
13	*0	0	*.5	1.4	1.4	2.1	a16	.8	0	0	93	6.3
14	0	0	.4	1.5	1.6	*2.6	a10	.4	0	*0	13	4.4
15	0	0	.4	1.0	1.3	3.2	a6.5	.2	.1	0	4.6	.9
16	0	0	.4	.6	*.8	6.4	a4.0	.4	*70	*0	*.7	.3
17	0	0	.4	.8	.6	18	*a2.4	.5	*497	0	.3	.2
18	0	.1	.4	*1.0	.6	49	2.2	*1.0	*50	0	.3	.1
19	0	.4	.3	1.2	.6	230	1.9	.2	16	0	43	.1
20	0	1.5	.3	1.4	.5	420	1.7	.1	*80	0	23	0
21	0	5.0	.3	1.7	.6	*412	1.5	.2	102	0	8.6	0
22	0	*3.8	5.0	1.4	1.3	*132	1.3	*.4	14	0	3.8	0
23	0	3.2	150	1.4	3.7	74	1.1	.1	4	0	1.2	0
24	0	2.8	250	2.1	*58	*49	1.0	.2	*1.8	*0	.6	0
25	0	2.4	100	1.2	96	28	*.8	.2	1.2	0	1.9	0
26	0	2.1	80	3.3	99	17	.8	.3	5.5	0	7.1	*0
27	0	1.8	50	2.6	*59	12	.9	.5	*6.4	0	*1.5	0
28	0	1.6	25	2.1	47	8.0	.9	.6	3.0	0	.6	0
29	0	1.4	*8.0	1.2	44	*8.5	1.0	.6	1.4	0	.3	0
30	0	1.3	6.0	.9	----	5.4	1.0	.6	.6	0	.1	0
31	0	------	4.5	.8	------	3.3	------	*1.0	------	0	0	------
Total	2.9	27.4	691.2	50.0	424.3	1,706.2	138.1	16.8	859.5	29.2	731.0	12.3
Mean	0.09	0.91	22.3	1.61	14.6	55.0	4.60	0.54	28.6	0.94	23.6	0.41
Ac-ft	5.8	54	1,370	99	842	3,380	274	33	1,700	58	1,450	24

Calendar year 1955:	Max 1,010	Min	0	Mean	46.0	Ac-ft	33,300
Water year 1955-56:	Max 519	Min	0	Mean	12.8	Ac-ft	9,300

Peak discharge (base, 360 cfs).--Mar. 21 (4:30 a.m.) 576 cfs (7.68 ft); June 17 (4 p.m.) 591 cfs (8.12 ft); Aug. 12 (1:30 p.m.) 717 cfs (9.09 ft).

* Discharge measurement or observation of no flow made on this day.

a No gage-height record; discharge estimated on basis of 1 discharge measurement and weather records.

Note.--Stage-discharge relation affected by ice Nov. 18 to Mar. 20, Mar. 28, 29. Backwater from beaver dam Oct. 1-10, Mar. 31 to Apr. 12, Apr. 18-24, Apr. 26 to May 1.

Keyhole Reservoir near Moorcroft, Wyo.

Location.--Lat 44°23', long 104°47', in sec. 27, T. 51 N., R. 66 W., at reservoir dam on Belle Fourche River, 12 miles northeast of Moorcroft.

Drainage area.--2,000 sq mi, approximately.

Records available.--March 1952 to September 1956.

Gage.--Electric tape gage. Datum of gage is at mean sea level (Bureau of Reclamation datum). Prior to Oct. 28, 1952, staff gage at same site and datum.

Extremes.--Maximum contents observed during year, 25,310 acre-ft Mar. 23 (elevation, 4,062.44 ft); minimum observed, 12,960 acre-ft Sept. 28-30 (elevation, 4,054.15 ft).
1952-56: Maximum contents observed, 35,620 acre-ft Apr. 20, 1955 (elevation, 4,067.48 ft); minimum observed since appreciable storage was attained, 6,030 acre-ft Mar. 8, 9, 1955 (elevation, 4,046.35 ft).

Remarks.--Reservoir is formed by earth-fill dam completed by Bureau of Reclamation Oct. 25 1952. Capacity, 199,900 acre-ft between elevations 4,036.0 ft (invert of 24-inch hole) and 4,099.3 ft (crest of spillway). Dead storage (below elevation 4,036.0 ft), 1,230 acre-ft. Records given herein represent total contents. Water is used for irrigation near Belle Fourche, S. Dak., and a small amount below reservoir in Wyoming.

Cooperation.--Records furnished by Bureau of Reclamation.

Month-end elevation and contents, water year October 1955 to September 1956

Date	Elevation (feet)†	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	4,057.33	16,990	-
Oct. 31	4,057.14	16,730	-260
Nov. 30	4,057.18	16,780	+50
Dec. 31	4,058.97	19,420	+2,640
Calendar year 1955	-	-	+12,930
Jan. 31	4,058.99	19,450	+30
Feb. 29	4,059.93	20,950	+1,500
Mar. 31	4,060.60	22,060	+1,110
Apr. 30	4,057.46	17,180	-4,880
May 31	4,057.17	16,770	-410
June 30	4,056.48	15,830	-940
July 31	4,054.79	13,700	-2,130
Aug. 31	4,054.50	13,360	-340
Sept. 30	4,054.15	12,960	-400
Water year 1955-56	-	-	-4,030

† Elevation at 8 a.m.

Belle Fourche River below Keyhole Reservoir, Wyo.

Location.--Lat 44°23'05", long 104°46'50", in NE¼SE¼SE¼ sec. 21, T. 51 N., R. 66 W., on right bank a quarter of a mile downstream from Keyhole Dam, 1 mile downstream from Mule Creek, 2½ miles upstream from Spring Creek, and 12 miles northeast of Moorcroft.

Drainage area.--2,000 sq mi, approximately.

Records available.--April 1951 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 4,031.26 ft above mean sea level, datum of 1929.

Average discharge.--5 years, 22.4 cfs (16,230 acre-ft per year).

Extremes.--Maximum discharge during year, 423 cfs Mar. 28 (gage height, 3.35 ft); minimum daily, 0.7 cfs Dec. 1-20, May 16-25 (seepage flow).

1951-56: Maximum discharge, 1,020 cfs Sept. 5, 1951 (gage height, 6.30 ft); minimum daily since appreciable storage in Keyhole Reservoir, 0.4 cfs Nov. 1-20, 1952, Jan. 21-31, 1954; no flow at times in 1951-52.

Remarks.--Records good. Flow regulated by Keyhole Reservoir (see preceding page). Discharge computed on basis of discharge measurements and records of gate openings at Keyhole Reservoir.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.8	0.8	0.7	0.8	0.8	0.8	75	*88	0.9	0.8	0.8	0.9
2	.8	.8	.7	.8	.8	.8	74	29	.9	.8	.8	.9
3	.8	.8	.7	.8	*.8	.8	74	.9	*.9	.8	.8	.9
4	.8	.8	.7	*.8	.8	.8	73	.9	.9	*.8	*.8	.9
5	.8	.8	.7	.8	.8	.8	*73	.9	.9	.8	.8	.9
6	.8	.8	.7	.8	.8	.8	73	.9	.9	.8	.8	.9
7	.8	.8	.7	.8	.8	.8	73	.9	.9	.8	.8	.9
8	.8	.8	.7	.8	.8	*.8	73	.9	.9	.8	.8	.9
9	.8	*.8	.7	.8	.8	.8	73	*.9	.9	.8	.8	.9
10	.8	.8	.7	.8	.8	.8	73	.9	.9	.8	.8	*.9
11	.8	.8	.7	.8	.8	.8	73	.9	.9	.8	.8	.9
12	.8	.8	.7	.8	.8	.8	72	.8	.9	.8	.8	.9
13	*.8	.8	*.7	.8	.8	.9	72	.8	16	27	.8	.9
14	.8	.8	.7	.8	.8	.9	72	.8	*75	56	51	.9
15	.8	.8	.7	.8	.8	.9	72	.8	75	56	76	.9
16	.8	.8	.7	.8	.8	.9	72	.7	75	*56	*76	.9
17	.8	.8	.7	.8	.8	.9	*81	.7	75	56	76	.9
18	.8	.8	.7	.8	.8	1.0	90	*.7	75	18	76	.9
19	.8	.8	.7	.8	.8	1.0	90	.7	75	.8	76	.9
20	.8	.8	.7	.8	.8	1.0	90	.7	75	.8	76	.9
21	.8	.8	.8	.8	.8	1.0	90	.7	75	.8	31	1.0
22	.8	.8	.8	.8	.8	*1.0	89	.7	75	.8	.9	1.0
23	.8	.8	.8	.8	.8	*67	89	.7	75	24	.9	1.0
24	.8	.8	.8	.8	.8	*173	*89	.7	*75	*75	.9	1.0
25	.8	.8	.8	.8	.8	203	89	.7	75	75	.9	1.0
26	.8	.8	.8	.8	.8	203	89	.8	75	75	.9	1.0
27	.8	.8	.8	.8	.8	203	88	.8	26	75	*.9	1.0
28	.8	.8	.8	.8	.8	*342	88	.8	.8	75	.9	1.0
29	.8	.8	.8	.8	.8	*419	88	.8	.8	75	.9	1.0
30	.8	.8	.8	.8	------	*188	88	.8	.8	75	.9	1.0
31	.8	------	.8	.8	------	76	------	.8	------	26	.9	------
Total	24.8	24.0	22.8	24.8	23.2	1,893.1	2,405	140.1	1,030.2	856.8	557.4	28.0
Mean	0.80	0.80	0.74	0.80	0.80	61.1	80.2	4.52	34.3	27.6	18.0	0.93
Ac-ft	49	48	45	49	46	3,750	4,770	278	2,040	1,700	1,110	56

Calendar year 1955:	Max 157	Min 0.7	Mean 50.8	Ac-ft 36,810
Water year 1955-56:	Max 419	Min 0.7	Mean 19.2	Ac-ft 13,940

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* Discharge measurement made on this day.

Belle Fourche River at Wyoming-South Dakota State line

Location.--Lat 44°45'00", long 104°02'45", in NE¼NW¼NW¼ sec. 18, T. 9 N., R. 1 E., on left bank a quarter of a mile downstream from State line, 3½ miles downstream from Oak Creek, and 11 miles northwest of Belle Fourche, S. Dak.

Drainage area.--3,280 sq mi, approximately.

Records available.--December 1946 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 3,095.7 ft above mean sea level (datum of 1929).

Average discharge.--10 years, 86.6 cfs (62,700 acre-ft per year).

Extremes.--Maximum discharge during year, 509 cfs Mar. 24 (gage height, 5.69 ft); maximum gage height, 7.12 ft Mar. 9 (backwater from ice); no flow for many days.
1946-56: Maximum discharge, 3,620 cfs June 23, 1947 (gage height, 12.51 ft), from rating curve extended above 1,700 cfs by logarithmic plotting; maximum gage height, 14.33 ft Mar. 22, 1947 (ice jam); no flow for many days most years.

Remarks.--Records good except those for period of ice effect, which are poor. Small diversions above station for irrigation. Flow regulated by Keyhole Reservoir (see p. 310).

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 1-16, Apr. 20 to May 10)

2.09	0	2.5	20
2.1	.1	3.0	73
2.2	2.1	4.0	207
2.3	6	5.0	353
2.4	12	6.0	572

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	152	14	5	30	12	50	335	124	38	50	46	3.3
2	151	*6	5	35	14	60	187	124	42	38	45	1.4
3	*145	7	5	*40	15	140	168	129	41	36	44	.8
4	88	10	5	50	15	150	*161	130	38	32	39	.3
5	56	10	4	45	15	120	189	115	34	26	39	.3
6	43	8	6	35	15	90	158	78	36	24	22	.1
7	36	8	6	30	15	70	140	64	26	22	16	0
8	32	8	7	35	14	70	151	54	24	18	14	0
9	26	10	5	30	15	70	138	50	20	18	11	0
10	24	10	6	25	17	60	134	50	18	15	8	0
11	20	8	4	20	18	50	130	68	18	14	6	0
12	18	7	7	20	20	50	129	58	16	12	4.7	0
13	16	6	7	20	15	60	126	52	14	10	3.3	0
14	15	*7	*7	12	13	*65	120	46	*14	8	2.0	0
15	15	7	6	8	*12	70	116	*42	83	7	1.0	0
16	14	5	6	*5	10	70	114	38	118	*72	*.3	0
17	*13	6	6	5	10	80	*114	36	92	28	0	*0
18	12	6	5	8	10	110	113	34	67	11	0	0
19	12	7	7	7	12	130	111	32	66	6	0	0
20	12	7	8	6	12	180	114	32	63	17	0	0
21	12	7	10	5	12	190	122	34	63	30	29	0
22	12	7	15	5	14	*300	123	32	64	30	40	0
23	12	6	50	8	15	400	124	36	60	22	38	0
24	15	7	300	10	20	409	123	34	67	14	40	0
25	15	7	220	15	18	307	123	32	70	10	37	0
26	14	7	200	14	17	*334	124	30	79	7	22	0
27	14	5	100	13	*16	371	122	28	75	4.7	14	0
28	14	4	75	12	20	334	123	43	*67	3.3	8	0
29	15	4	50	10	40	288	124	67	63	2.7	7	0
30	15	*4	30	*12	------	323	*124	53	63	43	*4.7	0
31	15	------	30	10	------	389	------	*43	------	*58	3.9	------
Total	1,053	215	1,197	580	451	5,390	4,180	1,788	1,539	688.7	544.9	6.2
Mean	34.0	7.2	38.6	18.7	15.6	174	139	57.7	51.3	22.2	17.6	0.21
Ac-ft	2,090	426	2,370	1,150	895	10,690	8,290	3,550	3,050	1,370	1,080	12

Calendar year 1955:	Max	1,460	Min	0.5	Mean	105	Ac-ft	76,250
Water year 1955-56:	Max	409	Min	0	Mean	48.2	Ac-ft	34,970

* Discharge measurement or observation of no flow made on this day.
Note.--Stage-discharge relation affected by ice Nov. 2 to Mar. 23.

Murray ditch at Wyoming-South Dakota State line

Location.--Lat 44°34'40", long 104°03'00", in SW¼SW¼ sec. 7, T. 7 N., R. 1 E., on right bank about 15 ft downstream from State line and 12 miles southwest of Belle Fourche.

Records available.--June 1954 to September 1956 (irrigation seasons only).

Gage.--Water-stage recorder. Altitude of gage is 3,440 ft (from topographic map).

Extremes.--1954-56: Maximum daily discharge, 17 cfs Aug. 18, 1956; no flow for many days each year.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Ditch diverts water from left bank of Redwater Creek about 2 miles upstream for irrigation of 700 acres. Flow maintained and records collected during the irrigation season only.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.4	1.7						0	*6.1	0	*0	6.6
2	4.2	1.3						0	5.9	5.1	0	8.1
3	4.0	*0						0	6.4	14	0	7.6
4	*3.6	0						0	7.2	12	0	7.6
5	3.4	0						0	7.3	11	0	6.4
6	3.4	0						0	7.4	11	9.0	5.2
7	3.0	0						0	7.4	8.0	12	4.7
8	2.9	0						0	7.1	14	13	4.7
9	3.5	0						0	6.9	13	12	4.7
10	3.3	0						0	6.9	13	11	4.6
11	3.4	0						0	6.8	13	12	4.6
12	2.4	0						0	10	15	15	4.4
13	2.4	0						0	12	16	14	4.4
14	2.3	0						0	13	16	11	4.4
15	2.6	0						0	*14	15	12	4.4
16	1.4	0						0	14	15	12	4.4
17	1.2	0						0	14	*15	*15	*4.4
18	*.5	0						0	14	15	17	4.4
19	3.0	0						0	13	14	16	9.6
20	5.4	0						0	14	12	13	14
21	4.4	0						0	13	12	13	14
22	4.2	0						0	13	12	11	11
23	3.6	0						0	12	12	6.5	7.4
24	a3.0	0						0	9.9	11	6.6	6.6
25	a3.5	0						0	8.0	8.6	6.6	5.5
26	a3.0	0						0	5.5	4.1	6.3	6.0
27	a2.5	0						0	5.4	4.1	6.2	8.9
28	a2.0	0						*a8.0	5.0	2.8	6.0	9.6
29	a2.5	0						7.5	*5.0	0	5.9	11
30	2.0	0			------			6.2	3.0	0	5.8	11
31	1.9	------			------		------	6.2	------	0	*6.2	------
Total	92.9	3.0	-	-	-	-	-	27.9	273.2	313.7	274.1	210.2
Mean	3.00	0.10	-	-	-	-	-	0.90	9.11	10.1	8.84	7.01
Ac-ft	184	6.0	-	-	-	-	-	55	542	622	544	417

Calendar year : Max Min Mean Ac-ft
Water year : Max Min Mean Ac-ft

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* Discharge measurement or observation of no flow made on this day.

a No gage-height record; discharge estimated on basis of 1 discharge measurement, fragmentary gage-height record, recorded range in stage, engineers' and observers' notes, and records for Redwater Creek at State line.

Redwater Creek at Wyoming-South Dakota State line

Location.--Lat 44°34'30", long 104°02'50", in NW¼NW¼ sec. 18, T. 7 N., R. 1 E., on left bank about 800 ft downstream from State line, 3 miles upstream from Crow Creek, and 12 miles southwest of Belle Fourche.

Drainage area.--471 sq mi.

Records available.--April 1929 to September 1931, February 1936 to July 1937, June 1954 to September 1956. Published as "near Beulah, Wyo." 1929-31, 1936-37.

Gage.--Water-stage recorder. Altitude of gage is 3,410 ft (from topographic map). Apr. 25, 1929, to Jan. 7, 1931, staff gage and Jan. 8 to Sept. 30, 1931, Feb. 28, 1936, to July 31, 1937, chain gage, at site 2 miles upstream at different datums.

Extremes.--Maximum discharge during year, 123 cfs July 7 (gage height, 3.70 ft); maximum gage height, 3.72 ft Feb. 2 (backwater from ice); minimum discharge, 7 cfs Aug. 16, 17; minimum gage height, 2.11 ft June 12.

1929-31, 1936-37, 1954-56: Maximum discharge, 3,250 cfs July 17, 1937 (gage height, about 11.5 ft, from floodmarks), from rating curve extended above 200 cfs; no flow Aug. 13-15, 1929.

Remarks.--Records good except those for periods of ice effect, which are fair. Large diversion for irrigation above station. Total flow passing State line may be obtained by adding flow of Murray ditch (see preceding page).

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	32	31	*b32	31	b28	31	33	*33	*25	29	*27	25
2	31	31	29	30	b30	31	33	33	25	20	27	22
3	32	*32	28	31	b32	31	33	34	24	10	27	23
4	*31	31	29	*31	30	31	32	33	24	11	26	23
5	32	31	29	31	30	32	*33	33	23	10	24	24
6	33	31	28	30	30	32	32	33	22	11	15	24
7	32	31	29	31	29	32	32	33	21	32	10	24
8	32	31	28	31	29	32	32	33	21	10	11	24
9	32	32	28	30	29	33	32	33	21	10	12	23
10	31	33	29	31	30	33	32	33	22	10	12	23
11	31	33	29	31	30	b33	32	33	21	10	13	24
12	32	32	29	32	30	b32	33	33	18	10	11	25
13	32	33	29	31	30	34	32	33	15	9	9	24
14	31	32	b28	31	30	34	32	31	12	9	9	24
15	32	*b35	*b27	b31	b31	*34	32	*32	*12	9	8	24
16	32	b30	b28	b30	*b27	34	33	32	13	10	8	24
17	33	b30	b28	*b31	b28	34	33	32	14	*10	*8	*24
18	*33	b32	b27	b31	b30	36	*34	32	15	9	9	24
19	31	b33	b27	31	30	34	33	32	14	10	10	21
20	30	30	b28	31	30	36	33	32	16	10	12	15
21	29	30	30	30	30	35	33	32	15	11	15	16
22	29	30	38	30	30	34	33	31	15	12	19	19
23	30	29	36	30	31	34	34	31	16	12	24	22
24	30	29	32	30	31	33	34	30	16	14	23	22
25	30	29	31	30	31	33	33	31	19	18	23	23
26	30	29	30	30	30	32	34	30	19	24	23	19
27	30	b28	30	30	31	33	34	31	20	23	23	14
28	31	b28	31	29	*30	33	34	29	19	26	23	15
29	31	b28	30	b28	30	33	33	27	*20	28	25	16
30	31	b29	b31	b28	------	33	33	27	22	28	25	14
31	31	------	31	*b27	------	33	------	26	------	27	*25	------
Total	967	923	919	939	867	1,025	986	978	559	472	536	644
Mean	31.2	30.8	29.6	30.3	29.9	33.1	32.9	31.5	18.6	15.2	17.3	21.5
Ac-ft	1,920	1,820	1,820	1,860	1,720	2,030	1,960	1,940	1,110	936	1,060	1,280

Calendar year 1955: Max 170 Min 14 Mean 31.7 Ac-ft 22,920
Water year 1955-56: Max 38 Min 8 Mean 26.8 Ac-ft 19,500

Peak discharge (base, 150 cfs).--No peak above base.
* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

Spearfish Creek at Spearfish, S. Dak.

Location.--Lat 44°29'00", long 103°51'15", in SE¼NW¼ sec. 15, T. 6 N., R. 2 E., on right bank in city park in Spearfish, 300 ft downstream from fish hatchery and nearest tributary and 12 miles upstream from mouth.

Drainage area.--168 sq mi.

Records available.--October 1946 to September 1956.

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

Average discharge.--10 years, 45.3 cfs (32,800 acre-ft per year).

Extremes.--Maximum discharge during year, 300 cfs July 16 (gage height, 5.61 ft); maximum gage height, 5.86 ft Feb. 2 (backwater from ice); minimum discharge, 18 cfs Dec. 5 (gage height, 4.25 ft); minimum daily, 25 cfs Nov. 16, 17, 27, Dec. 30.

1946-56: Maximum discharge, 947 cfs May 22, 1952 (gage height, 6.81 ft); maximum gage height, 7.29 ft Jan. 24, 1952 (backwater from ice); minimum discharge, 7 cfs Mar. 14, 1948; minimum daily, 20 cfs Mar. 14, 1948; minimum gage height, 3.89 ft Dec. 17, 1946.

Flood of June 5, 1904, reached a stage of 7.00 ft, site and datum of former gage near Spearfish, 1 mile upstream (drainage area, 157 sq mi), discharge, about 5,000 cfs.

Remarks.--Records good except those for periods of ice effect, which are fair. Regulation by fish hatchery and by hydroelectric plant half a mile upstream causes diurnal fluctuation, but since storage capacity is small, daily flows are not affected appreciably.

Revisions.--WSP 1116: Drainage area.

Rating tables, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 27		Mar. 27 to May 24		May 25 to Sept. 30	
4.3	21	4.4	29	4.4	26
4.5	34	4.6	48	4.6	40
4.7	54	4.8	79	4.8	61
5.0	108	5.0	123	5.0	96

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	35	36	*38	35	b36	31	47	*40	*73	38	*34	37
2	37	34	37	33	b37	35	46	40	67	36	35	36
3	39	*36	37	34	b37	33	40	45	61	38	40	36
4	*37	35	36	*34	b38	33	42	45	58	39	36	38
5	36	39	33	34	38	33	*41	46	54	37	34	39
6	41	38	38	34	40	32	41	47	53	37	36	35
7	40	37	36	34	38	33	38	45	50	47	38	36
8	38	36	36	33	36	33	40	46	45	40	34	37
9	37	38	36	32	35	32	40	48	46	40	33	33
10	38	39	36	34	33	33	41	49	45	37	32	35
11	37	40	33	32	33	32	46	50	43	36	31	34
12	38	37	37	34	33	38	41	51	42	34	34	34
13	36	b31	35	34	33	35	43	54	39	35	36	39
14	36	b31	b35	34	33	33	47	54	44	35	31	36
15	36	*b31	*b36	27	32	*35	46	52	*40	34	32	36
16	35	b25	33	b29	*b29	36	47	*52	42	43	34	34
17	37	b25	37	*32	b29	36	44	48	41	*33	*36	37
18	*35	b33	b37	37	b30	34	*44	49	46	35	39	*35
19	36	b40	b38	34	31	37	43	46	40	34	37	35
20	36	b38	35	34	32	37	43	46	39	33	40	35
21	36	b38	34	34	33	38	44	47	39	33	37	35
22	35	37	33	33	34	38	45	43	39	33	35	34
23	36	37	35	34	34	44	44	42	38	35	35	34
24	37	37	39	35	33	46	44	37	36	32	34	39
25	36	36	35	30	33	45	44	38	42	33	36	36
26	37	b29	36	37	33	58	43	38	38	33	34	38
27	36	b25	33	36	33	53	46	40	38	33	38	36
28	36	b26	34	34	*33	41	46	*78	37	36	33	38
29	36	b28	31	b32	33	41	42	94	*37	34	36	42
30	36	36	25	b32	------	48	42	92	35	37	36	27
31	38	------	34	*b36	------	46	------	84	------	36	*41	------
Total	1,139	1,028	1,088	1,037	982	1,179	1,300	1,586	1,347	1,116	1,097	1,076
Mean	36.7	34.3	35.1	33.5	33.9	38.0	43.3	51.2	44.9	36.0	35.4	35.9
Ac-ft	2,260	2,040	2,160	2,060	1,950	2,340	2,580	3,150	2,670	2,210	2,180	2,130

Calendar year 1955:	Max 164	Min 25	Mean 45.8	Ac-ft 33,140
Water year 1955-56:	Max 94	Min 25	Mean 38.2	Ac-ft 27,730

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

Redwater Creek above Belle Fourche, S. Dak.

Location.--Lat 44°40'05", long 103°49'55", in NW¼SE¼ sec. 11, T. 8 N., R. 2 E., on right bank at upstream side of bridge on U. S. Highway 212 in Belle Fourche, a quarter of a mile upstream from Hay Creek and half a mile upstream from mouth.

Drainage area.--920 sq mi.

Records available.--October 1945 to September 1956.

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

Average discharge.--11 years, 131 cfs (94,840 acre-ft per year).

Extremes.--Maximum discharge during year, 480 cfs Dec. 23 (gage height, 8.35 ft, backwater from ice); minimum, 1.8 cfs Aug. 4, 11 (gage height, 2.90 ft).

1945-56: Maximum discharge observed, 2,800 cfs June 22, 1947 (gage height, 8.98 ft); maximum gage height, 9.45 ft between Jan. 22 and Feb. 1, 1954 (ice jam; from recorded range in stage); minimum discharge, 0.6 cfs July 8, 1952; minimum gage height, that of Aug. 4, 11, 1956.

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of about 5,000 acres above station.

Revisions (water years).--WSP 1389: 1954 (maximum gage height only).

Rating tables, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Dec. 23		Dec. 24 to Sept. 30			
3.9	71	3.0	3.2	3.5	34
4.0	86	3.1	5	3.9	85
4.5	191	3.2	8	4.4	190
5.0	346	3.3	14	5.0	362

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	88	105	115	142	115	121	127	119	72	12	4.4	25
2	101	*103	115	136	120	123	127	119	65	17	3.5	23
3	*107	107	110	*138	150	123	129	129	65	12	3.5	23
4	109	111	115	136	180	127	*127	127	56	11	3.3	31
5	107	107	120	136	180	127	132	134	51	10	3.6	41
6	116	111	140	134	150	125	132	123	37	8	5	55
7	114	109	135	132	127	121	134	123	28	28	6	57
8	114	112	120	132	127	129	123	119	22	43	6	56
9	105	111	100	132	121	125	113	123	16	18	4.8	57
10	98	112	95	129	123	125	121	125	18	10	5	51
11	105	120	90	115	125	121	123	127	13	8	3.4	41
12	105	116	110	127	127	115	123	127	12	6	4.6	41
13	101	105	120	134	127	123	121	138	12	5	4.4	38
14	96	*100	*83	125	123	*129	127	134	*12	4.8	3.9	36
15	100	100	85	100	*115	123	127	*129	10	6	3.9	41
16	96	95	85	*100	115	129	125	129	27	*8	*4.5	42
17	*93	95	85	110	115	134	*125	125	47	8	4.3	*55
18	94	100	80	125	120	129	121	123	49	6	6	64
19	98	130	90	120	125	127	123	125	46	4.4	5	53
20	101	150	100	115	135	123	123	119	33	4.5	6	41
21	101	125	130	110	135	127	121	108	23	4.6	5	41
22	103	115	200	110	135	125	129	85	24	6	5	42
23	109	112	400	115	127	127	123	57	15	6	6	45
24	105	110	190	120	147	132	121	40	11	4.8	7	47
25	105	110	154	125	123	132	117	27	92	4.5	10	46
26	103	115	142	120	119	129	121	23	40	4.3	12	44
27	107	105	142	115	*125	138	123	23	27	4.1	12	37
28	105	105	140	110	121	132	125	42	*27	4.5	8	31
29	107	105	135	110	119	115	129	85	28	4.6	10	38
30	103	*110	125	*110	------	125	*125	80	16	5	*12	44
31	107	------	135	110	------	123	------	*76	------	*6	20	------
Total	3,203	3,311	3,986	3,773	3,771	3,904	3,737	3,163	994	284.1	198.1	1,286
Mean	103	110	129	122	130	126	125	102	33.1	9.16	6.39	42.9
Ac-ft	6,350	6,570	7,910	7,480	7,480	7,740	7,410	6,270	1,970	564	393	2,550

	Max	Min	Mean	Ac-ft
Calendar year 1955:	422	3.4	107	77,290
Water year 1955-56:	400	3.3	86.4	62,690

Peak discharge (base, 500 cfs).--No peak above base.

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 15-22, Nov. 24 to Dec. 13, Dec. 15-23, 28-31, Jan. 14 to Feb. 6, Feb. 15-22.

Hay Creek at Belle Fourche, S. Dak.

Location.--Lat 44°40'05", long 103°50'25", in NW¼SW¼ sec. 11, T. 8 N., R. 2 E., on right bank at the intersection of Tenth Avenue and Jackson Street in Belle Fourche and half a mile upstream from mouth.

Drainage area.--121 sq mi.

Records available.--October 1953 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 3,005.18 ft above mean sea level (city of Belle Fourche benchmark). Prior to Dec. 8, 1953, staff gage at site 300 ft downstream at same datum.

Extremes.--Maximum discharge during year, 15 cfs July 16 (gage height, 3.52 ft), from rating curve extended above 4 cfs by logarithmic plotting; maximum gage height, 3.89 ft Dec. 23 (backwater from ice); no flow for many days.

1953-56: Maximum discharge, 29 cfs Apr. 9, 1955 (gage height, 3.77 ft), from rating curve extended above 4 cfs by logarithmic plotting; no flow for many days each year.

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

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 12-30)

2.63	0	2.9	1.5
2.7	.2	3.1	4.4
2.8	.6		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.0	0	0.1	0		0.1	1.2	0.4		0		0
2	.7	*0	.1	0		.1	1.3	.2		0		0
3	*.9	.2	.1	*.1		.1	1.5	.3		0		0
4	.8	.3	.1	.1		.1	*.4	.3		.2		.2
5	.8	.3	.1	.2		.1	.4	.1		.2		.1
6	.8	.2	.1	.1		.1	.4	.3		.2		0
7	.8	.2	.1	.1		.1	.4	.1		.2		0
8	.8	.2	.1	.1		.1	.6	.4		.4		0
9	.7	.2	.1	.2		.1	.5	.1		.2		0
10	.6	.2	.1	.2		.1	.5	.4		0		0
11	.6	.2	.1	.1		0	.5	.4		0		0
12	.6	.2	.1	.1		0	.4	.1		0		0
13	.4	.2	.1	.2		.1	.3	.1		0		0
14	.2	*.2	.1	.2		*.1	.2	.1	(*)	0		0
15	.1	.1	*.1	.2	(*)	.1	.2	*.1		.2		0
16	.1	.1	.1	.1		.1	.1	.1		*4.1	(*)	0
17	*0	.1	.1	*.1		.2	*.1	.1		.8		*0
18	0	.1	.1	.1		.3	.1	.1		.1		0
19	0	.2	.1	.1		.4	.1	.1		0		0
20	0	.2	.1	.1		.6	.2	.1		0		0
21	.1	.1	.1	.1		.7	.2	.1		.1		0
22	.1	.1	.5	.1		*.8	.3	.1		.3		0
23	.1	.1	1.0	.1		.3	.2	.1		.3		0
24	0	.1	.7	.1		.2	.2	.1		.1		0
25	0	.1	.2	.1		.3	.3	.1		.1		0
26	.1	.1	.1	.1		.2	.3	.1		0		0
27	.2	.1	.1	.1	(*)	.8	.4	.2		0		0
28	.1	.1	.1	.1		.7	.4	.3	(*)	0		0
29	.1	.1	0	.1		.9	.4	.2		0		0
30	0	**.1	0	**.1	------	1.1	*.3	.1		0	(*)	0
31	0	------	0	0	------	1.3	------	*0	------	*0		------
Total	10.7	4.4	4.8	3.4	0	10.2	12.4	5.3	0	7.5	0	0.3
Mean	0.35	0.15	0.15	0.11	0	0.33	0.41	0.17	0	0.24	0	0.01
Ac-ft	21	8.7	9.5	6.7	0	20	25	11	0	15	0	0.6

Calendar year 1955:	Max	19	Min	0	Mean	0.42	Ac-ft	302
Water year 1955-56:	Max	4.1	Min	0	Mean	0.16	Ac-ft	118

Peak discharge (base, 50 cfs).--No peak above base.

* Discharge measurement or observation of no flow made on this day.

** Field estimate made on this day.

Note.--Stage-discharge relation affected by ice Nov. 3-24, 26, 27, Dec. 14-18, Dec. 21 to Jan. 2, Jan. 21-23, 25, Jan. 27 to Mar. 19.

Inlet Canal near Belle Fourche, S. Dak.

Location.--Lat 44°42'15", long 103°49'00", in NW¼ sec. 36, T. 9 N, R. 2 E., on right bank 1 mile (revised) downstream from Crow Creek, 1 mile downstream from diversion dam on Belle Fourche River, and 2½ miles northeast of Belle Fourche.

Records available.--October 1945 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 2,985.22 ft above mean sea level, datum of 1929. Prior to Dec. 10, 1946, staff gage and Dec. 10, 1946, to Nov. 26, 1949, water-stage recorder, at sites three-quarters of a mile upstream at same datum.

Average discharge.--11 years, 148 cfs (107,100 acre-ft per year); median of yearly mean discharges, 130 cfs (94,100 acre-ft per year).

Extremes.--1945-56: Maximum daily discharge, 1,330 cfs Mar. 29, 1952; no flow for many days during 1946-49.

Remarks.--Records good except those for periods of ice effect, which are poor. Records show actual diversions to Belle Fourche Reservoir (see following page) from Belle Fourche River and Crow Creek, except for 7,600 acre-ft which was diverted for irrigation from the canal between station and reservoir. Records of diversion from the canal furnished by the Bureau of Reclamation.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	260	124	120	155	110	161	589	242	112	79	50	g24
2	254	*121	120	155	125	166	452	242	98	79	52	g24
3	*264	119	115	*160	150	180	355	259	72	63	37	g21
4	255	123	115	170	170	209	*338	259	92	53	34	g23
5	194	123	120	180	180	262	362	267	90	49	30	g31
6	175	129	140	175	190	239	358	225	71	33	34	g51
7	159	130	145	170	190	212	326	199	80	29	41	65
8	151	129	130	170	160	230	299	183	63	43	30	89
9	135	138	110	165	140	212	283	180	31	71	16	78
10	124	133	105	160	140	190	283	177	29	40	13	76
11	128	147	95	150	145	180	276	181	30	24	10	53
12	118	139	110	150	145	170	269	207	28	19	8	46
13	121	124	120	155	140	180	264	202	33	17	6	g46
14	75	110	*100	140	130	*208	259	186	*31	14	6	g48
15	130	110	95	120	*125	197	255	*177	21	16	4.7	g43
16	114	100	95	110	120	200	243	174	102	*139	*5	41
17	*108	100	95	120	120	214	*240	168	186	99	6	*g41
18	109	110	90	130	125	235	238	160	113	38	9	g52
19	108	130	90	125	130	257	233	156	100	26	10	76
20	111	140	110	120	135	301	233	150	92	15	13	58
21	112	130	150	115	135	311	235	133	60	13	10	g40
22	113	120	250	115	140	451	247	112	73	26	12	g40
23	119	120	450	120	145	662	242	78	76	29	30	g38
24	119	115	500	130	150	708	240	54	82	24	36	g39
25	118	120	400	140	160	518	233	43	208	18	34	g45
26	115	120	350	135	145	*470	238	34	114	14	36	g46
27	118	115	300	125	*140	532	238	35	109	12	24	g42
28	121	110	220	120	135	524	242	49	*91	12	20	g30
29	121	110	200	115	155	472	245	137	75	11	16	41
30	121	*115	180	*110	------	444	*238	164	78	11	*g15	g50
31	120	-- --	155	110	-------	542	--------	*119	- ----	*24	g19	- -
Total	4,390	3,654	5,375	4,315	4,175	9,837	8,553	4,952	2,440	1,140	666.7	1,397
Mean	142	122	173	139	144	317	285	160	81.3	36.8	21.5	46.6
Ac-ft	8,710	7,250	10,660	8,560	8,280	19,510	16,960	9,820	4,840	2,260	1,320	2,770
(†)	0	0	0	0	0	0	0	690	2,280	1,370	1,190	2,070

Calendar year 1955: Max 1,160 Min 56 Mean 216 Ac-ft 156,600
Water year 1955-56: Max 708 Min 4.7 Mean 139 Ac-ft 100,900

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* Discharge measurement made on this day.

† Diversion, in acre-feet, from Inlet Canal between station and reservoir; records furnished by Bureau of Reclamation.

g Computed from graph based on wire-weight-gage readings.

Note.--Stage-discharge relation affected by ice Nov. 14 to Feb. 28, Mar. 10-13.

Belle Fourche Reservoir near Belle Fourche, S. Dak.

Location.--Lat 44°44'10", long 103°40'10", in SW¼SE¼ (corrected) sec. 18, T. 9 N., R. 4 E., at dam on Owl Creek, 9¾ miles northeast of Belle Fourche.

Records available.--January 1912 to September 1956.

Gage.--Staff gage read once daily. Datum of gage is at mean sea level, adjustment of 1912.

Extremes.--Maximum contents observed during year, 123,700 acre-ft May 20 (elevation, 2,966.6 ft); minimum observed, 2,000 acre-ft Sept. 30 (elevation, 2,929.2 ft).

1912-56: Maximum contents observed, 197,400 acre-ft Apr. 30, 1919, May 20, 1920 (elevation, 2,974.9 ft); minimum observed, -3,000 acre-ft Sept. 30, 1936 (water was lowered below empty level of 2,927.0 ft by opening holes in crib walls).

Remarks.--Reservoir is formed by earth-fill dam; dam completed and storage began in 1911. Usable capacity, 185,200 acre-ft (1949 survey) between elevations 2,927.0 ft (lowest outlet) and 2,975.0 ft (crest of spillway) above mean sea level. Dead storage below elevation 2,927.0 ft, 6,800 acre-ft. Figures given herein represent usable contents above elevation 2,927.0 ft. Water diverted from Belle Fourche River through Inlet Canal (see preceding page) is stored in Belle Fourche Reservoir and used for irrigation in the Belle Fourche project.

Cooperation.--Records of contents and capacity tables furnished by Bureau of Reclamation.

Month-end elevation and usable contents, water year October 1955 to September 1956

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	2,947.9	34,610	-
Oct. 31	2,950.7	43,480	+8,870
Nov. 30	2,952.2	48,700	+5,220
Dec. 31	2,955.1	60,930	+12,230
Calendar year 1955	-	-	+16,530
Jan. 31	2,957.3	69,780	+8,850
Feb. 29	2,959.0	78,200	+8,420
Mar. 31	2,962.5	98,850	+20,650
Apr. 30	2,965.4	115,900	+17,050
May 31	2,965.7	117,800	+1,900
June 30	2,960.7	88,510	-29,290
July 31	2,952.5	49,900	-38,610
Aug. 31	2,939.3	15,400	-34,500
Sept. 30	2,929.2	2,000	-13,400
Water year 1955-56	-	-	-32,610

Belle Fourche River near Fruitdale, S. Dak.

Location (revised).--Lat 44°41'25", long 103°44'15", in NW¼NE¼ sec. 3, T. 8 N., R. 3 E., near right bank on downstream side of pier of bridge on U. S. Highway 212, 2½ miles northwest of Fruitdale and 8¾ miles downstream from point of diversion to Belle Fourche Reservoir.

Drainage area.--4,540 sq mi, approximately.

Records available.--November 1945 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 2,925 ft (from topographic map). Nov. 4, 1945, to Apr. 9, 1947, chain gage and Apr. 10, 1947, to Oct. 14, 1948, water-stage recorder, at site 100 ft upstream at same datum.

Average discharge.--10 years (1946-56), 79.7 cfs (57,700 acre-ft per year); median of yearly mean discharges, 20 cfs (14,500 acre-ft per year).

Extremes.--Maximum discharge during year, about 320 cfs Dec. 23 (gage height, 4.36 ft, backwater from ice); minimum daily, 2 cfs Feb. 16; minimum gage height, 3.08 ft Feb. 19, 22, 23.

1945-56: Maximum discharge, 7,460 cfs June 23, 1947 (gage height, 11.03 ft), from rating curve extended above 3,800 cfs by logarithmic plotting; no flow Dec. 18-26, 1945, Feb. 5-12, July 5-10, 1948.

Remarks.--Records fair except those for period of ice effect, which are poor. At a point 8¾ miles above station, water is diverted to Belle Fourche Reservoir (see preceding page) through Inlet Canal (see p. 318), with other smaller diversions from the main stem and tributaries for irrigation. Total diversions for irrigation of about 60,000 acres above station.

Rating tables, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Nov. 11, Mar. 18-23, Sept. 30)

Oct. 1 to Mar. 17

2.9	3.4	3.3	56
3.0	9	3.5	118
3.1	19	4.0	344
3.2	34		

Mar. 18 to Sept. 30

3.2	2.5	3.5	10
3.3	3.7	3.6	24
3.4	6		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9	14	7	4	3	4	3.7	3.5	9	8	6	8
2	8	*14	6	4	4	4	3.9	3.5	8	7	6	8
3	*8	14	6	*5	4	4	3.9	3.5	7	7	6	8
4	8	14	6	5	4	4	*4.1	3.5	8	7	6	8
5	8	14	5	5	4	3	4.5	3.5	8	7	5	8
6	8	14	5	4	4	3	4.3	3.5	8	7	6	8
7	9	13	5	4	4	3	3.9	3.5	8	7	6	8
8	11	12	5	5	4	3	3.9	3.6	8	8	6	8
9	14	12	4	4	4	3	3.9	3.7	8	8	6	8
10	15	12	4	4	4	3	3.9	3.7	8	9	5	8
11	17	12	4	4	4	3	3.9	4.1	10	9	6	8
12	26	12	4	4	4	3	4.1	4.5	9	7	6	8
13	18	12	4	4	4	3	4.1	4.7	8	6	6	9
14	16	*12	*4	4	3	*4	4.1	4.7	*14	6	6	9
15	19	12	4	3	*3	4	3.9	*4.9	14	4.9	6	10
16	18	11	4	*3	2	4	3.7	4.9	12	*7	*6	11
17	*17	11	4	3	3	4	*3.6	5	10	11	6	*11
18	17	11	4	4	3	3.5	3.6	6	8	9	7	10
19	17	12	4	3	3	3.5	3.6	6	6	6	7	8
20	17	13	5	3	3	3.5	3.6	6	6	6	7	8
21	17	14	5	3	3	3.5	3.6	6	6	6	6	8
22	17	13	5	3	3	3.5	3.7	6	6	6	6	8
23	17	12	145	3	4	3.6	3.5	6	6	7	6	9
24	17	12	25	4	3	3.6	3.5	6	6	6	6	8
25	17	12	7	4	3	3.6	3.6	6	8	6	6	8
26	16	10	6	4	3	*3.6	3.6	6	9	6	6	7
27	16	9	5	3	*3	3.5	3.6	6	8	6	7	9
28	16	8	5	3	3	3.2	3.6	8	*7	5	7	9
29	15	8	4	3	3	3.6	3.5	9	6	4.7	7	9
30	14	*8	4	*3	------	3.7	*3.5	9	8	5	*7	8
31	14	------	4	3	------	3.6	------	*10	------	*5	8	------
Total	456	357	309	115	99	108.5	113.9	164.3	247	209.6	193	255
Mean	14.7	11.9	10.0	3.7	3.4	3.50	3.80	5.30	8.2	6.76	6.2	8.5
Ac-ft	904	708	613	228	196	215	226	326	490	416	383	506

Calendar year 1955:	Max	363	Min	1	Mean	8.75	Ac-ft	6,330
Water year 1955-56:	Max	145	Min	2	Mean	7.18	Ac-ft	5,210

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 12 to Mar. 17.

Belle Fourche River near Sturgis, S. Dak.

Location.--Lat 44°30'50", long 103°07'50", in SW¼NE¼ sec. 3, T. 6 N., R. 8 E., near right bank on downstream side of pier of bridge on State Highway 24, half a mile upstream from Bear Butte Creek and 20 miles northeast of Sturgis.

Drainage area.--5,870 sq mi, approximately.

Records available.--October 1945 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 2,525 ft (from topographic map). Prior to Oct. 31, 1946, chain gage at same site and datum.

Average discharge.--11 years, 294 cfs (212,800 acre-ft per year); median of yearly mean discharges, 220 cfs (159,300 acre-ft per year).

Extremes.--Maximum discharge during year, 2,580 cfs July 4 (gage height, 6.72 ft); minimum daily discharge, 15 cfs Dec. 9, Jan. 21, 22, Feb. 1; minimum gage height, 3.20 ft Mar. 29.

1945-56: Maximum discharge, 17,900 cfs May 24, 1946 (gage height, 13.86 ft), from rating curve extended above 11,000 cfs by logarithmic plotting; no flow for many days during 1945, 1950.

Remarks.--Records good except those for periods of ice effect, which are poor. At a point 70 miles above station, water is diverted to Belle Fourche Reservoir (see p. 319) through Inlet Canal (see p. 318), with other small diversions from the main stem and tributaries for irrigation. Total diversion for irrigation of about 60,000 acres above station. Records of chemical analyses, water temperatures, and suspended sediment loads for the water year 1956 are given in WSP 1451.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

3.3	30	5.0	650
3.6	70	5.5	1,060
4.0	165	6.0	1,600
4.5	343	7.0	3,000

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	141	60	20	20	15	70	97	50	213	180	162	162
2	141	35	20	20	20	80	82	49	197	162	165	174
3	120	50	20	20	20	90	90	64	182	171	160	180
4	111	80	20	25	20	100	*84	60	160	1,650	152	162
5	83	60	20	25	25	110	99	*53	*141	1,520	143	185
6	*76	55	20	20	25	110	118	51	130	702	154	177
7	70	55	20	20	25	*115	108	51	141	480	165	136
8	64	60	20	25	25	120	88	48	162	312	*194	102
9	65	64	15	25	25	120	76	46	141	225	177	76
10	59	60	20	20	25	120	68	42	130	210	188	61
11	57	54	25	20	25	110	68	48	162	210	168	39
12	56	40	25	20	25	100	67	44	180	194	152	59
13	60	40	25	20	*25	110	62	51	180	191	152	76
14	82	40	25	20	25	120	58	52	239	216	149	87
15	78	35	25	20	20	120	52	*48	245	228	141	138
16	67	30	25	20	20	150	47	51	278	210	149	126
17	67	30	20	20	20	200	47	44	267	200	152	*113
18	64	35	20	20	20	260	46	42	325	203	168	116
19	64	50	20	*20	25	*320	45	37	267	*219	213	111
20	65	70	*25	20	25	400	42	39	203	206	219	118
21	67	70	25	15	25	600	41	38	188	194	197	120
22	68	*60	25	15	30	*650	42	*38	154	194	180	123
23	68	50	25	20	35	*500	42	38	141	200	162	113
24	72	40	20	20	40	*487	*41	109	157	203	168	116
25	*67	30	20	20	45	320	43	164	203	197	138	118
26	65	40	20	20	50	275	45	118	*278	177	133	104
27	68	30	30	20	55	232	44	131	210	168	130	106
28	74	20	25	20	60	*100	48	239	188	143	123	102
29	70	20	20	20	65	55	51	320	191	157	118	164
30	65	20	20	20	------	150	50	259	182	168	*126	149
31	65	------	20	20	------	133	------	228	------	168	146	------
Total	2,339	1,383	680	630	860	6,427	1,891	2,652	5,835	9,658	4,944	3,613
Mean	75.4	46.1	21.9	20.3	29.7	207	63.0	85.5	194	312	159	120
Ac-ft	4,640	2,740	1,350	1,250	1,710	12,750	3,750	5,260	11,570	19,160	9,810	7,170

Calendar year 1955: Max 762 Min 15 Mean 114 Ac-ft 82,750
Water year 1955-56: Max 1,650 Min 15 Mean 112 Ac-ft 81,160

Peak discharge (base, 1,500 cfs).--July 4 (10:30 p.m.) 2,580 cfs (6.72 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 2-8, Nov. 13 to Mar. 23, Mar. 28-30. Once-daily wire-weight-gage readings used Nov. 11 to Mar. 26, Mar. 29, July 9 to Aug. 8, Sept. 10-12.

Bear Butte Creek near Sturgis, S. Dak.

Location.--Lat 44°28'35", long 103°15'50", in SW¼SW¼ sec. 15, T. 6 N., R. 7 E., on upstream side of highway bridge, 1½ miles downstream from Spring Creek, 8½ miles upstream from mouth, and 12¾ miles northeast of Sturgis.

Drainage area.--192 sq mi.

Records available.--November 1945 to September 1956.

Gage.--Wire-weight gage read once daily; crest-stage indicator since Feb. 21, 1950. Datum of gage is 2,768.12 ft above mean sea level, datum of 1929. Prior to Feb. 20, 1947, chain gage at same site and datum.

Average discharge.--11 years, 13.3 cfs (9,630 acre-ft per year); median of yearly mean discharges, 10 cfs (7,200 acre-ft per year).

Extremes.--Maximum discharge during year, 20 cfs May 29 (gage height, 2.73 ft); no flow for many days.

1945-56: Maximum discharge observed, 1,420 cfs May 24, 1946 (gage height, 12.07 ft), from rating curve extended above 1,000 cfs by logarithmic plotting; no flow for many days during 1949-50, 1952-56.

Flood of May 20, 1883 (maximum known), and one in 1909, were greater than flood of May 24, 1946, from information by local residents.

Revisions.--The maximum discharge for the water year 1951 has been revised to 352 cfs May 13, 1951 (gage height, 5.92 ft), superseding figure published in WSP 1209.

Remarks.--Records fair except those for period of ice effect, which are poor.

Revisions (water years).--WSP 1279: 1946-47, 1949(M).

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.85	0	2.2	2.9
1.9	.1	2.3	6
2.0	.4	2.4	9
2.1	1.0	2.6	15

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1				0	0.4	1.1	2.2	1.4	1.5			
2				0	.4	1.7	2.2	1.4	1.2			
3				.5	.4	5	2.9	1.4	1.0			
4				.6	.4	12	*2.6	1.2	.9			
5				.6	.4	10	3.5	1.2	*.6			
6				.6	.4	6	4.6	1.2	.5			
7				.6	.5	*4.9	4.4	1.2	.3			
8				.6	.5	3.5	3.2	1.2	.2		(*)	
9				.6	.5	3.2	2.9	1.2	.2			
10				.6	.6	1.7	2.2	1.2	0			
11				.6	.6	1.4	2.2	1.1	0			
12				.6	.8	*1.3	2.2	1.1	0			
13				.6	*.9	1.0	1.7	1.5	0			
14				.6	.9	.8	1.4	1.4	0			
15				.6	.9	.7	1.4	*1.4	0			
16				.6	.9	.8	1.4	1.4	0			(*)
17				.6	.9	1.0	1.2	1.2	0			
18				.6	.9	1.5	1.1	1.2	0			
19				*.6	.9	2.0	1.0	1.1	0			
20			(*)	.6	.9	2.5	1.0	1.0	0			
21				.6	.9	*3.0	1.0	.8	0			
22				.6	.9	4.0	1.0	.8	0			
23				.5	.9	7	1.0	.8	0			
24				.5	.8	6	*1.2	.6	0			
25				.5	.9	5	1.2	.6	0			
26				.5	.9	5	1.0	.6	*0			
27				.5	.9	4.6	1.0	.7	0			
28				.5	.9	4.6	1.0	1.0	0			
29				.5	1.1	2.9	1.2	*11	0			
30				.5	------	2.2	1.5	6	0			
31		------		.5	------	2.0	------	3.5	------		(*)	------
Total	0	0	0	16.4	21.3	110.4	56.4	51.4	6.4	0	0	0
Mean	0	0	0	0.53	0.73	3.56	1.88	1.66	0.21	0	0	0
Ac-ft	0	0	0	33	42	219	112	102	13	0	0	0

Calendar year 1955: Max	75	Min	0	Mean	2.55	Ac-ft	1,850
Water year 1955-56: Max	12	Min	0	Mean	0.72	Ac-ft	520

* Discharge measurement or observation of no flow made on this day.

Note.--Stage-discharge relation affected by ice Mar. 14-22.

Belle Fourche River near Elm Springs, S. Dak.

Location.--Lat 44°22'10", long 102°33'55", in NE¼NE¼ sec. 29, T. 5 N., R. 13 E., near right bank on downstream side of pier of highway bridge, 4½ miles northwest of Elm Springs and 5½ miles downstream from Hay Creek.

Drainage area.--7,210 sq mi, approximately.

Records available.--August 1928 to June 1932 (no winter records prior to December 1930), March 1934 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 2,171.60 ft above mean sea level, datum of 1929. Aug. 19, 1928, to June 30, 1932, and Mar. 4, 1934, to May 25, 1938, chain gage at same site and datum. May 26, 1938, to July 27, 1939, wire-weight gage at same site and datum.

Average discharge.--25 years (1928-31, 1934-56), 391 cfs (283,100 acre-ft per year); median of yearly mean discharges, 330 cfs (239,000 acre-ft per year).

Extremes.--Maximum discharge during year, 2,600 cfs July 5 (gage height, 4.22 ft); maximum gage height, 7.34 ft Mar. 19 (backwater from ice); minimum daily discharge, 15 cfs Dec. 9, 18, 19, 29, Jan. 31, Feb. 1, 17; minimum gage height recorded, -0.09 ft Nov. 12.

1928-32, 1934-56: Maximum discharge, 35,700 cfs June 10, 1941 (gage height, 14.3 ft); no flow for many days during 1936-37, 1939-40.

Maximum stage known, 21.8 ft in May 1927. Flood in spring of 1933 reached a stage of about 20 ft, from floodmarks.

Remarks.--Records good except those for periods of ice effect, which are poor. At a point 130 miles above station, water is diverted to Belle Fourche Reservoir (see p. 319) through Inlet Canal near Belle Fourche (see p. 318), with other smaller diversions from the main stem and tributaries for irrigation. Total diversions for irrigation of about 60,000 acres above station.

Revisions (water years).--WSP 786: Drainage area. WSP 926: 1929, 1931(M), 1935, 1937.

Rating tables, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Aug. 6				Aug. 6 to Sept. 30			
0.0	17	1.5	360	0.4	55	1.3	203
.2	38	2.0	639	.6	77	1.6	335
.5	78	3.0	1,360	1.0	134	2.0	575
1.0	181	4.0	2,360				

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	142	63	20	30	15	100	164	58	276	155	167	122
2	135	49	20	30	20	150	124	53	203	155	159	151
3	146	43	20	30	20	200	96	56	189	175	157	157
4	135	38	20	30	20	250	112	58	167	298	150	168
5	*114	81	20	30	25	300	*112	63	*137	2,050	146	168
6	97	70	20	30	25	*300	148	58	118	1,070	317	*181
7	80	40	20	25	25	200	144	54	108	721	*171	175
8	76	60	20	30	25	300	133	44	118	495	186	136
9	69	66	15	30	25	300	116	45	144	304	*183	102
10	64	66	20	30	25	300	93	44	122	225	166	79
11	62	30	20	30	25	200	90	43	103	198	166	62
12	55	30	20	30	25	200	78	44	129	203	162	56
13	54	20	20	30	25	300	72	53	150	187	144	66
14	53	20	20	30	*25	400	68	*49	159	176	140	72
15	59	20	20	25	25	500	59	49	225	171	138	70
16	75	20	20	25	20	700	54	46	266	201	134	110
17	70	20	20	25	15	800	50	38	288	184	136	114
18	64	25	15	25	20	1,100	46	43	404	*181	147	*105
19	64	25	15	25	20	1,500	46	32	378	192	164	102
20	63	30	20	*25	20	*1,110	44	31	248	198	228	96
21	63	*25	*20	20	20	1,150	41	27	179	192	248	102
22	63	20	25	20	20	*1,060	39	28	162	187	195	102
23	64	20	25	20	20	954	*39	26	135	187	171	106
24	*63	20	25	20	20	921	39	26	114	187	155	104
25	63	20	20	20	20	740	40	30	*162	198	155	104
26	63	25	20	20	20	462	46	88	188	195	136	110
27	66	20	20	20	20	370	45	139	248	174	116	100
28	66	20	20	20	20	272	50	103	184	162	110	98
29	66	20	15	20	50	574	56	689	150	142	*117	102
30	70	20	20	20	------	1,510	55	589	135	162	114	138
31	69	------	25	15	------	380	------	380	------	174	116	------
Total	2,393	1,026	620	780	655	17,603	2,299	3,086	5,589	9,499	4,994	3,358
Mean	77.2	34.2	20.0	25.2	22.6	568	76.6	99.5	186	306	161	112
Ac-ft	4,750	2,040	1,230	1,550	1,300	34.920	4,560	6,120	11,090	18,840	9,910	6,660

Calendar year 1955: Max 791 Min 15 Mean 124 Ac-ft 89,800
Water year 1955-56: Max 2,050 Min 15 Mean 142 Ac-ft 103,000

Peak discharge (base, 3,500 cfs).--No peak above base.

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 6-8, Nov. 11 to Mar. 19. Once-daily wire-weight-gage readings used entire year except Oct. 6 to Nov. 4, Nov. 7, 8, 11, 12, Mar. 22-25, Apr. 6-11, 14-25, May 15, June 9-19, 25, 28, July 2, 3, 5-7, Sept. 21-30.

Cheyenne River near Plainview, S. Dak.

Location.--Lat 44°31'25", long 101°59'30", in NE¼SW¼ sec. 31, T. 7 N., R. 18 E., on downstream side of third pier from right end of bridge on State Highway 73, 1¾ miles downstream from Ash Creek and 10 miles southeast of Plainview.

Drainage area.--21,600 sq mi, approximately.

Records available.--October 1950 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 1,877.65 ft above mean sea level, datum of 1929. Prior to Mar. 22, 1951, wire-weight gage at same site and datum.

Average discharge.--6 years, 462 cfs (334,500 acre-ft per year).

Extremes.--Maximum discharge during year, 4,220 cfs May 29 (gage height, 5.48 ft); maximum gage height, 6.92 ft Mar. 20 (backwater from ice); minimum daily discharge, 60 cfs Nov. 16-18.

1950-56: Maximum discharge, 41,400 cfs Mar. 30, 1952 (gage height, 10.55 ft), from rating curve extended above 24,000 cfs by logarithmic plotting; maximum gage height, 10.62 ft Mar. 29, 1952 (backwater from ice); minimum daily discharge, 7 cfs Jan. 26-28, 1952.

Maximum stage known, about 17½ ft, late in May 1920, from information by local residents. Flood in May 1927 reached a stage of about 14 ft, from information by local residents.

Remarks.--Records fair except those for period of ice effect, which are poor. Natural flow of stream affected by storage reservoirs, diversions for irrigation of about 70,000 acres, and return flow from irrigated areas.

Rating tables, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 22, 23)

Oct. 1 to Mar. 21		Mar. 22 to Sept. 30			
2.2	122	2.1	94	3.5	830
2.4	183	2.3	166	3.9	1,320
2.6	257	2.5	249	4.4	2,170
3.0	455	2.8	382	5.0	3,310
		3.1	527		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	329	190	130	250	80	280	496	484	545	*210	315	a160
2	319	157	130	260	80	350	428	1,340	475	219	a280	198
3	310	125	120	280	100	400	419	746	396	a250	a250	219
4	310	148	120	280	110	500	*387	410	387	877	a230	a220
5	*291	161	130	280	110	700	328	a350	*337	2,040	a230	a220
6	257	173	130	270	110	650	405	275	262	2,170	a250	a230
7	253	173	130	260	120	650	496	a270	249	1,200	*1,410	a230
8	241	167	130	270	130	750	a460	391	232	662	446	a200
9	241	166	130	260	140	700	433	350	223	527	456	a160
10	234	154	130	250	160	650	428	311	228	378	546	133
11	226	150	130	240	170	550	346	a280	182	293	553	a130
12	222	130	130	230	190	*500	289	236	a180	382	669	126
13	194	100	130	230	*200	500	315	a230	a180	a270	584	a120
14	197	80	130	220	180	460	311	*297	198	a280	a350	182
15	208	70	130	200	170	550	284	574	a180	a280	a300	a160
16	208	60	130	150	150	700	253	346	280	a250	a300	a150
17	218	60	130	100	120	850	271	a300	319	a260	364	a170
18	218	60	140	80	130	950	267	a270	360	*433	a280	*186
19	222	70	160	*70	140	*1,000	219	249	652	337	a280	a150
20	208	80	*170	70	140	1,500	245	223	517	293	297	133
21	194	*80	180	70	150	*3,000	249	a200	355	311	328	a140
22	200	90	200	70	160	*2,640	a238	a180	a300	a300	a330	a150
23	194	110	210	80	180	2,360	*228	a160	a270	293	a320	a160
24	*197	120	220	90	190	1,760	223	151	267	a270	306	a170
25	200	130	250	90	210	1,460	223	a150	*328	a240	a280	178
26	200	140	700	90	200	1,160	a221	a150	a280	223	a250	166
27	197	140	500	90	190	860	219	a180	297	a210	a220	159
28	190	140	400	80	190	636	245	a250	302	a210	a200	159
29	194	140	400	80	250	456	262	1,800	271	a210	*182	182
30	197	130	300	80	------	559	267	1,490	240	328	a170	186
31	200	------	250	80	------	572	------	879	------	315	166	------
Total	7,069	3,694	6,270	5,150	4,450	28,653	9,455	13,522	9,292	14,521	11,142	5,127
Mean	228	123	202	166	153	924	315	436	310	468	359	171
Ac-ft	14,020	7,330	12,440	10,210	8,830	56,830	18,750	26,820	18,430	28,800	22,100	10,170

Calendar year 1955:	Max 13,400	Min 55	Mean 392	Ac-ft 283,700
Water year 1955-56:	Max 3,000	Min 60	Mean 323	Ac-ft 234,700

Peak discharge (base, 4,500 cfs).--No peak above base.

* Discharge measurement made on this day.

a No gage-height record; discharge interpolated or estimated on basis of weather records and records for nearby stations.

Note.--Stage-discharge relation affected by ice Nov. 11 to Mar. 21. Doubtful gage-height record Nov. 13 to Mar. 19, Mar. 27-30, Apr. 2-23, 26, May 5-7, 11-13, 17-28, June 11-15, 22-27, June 29 to July 3, July 11 to Aug. 9, Aug. 14 to Sept. 26; discharge computed on basis of once-daily wire-weight-gage readings and fragmentary recorder record.

Cherry Creek near Plainview, S. Dak.

Location.--Lat 44°44'35", long 102°03'10", in SW¼NE¼ sec. 16, T. 9 N., R. 17 E., on left bank 5 ft downstream from bridge on State Highway 73, a quarter of a mile downstream from small tributary, 6¼ miles downstream from Red Owl Creek, and 11 miles northeast of Plainview.

Drainage area.--1,190 sq mi, approximately.

Records available.--November 1945 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 2,158.06 ft above mean sea level, datum of 1929. Prior to June 8, 1948, chain or wire-weight gage at same site and datum.

Average discharge.--11 years, 65.3 cfs (47,280 acre-ft per year); median of yearly mean discharges, 45 cfs (32,600 acre-ft per year).

Extremes.--Maximum discharge during year, 940 cfs Mar. 18 (gage height, 9.53 ft, backwater from ice); no flow for many days.
1945-56: Maximum discharge, 17,500 cfs Apr. 1, 1952 (gage height, 22.63 ft); no flow for many days each year.

Remarks.--Records good except those for period of ice effect, which are poor.

Revisions (water years).--WSP 1279: 1949.

Rating tables, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-5)

Oct. 1 to Feb. 29		Mar. 1 to Sept. 30			
3.8	0	3.75	0	5.0	44
3.9	.4	3.8	.2	5.5	94
4.0	1.3	3.9	1.0	6.0	164
4.1	2.5	4.0	2.2	6.5	270
4.2	4.4	4.2	6	7.0	412
		4.4	11	8.0	760
		4.7	23		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.7					0	35	1.5	0		0	
2	1.7					0	26	1.9	0		0	
3	.9					2.1	21	1.9	0		0	
4	.5					11	*19	1.7	0		0	
5	*.1					6	16	1.6	*0		0	
6	0					b60	14	1.3	0		0	
7	0					b50	12	1.2	1.3		*0	
8	0					b100	11	1.5	3.9		0	
9	0					b130	9	.3	2.9		0	
10	0					b120	8	2.3	1.1		21	
11	0					b110	7	4.3	.2		13	
12	0					*b100	6	2.9	0		8	
13	0				(*)	b100	5	2.4	0		5	
14	0					b100	4.3	2.1	0		3.1	
15	0					b100	4.1	*1.7	0		1.5	
16	0					b100	4.3	1.3	0		.5	
17	0					b200	4.1	.8	0		.1	
18	0					b800	3.6	.7	0	(*)	0	(*)
19	0					*569	3.2	.4	0		0	
20	0		(*)	(*)		*688	2.9	.2	0		0	
21	0	(*)				*627	2.6	.1	0		0	
22	0					496	1.9	0	0		0	
23	0					400	*1.5	0	0		0	
24	*0					274	1.5	0	0		0	
25	0					170	1.0	0	*0		0	
26	0					80	.8	0	0		0	
27	0					70	.7	0	0		0	
28	0					71	.7	0	0		0	
29	0					66	.8	0	0		*0	
30	0				------	73	1.0	0	0		0	
31	0	------			------	51	------	0	------		0	------
Total	5.9	0	0	0	0	5,724.1	228.0	32.1	9.4	0	52.2	0
Mean	0.19	0	0	0	0	185	7.60	1.04	0.31	0	1.68	0
Ac-ft	12	0	0	0	0	11,350	452	64	19	0	104	0

Calendar year 1955: Max 399 Min 0 Mean 3.23 Ac-ft 2,340
Water year 1955-56: Max 800 Min 0 Mean 16.5 Ac-ft 12,000

Peak discharge (base, 1,000 cfs).--No peak above base.
* Discharge measurement or observation of no flow made on this day.
b Stage-discharge relation affected by ice.
Note.--Discharge computed from once-daily wire-weight-gage readings Mar. 7-9, 12-17, 19, 22-24, 26-28, 31, Apr. 23-26, May 9-11.

Cheyenne River near Eagle Butte, S. Dak.

Location.--Lat 44°41'40", long 101°13'05", in NE¼SE¼ sec. 32, T. 9 N., R. 24 E., on downstream side of fourth pier from left abutment of bridge on State Highway 63, 0.5 miles upstream from Hermaphrodite Creek and 21 miles south of Eagle Butte.

Drainage area.--24,500 sq mi, approximately.

Records available.--August 1928 to September 1956. Published as "near Carlin" 1928-33.

Gage.--Water-stage recorder and supplemental wire-weight-gage read once daily. Datum of gage is 1,601.57 ft above mean sea level, datum of 1929. Prior to Nov. 23, 1934, chain gage at same site and datum.

Average discharge.--27 years (1929-56), 920 cfs (666,100 acre-ft per year).

Extremes.--Maximum discharge during year, 6,870 cfs Mar. 22 (gage height, 6.55 ft); maximum gage height, 8.42 ft Mar. 19 (backwater from ice); minimum daily discharge, 40 cfs Nov. 17; minimum gage height, 2.19 ft Nov. 3.

1928-56: Maximum discharge observed, 104,000 cfs May 24, 1933 (gage height, 15.00 ft), from rating curve extended above 30,000 cfs; no flow Feb. 14-16, 1949, Jan. 25 to Feb. 4, 1950.

Maximum stage known, 18.9 ft May 13, 1920, from information by local residents. Flood of May 9, 1927, reached a stage of 18.1 ft, from information by local residents.

Remarks.--Records good except those for period of ice effect, which are poor. Discharge measurements generally made twice a month December to February and once a week during remainder of year. Natural flow of stream affected by storage reservoirs and diversions for irrigation of about 70,000 acres above station.

Revisions.--WSP 786: Drainage area.

Rating tables, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 5, 6, Mar. 31 to May 10, July 5, 6)

Oct. 1 to Mar. 17		Mar. 18 to Sept. 30			
2.4	180	2.6	125	4.5	1,710
2.6	240	3.0	288	5.0	2,470
2.8	340	3.5	580	5.5	3,580
3.0	470	4.0	1,070	6.0	5,080

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	442	207	140	280	80	210	830	308	993	266	293	189
2	400	207	140	260	80	230	750	440	660	256	327	182
3	376	180	140	250	90	300	644	1,180	580	261	293	178
4	370	192	140	250	100	450	573	760	478	288	266	197
5	364	195	140	260	100	750	545	510	441	638	270	214
6	340	222	140	280	100	1,200	517	447	401	1,620	261	222
7	295	240	140	280	105	1,100	545	379	342	1,640	266	218
8	280	280	140	280	110	1,000	644	337	327	1,290	1,190	222
9	260	237	130	280	110	800	580	436	348	770	819	235
10	255	231	120	285	120	700	491	430	298	588	554	226
11	234	234	120	285	130	600	447	441	279	430	588	193
12	231	210	130	285	140	550	418	385	256	353	598	182
13	222	170	130	285	160	520	364	327	226	374	695	174
14	213	140	135	280	160	520	353	327	248	327	584	162
15	198	110	135	250	150	500	348	317	235	279	374	197
16	204	75	135	200	130	600	332	566	214	284	317	170
17	204	40	135	160	110	1,200	322	385	261	332	270	162
18	210	45	135	120	110	2,500	308	303	317	348	284	158
19	213	50	135	100	110	4,100	298	261	342	317	298	170
20	222	55	135	80	110	4,600	270	239	531	348	284	174
21	216	60	135	70	110	5,400	252	230	504	303	322	155
22	198	70	150	70	130	4,950	248	230	358	288	332	158
23	210	75	170	70	150	3,980	243	222	279	270	337	158
24	210	85	190	70	180	2,600	243	218	298	256	308	162
25	207	100	210	70	175	2,320	235	193	270	243	298	170
26	210	115	230	70	170	2,240	239	201	270	230	270	174
27	204	130	250	80	170	1,950	239	205	284	230	252	166
28	201	140	300	80	180	1,430	230	235	270	235	261	158
29	192	140	350	80	190	1,000	274	390	293	239	243	162
30	201	140	320	80	------	652	288	1,380	266	308	209	174
31	204	------	300	80	------	750	------	1,200	------	332	205	------
Total	7,786	4.375	5,300	5,570	3,760	49,702	12,070	13,482	10,869	13,943	11,868	5,462
Mean	251	146	171	180	130	1,603	402	435	362	450	383	182
Ac-ft	15,440	8,680	10,510	11,050	7,460	98,580	23,940	26,740	21,560	27,660	23,540	10,830

Calendar year 1955:	Max 10,300	Min 35	Mean 387	Ac-ft 280,200
Water year 1955-56:	Max 5,400	Min 40	Mean 394	Ac-ft 286,000

Peak discharge (base, 5,500 cfs).--Mar. 22 (12:30 a.m.) 6,870 cfs (6.55 ft).

Note.--Stage-discharge relation affected by ice Nov. 12 to Mar. 21. Discharge computed from once-daily wire-weight-gage readings Nov. 13 to Mar. 16, Mar. 29 (many scattered days of no gage-height record).

Missouri River at Pierre, S. Dak.

Location.--Lat 44°22'25", long 100°22'05", in SW¼ sec. 32, T. 111 N., R. 79 W., near left bank on downstream side of pier of Chicago and North Western Railway bridge at Pierre, 1.2 miles upstream from Bad River and at mile 1,117.6.

Drainage area.--243,500 sq mi, approximately.

Records available.--October 1929 to September 1956. Gage-height records collected in this vicinity for 1882, 1895-99 are contained in reports of Missouri River Commission and records for 1891-1916, and 1918 to date are contained in reports of U. S. Weather Bureau.

Gage.--Water-stage recorder. Datum of gage is 1,414.26 ft (revised) above mean sea level, datum of 1929. Prior to Mar. 11, 1932, chain gage at same site at datum 2.00 ft higher.

Average discharge.--27 years, 23,580 cfs (17,070,000 acre-ft per year).

Extremes.--Maximum discharge during year, 73,900 cfs Mar. 24 (gage height, 11.11 ft); minimum daily, 4,800 cfs Feb. 20; minimum gage height, 3.38 ft Nov. 18.

1929-56: Maximum discharge, 440,000 cfs Apr. 10, 1952 (gage height, 25.35 ft); minimum daily, 2,300 cfs Nov. 14-16, 1940; minimum gage height observed, 0.20 ft Nov. 27, 1946.

Remarks.--Records excellent except those for period of ice effect, which are good. Discharge measurements generally made two or three times a week during open water and once a week during winter period. Many diversions above station for irrigation. Flow regulated by Garrison Reservoir (see p. 250). Records of chemical analyses and water temperatures for the water year 1956 are given in WSP 1451.

Revisions (water years).--WSP 716: 1930. WSP 761: Drainage area.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	33,600	32,500	8,800	10,500	8,000	6,300	25,300	25,600	31,800	35,600	27,600	24,200
2	32,900	33,100	6,500	10,400	7,400	6,200	29,600	25,600	31,700	34,400	23,300	23,600
3	31,900	32,800	7,000	10,300	7,600	6,300	31,200	26,200	31,500	33,100	30,600	22,500
4	31,700	32,600	7,400	10,300	7,600	6,800	26,500	28,200	30,800	31,900	31,200	20,400
5	31,900	32,400	7,200	10,500	7,500	6,900	27,400	29,500	30,500	32,200	30,900	20,300
6	31,800	32,000	7,000	10,400	7,500	6,600	34,400	29,100	31,000	33,100	30,700	20,300
7	31,700	31,700	6,800	9,900	8,000	6,600	36,800	28,100	30,900	35,700	31,400	20,700
8	31,600	31,400	7,000	9,900	7,800	7,000	32,800	27,800	31,000	34,800	31,600	21,300
9	31,400	28,700	6,900	9,800	8,000	7,200	34,100	27,400	32,700	32,800	31,900	21,800
10	31,400	26,700	7,400	9,700	7,200	7,400	35,600	27,300	33,000	32,400	32,400	22,000
11	32,000	25,000	8,100	9,400	6,600	7,600	41,700	27,700	31,700	33,400	31,100	22,800
12	32,200	24,200	8,200	9,300	6,400	7,500	35,000	27,900	31,500	32,600	31,900	22,500
13	32,300	20,400	7,900	9,200	6,600	7,400	26,500	29,200	32,000	31,700	31,200	22,400
14	31,400	20,000	7,800	8,900	6,000	7,300	25,800	30,000	32,000	30,900	31,000	22,700
15	31,500	17,100	7,800	8,400	5,500	7,400	26,900	30,200	32,900	30,700	31,000	22,400
16	31,600	13,400	8,000	7,900	5,600	7,600	26,700	30,300	34,200	30,800	30,800	22,200
17	31,600	12,600	8,300	7,800	5,300	8,800	26,400	29,400	35,000	31,700	30,600	22,100
18	31,800	10,900	8,900	8,300	5,400	10,500	26,300	28,600	34,500	32,200	30,200	21,900
19	32,000	11,000	9,500	8,400	5,100	12,000	25,900	28.400	34,000	31,400	30,000	21,900
20	32,000	11,000	10,000	8,100	4,800	22,000	25,600	27,900	35,000	30,800	29,600	22,500
21	31,900	12,900	10,000	7,900	5,000	27,000	25,600	27,000	37,100	30,600	23,000	22,400
22	31,800	12,800	10,000	7,800	5,400	32,000	25,300	26,800	36,700	30,500	26,000	21,500
23	32,100	11,600	10,000	7,700	5,800	38,000	24,800	27,100	36,300	30.300	25,500	19,900
24	32,300	11,000	9,900	7,700	6,000	46,000	24,900	27,600	36,400	30,000	25,800	18.600
25	32,400	10,500	9,900	7,700	6,400	58,700	24.900	27,900	37,000	29,800	25,400	17,900
26	32,700	10,000	10,100	7,800	6,400	45,700	25,200	27,900	37,800	29,400	24,900	17,900
27	33,000	9,700	10,400	8,000	6,800	39,000	26,400	28,100	38,200	29,100	24,500	17,800
28	33,200	9,500	10,300	8,000	6,300	35,700	26,200	29,300	37,600	29,500	24,800	17,400
29	33,100	9,000	10,300	8,000	6,400	25,500	26,200	30,700	36,500	29,600	24,900	17,400
30	32,800	9,000	10,400	8,000	------	21,600	25,600	31,900	35,800	30,300	25,100	17,500
31	32,300	------	10,500	8,000	------	21,800	------	32,200	------	28,700	24,800	------
Total	995,900	585,500	268,300	274,000	188,400	556,400	855,600	880,900	‡1,017.1	980,000	893,700	628,800
Mean	32,130	19,520	8,655	8,839	6,497	17,950	28,520	28,420	33,900	31,610	23,830	20,960
Ac-ft	‡1,975	‡1,161	532,200	543,500	373,700	‡1,104	‡1,697	‡1,747	‡2,017	‡1,944	‡1,773	‡1,247

Calendar year 1955: Max 48,600 Min 5,320 Mean 20,680 Ac-ft 14,970,000
Water year 1955-56: Max 58,700 Min 4,800 Mean 22,200 Ac-ft 16,110,000

Peak discharge (base, 60,000 cfs).--Mar. 24 (10 p.m.) 73,900 cfs (11.11 ft).

‡ Expressed in thousands.

Note.--Stage-discharge relation affected by ice Nov. 17 to Mar. 24. Discharge computed from twice-daily or more frequent wire-weight-gage readings Oct. 15, 16, Nov. 9 to Mar. 20, Mar. 29 to Apr. 1, July 9-12, 28, 29, July 31 to Aug. 3, Aug. 18 to Sept. 16, Sept. 26-30.

Bad River near Midland, S. Dak.

Location.--Lat 44°04'05", long 101°07'45", in SE¼SE¼ sec. 5, T. 1 N., R. 25 E., near center of span on downstream side of highway bridge, three-fifths of a mile downstream from Ash Creek, 1¼ miles east of Midland, and 2¼ miles downstream from Mitchell Creek.

Drainage area.--1,500 sq mi, approximately.

Records available.--January 1946 to September 1956.

Gage.--Wire-weight gage and crest-stage indicator; gage read once daily. Datum of gage is 1,833.42 ft above mean sea level, datum of 1929. Prior to Apr. 11, 1947, chain gage at same site and datum.

Average discharge.--10 years, 92.1 cfs (66,680 acre-ft per year); median of yearly mean discharges, 55 cfs (38,800 acre-ft per year).

Extremes.--Maximum discharge during year, 2,460 cfs Mar. 20 (gage height, 6.71 ft); no flow for many days.

1946-56: Maximum discharge, 11,200 cfs Apr. 2, 1952 (gage height, 14.00 ft); no flow for many days each year.

Remarks.--Records fair except those for period of ice effect, which are poor. Records of chemical analyses and water temperatures for the water year 1956 are given in WSP 1451.

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-8, Mar. 23-27, Apr. 4-7, 22-28, May 22 to June 7, July 3, 7, 8, Aug. 9, 19-26)

1.88	0	2.5	53
1.9	.1	2.7	113
2.0	1.0	3.0	226
2.1	4.0	4.0	611
2.2	11	5.0	1,060
2.3	21	6.0	1,770
2.4	35		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6					*2	22	5	3.2	0	0	
2	6					200	32	16	1.9	0	0	
3	3.2					500	28	146	1.2	52	0	
4	.5					450	*28	128	.7	981	0	
5	0					*360	24	58	.3	763	0	
6	.1					250	14	27	.1	619	0	
7	.2				(*)	110	8	*19	.3	443	*.5	
8	.1					*75	5	11	0	230	*85	
9	0	(*)				70	7	2.5	0	*56	150	
10	0					50	1.9	1.6	0	18	113	(*)
11	0			(*)		30	6	.5	*0	13	48	
12	0					20	11	1.4	0	6	15	
13	0					30	6	1.9	0	6	6	
14	0					50	4.0	2.2	0	24	0	
15	0					80	2.2	*3.6	0	16	0	
16	0					130	.8	5	0	10	0	
17	*0					110	.3	6	0	4.0	0	
18	0					170	.4	8	0	1.6	.3	
19	0					1,160	*.6	6	0	.4	0	
20	0		(*)			1,660	0	3.6	0	0	*.3	
21	0					*848	0	1.9	0	0	0	
22	0					568	.1	3.2	0	0	.5	
23	0					*389	.2	.1	0	0	.1	
24	0					313	*.2	0	0	0	.2	
25	0					264	0	.2	0	*0	0	
26	0					*241	.3	.3	*0	0	.1	
27	0					188	.3	.4	0	0	0	
28	0					154	.8	*.8	0	0	0	
29	0					150	1.6	.7	0	0	0	
30	0				------	53	3.6	2.5	0	0	0	
31	0	------			------	21	------	1.0	------	0	0	------
Total	16.1	0	0	0	0	8,696	208.3	463.4	7.7	3,243.0	419.0	0
Mean	0.52	0	0	0	0	281	6.94	14.9	0.26	105	13.5	0
Ac-ft	32	0	0	0	0	17,250	413	919	15	6,430	831	0

Calendar year 1955:	Max	1,610	Min	0	Mean	35.0	Ac-ft	25,300
Water year 1955-56:	Max	1,660	Min	0	Mean	35.7	Ac-ft	25,890

Peak discharge (base, 500 cfs).--Mar. 2 (570 cfs); Mar. 20 (1 a.m.) 2,460 cfs (6.71 ft); July 4 (11 a.m.) 1,170 cfs (5.20 ft).

* Discharge measurement or observation of no flow made on this day.

Note.--Stage-discharge relation affected by ice Nov. 11 to Mar. 18.

Bad River near Fort Pierre, S. Dak.

Location.--Lat 44°19'40", long 100°23'00", in NW¼ sec. 10, T. 4 N., R. 31 E., on right bank on downstream side of pier of highway bridge, 2½ miles south of Fort Pierre, 4¾ miles downstream from Willow Creek, and 5 miles upstream from mouth.

Drainage area.--3,107 sq mi.

Records available.--August 1928 to June 1932, March 1934 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 1,427.83 ft above mean sea level, datum of 1929. Aug. 22, 1928, to June 30, 1932, and Mar. 1 to Nov. 25, 1934, chain gage at same site and datum. Nov. 26, 1934, to July 9, 1951, wire-weight gage at same site and datum.

Average discharge.--25 years (1928-31, 1934-56), 176 cfs (127,400 acre-ft per year); median of yearly mean discharges, 100 cfs (72,400 acre-ft per year).

Extremes.--Maximum discharge during year, 3,050 cfs Mar. 20 (gage height, 10.41 ft); maximum gage height, 12.25 ft Mar. 17 (backwater from ice); no flow for many days.

1928-32, 1934-56: Maximum discharge, 34,200 cfs May 1, 1942 (gage height, 27.8 ft, from floodmark); no flow during long periods each year.

Flood in April 1927 reached a stage of 30.89 ft, from floodmark (discharge, 50,000 cfs, from rating curve extended above 33,000 cfs). Flood in July 1905 reached a stage about 2 ft higher than that in April 1927.

Remarks.--Records fair except those for period of ice effect, which are poor.

Revisions (water years).--WSP 786: Drainage area. WSP 856: 1929(M), 1937.

Rating tables, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used July 5-8, Aug. 12, 13, Aug. 22 to Sept. 30)

Oct. 1 to Mar. 3		Mar. 4 to Sept. 30			
3.8	0	3.2	0	4.2	81
3.9	.3	3.3	1.0	4.6	190
4.0	1.5	3.4	2.5	5.0	320
4.1	3.3	3.6	10	6.0	710
4.2	6	3.8	23	8.0	1,610
4.3	12	4.0	43	10.0	2,800
4.4	21				

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	15					0	376	*20	11	0	1.3	
2	10	(*)				*0	299	142	7	0	1.2	
3	6				(*)	0	220	109	5	0	1.2	
4	4.3					470	179	43	*3.7	4.3	1.9	
5	3.1					*950	159	39	2.5	*447	1.3	
6	2.2					*750	*137	81	2.5	*555	30	
7	2.0					150	126	*55	1.6	1,040	18	
8	1.5					100	73	52	1.0	372	1.9	
9	1.5					80	55	36	1.0	*137	.7	
10	1.0					50	40	22	.5	123	.6	
11	.4					50	33	18	*0	91	122	
12	.2		(*)			40	30	15	0	50	*917	
13	*.4					30	26	14	0	31	*203	(*)
14	.3					50	22	*15	0	21	46	
15	.3					60	19	12	0	16	29	
16	.2					80	15	12	0	*11	15	
17	.2					500	14	11	0	6	10	
18	.1			(*)		1,770	13	8	0	10	6	
19	.1					*1,600	*11	7	0	15	5	
20	.1					*2,630	14	7	0	11	4.0	
21	.1					2,640	9	6	0	7	2.4	
22	.1					*1,820	8	*12	0	6	1.4	
23	.1					1,360	8	10	0	4.6	*1.2	
24	.1					1,020	8	5	0	2.8	.7	
25	.1					1,140	8	5	*0	1.6	.4	
26	.1					*1,180	9	4.9	0	1.4	.3	
27	0					1,200	12	5	0	1.0	.2	(*)
28	0					678	11	6	0	.9	.2	
29	0					320	14	15	0	.8	0	
30	0		(*)		------	*196	14	9	0	*4.0	*0	
31	0	------			------	316	------	6	------	1.4	0	------
Total	49.5	0	0	0	0	21,230	1,962	801.9	35.8	2,971.8	1,321.9	0
Mean	1.60	0	0	0	0	685	65.4	25.9	1.19	95.9	42.6	0
Ac-ft	98	0	0	0	0	42,110	3,890	1,590	71	5,890	2,620	0

	Max	Min	Mean	Ac-ft
Calendar year 1955:	2,160	0	82.6	59,780
Water year 1955-56:	2,640	0	77.5	56,270

Peak discharge (base, 1,100 cfs).--Mar. 4 (5 p.m.) 1,460 cfs (7.71 ft); Mar. 17 (12 p.m.) 2,300 cfs; Mar. 20 (3:30 a.m.) 3,050 cfs (10.41 ft); Mar. 27 (11 a.m.) 1,330 cfs (7.45 ft); July 6 (12 p.m.) 1,440 cfs (7.50 ft); Aug. 12 (11:30 a.m.) 1,330 cfs (7.27 ft).

* Discharge measurement or observation of no flow made on this day.

Note.--Stage-discharge relation affected by ice Mar. 4-18. Discharge computed from recorder record Mar. 4-24 and from once-daily wire-weight-gage readings and partial recorder record, at times, during remainder of year.

Medicine Creek near Blunt, S. Dak.

Location.--Lat 44°33'45", long 99°54'40", in NW¼ sec. 31, T. 113 N., R. 75 W., on left bank at downstream side of highway bridge, 3 miles upstream from South Fork Medicine Creek and 5 miles northeast of Blunt.

Drainage area.--455 sq mi, approximately.

Records available.--March 1950 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 1,612 ft (by barometer). Prior to Oct. 31, 1950, wire-weight gage at same site and datum.

Average discharge.--6 years, 8.72 cfs (6,310 acre-ft per year).

Extremes.--Maximum discharge during year, 12 cfs Mar. 21; maximum gage height, 9.85 ft Mar. 19 (backwater from ice); no flow for many days.

1950-56: Maximum discharge, 1,830 cfs Apr. 5, 1952 (gage height, 12.34 ft, from floodmarks); maximum gage height, 13.2 ft between Mar. 26 and Mar. 29, 1950, from floodmark (backwater from ice); no flow for long periods each year.

Remarks.--Records fair except those for period of ice effect, which are poor.

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 3-11)

6.88	0	7.4	3.2
7.0	.2	7.7	8
7.1	.6	8.0	16
7.2	1.2		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						0	3	0.9	0.4			
2			(*)			0	2	.9	.5			
3		(*)				0	3	.9	.3			
4						0	4	.8	.3			
5						0	*4	.6	*.3			
6	(*)					0	4	.7	.4	(*)	(*)	
7						*0	4	.7	.3			
8						0	3	.8	.4			
9						0	*3.0	.3	.2			
10						0	2.9	.2	.3			
11						0	2.4	.7	.3			
12						0	2.2	.3	0			
13						*0	2.1	.4	0		(*)	
14					(*)	0	1.7	*.7	0			
15						0	1.4	.4	0			
16						0	1.2	.5	0	(*)		
17				(*)		0	1.1	.3	0			(*)
18						0	1.1	.2	0			
19						*1	*1.3	.2	0			
20						5	1.2	.1	0			
21						*11	.8	0	0			
22						6	.8	0	0			
23						*4	.8	0	0			
24						4	1.0	0	0			
25						3	.7	0	*0			
26						3	.6	0	0			
27						2	.2	0	0		(*)	
28						1	.5	.2	0			
29						*0	.8	.4	0			
30					------	1	.7	.6	0			
31		------			------	2	------	.3	------			------
Total	0	0	0	0	0	43	55.5	12.1	3.7	0	0	0
Mean	0	0	0	0	0	1.4	1.85	0.39	0.12	0	0	0
Ac-ft	0	0	0	0	0	85	110	24	7.3	0	0	0

Calendar year 1955:	Max	410	Min	0	Mean	5.87	Ac-ft	4,240
Water year 1955-56:	Max	11	Min	0	Mean	0.31	Ac-ft	226

Peak discharge (base, 50 cfs).--No peak above base.

* Discharge measurement or observation of no flow made on this day.

Note.--Stage-discharge relation affected by ice Mar. 18 to Apr. 8. Discharge computed from once-daily wire-weight-gage readings Mar. 18 to Apr. 19.

Medicine Creek at Kennebec, S. Dak.

Location.--Lat 43°54', long 99°52', in NW¼NE¼ sec. 18, T. 105 N., R. 75 W., on right bank 4 ft downstream from highway bridge, half a mile west of Kennebec, and half a mile downstream from nearest tributary.

Drainage area.--465 sq mi, approximately.

Records available.--July 1954 to September 1956.

Gage.--Water-stage recorder. Prior to Dec. 28, 1954, wire-weight gage read once daily at same site and datum.

Extremes.--Maximum discharge during year, 271 cfs Mar. 22 (gage height, 5.65 ft); no flow for many days.

1954-56: Maximum discharge, 1,840 cfs Mar. 10, 1955 (gage height, 13.54 ft); no flow for many days each year.

Flood in April 1952 reached a stage of 17.0 ft, from floodmarks (discharge, about 3,500 cfs).

Remarks.--Records good.

Rating table, water year 1955-56 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 21, 22)

0.65	0	1.6	18
.7	.3	2.0	33
.8	1.2	3.0	88
1.0	4.2	4.0	157
1.3	10	6.0	324

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		(*)				0	39	0			0	
2						*0	164	g.5			*0	
3						0	142	*g2.2		(*)	0	
4						0	63	10			0	
5						*0	58	10			0	
6						0	88	9	(*)		0	
7						0	66	5			0	(*)
8						0	45	3.2			0	
9				(*)		0	27	2.0			0	
10						0	*18	1.3			*g.2	
11						0	13	1.2			0	
12						0	10	g.7		(*)	0	(*)
13						0	7	g.1			0	
14						0	6	g.1			0	
15						0	4.6	0			0	
16						g.3	4.9	0			*0	
17						g0	3.9	0			0	
18						0	2.8	g1.4		(*)	0	
19						*2.0	g1.8	.1	(*)		0	
20						*5	g1.2	0				
21						99	g1.0	0			0	
22						*244	.6	0			*0	
23						236	.2	*g0		(*)	0	
24					(*)	186	0	0			0	
25						145	*g0	0			0	
26						*175	g.2	0	(*)		0	
27						175	.1	0			0	(*)
28						147	0	0			0	
29						39	0	0			0	
30					------	28	0	0			0	
31		------			------	25	------	0	------		0	------
Total	0	0	0	0	0	1,506.3	767.3	46.8	0	0	0.2	0
Mean	0	0	0	0	0	48.6	25.6	1.51	0	0	0.01	0
Ac-ft	0	0	0	0	0	2,990	1,520	93	0	0	0.4	0

Calendar year 1955:	Max	1,570	Min	0	Mean	22.7	Ac-ft	16,460
Water year 1955-56:	Max	244	Min	0	Mean	6.34	Ac-ft	4,600

Peak discharge (base, 100 cfs).--Mar. 22 (8 p.m.) 271 cfs (5.65 ft); Mar. 26 (2:30 p.m.) 210 cfs (4.59 ft); Apr. 2 (3:30 p.m.) 229 cfs (4.84 ft); Apr. 6 (12 m.) 107 cfs (3.24 ft).

* Discharge measurement or observation of no flow made on this day.

g Computed from once-daily wire-weight-gage readings or fragmentary recorder record.

White River at Crawford, Nebr.

Location.--Lat 42°41', long 103°25', in W½ sec. 3, T. 31 N., R. 52 W., on right bank 15 ft downstream from bridge in city park at Crawford.

Drainage area.--313 sq mi.

Records available.--February 1931 to September 1943 and October 1947 to September 1956 in reports of Geological Survey. January 1924 to December 1927, February 1931 to September 1943, and October 1947 to September 1956 in reports of State engineer.

Gage.--Water-stage recorder. Datum of gage is 3,659.52 ft above mean sea level, datum of 1929. Prior to Dec. 31, 1927, staff gage in vicinity of present gage at different datum. Feb. 25, 1931, to Oct. 2, 1933, staff gage at old highway bridge half a mile upstream at different datum and Oct. 3, 1933, to Sept. 30, 1943, chain gage 1 mile upstream at different datum.

Average discharge.--21 years (1931-43, 1947-56), 21.1 cfs (15,280 acre-ft per year).

Extremes.--Maximum discharge during year, 958 cfs July 2 (gage height, 5.10 ft); from rating curve extended above 250 cfs; minimum daily, 7.0 cfs Sept. 3.
1931-43, 1947-56: Maximum gage height, 6.88 ft Mar. 15, 1948 (discharge not determined); minimum daily discharge, 3.9 cfs Aug. 11, 1936.

Remarks.--Records good except those for periods of ice effect, which are fair. Discharge measurements generally made once a week.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	14	17	17	21	17	22	21	25	17	73	13	8.5
2	14	17	17	20	17	22	22	23	16	96	15	7.5
3	15	17	17	19	19	21	23	21	16	26	13	7.0
4	15	18	17	20	21	23	22	22	15	20	12	9.5
5	14	17	17	20	23	23	22	21	16	18	11	11
6	12	17	18	20	25	21	23	20	15	15	11	12
7	14	17	18	20	22	20	22	20	14	15	10	11
8	15	18	18	20	22	21	22	20	13	12	9.5	11
9	14	20	18	20	20	21	22	20	16	12	10	9.5
10	14	21	18	20	20	21	22	20	13	12	9.5	8.5
11	13	20	18	20	21	21	21	20	13	12	10	9.0
12	14	20	18	20	21	21	22	17	12	14	10	9.5
13	16	20	19	20	22	21	21	23	12	13	9.0	9.5
14	15	19	21	20	22	21	20	22	11	11	7.5	9.0
15	14	16	20	14	22	21	20	21	14	9.5	8.0	9.5
16	13	13	20	15	20	23	20	17	15	8.5	8.5	9.5
17	14	13	20	16	18	23	20	18	44	12	9.0	9.5
18	14	14	19	22	18	29	19	18	17	12	12	9.5
19	14	16	20	28	20	27	20	18	14	11	14	9.5
20	13	17	23	24	22	27	19	18	14	11	15	10
21	14	17	25	19	22	25	19	20	11	10	14	10
22	14	17	22	20	22	24	19	20	11	10	11	10
23	17	17	29	20	22	23	22	19	9.5	11	10	11
24	17	17	25	20	22	23	22	19	11	9.5	11	11
25	17	17	23	20	22	22	20	18	11	9.0	11	11
26	17	17	22	21	22	22	20	18	12	9.5	10	11
27	18	17	22	21	23	22	22	30	12	9.5	9.5	10
28	18	17	22	21	22	22	24	22	9.0	10	10	9.5
29	19	17	21	20	22	22	23	20	9.5	10	8.0	11
30	18	17	20	19	------	22	25	20	9.5	12	7.5	12
31	18	------	20	18	------	22	------	19	------	12	8.5	------
Total	468	517	624	618	611	698	639	629	419.5	525.5	327.5	296.5
Mean	15.1	17.2	20.1	19.9	21.1	22.5	21.3	20.3	14.0	17.0	10.6	9.88
Ac-ft	928	1,030	1,240	1,230	1,210	1,380	1,270	1,250	832	1,040	650	588

Calendar year 1955:	Max 187	Min 7.5	Mean 18.9	Ac-ft 13,700
Water year 1955-56:	Max 96	Min 7.0	Mean 17.4	Ac-ft 12,650

Peak discharge (base, 60 cfs).--May 27 (4 a.m.) 66 cfs (1.75 ft); June 17 (1:30 a.m.) 182 cfs (2.42 ft); July 2 (12:15 a.m.) 958 cfs (5.10 ft).

Note.--Stage-discharge relation affected by ice Nov. 14-20, Nov. 27 to Dec. 9, Dec. 11, 12, 14-21, 30, 31, Jan. 15-21, 23, 25, Jan. 29 to Feb. 5, Feb. 9, 10, 12, 14, 16-21, 23, 24, Mar. 12-15.

White River below Cottonwood Creek near Whitney, Nebr.

Location.--Lat 42°48'35", long 103°10'05", in NE¼NE¼ sec. 26, T. 33 N., R. 50 W., on left bank half a mile downstream from Cottonwood Creek and 4½ miles northeast of Whitney.

Drainage area.--676 sq mi.

Records available.--October 1948 to September 1956.

Gage.--Water-stage recorder.

Average discharge.--8 years, 20.4 cfs (14,770 acre-ft per year).

Extremes.--Maximum discharge during year, 974 cfs May 27 (gage height, 14.72 ft); no flow June 30.

1948-56: Maximum discharge, 1,690 cfs May 23, 1954 (gage height, 19.01 ft), from rating curve extended above 250 cfs on basis of slope-area determinations at gage heights 15.95 ft and 19.01 ft; no flow Mar. 14-16, 1954, June 30, 1956.

Remarks.--Records fair except those for periods of ice effect or no gage-height record and those below 5 cfs, which are poor. Discharge measurements generally made once a week. Natural flow of stream affected by diversions for irrigation, off-stream storage in Whitney Reservoir (capacity 10,000 acre-ft), and return flow from irrigated areas.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a6.0	2.9	6.2	4.3	0.8	3.5	6.5	64	16	0.5	5.5	1.2
2	a5.0	2.6	8.2	5.3	.7	3.4	6.5	44	9.0	83	4.5	1.6
3	4.8	2.8	1.2	3.9	.8	3.1	6.8	32	8.1	61	12	1.6
4	5.2	3.0	1.1	2.8	1.0	2.8	7.3	28	7.5	18	7.0	1.0
5	3.5	3.9	.9	2.9	1.5	2.4	7.8	27	7.3	36	2.5	.8
6	2.6	2.8	.8	2.9	2.0	2.2	6.5	27	7.3	11	1.9	6.2
7	2.6	2.8	.8	2.3	3.0	1.6	6.8	25	7.0	7.5	1.3	6.2
8	2.5	2.5	.9	2.0	3.0	1.3	6.8	13	7.0	5.7	.8	5.7
9	2.6	3.1	1.1	2.4	2.1	1.5	6.5	9.0	7.0	4.1	.7	5.2
10	2.6	4.8	1.2	2.8	2.1	1.2	6.8	6.5	7.0	3.7	5.6	4.5
11	2.5	8.7	.8	2.4	2.3	.9	9.0	6.0	6.8	4.5	6.5	3.9
12	2.3	9.0	.9	2.3	2.0	.7	5.7	6.2	a7.0	6.5	4.3	1.9
13	1.9	2.0	.9	2.4	2.2	1.0	15	9.9	a7.0	7.3	2.3	2.3
14	2.0	1.3	.8	2.8	2.3	1.0	18	35	a7.0	6.2	1.6	2.2
15	2.0	1.6	.8	1.8	.4	1.6	18	20	11	2.9	2.2	2.0
16	1.9	1.3	.7	1.4	.3	3.9	18	9.9	11	4.8	2.5	1.3
17	1.9	2.2	.9	1.9	.3	7.1	18	7.3	45	5.5	2.0	1.0
18	2.9	4.1	.8	1.7	.4	15	18	8.7	32	4.5	2.0	1.2
19	3.1	7.4	.9	1.9	.5	18	20	8.4	9.0	3.5	1.6	1.2
20	2.8	25	1.1	1.8	.6	18	20	7.8	7.0	2.3	7.3	1.0
21	2.3	13	1.2	1.8	.8	17	20	7.3	6.0	2.2	10	.8
22	2.2	11	1.2	1.7	1.4	20	17	23	a4.8	2.0	3.3	.9
23	2.0	12	5.5	1.6	2.1	16	18	17	a3.6	2.3	2.8	2.9
24	2.2	11	43	1.6	3.1	11	27	8.4	a2.4	1.7	1.9	3.5
25	6.0	8.7	29	1.5	3.3	9.0	34	5.2	1.2	2.3	1.9	4.3
26	3.3	7.8	24	1.5	3.9	7.8	28	3.9	a1.6	3.1	1.7	5.2
27	2.3	5.9	23	1.4	3.6	6.5	22	416	.5	2.8	2.6	5.0
28	2.2	4.0	16	1.4	3.3	6.0	16	189	.9	2.8	2.9	4.3
29	2.0	2.6	8.3	1.2	3.4	5.2	a27	46	.1	3.7	1.6	2.8
30	2.5	4.0	4.6	1.1	------	7.5	a50	127	0	6.0	.8	2.0
31	2.5	------	3.5	1.0	------	6.2	------	54	------	6.5	2.3	------
Total	90.2	173.8	190.3	67.8	53.2	202.4	487.0	1,291.5	247.1	313.9	105.9	83.7
Mean	2.91	5.79	6.14	2.19	1.83	6.53	16.2	41.7	8.24	10.1	3.42	2.79
Ac-ft	179	345	377	134	106	401	966	2,560	490	623	210	166

Calendar year 1955:	Max 600	Min 0.2	Mean 18.9	Ac-ft 13,660
Water year 1955-56:	Max 416	Min 0	Mean 9.03	Ac-ft 6,560

Peak discharge (base, 350 cfs).--May 27 (1 p.m.) 974 cfs (14.72 ft).

a No gage-height record; discharge estimated on basis of weather records, trend of flow, and records for station at Crawford.

Note.--Stage-discharge relation affected by ice Nov. 2-4, 8, Nov. 13 to Mar. 22, Mar. 29.

White River near Oglala, S. Dak.

Location.--Lat 43°15'10", long 102°49'30", in SW¼NE¼ sec. 24, T. 38 N., R. 47 W., on right bank at downstream side of highway bridge, 3 miles downstream from Blacktail Creek and 7 miles northwest of Oglala.

Drainage area.--2,200 sq mi, approximately.

Records available.--May 1943 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 2,853.54 ft above mean sea level, datum of 1929. Prior to May 6, 1947, wire-weight gage at same site and datum.

Average discharge.--13 years, 64.3 cfs (46,550 acre-ft per year); median of yearly mean discharges, 56 cfs (40,500 acre-ft per year).

Extremes.--Maximum discharge during year, 510 cfs May 30 (gage height, 10.64 ft); maximum gage height, 17.04 ft Feb. 24 (backwater from ice); minimum discharge, 1.0 cfs Nov. 12 (result of freezeup); minimum gage height, 2.99 ft Oct. 15.

1943-56: Maximum discharge, 5,200 cfs June 21, 1947 (gage height, 23.50 ft), from rating curve extended above 2,800 cfs by velocity-area studies; no flow at times during 1952, 1954.

Remarks.--Records good except those for periods of ice effect, which are poor. Some diversions above station for irrigation.

Rating tables, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 8 to Nov. 12, Apr. 17 to May 29, Sept. 11-30)

Oct. 1 to Mar. 18				Mar. 19 to Sept. 30			
2.6	3.5	4.4	54	3.4	6	4.5	28
2.8	6	5.0	83	3.6	8	5.0	49
3.3	16	7.0	200	3.8	11	6.0	106
3.8	30	9.0	353	4.0	14	8.0	263
				4.2	19	10.0	446

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	58	24	10	35	9	180	15	40	135	9	9	7
2	45	16	9	30	9	200	18	*34	116	*11	9	7
3	35	8	8	*30	9	160	22	58	59	26	17	7
4	32	11	9	35	20	120	22	76	36	20	15	7
5	24	8	10	40	40	95	23	*58	28	89	11	*8
6	22	4.6	*11	45	35	85	22	46	22	48	9	8
7	21	4.6	9	35	30	85	23	40	20	29	9	8
8	16	*7	8	30	28	75	25	38	18	32	8	8
9	14	9	9	30	26	65	25	37	17	24	8	8
10	24	8	10	28	25	60	*25	37	17	18	9	7
11	12	10	11	26	25	50	23	31	16	14	12	7
12	9	6	11	20	28	40	23	25	*15	16	13	8
13	9	5	11	14	30	35	23	31	15	12	*9	8
14	8	4	10	10	28	35	22	35	14	11	8	8
15	8	3	9	10	26	50	21	22	15	11	8	8
16	8	2	10	10	25	65	21	23	16	12	8	8
17	8	2	10	9	26	75	22	60	16	11	8	8
18	*8	3	10	9	28	90	20	52	55	10	98	8
19	9	4	9	8	30	*165	20	35	83	9	148	8
20	14	5	9	8	32	*260	18	28	66	9	21	8
21	9	6	10	8	34	213	18	23	44	9	16	8
22	10	6	14	8	36	170	18	*24	22	11	13	8
23	12	7	20	9	75	119	20	26	16	10	10	9
24	13	8	35	10	280	75	21	23	15	9	8	9
25	15	10	60	9	240	68	23	21	14	9	8	*8
26	17	12	166	9	180	64	22	62	13	*8	10	8
27	24	10	344	9	160	51	24	52	14	8	8	8
28	19	8	250	9	*155	31	48	84	13	8	7	7
29	21	8	150	10	150	23	45	144	11	8	6	8
30	21	9	75	*9	------	17	44	392	10	9	6	7
31	21	------	40	9	------	15	------	134	------	9	6	------
Total	566	228.2	1,357	561	1,819	2,836	716	1,791	951	519	535	234
Mean	18.2	7.61	43.8	18.1	62.7	91.5	23.9	57.8	31.7	16.7	17.3	7.8
Ac-ft	1,120	453	2,690	1,110	3,610	5,620	1,420	3,550	1,890	1,030	1,060	464

Calendar year 1955: Max 1,730 Min 2 Mean 60.8 Ac-ft 44,000
Water year 1955-56: Max 392 Min 2 Mean 33.1 Ac-ft 24,020

Peak discharge (base, 800 cfs).--No peak above base.
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 13 to Dec. 25, Dec. 29 to Mar. 20.

White River near Kadoka, S. Dak.

Location.--Lat 43°45'10", long 101°31'30", in SE¼SE¼ sec. 30, T. 3 S., R. 22 E., Black Hills meridian, near center of span on downstream side of bridge on State Highway 73, 5 miles upstream from Pass Creek, 5½ miles downstream from Cottonwood Creek, and 5¾ miles south of Kadoka.

Drainage area.--5,000 sq mi, approximately.

Records available.--July 1942 to September 1956.

Gage.--Wire-weight gage read once daily, with additional readings during high-water periods. Datum of gage is 2,122.18 ft above mean sea level, datum of 1929. Prior to June 14, 1949, wire-weight gage only and June 14, 1949, to Mar. 8, 1955, water-stage recorder and wire-weight gage, at site a quarter of a mile downstream at same datum.

Average discharge.--14 years, 302 cfs (218,600 acre-ft per year).

Extremes.--Maximum discharge during year, about 3,000 cfs Feb. 27 (gage height, 12.81 ft, from floodmarks, backwater from ice); minimum daily, 0.1 cfs Sept. 25.

1942-56: Maximum discharge, 21,700 cfs June 7, 1951 (gage height, 13.83 ft), from rating curve extended above 16,000 cfs by logarithmic plotting; no flow during many periods.

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

Remarks.--Records fair except those for period of ice effect, which are poor. Discharge measurements generally made at 2-week intervals during the winter season and weekly during the remainder of the year. Some diversions above station for irrigation.

Revisions (water years).--WSP 1279: 1944(M), 1948.

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1, Nov. 1-4, Mar. 18-23, 27-30, May 15, 16, June 20, 21, Aug. 9-14)

3.85	0	4.5	62
3.9	.3	4.7	126
4.0	2.0	5.0	270
4.1	7	5.5	540
4.2	15	6.0	840
4.3	27	7.0	1,790
4.4	42		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	190	11	10	250	25	1,000	94	g1,190	205	14	g104	36
2	161	9	10	200	25	1,000	87	g1,320	152	15	g90	28
3	144	11	10	250	25	900	82	g678	235	g316	g44	23
4	84	14	10	300	25	900	73	g330	152	g622	g68	16
5	70	17	10	300	30	700	157	g205	144	230	g315	16
6	54	22	10	250	35	600	161	g215	122	148	g355	16
7	42	23	10	200	35	400	157	g157	101	73	g984	22
8	32	19	10	150	35	300	135	g88	65	79	g1,080	25
9	28	19	9	120	35	300	122	g265	42	87	g702	14
10	22	20	9	110	35	280	84	g166	33	101	g558	9
11	20	20	9	100	35	260	84	g115	28	87	g976	9
12	17	17	9	90	35	240	84	g94	36	g233	g1,050	9
13	13	12	9	90	30	220	84	g94	28	g156	g768	6
14	13	9	9	80	30	200	70	g460	20	46	g768	3.5
15	11	5	9	70	30	200	68	g480	22	65	g375	3.0
16	9	3	9	70	30	190	62	g290	g35	104	g462	2.0
17	6	2	8	60	30	g400	58	126	g250	56	g420	2.0
18	9	2	8	50	30	g903	58	104	g295	g39	g390	1.5
19	7	3	8	45	30	g1,500	54	90	g230	g104	g255	1.5
20	7	5	8	40	35	g1,300	54	76	g568	84	g65	1.2
21	10	5	8	35	40	g1,090	54	68	g410	60	32	1.2
22	10	6	10	30	40	g875	54	76	225	36	40	.8
23	10	6	50	30	40	666	58	62	130	13	52	.8
24	9	6	300	30	150	492	56	60	60	9	68	.3
25	8	7	1,200	30	200	395	54	60	19	4.5	40	.1
26	8	7	1,000	30	300	305	58	70	48	3.5	70	.2
27	9	8	500	30	1,500	235	84	100	30	1.3	119	.2
28	7	9	450	30	1,400	135	94	g280	23	1.0	84	.5
29	7	10	400	25	1,200	112	108	g882	20	g5	65	1.0
30	8	10	350	25	------	97	g144	g648	15	g722	58	1.2
31	12	------	300	25	------	94	------	g335	------	g389	50	------
Total	1,037	317	4,752	3,145	5,490	16,289	2,592	9,184	3,743	3,903.3	10,507	250.0
Mean	33.5	10.6	153	101	189	525	86.4	296	125	126	339	8.33
Ac-ft	2,060	629	9,430	6,240	10,890	32,310	5,140	18,220	7,420	7,740	20,840	496

Calendar year 1955: Max 11,400 Min 0 Mean 288 Ac-ft 208,200
Water year 1955-56: Max 1,500 Min 0.1 Mean 167 Ac-ft 121,400

Peak discharge (base, 3,600 cfs).--No peak above base.
g Computed from graph based on wire-weight-gage readings.
Note.--Stage-discharge relation affected by ice Nov. 12 to Mar. 16.

South Fork White River near Rosebud, S. Dak.

Location.--Lat 43°19'30", long 100°53'05", in NW¼ sec. 28, T. 39 N., R. 30 W., on left bank at downstream side of bridge on U. S. Highway 18, 4½ miles downstream from Rosebud Creek and 6½ miles northwest of Rosebud.

Drainage area.--1,020 sq mi, approximately.

Records available.--May 1943 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 2,295 ft (by barometer). Prior to May 11, 1948, wire-weight gage at same site and datum.

Average discharge.--13 years, 117 cfs (84,700 acre-ft per year).

Extremes.--Maximum discharge during year, 358 cfs Mar. 20 (gage height, 4.58 ft); maximum gage height, 7.51 ft Mar. 16 (backwater from ice); minimum daily discharge, 45 cfs Nov. 16.

1943-56: Maximum discharge, 4,470 cfs May 17, 1944 (gage height, 13.92 ft, from floodmarks), from rating curve extended above 810 cfs by velocity-area studies; minimum daily, 10 cfs Jan. 4, 1949, Feb. 20, 1955; minimum gage height observed, 3.22 ft Dec. 15, 1943.

Remarks.--Records good except those for period of ice effect, 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.

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 18-21, May 15-23)

3.5	47
3.7	77
4.0	152
5.0	442

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	68	83	*90	70	75	180	216	141	96	62	62	56
2	70	81	90	75	85	*180	216	152	94	70	70	56
3	70	85	85	80	90	180	227	146	94	70	83	55
4	70	81	85	85	100	170	216	135	94	65	79	57
5	70	96	80	90	110	160	227	130	90	67	67	62
6	68	92	80	90	115	160	227	130	116	67	64	67
7	68	88	80	95	120	140	210	149	101	62	81	65
8	68	*83	80	95	*120	*140	210	152	90	59	75	67
9	67	92	75	95	120	130	198	152	88	56	*83	62
10	67	94	70	95	120	130	184	152	88	*59	111	57
11	68	92	70	*95	120	120	181	144	81	57	164	*57
12	70	85	70	95	120	120	178	138	*77	59	201	60
13	70	70	70	95	120	180	166	164	77	63	166	59
14	70	57	70	95	110	160	144	155	75	62	135	65
15	72	50	65	90	100	280	138	138	75	56	116	68
16	72	45	65	70	100	290	130	138	79	55	98	63
17	72	50	65	80	90	250	119	*127	85	55	111	62
18	*72	60	60	90	100	227	119	106	79	55	130	60
19	72	70	55	90	110	251	119	103	74	56	103	59
20	72	80	55	90	120	*309	119	94	70	54	94	57
21	72	90	*55	90	120	251	116	96	67	54	*85	56
22	77	75	55	90	130	*227	114	96	65	55	79	57
23	90	75	60	90	150	224	114	92	62	55	75	57
24	85	80	70	90	180	224	116	88	59	*50	70	60
25	85	90	75	90	170	227	*111	85	59	48	67	60
26	85	90	80	90	160	236	116	90	59	48	63	62
27	88	75	80	90	170	*239	119	96	*60	47	62	60
28	88	70	80	90	170	236	121	116	57	50	62	59
29	88	80	70	85	175	216	124	*103	55	52	60	65
30	83	90	60	80	------	216	130	94	55	60	57	67
31	83	------	65	75	------	233	------	96	------	59	57	------
Total	2,320	2,349	2,210	2,720	3,570	6,286	4,725	3,798	2,321	1,787	2,830	1,817
Mean	74.8	78.3	71.3	87.7	123	203	158	123	77.4	57.6	91.3	60.6
Ac-ft	4,600	4,660	4,380	5,400	7,080	12,470	9,370	7,530	4,600	3,540	5,610	3,600

Calendar year 1955: Max 650 Min 10 Mean 114 Ac-ft 82,610
Water year 1955-56: Max 309 Min 45 Mean 100 Ac-ft 72,840

Peak discharge (base, 330 cfs).--Mar. 20 (3 a.m.) 358 cfs (4.58 ft).
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 15 to Mar. 17.

South Fork White River below White River, S. Dak.

Location.--Lat 43°36'00", long 100°43'50", in NE¼SE¼ sec. 23, T. 42 N., R. 29 W., on right bank 1 mile upstream from small tributary, 2 miles downstream from Pine Creek, and 2½ miles northeast of town of White River.

Drainage area.--1,570 sq mi, approximately.

Records available.--October 1949 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 1,906 ft (by barometer).

Average discharge.--7 years, 142 cfs (102,800 acre-ft per year).

Extremes.--Maximum discharge during year, 1,960 cfs Aug. 6 (gage height, 3.41 ft); maximum gage height, 6.28 ft Mar. 20 (backwater from ice); minimum discharge, 9 cfs Aug. 16; minimum daily, 22 cfs Nov. 17.

1949-56: Maximum discharge, 5,850 cfs Mar. 29, 1952 (gage height, 6.15 ft); maximum gage height, 10.90 ft Mar. 28, 1952 (backwater from ice); no flow for parts of several days during 1952, 1954; minimum daily discharge, 7 cfs July 31, Aug. 31, Sept. 1, 1952.

Remarks.--Records fair except those for period of ice effect, which are poor. Discharge measurements generally made at 2-week intervals during winter season and weekly during the remainder of the year. Diurnal fluctuations caused by small powerplant reservoir 3 miles upstream. Several small diversions for irrigation and some storage in several small lakes above station. Records of chemical analyses and water temperatures for the water year 1956 are given in WSP 1451.

Rating tables, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 29 to Nov. 3, Mar. 22-26, Mar. 28 to May 2, July 29 to Aug. 3, Aug. 26 to Sept. 14)

Oct. 1 to Apr. 5				Apr. 6 to Sept. 30			
1.3	38	1.7	162	0.6	30	1.2	149
1.4	53	1.8	240	.8	54	1.5	306
1.5	75	2.0	430	1.0	90	2.0	700
1.6	109						

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	57	136	85	70	75	145	209	158	108	49	45	57
2	52	102	80	70	75	210	201	153	93	90	55	58
3	59	102	80	75	75	220	193	149	90	67	75	56
4	54	75	80	70	85	220	193	142	93	80	88	55
5	57	64	80	75	95	200	201	146	72	63	127	54
6	50	65	80	80	90	180	207	116	93	62	180	65
7	52	62	80	90	75	180	162	125	98	65	621	62
8	64	59	75	75	85	180	162	170	70	57	136	62
9	64	50	75	70	110	180	152	178	75	64	104	60
10	55	62	80	100	90	200	131	174	79	59	78	64
11	68	38	80	90	100	180	132	183	84	52	138	51
12	71	32	75	100	115	145	117	170	65	55	174	52
13	62	24	75	95	115	130	111	207	72	53	186	58
14	75	32	75	100	120	180	103	249	75	57	119	57
15	76	36	70	100	115	230	100	207	66	57	108	54
16	82	26	60	75	95	220	98	174	61	49	87	54
17	78	22	60	95	85	230	96	166	77	49	82	53
18	68	60	70	90	80	240	105	138	76	54	104	50
19	79	90	65	100	115	250	126	114	67	48	112	45
20	62	90	55	80	120	420	116	106	69	57	78	48
21	68	85	65	80	120	450	123	100	57	49	72	41
22	64	85	65	75	120	394	113	100	60	47	64	44
23	75	90	75	75	125	258	119	100	56	47	70	46
24	104	90	75	80	145	240	119	93	60	46	68	46
25	102	90	80	85	170	228	126	80	53	40	67	49
26	94	90	75	85	160	227	126	133	57	42	55	45
27	106	90	75	85	135	217	126	106	51	38	76	50
28	114	85	75	80	140	209	126	155	48	37	59	44
29	109	80	75	75	145	193	101	127	46	38	59	53
30	125	85	60	75	------	201	109	104	46	54	55	52
31	95	------	65	70	------	194	------	111	------	44	55	------
Total	2,341	2,097	2,265	2,565	3,175	6,951	4,103	4,434	2,117	1,669	3,397	1,585
Mean	75.5	69.9	73.1	82.7	109	224	137	143	70.6	53.8	110	52.8
Ac-ft	4,640	4,160	4,490	5,090	6,300	13,790	8,140	8,790	4,200	3,310	6,740	3,140

Calendar year 1955:	Max 1,500	Min 22	Mean 136	Ac-ft 98,200
Water year 1955-56:	Max 621	Min 22	Mean 100	Ac-ft 72,790

Note.--Stage-discharge relation affected by ice Nov. 12 to Mar. 21 (once-daily wire-weight-gage readings used Dec. 10 to Jan. 5, Jan. 17 to Feb. 2, Feb. 6-8, 16-19).

White River near Oacoma, S. Dak.

Location.--Lat 43°44'45", long 99°33'20", in NE¼NW¼ sec. 10, T. 103 N., R. 73 W., on left bank a quarter of a mile downstream from bridge on State Highway 47, 8 miles southwest of Oacoma, 8½ miles downstream from Black Dog Creek, and 16 miles upstream from mouth.

Drainage area.--10,200 sq mi, approximately.

Records available.--August 1928 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 1,375 ft (from topographic map). Aug. 24, 1928, to May 18, 1934, chain gage, May 19, 1934, to May 9, 1942, water-stage recorder (gage destroyed by flood), and May 10, 1942, to Sept. 30, 1951, wire-weight gage, at site 12 miles downstream at different datum. Oct. 1, 1951, to May 23, 1955, water-stage recorder at site 1 mile downstream at different datum.

Average discharge.--28 years, 542 cfs (392,400 acre-ft per year); median of yearly mean discharges, 470 cfs (340,000 acre-ft per year).

Extremes.--Maximum discharge during year, 5,500 cfs Mar. 9 (gage height, 7.92 ft, backwater from ice); minimum daily, 10 cfs Dec. 9, 15-19; minimum gage height, 0.48 ft Nov. 3.

1928-56: Maximum discharge, 51,900 cfs Mar. 30, 1952 (gage height, 15.40 ft); maximum gage height, 17.6 ft Mar. 31, 1950 (site and datum then in use), from floodmark (ice jam); minimum discharge, 0.5 cfs July 7, 8, 21, 23, Aug. 8, 10, 1936.

Remarks.--Records good except those based on wire-weight-gage readings, which are fair, and those for periods of ice effect, which are poor. Discharge measurements generally made at 2-week intervals during winter period and weekly during remainder of year. Some diversions above station.

Revisions.--WSP 786: Drainage area.

Rating tables, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 26 to Nov. 2, Nov. 4-10, Mar. 25-29, May 7-10)

Oct. 1 to May 17				May 18 to Sept. 30			
0.7	55	2.5	814	0.7	11	2.0	433
1.0	130	3.0	1,220	.8	22	2.5	760
1.5	300	3.5	1,810	1.0	55	3.0	1,190
2.0	521	4.0	2,610	1.2	101	3.5	1,780
				1.5	199	4.0	2,580

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	923	76	18	70	75	140	628	300	264	118	68	86
2	590	73	18	100	75	150	547	348	g602	94	222	78
3	454	70	16	140	75	350	516	408	g582	81	g954	78
4	357	78	16	200	75	1,200	526	2,160	g479	86	g412	76
5	296	76	15	180	75	2,000	748	g1,280	g330	130	g496	78
6	281	83	14	160	80	2,000	807	g1,020	g401	118	563	81
7	281	100	13	150	80	1,400	590	g794	g406	298	563	76
8	237	88	12	140	80	1,000	454	g651	g306	214	556	70
9	195	98	10	135	85	2,800	482	g542	g235	292	1,030	70
10	160	86	12	130	85	2,600	552	g477	g195	235	2,250	70
11	142	80	12	100	85	850	g501	g444	g185	181	1,380	63
12	130	75	14	100	90	g780	444	g454	g137	140	g859	57
13	116	60	14	110	90	g600	413	573	g130	110	g589	50
14	100	35	12	110	90	g600	357	516	116	133	g685	48
15	100	21	10	100	85	g850	320	408	107	137	g1,480	50
16	88	18	10	90	90	g800	300	404	110	140	1,040	44
17	80	18	10	85	85	700	270	g840	91	146	782	41
18	78	19	10	80	80	700	251	g715	94	188	983	42
19	80	22	10	80	85	1,000	240	g622	81	150	538	39
20	g83	22	15	80	75	1,400	233	g456	76	124	365	36
21	86	22	25	75	70	1,400	226	g345	72	127	306	34
22	76	20	35	75	60	3,200	209	302	427	110	325	31
23	76	20	38	75	70	3,400	199	279	292	91	223	26
24	69	18	40	80	85	2,650	202	265	302	81	170	25
25	69	18	42	85	100	g2,140	202	248	350	88	137	g22
26	66	20	45	90	100	g2,110	195	223	265	78	116	g20
27	76	18	46	90	110	1,420	189	211	219	66	98	21
28	66	16	48	85	120	1,280	186	227	220	53	88	22
29	73	15	48	80	130	755	226	239	146	41	113	26
30	73	16	50	75	------	557	273	248	113	118	116	37
31	71	------	50	75	------	600	------	243	------	118	101	------
Total	5,572	1,381	728	3,225	2,485	41,432	11,286	16,242	7,333	4,086	17,608	1,497
Mean	180	46.0	23.5	104	85.7	1,337	376	524	244	132	568	49.9
Ac-ft	11,050	2,740	1,440	6,400	4,930	82,180	22,390	32,220	14,540	8,100	34,920	2,970

Calendar year 1955:	Max 8,200	Min 10	Mean 517	Ac-ft 374,500
Water year 1955-56:	Max 3,400	Min 10	Mean 308	Ac-ft 223,900

Peak discharge (base, 5,500 cfs).--Mar. 9 (5 p.m.) 5,500 cfs.
g Computed from once-daily wire-weight-gage readings.
Note.--Stage-discharge relation affected by ice Nov. 3, Nov. 11 to Mar. 24.

Fort Randall Reservoir at Pickstown, S. Dak.

Location.--Lat 43°04', long 98°33', in sec. 8, T. 95 N., R. 65 W., in tower 6 of outlet works of dam on Missouri River at Pickstown, 1 mile upstream from Randall Creek and at mile 922.0.

Drainage area.--263,500 sq mi, approximately.

Records available.--December 1952 to September 1956.

Gage.--Water-stage recorder. Datum of gage is at mean sea level, datum of 1929. Prior to Mar. 25, 1953, elevations determined from temporary staff gages or reference marks.

Extremes.--Maximum contents during year, 3,172,000 acre-ft Apr. 15 (elevation, 1,342.0 ft); minimum, 2,023,000 acre-ft Sept. 30 (elevation, 1,323.4 ft).

1952-56: Maximum contents, 3,424,000 acre-ft Mar. 23, 1955 (elevation, 1,345.4 ft); minimum since initial filling, that of Sept. 30, 1956.

Remarks.--Reservoir is formed by an earth-fill dam; storage began during December 1952; initial closure made July 1952. Total capacity is 6,281,000 acre-ft between elevations 1,240 and 1,375 ft. Active capacity, 4,896,000 acre-ft between elevations 1,310 and 1,375 ft. Inactive storage below elevation 1,310 ft, 1,385,000 acre-ft (this water may be released through the outlet tunnels). Superstorage between elevations 1,375 ft (top of spillway gates) and 1,400 ft, 3,425,000 acre-ft. Figures given herein represent total contents above elevation 1,240.0 ft. Normal releases are through 12 tunnels 22 ft in diameter; 8 of these tunnels are scheduled for eventual use for power generation. The spillway consists of 21 taintor gates, each 40 ft wide by 29 ft high; total spillway capacity, 620,000 cfs. Crest of spillway is at elevation 1,346 ft. Water is used for flood control, navigation, power, and incidental uses.

Cooperation.--Elevations and capacity table furnished by Corps of Engineers.

Month-end elevation and total contents, water year October 1955 to September 1956

Date	Elevation (feet)†	Contents (acre-feet)	Change in contents (acre-feet)
Sept.30	1,332.0	2,508,000	-
Oct. 31	1,333.5	2,601,000	+93,000
Nov. 30	1,340.3	3,052,000	+451,000
Dec. 31	1,340.0	3,030,000	-22,000
Calendar year 1955	-	-	-92,000
Jan. 31	1,339.7	3,010,000	-20,000
Feb. 29	1,337.1	2,833,000	-177,000
Mar. 31	1,339.0	2,961,000	+128,000
Apr. 30	1,340.3	3,052,000	+91,000
May 31	1,340.5	3,066,000	+14,000
June 30	1,339.4	2,989,000	-77,000
July 31	1,340.1	3,037,000	+48,000
Aug. 31	1,337.7	2,873,000	-164,000
Sept.30	1,323.4	2,023,000	-850,000
Water year 1955-56	-	-	-485,000

† Elevation at 12 p.m.

Missouri River below Fort Randall Dam, S. Dak.

Location.--Lat 42°58'55", long 98°29'35", in SW¼NE¼ sec. 28, T. 35 N., R. 10 W., sixth principal meridian, on right bank 6 miles downstream from Randall Creek, 7 miles downstream from Fort Randall Dam, 12 miles south of Lake Andes, and at mile 915.

Drainage area.--263,500 sq mi, approximately.

Records available.--May 1947 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 1,230.00 ft above mean sea level, datum of 1929 (Corps of Engineers benchmark).

Average discharge.--9 years, 28,410 cfs (20,570,000 acre-ft per year).

Extremes.--Maximum discharge during year, 53,400 cfs June 14 (gage height, 7.76 ft); minimum daily, 6,220 cfs Dec. 26.

1947-56: Maximum discharge, 447,000 cfs Apr. 12, 1952; maximum gage height, 20.82 ft Apr. 12, 1952; minimum daily discharge, 3,800 cfs Nov. 30, 1950.

Flood in April 1943 reached a stage of about 16.5 ft. Maximum stage known, in April 1881, was about 5 ft higher than that of April 1943.

Remarks.--Records good. Discharge measurements generally made twice a week except for winter season when they were made at approximately 10-day intervals. Flow regulated by Fort Randall Reservoir (see preceding page). Many diversions above station for irrigation.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	31,600	21,400	10,600	6,980	10,100	9,460	19,900	28,400	29,000	32,600	34,800	34,500
2	32,200	19,900	10,200	6,880	a9,500	9,530	27,200	26,900	28,400	31,500	34,500	34,500
3	31,900	16,800	10,600	10,600	a9,500	9,570	25,400	27,700	25,100	35,400	30,200	34,300
4	32,900	13,700	10,000	10,500	9,760	7,260	25,900	28,900	25,900	28,200	28,900	35,100
5	31,700	11,500	10,000	9,500	7,690	9,460	25,400	26,800	30,100	27,600	29,500	35,500
6	30,800	8,740	10,200	9,650	10,300	9,610	25,800	22,100	28,200	28,500	34,100	34,100
7	30,300	10,100	10,200	10,300	10,700	9,760	25,800	25,800	29,200	25,200	30,800	34,300
8	30,300	10,000	10,000	7,160	10,300	10,300	22,800	27,500	28,400	22,000	31,400	33,900
9	29,200	9,570	10,000	8,480	10,300	11,200	24,800	26,600	28,100	26,600	31,000	33,300
10	30,000	9,720	10,000	10,000	10,300	13,900	25,100	26,900	25,500	30,700	31,000	32,900
11	29,500	9,530	8,500	10,400	10,600	17,700	25,100	25,800	28,000	31,000	32,200	33,800
12	29,600	9,650	10,000	9,920	8,160	17,300	24,800	25,400	28,300	29,000	30,700	33,500
13	29,300	6,950	10,500	9,310	10,400	16,500	26,600	23,600	39,300	29,700	32,500	33,500
14	29,200	9,650	10,000	9,040	10,600	18,100	26,900	28,700	49,900	29,800	31,900	30,800
15	28,700	10,300	10,000	8,410	11,000	18,800	27,600	27,800	47,700	29,300	32,400	31,600
16	28,400	10,500	10,500	a9,000	12,000	18,700	28,800	27,100	32,500	30,600	31,900	32,300
17	29,000	11,100	10,000	a9,500	12,000	18,500	28,600	31,700	31,400	29,800	31,600	32,600
18	30,500	10,700	8,500	a9,500	10,300	19,000	28,500	29,700	31,900	28,100	31,400	32,400
19	31,200	10,700	10,000	a9,000	7.830	17,800	28,000	30,800	31,000	28,700	29,300	32,300
20	32,100	6,950	10,000	a9,500	10,600	18,000	27,600	29,500	30,000	30,000	32,700	32,500
21	33,500	10,500	10,000	a9,000	11,500	17,900	28,400	30,200	30,800	29,500	30,000	33,000
22	33,300	12,000	10,000	a8,000	10,900	20,700	24,900	28,000	30,300	27,100	32,600	33,700
23	33,100	11,500	10,000	a9,000	11,200	23,000	31,000	27,500	24,800	28,700	31,600	33,100
24	33,200	8,230	10,000	a9,000	10,600	22,400	30,700	28,800	21,100	30,300	32,100	33,800
25	31,600	9,690	7,480	a9,000	10,700	18,800	28,100	27,400	35,100	30,800	32,900	34,100
26	31,600	10,400	6,220	a9,500	8,410	20,000	29,200	26,300	49,600	32,800	31,000	33,100
27	29,600	7,690	9,420	10,600	10,500	20,400	29,600	23,500	50,500	34,700	34,400	33,100
28	28,300	11,500	10,400	9,650	10,600	19,900	28,900	28,600	49,700	34,700	32,800	33,500
29	27,800	11,200	11,000	7,830	10,200	20,000	27,500	31,100	45,300	35,500	32,100	32,700
30	25,400	10,900	10,900	10,100	------	20,500	30,500	31,000	39,800	35,900	33,000	33,600
31	22,400	------	10,400	11,500	------	19,300	------	29,600	------	36,600	34,100	------
Total	938,200	331,070	305,620	286,810	296,550	503,350	809,400	859,700	‡1,004.9	940,900	989,400	‡1,001.4
Mean	30,260	11,040	9,859	9,252	10,230	16,240	26,980	27,730	33,500	30,350	31,920	33,380
Ac-ft	‡1,861	656,700	606,200	568,900	588,200	998,400	‡1,605	‡1,705	‡1,993	‡1,866	‡1,962	‡1,986

Calendar year 1955: Max 38,700 Min 5,530 Mean 21,420 Ac-ft 15,510,000
Water year 1955-56: Max 50,500 Min 6,220 Mean 22,590 Ac-ft 16,400,000

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‡ Expressed in thousands.

a No gage-height record; discharge estimated on basis of Corps of Engineers discharge record at Fort Randall Dam 7 miles upstream.

Note.--Stage-discharge relation affected by ice Dec. 8-24.

Ponca Creek at Anoka, Nebr.

Location.--Lat 42°56'25", long 98°50'30", in NE¼ sec. 9, T. 34 N., R. 13 W., on downstream side of left pier of bridge on U. S. Highway 281, half a mile southwest of Anoka and half a mile upstream from Dry Creek.

Drainage area.--410 sq mi, approximately.

Records available.--March 1949 to September 1956.

Gage.--Wire-weight gage read twice daily and water-stage recorder above 3.7 ft gage height. Prior to Sept. 13, 1950, wire-weight gage only.

Average discharge.--7 years, 62.5 cfs (45,250 acre-ft per year).

Extremes.--Maximum discharge during year, 582 cfs Mar. 18 (gage-height, 4.62 ft), but may have been exceeded on Mar. 18 during period of ice breakup; maximum gage height, 5.97 ft Mar. 18 (ice jam); no flow for many days.

1949-56: Maximum discharge, 6,770 cfs Apr. 2, 1950 (gage height, 15.0 ft, from graph based on gage readings); no flow at times during 1949-50, 1955-56.

Remarks.--Records fair except those for periods of ice effect, which are poor. Discharge measurements generally made once a week.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.4	0.1	0.2	0.1		4.8	153	58	11			
2	.5	.1	.3	.2		59	170	61	9.5			
3	.7	.3	.2	.3		150	164	82	8.4			
4	.5	1.1	.2	.3		251	94	104	7.6			
5	.4	1.1	.2	.3		278	146	72	6.8			
6	.3	.6	.2	.3		253	248	52	10			
7	.2	.5	.2	.3		79	170	43	9.5			
8	.2	.6	.3	.3		72	111	37	11			
9	.2	.9	.3	.3		88	107	34	6.8			
10	.2	.7	.3	.3		70	94	32	9.5			
11	0	.6	.3	.3		46	85	28	9.9			
12	0	.6	.3	.3		25	79	25	5.7			
13	0	.5	.3	.3		26	72	22	4.0			
14	0	.4	.3	.3		26	67	24	3.2			
15	0	.2	.3	.3		33	58	23	2.1			
16	0	.1	.3	.3		45	46	20	2.5			
17	0	.1	.3	.2		62	42	19	3.2			
18	0	.1	.3	.1		334	37	16	2.3			
19	0	.1	.3	0		442	33	14	1.5			
20	0	.2	.3	0		337	31	13	1.1			
21	0	.3	.3	0		331	29	12	1.1			
22	0	.4	.3	0		260	25	15	.5			
23	.1	.5	.3	0		224	23	11	.4			
24	.2	.3	.3	0		128	23	9.5	.1			
25	0	.2	.3	0		135	25	8.8	0			
26	0	.2	.3	0		133	24	9.5	0			
27	0	.3	.3	0		100	28	8.8	0			
28	0	.2	.2	0		76	28	94	0			
29	0	.1	.2	0		37	31	48	0			
30	0	.1	.1	0	------	29	50	23	0			
31	.1	------	.1	0	------	60	------	14	------			------
Total	4.0	11.5	8.1	4.8	0	4,193.8	2,293	1,032.6	127.7	0	0	0
Mean	0.13	0.38	0.26	0.15	0	135	76.4	33.3	4.26	0	0	0
Ac-ft	7.9	23	16	9.5	0	8,320	4,550	2,050	253	0	0	0

Calendar year 1955: Max 1,240 Min 0 Mean 30.2 Ac-ft 21,840
Water year 1955-56: Max 442 Min 0 Mean 21.0 Ac-ft 15,230

Peak discharge (base, 500 cfs).--Mar. 18 (12 p.m.) 582 cfs (4.62 ft).
Note.--Stage-discharge relation affected by ice Nov. 1-3, Nov. 6 to Mar. 18.

Niobrara River at Wyoming-Nebraska State line

Location.--Lat 42°39', long 104°04', in SW¼ sec. 15, T. 31 N., R. 60 W., on left bank a quarter of a mile downstream from Van Tassel Creek, 0.3 mile upstream from Wyoming-Nebraska State line, and 3 miles east of Van Tassel, Wyo.

Records available.--October 1955 to September 1956.

Gage.--Water-stage recorder.

Extremes.--Maximum discharge during year, 18 cfs Feb. 24 (gage height, 1.83 ft); minimum daily, 2.1 cfs July 24, 25, Aug. 28.

Remarks.--Records good.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.7	3.9	4.1	6.2	3.8	4.4	3.7	5.0	4.0	3.2	2.5	2.5
2	3.5	3.9	4.1	5.8	3.8	4.6	3.7	5.0	3.8	3.9	2.7	2.3
3	3.7	4.1	3.9	5.2	3.7	4.4	3.8	4.8	3.7	*3.3	2.7	2.3
4	*3.5	4.5	3.7	5.0	3.6	4.6	3.9	4.8	3.7	2.9	2.5	2.5
5	3.3	4.5	3.5	5.0	3.8	4.6	3.9	4.8	3.6	2.9	2.5	2.3
6	3.1	4.1	*3.7	5.0	3.8	4.3	3.9	4.8	3.5	*2.7	2.3	2.3
7	3.1	*3.9	3.7	5.0	3.9	4.0	5.0	5.0	3.4	2.3	2.3	2.3
8	3.1	3.5	3.5	5.0	*3.9	4.0	5.4	5.4	*3.3	2.3	2.5	2.3
9	3.3	3.7	3.5	4.8	3.9	4.3	5.0	*5.2	3.4	2.3	2.5	2.3
10	3.3	3.9	3.5	4.5	3.9	4.2	4.9	5.2	3.4	2.3	2.5	2.5
11	3.3	4.1	3.5	*4.5	4.0	4.0	4.8	5.0	3.3	2.3	2.7	*2.3
12	3.3	3.7	3.7	4.5	4.0	4.0	4.8	5.0	3.3	2.5	2.9	2.5
13	*3.3	3.7	3.7	4.8	3.9	*4.0	4.8	5.5	3.3	2.3	2.9	2.9
14	3.3	3.5	3.5	4.5	3.9	4.0	4.9	4.8	3.2	2.3	2.5	2.7
15	3.3	3.5	3.1	4.3	4.0	4.0	5.8	4.6	3.2	2.5	*2.3	2.7
16	3.3	3.7	3.1	3.9	4.2	4.0	7.2	4.8	3.5	2.5	2.7	2.7
17	3.3	*4.1	3.1	3.7	3.9	4.3	7.4	4.8	3.4	*2.7	2.9	2.5
18	3.3	4.8	2.9	3.9	3.9	4.3	*7.2	4.8	3.2	2.7	2.9	2.3
19	*3.1	5.5	2.9	3.9	3.9	4.4	7.2	4.6	3.2	2.5	3.1	2.3
20	3.1	5.8	2.9	4.1	3.8	7.3	7.2	4.6	3.1	2.5	3.3	2.3
21	3.9	5.8	3.3	4.1	*3.9	4.9	7.4	4.6	3.0	2.5	3.1	2.5
22	3.7	5.5	4.1	4.1	3.9	4.0	7.2	4.6	3.0	2.5	2.5	2.5
23	3.5	5.2	5.5	3.9	4.8	4.0	6.8	*4.4	2.9	2.5	2.3	2.5
24	3.3	5.5	6.0	3.9	12	3.9	6.2	4.3	2.9	2.1	2.7	2.7
25	3.3	5.5	4.8	3.9	7.4	3.8	5.2	4.2	*2.9	2.1	2.9	*2.5
26	3.3	5.5	5.2	*3.9	4.8	*3.7	4.9	4.6	2.9	2.3	2.5	2.3
27	*3.5	4.8	*5.5	4.0	4.6	3.8	4.9	5.6	2.8	2.3	2.3	2.5
28	3.7	4.3	5.2	3.9	4.4	3.6	4.9	5.0	2.7	2.3	*2.1	2.5
29	3.5	4.1	5.2	3.8	4.4	3.6	5.2	4.6	2.6	2.3	2.3	2.9
30	3.7	4.1	5.2	3.9	------	3.7	5.2	4.3	2.8	*2.5	2.5	*2.9
31	3.9	------	5.2	3.9	------	3.7	------	4.2	------	2.5	2.5	------
Total	105.5	132.7	124.8	136.9	127.8	130.4	162.4	148.9	97.0	78.8	80.9	74.6
Mean	3.40	4.42	3.90	4.42	4.41	4.21	5.41	4.80	3.23	2.54	2.61	2.49
Ac-ft	209	263	248	272	253	259	322	295	192	156	160	148

Calendar year 1955: Max - Min - Mean - Ac-ft -
Water year 1955-56: Max 12 Min 2.1 Mean 3.83 Ac-ft 2,780

* Discharge measurement made on this day.

Niobrara River above Box Butte Reservoir, Nebr.

Location.--Lat 42°27'35", long 103°10'15", in NE¼ sec. 27, T. 29 N., R. 50 W., on right bank 1 mile upstream from high-water line of Box Butte Reservoir and 6 miles east of Marsland.

Records available.--October 1946 to September 1956 in reports of Geological Survey. October 1945 to September 1956 in reports of State engineer.

Gage.--Water-stage recorder and concrete control since Oct. 12, 1953. Datum of gage is 4,012.47 ft above mean sea level, datum of 1929. Prior to Nov. 27, 1949, staff gage at same site and datum.

Average discharge.--10 years (1946-56), 33.6 cfs (24,330 acre-ft per year).

Extremes.--Maximum discharge during year, 82.0 cfs May 27 (gage height, 4.22 ft); maximum gage height, 4.31 ft Dec. 14 (backwater from ice); minimum daily discharge, 2.1 cfs Sept. 26.

1946-56: Maximum gage height, 10.30 ft July 28, 1951 (discharge not determined); minimum daily discharge, 1.6 cfs Sept. 26, 1953.

Remarks.--Records good except those for periods of ice effect, which are fair. Many small diversions above station for irrigation.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*31	*34	*42	50	*38	54	51	*42	*6.9	2.3	8.7	*4.3
2	30	32	42	50	37	*56	50	35	3.7	*2.3	7.3	3.4
3	28	31	34	48	38	55	50	28	3.4	2.6	*8.3	3.4
4	28	35	42	52	38	60	50	21	4.0	2.8	6.9	3.1
5	17	36	35	51	41	60	50	25	3.1	2.8	6.5	3.4
6	17	41	35	50	41	60	50	25	3.4	2.6	6.5	3.4
7	15	38	40	42	41	54	50	22	3.7	2.6	6.5	3.4
8	14	38	41	42	41	54	50	17	3.7	2.6	6.5	3.1
9	14	37	40	36	43	54	50	17	4.0	3.1	6.9	2.8
10	15	38	41	42	43	52	49	10	3.1	3.7	6.9	2.8
11	17	40	48	38	38	50	48	8.7	2.8	3.1	6.9	2.8
12	13	44	41	42	41	37	48	12	2.8	3.4	6.5	2.8
13	10	41	35	39	43	42	47	18	2.6	3.7	6.5	2.8
14	8.7	42	33	36	44	46	46	19	2.8	3.4	6.5	2.8
15	11	37	50	34	45	48	46	18	3.1	3.1	6.5	2.8
16	11	39	42	35	38	49	44	13	4.0	3.4	5.3	2.6
17	13	37	39	35	44	55	42	14	3.1	5.3	3.4	2.3
18	16	39	42	36	38	58	42	9.7	2.8	5.7	3.4	2.3
19	12	42	43	38	38	55	38	9.7	3.1	5.7	3.4	2.3
20	10	46	38	40	46	54	32	9.7	2.6	5.3	5.0	2.8
21	10	46	38	39	42	54	24	9.2	2.6	4.7	4.0	2.6
22	10	48	41	39	44	54	31	9.2	2.8	2.8	3.1	2.3
23	9.7	42	47	39	46	54	32	7.8	2.6	3.4	3.4	2.3
24	13	47	49	40	48	55	42	7.8	2.6	3.4	3.1	2.8
25	14	46	48	40	46	57	44	6.1	2.6	3.4	4.7	2.3
26	14	50	48	42	46	56	42	6.1	2.3	3.1	5.3	2.1
27	15	50	52	43	49	55	41	26	2.3	2.8	5.0	2.3
28	14	50	57	39	47	54	42	12	2.3	2.8	4.7	2.8
29	20	43	52	38	49	49	45	11	2.3	2.8	4.0	2.8
30	28	40	50	38	------	54	46	11	2.3	4.7	4.7	3.1
31	31	------	*52	38	------	*52	------	9.7	------	5.0	4.3	------
Total	509.4	1,229	1,337	1,271	1,233	1,647	1,322	489.7	93.4	108.4	170.7	84.8
Mean	16.4	41.0	43.1	41.0	42.5	53.1	44.1	15.8	3.11	3.50	5.51	2.83
Ac-ft	1,010	2,440	2,650	2,520	2,450	3,270	2,620	971	185	215	339	168

Calendar year 1955:	Max 89	Min 2.3	Mean 28.5	Ac-ft 20,670
Water year 1955-56:	Max 60	Min 2.1	Mean 25.9	Ac-ft 18,840

Peak discharge (base, 150 cfs).--No peak above base.

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Dec. 14, 15, Jan. 5-26, Jan. 28 to Feb. 4, Feb. 10, 25, 26, Mar. 12-14.

Box Butte Reservoir, Nebr.

Location.--Lat 42°27'30", long 103°04'30", in sec. 28, T. 29 N., R. 49 W., in control tower on dam near left bank on Niobrara River, 9 miles north of Hemingford.

Records available.--October 1945 to September 1956.

Gage.--Electric tape gage read once a week or more often. Datum of gage is at mean sea level, datum of 1929.

Extremes.--Maximum contents observed during year, 22,330 acre-ft May 10 (elevation, 4,001.0 ft); minimum observed, 4,480 acre-ft Sept. 20 (elevation, 3,981.5 ft).
1945-56: Maximum contents, 32,210 acre-ft Mar. 26, 1948 (elevation, 4,007.7 ft); minimum observed since normal use of water started, that of Sept. 20, 1956.

Remarks.--Reservoir is formed by earth dam; outlet gate first closed Oct. 3, 1945. Usable capacity, 30,400 acre-ft between elevations 3,969.0 ft (sill of outlet gate) and 4,007.0 ft (crest of spillway). Dead storage, 640 acre-ft. Figures given herein represent total capacity or contents. Water used for irrigation of Mirage Flats project of Bureau of Reclamation.

Cooperation.--Records of elevations and capacity table furnished by Bureau of Reclamation.

Revisions (water years).--WSP 1209: 1946-48.

Month-end elevation and contents, water year October 1955 to September 1956

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept.30	3,984.6	6,240	-
Oct. 31	*3,986.2	7,290	+1,050
Nov. 30	3,989.5	9,840	+2,550
Dec. 31	3,992.9	12,970	+3,130
Calendar year 1955	-	-	+1,620
Jan. 31	3,995.2	15,330	+2,360
Feb. 29	3,997.2	17,560	+2,230
Mar. 31	*3,999.3	20,120	+2,560
Apr. 30	4,000.7	21,930	+1,810
May 31	4,000.1	21,140	-790
June 30	*3,996.0	16,200	-4,940
July 31	3,989.3	9,670	-6,530
Aug. 31	3,983.6	5,640	-4,030
Sept.30	3,981.9	4,690	-950
Water year 1955-56	-	-	-1,550

* Estimated from elevation read near last day of month.

Niobrara River below Box Butte Reservoir, Nebr.

Location.--Lat 42°27'25", long 103°04'05", in SE¼ sec. 28, T. 29 N., R. 49 W., on left bank a quarter of a mile downstream from Box Butte Reservoir and 9 miles north of Hemingford.

Records available.--October 1946 to September 1956 in reports of Geological Survey. October 1941 to September 1942 and October 1944 to September 1956 in reports of State engineer.

Gage.--Water-stage recorder and concrete control. Datum of gage is 3,950.08 ft above mean sea level, datum of 1929. Prior to October 1945, staff gage at site 125 ft upstream at various datums; October 1945 to Apr. 9, 1953, at present datum.

Extremes.--Maximum discharge during year, 158 cfs July 12, 13 (gage height, 4.24 ft); minimum daily, 0.7 cfs Oct. 16, 18, 20.

1946-56: Maximum discharge, 232 cfs Aug. 14, 1949; maximum gage height, 4.38 ft July 13-16, 1954; minimum daily discharge, 0.1 cfs for many days during the water years 1947 and 1951.

Remarks.--Records good except those below 2 cfs, which are fair. Flow completely regulated by Box Butte Reservoir.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*0.9	*0.9	*1.0	1.1	*1.0	1.0	1.1	*1.0	*65	123	108	*57
2	.9	.9	1.0	1.1	1.0	*1.0	1.2	1.0	65	*121	110	48
3	1.0	1.0	1.0	1.1	1.0	1.0	1.2	1.0	65	3.1	*106	38
4	.9	.9	1.0	1.1	1.0	1.0	1.2	1.0	65	1.4	104	38
5	.9	.9	1.0	1.0	1.0	1.0	1.2	1.0	65	1.4	102	36
6	.9	.9	1.0	1.1	1.0	1.0	1.1	1.0	58	1.3	90	33
7	1.0	.9	1.0	1.1	1.0	1.0	1.1	1.0	47	41	90	30
8	1.0	.9	1.0	1.1	1.0	1.0	1.1	.9	34	65	99	30
9	.9	.9	1.0	1.1	1.1	1.0	1.1	.9	30	74	104	33
10	1.0	1.0	1.0	1.1	1.1	1.0	1.2	.9	1.9	108	99	38
11	1.0	1.0	1.0	1.1	1.1	1.0	1.1	.9	1.1	134	90	41
12	1.0	1.0	1.0	1.1	1.1	1.0	1.1	.9	1.1	158	86	41
13	.9	.9	1.0	1.1	1.0	1.0	1.1	1.2	1.0	156	80	37
14	.8	1.0	1.0	1.1	1.1	1.0	1.1	1.0	1.0	143	82	41
15	.8	.9	1.0	1.1	1.0	1.0	1.1	1.0	20	143	88	48
16	.7	.9	1.0	1.1	1.0	1.1	1.2	1.0	33	143	91	49
17	.8	.9	1.0	1.0	1.0	1.1	1.1	1.0	40	139	88	51
18	.7	.9	1.0	1.0	1.0	1.1	1.1	1.0	59	134	77	50
19	.8	1.0	1.0	1.0	1.0	1.1	1.1	1.0	59	125	72	39
20	.7	1.0	1.0	1.0	1.0	1.1	1.1	1.1	61	117	64	5.9
21	.8	1.0	1.0	1.1	1.0	1.1	1.1	1.0	67	106	52	e1.0
22	.8	.9	1.1	1.0	1.0	1.1	1.2	.9	67	106	44	e1.0
23	.8	.9	1.2	1.0	1.0	1.1	1.2	.8	67	100	37	e1.0
24	.9	.9	1.1	1.0	1.1	1.2	1.1	1.2	67	99	34	e1.0
25	.9	.9	1.1	1.0	1.1	1.1	1.0	65	71	104	31	e1.0
26	.8	.9	1.1	1.0	1.1	1.1	1.0	65	80	112	36	e1.0
27	.8	.9	1.1	1.1	1.0	1.2	1.0	65	86	119	51	e1.0
28	.8	1.0	1.1	1.0	1.0	1.2	1.0	65	90	114	59	e1.0
29	.8	1.0	1.1	1.0	1.0	1.2	1.1	65	119	114	64	e1.0
30	.8	1.0	1.0	1.0	------	1.2	1.1	65	123	114	64	e1.0
31	.9	------	*1.0	1.0	------	*1.1	------	65	------	108	61	------
Total	26.7	28.1	31.9	32.7	29.8	33.1	33.4	478.7	1,609.1	3,127.2	2,363	793.9
Mean	0.86	0.94	1.03	1.05	1.03	1.07	1.11	15.4	53.6	101	76.2	26.5
Ac-ft	53	56	63	65	59	66	66	949	3,190	6,200	4,690	1,570

Calendar year 1955: Max 181 Min 0.6 Mean 23.5 Ac-ft 17,020
Water year 1955-56: Max 158 Min 0.7 Mean 23.5 Ac-ft 17,030

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* Discharge measurement made on this day.
e Stage-discharge relation indefinite because of beaver dam on control.

Niobrara River near Hay Springs, Nebr.

Location.--Lat 42°29'00", long 102°41'40", in NW¼ sec. 23, T. 29 N., R. 46 W., on left bank 20 ft downstream from bridge on State Highway 87, 4 miles upstream from Box Butte Creek, and 14 miles south of Hay Springs.

Records available.--June 1950 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 3,723.42 ft above mean sea level, datum of 1929. Prior to July 28, 1951, at site 500 ft upstream at 1.5 ft higher datum.

Extremes.--Maximum discharge during year, 141 cfs July 3 (gage height, 2.13 ft); maximum gage height, 3.12 ft Feb. 25 (backwater from ice); minimum daily discharge, 2.7 cfs Feb. 16.

1950-56: Maximum discharge, 7,330 cfs July 28, 1951 (gage height, 7.2 ft, from floodmarks at site and datum then in use), by slope-area determination of peak flow; minimum daily, that of Feb. 16, 1956.

Remarks.--Records good except those below 10 cfs, which are fair, and those for periods of ice effect, which are poor. Flow regulated by Box Butte Reservoir (see p. 344). Major part of release from reservoir diverted 12 miles upstream for irrigation. Records of suspended sediment loads for the water year 1956 are given in WSP 1451.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	27	19	18	37	19	31	22	40	18	13	14	9.9
2	28	22	20	30	17	31	20	34	16	14	12	11
3	28	*27	22	26	18	33	*25	*25	18	54	11	12
4	25	23	24	*26	20	34	24	25	20	28	9.9	*12
5	24	17	24	23	25	35	20	25	22	*31	11	13
6	*24	19	*23	20	28	36	19	25	*22	36	11	13
7	25	19	21	19	31	28	19	27	20	28	*11	13
8	24	*20	20	19	*29	38	23	23	20	22	11	11
9	24	22	18	19	21	*33	24	17	13	17	11	11
10	23	24	18	20	24	31	22	11	19	12	12	11
11	23	25	18	21	32	33	20	8.2	18	13	14	9.9
12	23	20	18	23	25	25	22	11	15	20	11	9.9
13	23	18	17	24	28	27	22	18	12	15	11	9.3
14	24	16	13	24	26	*30	22	23	*11	14	11	9.3
15	23	14	*14	23	14	32	23	*17	*13	12	9.3	9.9
16	24	13	17	21	*2.7	33	24	14	18	*12	*9.9	11
17	23	*14	18	19	5.0	29	24	13	12	14	11	12
18	24	15	18	*21	9.0	27	24	13	12	15	12	11
19	27	17	18	18	14	25	*24	12	12	16	18	11
20	*24	22	19	17	20	25	24	12	11	15	24	*18
21	25	27	23	18	25	25	24	12	9.9	13	19	24
22	24	30	29	19	28	25	27	12	*9.9	12	14	19
23	24	31	39	20	32	25	33	12	9.3	9.9	13	18
24	25	19	40	20	37	25	34	12	11	11	12	17
25	25	25	39	21	33	24	27	*14	12	9.9	13	18
26	27	18	42	22	32	22	23	23	16	9.9	12	*18
27	27	15	41	24	31	22	24	34	11	*12	*11	18
28	25	15	36	22	30	17	36	24	8.7	12	11	18
29	27	16	29	21	30	28	40	18	12	12	11	19
30	27	17	27	20	------	28	42	16	14	12	9.9	18
31	25	------	33	19	------	24	------	*16	------	14	9.3	------
Total	771	599	756	676	685.7	881	757	586.2	435.8	528.7	380.3	415.2
Mean	24.9	20.0	24.4	21.8	23.6	28.4	25.2	18.9	14.5	17.1	12.3	13.8
Ac-ft	1,530	1,190	1,500	1,340	1,360	1,750	1,500	1,160	864	1,050	754	824

Calendar year 1955: Max 189 Min 8.2 Mean 25.4 Ac-ft 18,380
Water year 1955-56: Max 54 Min 2.7 Mean 20.4 Ac-ft 14,820

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 1-3, 12-22, Nov. 27 to Mar. 5, Mar. 12-18, 28, 29.

Niobrara River near Gordon, Nebr.

Location.--Lat 42°38'00", long 102°12'40", in NE¼ sec. 26, T. 31 N., R. 42 W., on left bank just downstream from bridge on State Highway 27, 4 miles downstream from Rush Creek and 11 miles south of Gordon.

Drainage area.--2,595 sq mi, approximately.

Records available.--August 1928 to June 1932, December 1945 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 3,434.49 ft above mean sea level, datum of 1929. Aug. 24, 1928, to June 30, 1932, staff gage at bridge 4 miles downstream at different datum.

Extremes.--Maximum discharge during year, 202 cfs Mar. 25 (gage height, 1.37 ft); maximum gage height, 2.19 ft Dec. 25 (backwater from ice); minimum daily discharge, 47 cfs Nov. 16.

1928-32, 1945-56: Maximum discharge, 5,940 cfs July 28, 1951 (gage height, 4.81 ft); minimum daily, 18 cfs Mar. 3, 1951.

Remarks.--Records poor Oct. 1 to May 31, fair thereafter. Natural flow of stream affected by storage in Box Butte Reservoir (see p. 344) for irrigation of Mirage Flats project and return flow from irrigated land.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	94	96	90	125	90	145	164	111	91	80	70	68
2	94	94	92	125	90	157	164	121	94	96	*75	65
3	94	102	94	120	100	161	161	125	94	128	70	63
4	96	105	91	120	115	168	149	125	94	135	70	65
5	*96	111	85	125	130	161	149	114	*102	99	68	70
6	95	102	86	128	140	153	138	102	102	*94	63	68
7	94	102	90	131	150	149	135	99	102	96	65	*65
8	94	105	92	128	150	149	131	88	99	88	65	63
9	95	111	94	142	145	172	138	88	94	77	70	58
10	96	121	96	145	140	145	138	82	77	65	82	56
11	95	135	98	135	135	130	121	82	75	60	82	58
12	94	131	99	142	135	131	118	80	77	63	80	60
13	94	75	99	138	135	149	121	105	*68	75	72	60
14	94	60	98	135	130	*135	105	118	70	70	68	60
15	95	50	*97	120	126	145	102	*125	77	68	60	58
16	95	*47	101	100	*71	149	102	108	88	*65	*60	60
17	96	55	98	85	80	172	*105	99	94	68	72	65
18	96	90	95	*135	90	164	111	94	77	72	75	68
19	95	110	93	140	110	149	111	88	72	70	75	*65
20	95	120	96	140	130	145	105	85	63	60	102	65
21	96	110	102	145	140	168	96	85	56	58	91	72
22	98	100	110	145	150	172	91	88	54	60	80	82
23	98	102	115	145	160	168	108	88	58	60	75	77
24	98	145	130	140	160	168	114	85	65	58	72	80
25	96	138	140	130	155	184	114	88	63	54	68	80
26	98	135	150	115	150	184	96	111	60	54	65	82
27	96	80	145	115	145	180	85	142	68	58	65	82
28	98	70	138	110	142	153	88	149	68	58	63	77
29	98	80	130	110	142	157	111	128	65	60	60	80
30	97	85	120	100	------	153	138	105	65	63	60	82
31	97	------	125	90	------	161	------	96	------	60	65	------
Total	2,967	2,967	3,289	3,904	3,736	4,877	3,609	3,204	2,332	2,272	2,208	2,054
Mean	95.7	98.9	106	126	129	157	120	103	77.7	73.3	71.2	68.5
Ac-ft	5,880	5,880	6,520	7,740	7,410	9,670	7,160	6,360	4,630	4,510	4,380	4,070

Calendar year 1955:	Max 410	Min 25	Mean 110	Ac-ft 79,750
Water year 1955-56:	Max 184	Min 47	Mean 102	Ac-ft 74,210

* Discharge measurement made on this day.

Note.--No gage-height record Oct. 1-4, Oct. 6 to Nov. 1; discharge estimated on basis of records for stations near Cody and Hay Springs. Stage-discharge relation affected by ice Nov. 13-22, Nov. 27 to Jan. 6, Jan. 15 to Feb. 26, Mar. 11.

Niobrara River near Cody, Nebr.

Location.--Lat 42°49'50", long 101°17'20", in NW$\frac{1}{4}$NE$\frac{1}{4}$ sec. 23, T. 33 N , R. 34 W., on left bank a quarter of a mile upstream from Mogle Bridge, 3 miles upstream from Medicine Creek, 5 miles downstream from Bear Creek, and 10 miles south of Cody.

Records available.--December 1947 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 2,770 ft (from topographic map).

Average discharge.--8 years (1948-56), 316 cfs (228,800 acre-ft per year).

Extremes.--Maximum discharge during year, 968 cfs Aug. 8 (gage height, 2.08 ft); minimum daily, 95 cfs Jan. 17.

1947-56: Maximum discharge, 4,170 cfs July 29, 1951 (gage height, 6.22 ft); minimum daily, 40 cfs Feb. 19, 1955.

Remarks.--Records good except those for periods of ice effect, which are poor. Natural flow of stream affected by storage in Box Butte Reservoir and irrigation developments. Records of water temperatures for the water year 1956 are given in WSP 1451.

Revisions (water years).--WSP 1209: 1948-49(M).

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	258	*302	302	380	262	415	337	*400	324	226	*238	212
2	262	302	286	365	250	*460	346	400	310	282	250	215
3	258	302	b226	375	b270	490	350	380	294	*298	258	215
4	*266	302	b212	346	b302	500	342	375	286	290	246	223
5	*290	302	286	365	b332	522	337	355	286	310	250	234
6	286	310	298	365	360	596	346	337	*310	306	230	238
7	274	306	310	324	346	516	342	*342	370	324	242	250
8	278	294	302	332	360	*425	342	342	328	254	267	242
9	282	306	319	328	324	420	328	337	298	246	242	234
10	290	306	294	328	*350	425	*328	328	286	242	302	226
11	274	314	294	332	346	355	*332	332	266	226	246	223
12	278	328	310	*342	337	b230	337	310	*250	250	238	*234
13	282	324	294	350	346	b314	324	342	242	250	238	250
14	278	302	b290	350	350	390	319	337	242	258	230	242
15	282	*246	b306	302	342	380	324	*332	230	234	226	234
16	286	158	*314	b208	b219	370	319	328	274	226	*223	223
17	294	155	298	b95	b230	400	*314	306	278	219	215	219
18	*294	186	b282	b246	b282	415	310	306	270	223	270	223
19	294	254	b290	b306	b314	405	306	298	266	223	258	230
20	302	355	294	b342	b324	*410	*306	294	246	*223	270	230
21	294	405	282	b346	346	400	314	*286	*234	219	274	226
22	298	430	282	b350	375	395	314	282	223	212	274	226
23	310	405	302	b350	395	395	332	286	212	215	266	230
24	310	370	314	355	420	390	350	278	212	219	246	242
25	306	*319	332	324	b420	370	332	274	223	212	230	246
26	298	324	346	*319	b415	365	328	282	*223	208	223	246
27	310	b230	425	328	425	380	346	342	219	208	223	*250
28	294	b113	420	324	*395	380	370	395	219	219	223	246
29	310	b208	360	278	385	332	350	*400	219	215	*215	262
30	306	b240	*375	290	------	324	395	370	212	219	219	258
31	310	------	346	262	------	346	------	332	------	226	212	------
Total	8,954	8,698	9,591	9,907	9,822	12,515	10,020	10,308	7,852	7,482	7,544	7,029
Mean	289	290	309	320	339	404	334	333	262	241	243	234
Ac-ft	17,760	17,250	19,020	19,650	19,480	24,820	19,870	20,450	15,570	14,840	14,960	13,940

Calendar year 1955: Max 1,180 Min 40 Mean 304 Ac-ft 220,200
Water year 1955-56: Max 596 Min 95 Mean 300 Ac-ft 217,600

Peak discharge (base, 1,300 cfs).--No peak above base.

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Snake River near Burge, Nebr.

Location.--Lat 42°39'20", long 100°51'00", in NE¼ sec. 20, T. 31 N., R. 30 W., on right bank 150 ft downstream from Nebraska National Forest boundary, 6½ miles southwest of Burge, and 22 miles southwest of Valentine.

Drainage area.--620 sq mi, approximately, of which about 100 sq mi contribute directly to surface runoff.

Records available.--June 1947 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 2,805.36 ft above mean sea level, datum of 1929 (levels by Bureau of Reclamation).

Average discharge.--9 years, 251 cfs (181,700 acre-ft per year).

Extremes.--Maximum discharge during year, 491 cfs Aug. 3 (gage height, 2.95 ft); minimum daily, 107 cfs Jan. 16.

1947-56: Maximum discharge, 577 cfs May 26, 1955; maximum gage height, 4.04 ft Feb. 2, 1951 (backwater from ice); minimum daily discharge, 100 cfs Jan. 3, 1949, Feb. 19, 1955.

Remarks.--Records good except those for periods of ice effect, which are fair. Discharge measurements generally made twice a mohth.

Revisions (water years).--WSP 1279: 1950(M), 1951(P).

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	232	249	257	254	b211	282	246	305	230	211	230	214
2	238	254	260	254	b238	291	257	308	222	243	243	214
3	238	251	214	251	b246	323	268	317	219	265	308	217
4	243	249	152	249	b271	359	249	299	214	251	249	219
5	249	249	227	251	b274	377	243	276	217	238	243	224
6	251	251	b274	254	285	380	265	257	251	227	227	227
7	246	249	b274	254	305	341	249	251	243	217	222	222
8	235	243	b254	249	294	308	249	249	224	214	222	219
9	235	240	b260	243	302	302	254	246	211	211	243	217
10	235	249	b260	232	279	b308	246	249	206	206	262	217
11	238	249	254	232	268	b265	243	246	201	206	249	219
12	238	251	268	235	254	b254	254	232	201	214	232	227
13	238	254	276	240	246	b243	243	260	206	214	224	232
14	235	240	b282	249	251	249	243	268	206	211	222	227
15	235	b182	257	b178	246	246	246	249	206	209	217	224
16	235	b147	238	b107	b186	240	249	246	235	209	217	222
17	235	b175	b238	b154	b196	249	249	238	271	211	235	222
18	235	238	b250	b227	b271	262	240	240	243	217	282	222
19	235	279	b219	b268	b279	285	243	235	227	214	260	222
20	235	353	b224	b246	b285	299	243	230	219	211	260	224
21	246	359	b249	b249	b268	288	240	230	227	211	251	222
22	235	308	285	b246	260	271	254	232	219	211	235	224
23	251	274	314	b246	262	274	268	230	211	209	227	224
24	251	262	335	b243	276	271	274	224	209	209	222	224
25	238	260	299	b262	274	265	260	217	211	206	219	224
26	235	260	282	260	265	268	257	230	214	206	217	222
27	243	b188	285	257	265	b274	271	282	214	211	217	219
28	249	b196	279	260	265	b276	311	288	211	214	219	222
29	246	b164	b276	b260	271	246	282	285	206	214	217	230
30	246	b224	282	b238	------	243	296	271	206	214	217	232
31	238	------	268	b235	------	246	------	251	------	222	219	------
Total	7,439	7,347	8,092	7,374	7,593	8,785	7,692	7,941	6,580	6,726	7,307	6,674
Mean	240	245	261	238	262	283	256	256	219	217	236	222
Ac-ft	14,760	14,570	16,050	14,630	15,060	17,420	15,260	15,750	13,050	13,340	14,490	13,240

Calendar year 1955: Max 504 Min 100 Mean 250 Ac-ft 181,000
Water year 1955-56: Max 380 Min 107 Mean 245 Ac-ft 177,600

Peak discharge (base, 380 cfs).--Nov. 21 (9:30 p.m.) 390 cfs (2.56 ft); Mar. 4-6 (time unknown) about 400 cfs; Aug. 3 (6:30 a.m.) 491 cfs (2.95 ft).

b Stage-discharge relation affected by ice.

Minnechaduza Creek at Valentine, Nebr.

Location.--Lat 42°53'10", long 100°33'10", in SW¼ sec. 30, T. 34 N., R. 27 W., on right bank 500 ft downstream from powerplant in city park at north edge of Valentine and 4 miles upstream from mouth.

Drainage area.--510 sq mi, approximately, of which about 200 sq mi contribute directly to surface runoff.

Records available.--December 1947 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 2,470 ft (from topographic map).

Average discharge.--8 years (1948-56), 36.0 cfs (26,060 acre-ft per year).

Extremes.--Maximum discharge during year, 170 cfs Mar. 5 (gage height, 3.03 ft); minimum daily, 7.7 cfs Jan. 15.

1947-56: Maximum discharge, 894 cfs Mar. 30, 1952 (gage height, 6.58 ft); minimum daily, 2.6 cfs Feb. 22, 1955.

Remarks.--Records good. Discharge measurements generally made twice a month. Flow regulated by powerplant 500 ft above station.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	24	22	28	44	31	48	28	55	34	13	19	21
2	27	24	23	39	27	56	45	63	35	14	21	17
3	28	29	19	39	31	77	51	77	29	25	23	18
4	26	31	17	43	31	111	52	76	39	17	29	15
5	21	31	16	43	28	158	80	89	22	21	40	19
6	24	35	26	42	28	142	44	49	26	17	38	18
7	25	22	22	30	38	77	40	51	28	18	50	18
8	27	27	24	30	33	73	41	49	26	16	37	19
9	22	28	32	39	35	80	42	42	25	14	42	19
10	22	37	26	39	32	76	47	43	18	16	39	19
11	23	28	22	39	37	39	45	37	21	15	64	16
12	24	35	34	40	33	40	42	51	11	14	75	18
13	25	26	26	39	39	42	42	26	22	15	81	20
14	26	15	31	35	34	47	43	41	16	15	53	19
15	22	19	30	7.7	31	44	38	45	19	14	46	19
16	25	16	24	20	21	58	39	37	15	11	38	19
17	28	28	30	33	19	62	37	39	31	14	40	14
18	26	31	24	28	42	50	38	35	18	15	39	18
19	21	28	30	30	33	114	36	45	26	12	40	18
20	28	29	30	29	33	106	38	32	17	14	36	12
21	23	42	29	28	32	124	40	30	18	15	31	17
22	23	41	26	30	40	91	24	27	14	15	29	17
23	24	31	34	27	42	104	42	29	12	15	26	13
24	28	35	38	31	44	84	42	34	17	11	25	19
25	23	25	38	32	38	63	34	23	18	11	21	19
26	26	40	41	29	35	43	36	33	16	16	21	18
27	25	18	45	33	39	77	40	39	15	8.1	21	28
28	25	16	44	30	43	44	43	30	13	16	22	8.0
29	25	25	37	28	38	48	37	56	13	12	22	24
30	26	28	30	33	------	50	49	45	14	16	17	26
31	32	------	44	27	------	82	------	38	------	16	18	------
Total	774	842	920	1,016.7	987	2,310	1,255	1,366	628	461.1	1,103	545.0
Mean	25.0	28.1	29.7	32.8	34.0	74.5	41.8	44.1	20.9	14.9	35.6	18.2
Ac-ft	1,540	1,670	1,820	2,020	1,960	4,580	2,490	2,710	1,250	915	2,190	1,080

Calendar year 1955:	Max 451	Min 2.6	Mean 35.5	Ac-ft 25,700
Water year 1955-56:	Max 158	Min 7.7	Mean 33.4	Ac-ft 24,220

Niobrara River near Sparks, Nebr.

Location.--Lat 42°54'10", long 100°21'40", in SE¼ sec. 22, T. 34 N., R. 26 W., on left bank 18 ft downstream from bridge on State Highway 7, 2¼ miles downstream from Big Beaver Creek, 5½ miles downstream from Minnechaduza Creek, and 6¼ miles southwest of Sparks.

Drainage area.--6,406 sq mi.

Records available.--December 1945 to September 1956.

Gage.--Water-stage recorder.

Average discharge.--10 years (1946-56), 839 cfs (607,400 acre-ft per year).

Extremes.--Maximum discharge during year not determined (probably occurred during ice breakup in March); maximum gage height, 6.11 ft Mar. 5 (backwater from ice); minimum daily discharge, 330 cfs Nov. 17.

1945-56: Maximum discharge, 10,200 cfs Mar. 5, 1949 (gage height, 6.73 ft), from rating curve extended above 3,800 cfs; minimum daily, 170 cfs Dec. 12, 13, 1949.

Remarks.--Records fair except those for periods of ice effect, which are poor. Discharge measurements generally made every two weeks. Natural flow of stream affected by storage in Box Butte Reservoir (see p. 344) and irrigation and power developments.

Revisions (water years).--WSP 1209: 1947(M), 1948-50(P).

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	760	816	726	902	700	1,180	909	1,030	839	687	687	618
2	770	804	838	933	700	1,310	933	1,030	804	728	739	618
3	782	804	667	911	780	1,450	957	1,030	804	793	839	628
4	770	816	440	920	878	1,670	945	1,030	793	816	782	637
5	816	804	571	942	900	1,670	933	1,020	804	793	874	647
6	828	804	726	959	963	1,440	969	909	874	804	749	687
7	816	816	951	862	920	1,270	897	885	839	770	739	666
8	749	793	912	849	910	1,180	909	897	850	760	718	687
9	760	804	1,040	920	868	1,110	921	885	793	708	676	666
10	770	816	1,020	911	882	1,150	874	957	770	708	793	697
11	760	816	1,060	902	860	1,000	850	933	708	697	885	697
12	816	828	1,000	924	880	909	909	862	697	697	760	718
13	782	816	847	924	821	862	874	945	676	697	749	728
14	782	793	1,040	920	814	981	839	993	647	708	739	718
15	770	608	1,070	676	779	993	850	933	676	687	687	728
16	782	356	1,020	437	722	945	828	969	656	676	697	718
17	793	330	1,100	380	598	1,000	828	885	793	656	697	697
18	793	666	1,140	444	717	1,030	804	885	749	637	760	697
19	816	921	1,030	629	913	1,070	782	897	718	637	728	687
20	793	1,030	952	790	1,020	1,100	793	850	708	647	749	708
21	828	1,180	1,170	946	942	1,100	793	839	666	647	749	697
22	828	1,200	1,090	1,030	873	1,030	782	828	647	647	718	718
23	839	1,020	1,030	1,050	953	1,030	816	850	637	666	687	697
24	850	981	1,040	1,020	981	1,020	885	816	637	647	666	697
25	816	885	1,090	1,000	942	981	839	749	666	637	656	728
26	839	897	1,080	946	1,050	945	816	749	676	637	647	728
27	816	590	1,010	846	1,060	981	839	850	666	647	656	728
28	828	336	990	851	1,150	993	981	981	647	647	647	708
29	816	403	920	860	1,230	933	969	993	656	656	637	728
30	828	461	911	800	------	885	981	981	687	656	589	739
31	816	------	924	764	------	909	------	921	------	666	628	------
Total	24,812	23,194	29,405	26,248	25,806	34,127	26,305	28,382	21,783	21,459	22,327	20,815
Mean	800	773	949	847	890	1,101	877	916	726	692	720	694
Ac-ft	49,210	46,000	58,320	52,060	51,190	67,690	52,180	56,290	43,210	42,560	44,280	41,290

Calendar year 1955:	Max	2,860	Min	280	Mean	823	Ac-ft	595,800
Water year 1955-56:	Max	1,670	Min	330	Mean	832	Ac-ft	604,300

Note.--Stage-discharge relation affected by ice Nov. 15-18, Nov. 27 to Mar. 5.

Niobrara River near Norden, Nebr.

Location.--Lat 42°47'13", long 100°02'06", in N½SW¼ sec. 33, T. 33 N., R. 23 W., on left bank 15 ft upstream from bridge on county road, 1½ miles downstream from Fairfield Creek, and 6 miles south of Norden.

Records available.--October 1952 to September 1956.

Gage.--Water-stage recorder.

Extremes.--Maximum discharge during year, 2,130 cfs Mar. 7 (gage height, 3.60 ft); maximum gage height not determined, occurred during period of no gage-height record Feb. 3-7 (backwater from ice); minimum daily discharge, 440 cfs Nov. 17.

1952-56: Maximum discharge, 3,730 cfs Mar. 11, 1955 (gage height, 4.41 ft); maximum gage height, 6.81 ft Feb. 23, 1953 (backwater from ice); minimum daily discharge, 410 cfs Jan. 18, 1954.

Remarks.--Records poor. Discharge measurements generally made every two weeks. Flow affected by storage in Box Butte Reservoir (see p. 344), regulation by powerplants, diversions for irrigation, and return flow from irrigated areas.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	833	852	880	1,100	850	1,190	1,080	1,160	840	731	800	892
2	852	846	1,050	1,080	820	1,280	1,020	1,130	774	731	878	892
3	800	878	850	1,050	900	1,400	1,070	1,140	788	788	859	906
4	826	892	740	1,050	1,000	1,560	1,090	1,120	768	814	814	906
5	852	a860	800	1,000	1,100	1,790	970	1,070	800	743	913	906
6	920	a840	980	1,010	1,140	1,790	1,040	a1,010	885	768	762	913
7	962	a840	1,060	1,050	1,160	1,700	962	a1,000	885	755	762	872
8	885	a840	1,040	949	1,120	1,520	1,000	a980	885	731	788	899
9	892	a850	1,010	931	1,080	1,430	912	a980	807	707	788	885
10	833	a850	994	945	1,010	1,320	934	a1,060	768	707	833	892
11	899	a860	929	945	965	1,070	892	a1,040	788	713	978	913
12	970	a860	906	982	958	992	906	a990	755	743	800	906
13	934	a860	871	978	897	1,170	920	a1,040	820	774	774	941
14	1,040	a840	822	932	924	1,250	885	a1,080	826	768	768	872
15	1,070	a700	808	874	973	1,410	948	1,050	846	731	788	820
16	1,030	a460	788	630	984	1,420	872	978	807	768	800	800
17	948	a440	808	552	946	1,410	913	a980	885	743	833	814
18	892	a800	840	688	882	1,400	866	a980	846	743	878	807
19	872	1,000	816	810	1,060	1,300	892	a980	731	731	941	762
20	774	1,120	816	955	1,120	1,300	899	a950	774	707	859	731
21	807	1,400	844	998	1,060	1,270	899	a930	743	690	878	762
22	749	1,560	914	1,020	1,040	1,250	927	a920	755	656	833	788
23	788	1,250	955	942	1,020	1,240	906	a910	707	690	833	762
24	749	1,000	1,030	950	1,020	1,230	1,000	a880	701	673	859	774
25	762	877	1,150	1,000	1,020	1,250	955	a830	668	684	852	768
26	755	800	1,110	980	998	1,160	913	a830	719	684	840	774
27	768	700	1,110	930	1,060	1,180	962	a960	713	737	859	807
28	807	500	1,050	920	1,140	1,180	a1,000	a1,080	690	719	872	820
29	820	600	1,080	900	1,130	1,100	a1,060	a1,100	701	713	892	820
30	885	750	1,080	880	------	1,060	a1,100	1,080	719	762	878	807
31	814	------	1,100	870	------	1,040	------	934	------	774	859	------
Total	26,788	25,925	29,231	28,901	29,377	40,662	28,794	31,172	23,394	22,678	26,071	25,211
Mean	864	864	943	932	1,013	1,312	960	1,006	780	732	841	840
Ac-ft	53,130	51,420	57,980	57,320	58,270	80,650	57,110	61,830	46,400	44,980	51,710	50,010

Calendar year 1955: Max 3,470 Min 440 Mean 941 Ac-ft 681,600
Water year 1955-56: Max 1,790 Min 440 Mean 924 Ac-ft 670,800

a No gage-height record; discharge estimated on basis of weather records and records for station near Sparks.

Note.--Stage-discharge relation affected by ice Nov. 19 to Mar. 5 (no gage-height record Feb. 3-7).

Plum Creek near Meadville, Nebr.

Location.--Lat 42°42'30", long 99°54'40", in NW¼NW¼ sec. 33, T. 32 N., R. 22 W., on right bank a quarter of a mile downstream from powerplant, 4½ miles southwest of Meadville, and 5 miles upstream from mouth.

Records available.--December 1947 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 2,130 ft (from topographic map).

Average discharge.--8 years (1948-56), 109 cfs (78,910 acre-ft per year).

Extremes.--Maximum daily discharge during year, 144 cfs May 4; minimum daily, 50 cfs Dec. 4.
1947-56: Maximum daily discharge, 790 cfs May 25, 1952; minimum daily, 15 cfs Feb. 19, 1955.

Remarks.--Records fair except those for periods of ice effect, indefinite stage-discharge relation, or no gage-height record, which are poor. Discharge measurements generally made every two weeks. Flow temporarily affected at times by sluicing operations at powerplant upstream.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	91	e88	105	94	56	99	105	112	88	e81	a88	78
2	92	e91	92	92	60	103	105	114	88	84	a140	78
3	e98	83	89	92	70	108	114	135	88	84	a120	78
4	96	88	50	94	78	122	99	144	89	84	a100	81
5	96	88	70	96	81	131	116	140	88	88	a90	83
6	94	86	81	96	86	122	129	129	98	e94	86	83
7	94	89	86	92	89	105	129	120	99	e88	83	83
8	92	86	88	92	90	112	120	116	94	e83	81	81
9	e94	88	89	91	90	120	112	110	94	78	83	81
10	94	89	94	91	91	127	108	107	e98	78	98	80
11	88	91	94	91	91	91	105	101	e80	76	120	76
12	88	91	96	91	92	99	101	99	78	76	103	80
13	86	89	92	92	92	105	99	103	81	76	92	80
14	88	89	88	94	92	108	96	101	81	78	89	80
15	e88	84	83	70	92	101	92	99	81	e84	88	78
16	e88	68	86	80	89	105	89	98	80	89	94	76
17	92	84	89	83	83	108	89	96	91	81	e88	76
18	94	89	91	84	88	114	84	96	88	78	e83	76
19	92	98	92	86	94	122	84	96	e94	80	83	76
20	94	105	94	88	91	127	86	94	e90	81	84	76
21	91	94	94	88	89	120	86	94	89	80	83	76
22	91	91	103	88	89	122	88	e96	86	81	81	76
23	92	89	125	88	92	122	89	91	84	84	78	76
24	91	89	142	86	96	118	91	89	86	81	e80	78
25	92	89	107	84	92	116	89	89	e90	81	e74	78
26	e96	89	101	86	94	108	91	89	e86	80	70	80
27	89	69	96	88	92	107	94	91	e82	a80	72	78
28	86	80	96	86	91	107	105	96	80	a81	75	78
29	86	89	91	84	92	98	103	e101	81	a82	78	84
30	88	99	92	78	------	99	107	92	81	a84	78	83
31	e88	------	92	57	------	103	------	88	------	86	78	------
Total	2,829	2,642	2,888	2,702	2,522	3,449	3,005	3,226	2,613	2,541	2,740	2,367
Mean	91.3	88.1	93.2	87.2	87.0	111	100	104	87.1	82.0	88.4	78.9
Ac-ft	5,610	5,240	5,730	5,360	5,000	6,840	5,960	6,400	5,180	5,040	5,430	4,690

Calendar year 1955:	Max 240	Min 15	Mean 99.6	Ac-ft 72,140
Water year 1955-56:	Max 144	Min 50	Mean 91.6	Ac-ft 66,480

a No gage-height record; discharge estimated on basis of 1 discharge measurement, weather records, and trend of flow.

e Stage-discharge relation indefinite; discharge estimated on basis of weather records and trend of flow.

Note.--Stage-discharge relation affected by ice Nov. 16, 17, 27-29, Dec. 4-26, 29-31, Jan. 15 to Feb. 12, Feb. 17, 18, Mar. 6, 7, 11-13 (no gage-height record Dec. 21, 22, Feb. 8-12).

Long Pine Creek near Riverview, Nebr.

Location.--Lat 42°41'20", long 99°41'20", in N½ sec. 5, T. 31 N., R. 20 W., on right bank 75 ft upstream from county road bridge, 1 mile downstream from Bone Creek, and 5½ miles southwest of Riverview.

Drainage area.--390 sq mi, approximately.

Records available.--April 1948 to January 1954, September 1954 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 1,983.34 ft above mean sea level (levels by Bureau of Reclamation).

Average discharge.--7 years (1948-53, 1954-56), 134 cfs (97,010 acre-ft per year).

Extremes.--Maximum discharge during year, 1,060 cfs June 16 (gage height, 5.37 ft); minimum daily, 103 cfs July 24, 25, 27.

1948-56: Maximum discharge, 5,410 cfs Aug. 20, 1951 (gage height, 10.24 ft); minimum daily, 45 cfs Feb. 19, 1955, result of freezeup.

Remarks.--Records fair except those for periods of ice effect, which are poor. Discharge measurements generally made every two weeks.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	134	120	b136	128	b115	135	144	134	123	111	108	108
2	134	118	b133	125	b124	140	141	147	123	111	136	108
3	135	119	b130	124	b126	126	144	154	122	111	114	107
4	135	122	b136	124	129	b130	143	142	123	112	111	108
5	134	122	b137	125	129	b135	148	136	123	120	111	110
6	134	123	137	128	132	b135	163	134	143	108	111	110
7	132	122	137	124	130	b135	152	136	118	107	110	110
8	130	123	138	127	130	138	142	134	116	106	111	107
9	129	125	b138	128	129	140	136	135	115	106	111	106
10	130	127	138	128	130	139	131	132	114	106	119	106
11	129	128	139	128	131	135	129	131	114	106	121	106
12	129	127	139	130	129	135	132	130	114	106	116	106
13	124	129	137	130	129	134	131	130	114	106	114	106
14	126	128	b130	130	129	132	130	128	114	106	113	106
15	125	127	b132	b124	128	132	130	128	114	106	113	106
16	124	b125	133	b120	128	132	130	126	168	105	123	106
17	128	b127	134	b124	b126	135	129	125	155	104	115	106
18	129	128	134	b128	b125	141	129	125	118	105	115	106
19	126	134	b130	b120	124	138	129	124	118	104	115	106
20	124	137	132	b125	127	139	129	127	117	104	116	107
21	122	137	133	130	129	139	129	126	117	104	114	107
22	119	137	135	130	128	139	129	125	115	108	114	107
23	118	135	135	129	129	138	130	124	113	104	112	108
24	117	135	134	130	130	140	132	123	114	103	111	108
25	114	135	131	128	129	141	132	122	114	103	111	108
26	116	137	130	129	129	143	129	123	113	104	110	110
27	115	137	130	128	131	142	127	124	111	103	110	111
28	116	b135	130	129	129	143	129	125	110	104	110	112
29	117	b136	127	124	133	141	129	126	109	104	109	114
30	117	b130	127	125	------	142	132	125	109	104	108	114
31	119	------	128	124	------	144	------	122	------	105	108	------
Total	3,881	3,865	4,140	3,926	3,717	4,258	4,040	4,023	3,591	3,296	3,520	3,240
Mean	125	129	134	127	128	137	135	130	120	106	114	108
Ac-ft	7,700	7,670	8,210	7,790	7,370	8,450	8,010	7,980	7,120	6,540	6,980	6,430

Calendar year 1955: Max 181 Min 45 Mean 126 Ac-ft 90,930
Water year 1955-56: Max 168 Min 103 Mean 124 Ac-ft 90,250

Peak discharge (base, 650 cfs).--June 16 (4 p.m.) 1,060 cfs (5.37 ft).
b Stage-discharge relation affected by ice.

Keyapaha River at Wewela, S. Dak.

Location.--Lat 43°01'40", long 99°46'45", in NE¼SE¼ sec. 24, T. 95 N., R. 76 W., near left bank on downstream side of bridge on U. S. Highway 183, three-quarters of a mile north of Wewela, 4½ miles upstream from Holt Creek, and 11½ miles downstream from Lost Creek.

Drainage area.--1,070 sq mi, approximately.

Records available.--November 1937 to September 1940, October 1947 to September 1956.

Gage.--Wire-weight gage read once daily, and crest-stage indicator. Datum of gage is 2,049.78 ft above mean sea level, datum of 1929.

Average discharge.--11 years (1938-40, 1947-56), 75.1 cfs (54,370 acre-ft per year).

Extremes.--Maximum discharge during year not determined, occurred in March during period of backwater from ice; maximum gage height observed, 5.91 ft Mar. 4 (backwater from ice); minimum daily discharge, 6.2 cfs Dec. 14.

1937-40, 1947-56: Maximum discharge, 5,430 cfs Mar. 31, 1952 (gage height, 13.08 ft); maximum gage height, 13.5 ft Mar. 25, 1950 (from floodmark, backwater from ice); no flow Jan. 10 to Feb. 15, 1949.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. Discharge measurements generally made every two weeks.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	27	32	7.4	14	29	51	192	140	55	25	19	18
2	26	31	7.9	15	27	54	207	178	53	26	28	18
3	30	14	7.7	16	27	275	174	194	53	a28	31	18
4	30	10	7.7	17	27	353	109	251	95	a29	28	19
5	30	11	8.4	17	28	350	136	202	85	31	24	19
6	30	10	7.7	17	29	246	215	172	a76	31	24	19
7	29	9.0	7.5	17	31	213	265	149	67	32	34	21
8	29	9.2	8.0	17	31	184	211	146	64	31	99	21
9	28	12	7.4	17	31	166	178	121	49	30	72	a20
10	27	12	6.6	17	31	156	a160	113	48	30	74	18
11	28	11	6.6	17	31	146	140	a105	47	25	58	a18
12	28	10	6.6	18	32	140	136	92	42	22	46	a19
13	27	9.2	6.8	18	32	99	126	92	38	21	43	19
14	28	7.8	6.2	17	32	93	121	93	37	19	41	19
15	30	12	6.6	17	34	89	115	99	34	22	36	20
16	30	14	6.6	17	33	89	104	82	34	20	36	21
17	31	14	6.5	18	32	186	97	85	39	15	a36	22
18	32	14	6.8	18	33	389	93	82	43	17	37	22
19	32	14	7.1	18	34	455	90	75	44	17	38	19
20	33	14	7.0	18	35	449	86	a69	a39	17	a36	21
21	31	17	7.1	18	34	446	76	64	34	17	34	20
22	32	18	7.4	18	34	437	78	64	29	17	28	21
23	a33	20	9.2	23	35	395	96	58	22	15	26	20
24	34	20	11	29	35	350	a86	56	27	15	24	19
25	35	22	12	30	35	301	78	55	27	14	21	21
26	35	22	13	29	35	268	77	57	27	14	19	22
27	35	23	13	29	38	241	77	61	27	13	19	22
28	34	13	13	26	43	202	78	a65	26	13	19	21
29	33	6.8	14	26	45	a155	92	70	27	a14	18	24
30	33	7.3	14	26	------	118	100	a62	24	15	18	26
31	33	------	14	29	------	186	------	54	------	15	18	------
Total	953	439.3	270.8	623	953	7,282	3,793	3,206	1,312	650	1,084	607
Mean	30.7	14.6	8.74	20.1	32.9	235	126	103	43.7	21.0	35.0	20.2
Ac-ft	1,890	871	537	1,240	1,890	14,440	7,520	6,360	2,600	1,290	2,150	1,200

Calendar year 1955: Max 1,250 Min 6.2 Mean 73.1 Ac-ft 52,930
Water year 1955-56: Max 455 Min 6.2 Mean 57.8 Ac-ft 41,990

Peak discharge (base, 250 cfs).--Mar. 4 (time and discharge unknown); Mar. 19 (time and discharge unknown); Apr. 6 (6:30 p.m.) 314 cfs (3.10 ft); May 4 (11:30 a.m.) 251 cfs (2.82 ft).

a No gage-height record; discharge interpolated.

Note.--Stage-discharge relation affected by ice Nov. 1 to Mar. 25.

Niobrara River near Spencer, Nebr.

Location.--Lat 42°48'25", long 98°38'55", in S½NE¼ sec. 30, T. 33 N., R. 11 W., on left bank 700 ft downstream from bridge on U. S. Highway 281, 0.4 mile downstream from Spencer powerplant dam, and 5 miles southeast of Spencer.

Drainage area.--10,400 sq mi, approximately.

Records available.--May to December 1908 (gage heights only), August 1913 to September 1915 (fragmentary), August 1927 to September 1936, June 1940 to September 1956. Published as "near Lynch" 1913-15.

Gage.--Water-stage recorder. Datum of gage is 1,464.09 ft above mean sea level, datum of 1929. May to December 1908, chain gage on former highway bridge 0.3 mile upstream at different datum. Aug. 1, 1913, to Sept. 30, 1915, staff gage at highway bridge 10 miles downstream at different datum. August 1927 to Sept. 30, 1936, and June 14, 1940, to Sept. 30, 1944, discharge computed as flow through powerhouse and over dam 0.4 mile upstream. Oct. 1, 1944, to Nov. 10, 1954, water-stage recorder at highway bridge 0.3 mile upstream.

Average discharge.--25 years (1927-36, 1940-56), 1,372 cfs (993,300 acre-ft per year).

Extremes.--Maximum daily discharge during year, 2,990 cfs Mar. 18; minimum daily, 210 cfs Dec. 4.

1927-36, 1940-56: Maximum discharge, 27,400 cfs Mar. 12, 1955 (gage height, 12.16 ft), from rating curve extended above 13,000 cfs on basis of slope-area determination of peak flow; minimum daily, 5 cfs Nov. 14, Dec. 18, 19, 1940.

Remarks.--Records poor. Discharge measurements generally made twice a week. Natural flow of stream affected by irrigation and power developments.

Revision.--WSP 1056: Drainage area.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,280	1,210	392	1,480	1,110	1,460	1,840	1,860	1,480	730	910	910
2	1,350	1,170	276	1,430	1,230	1,640	1,790	1,840	1,340	775	1,100	920
3	1,390	988	240	1,470	1,280	1,880	1,770	1,840	1,250	880	1,260	868
4	1,330	1,180	210	1,520	1,200	2,070	1,980	1,930	1,150	1,080	1,150	870
5	1,600	962	423	1,440	1,120	2,340	2,150	1,750	1,150	1,350	1,150	880
6	1,750	969	700	1,490	1,060	a2,400	2,050	1,680	1,250	1,460	1,420	888
7	1,490	1,070	860	1,570	1,120	a2,450	1,920	1,570	1,160	1,100	1,420	850
8	1,210	1,390	930	1,480	1,180	a2,300	1,810	1,390	1,160	960	1,400	830
9	1,130	1,360	950	1,530	1,210	a2,050	1,720	1,400	1,070	1,050	1,160	850
10	969	1,260	950	1,530	1,210	a1,950	1,570	1,430	1,040	971	980	894
11	1,160	1,110	1,000	1,460	1,240	a1,830	1,550	1,480	860	960	1,070	850
12	1,070	1,190	1,120	1,410	1,230	a1,720	1,530	1,310	746	957	1,170	800
13	1,040	894	1,290	1,260	1,190	a1,630	1,570	1,320	740	960	1,240	930
14	995	640	1,260	968	1,190	1,530	1,490	1,450	948	1,000	1,150	1,150
15	976	620	1,250	794	1,200	1,430	1,480	1,450	1,050	1,190	1,000	1,030
16	995	447	1,220	789	1,240	a1,670	1,500	1,410	1,220	1,020	1,020	950
17	1,010	396	1,170	713	1,280	a2,200	1,450	1,220	1,500	890	1,060	926
18	1,050	510	1,170	746	1,210	2,990	1,390	1,210	1,330	1,000	1,300	940
19	1,100	640	1,340	867	1,070	2,800	1,380	1,100	1,150	1,150	1,390	940
20	1,050	900	1,560	1,010	946	2,360	1,400	1,200	950	1,090	1,310	925
21	1,190	1,740	1,390	1,100	1,000	1,980	1,310	1,210	879	1,080	1,170	970
22	918	2,010	1,250	1,200	1,200	a2,000	1,290	1,210	910	1,060	1,050	840
23	1,030	2,010	1,200	1,320	1,260	a2,100	1,320	1,220	920	1,050	969	820
24	1,030	1,530	1,140	1,350	1,290	a2,200	1,350	1,280	820	980	970	866
25	943	1,190	1,180	1,320	1,310	a2,300	1,420	1,080	763	800	980	870
26	1,060	1,080	1,140	1,290	1,340	a2,400	1,280	1,100	730	782	960	900
27	1,030	483	1,260	1,260	1,330	a2,500	1,490	1,300	660	680	938	1,070
28	1,340	288	1,620	1,220	1,340	2,600	1,730	1,470	739	690	910	1,040
29	1,070	452	1,740	1,310	1,380	1,980	1,910	1,320	780	700	910	1,000
30	1,190	550	1,590	1,260	------	a1,900	2,030	1,320	700	710	901	970
31	1,170	------	1,530	1,160	------	a1,890	------	1,470	------	850	890	------
Total	35,916	30,239	33,351	38,747	34,966	64,550	48,470	43,820	30,445	29,955	34,308	27,547
Mean	1,159	1,008	1,076	1,250	1,206	2,082	1,616	1,414	1,015	966	1,107	918
Ac-ft	71,240	59,980	66,150	76,850	69,350	128,000	96,140	86,920	60,390	59,410	68,050	54,640

Calendar year 1955: **Max** 14,500 **Min** 210 **Mean** 1,277 Ac-ft 924,400
Water year 1955-56: **Max** 2,990 **Min** 210 **Mean** 1,236 Ac-ft 897,100

a No gage-height record; discharge estimated on basis of records for station at Niobrara.

Note.--Stage-discharge relation affected by ice Dec. 3 to Mar. 5, Mar. 14, 15. Indefinite stage-discharge relation or no gage-height record May 24 to Sept. 30; discharge estimated on basis of 38 discharge measurements and records for stations near Norden and at Niobrara.

Niobrara River at Niobrara, Nebr.

Location.--Lat 42°44'50", long 98°03'00", in SW¼ sec. 17, T. 32 N., R. 6 W., near left bank on downstream side of bridge on State Highway 12, 0.8 mile southwest of Niobrara and 1.5 miles upstream from mouth.

Records available.--May to October 1902 and August 1910 to July 1913 (gage heights only), July 1954 to September 1956.

Gage.--Wire-weight gage read once daily. Altitude of gage is 1,230 ft (from topographic map). Prior to July 1954, staff or chain gages in same vicinity at different datum.

Extremes.--Maximum discharge during year not determined, probably occurred during high-water period Mar. 30 to Apr. 3; minimum daily, 90 cfs Nov. 29.

1954-56: Maximum discharge observed, 16,900 cfs Mar. 13, 1955 (gage height, 5.80 ft); maximum gage height observed, 6.60 ft Feb. 27, 1955 (backwater from ice); minimum daily discharge, that of Nov. 29, 1955.

Remarks.--Records poor. Discharge measurements generally made five times a week. Natural flow of stream affected by irrigation and power developments.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,110	1,500	600	1,570	1,180	1,690	4,100	2,530	1,780	950	970	980
2	1,120	1,230	420	1,770	1,340	1,830	4,000	2,400	1,610	970	1,220	730
3	1,470	1,460	320	1,820	1,380	2,020	3,750	2,540	1,610	1,010	1,830	750
4	1,360	1,610	240	1,890	1,320	2,160	3,420	2,480	1,540	1,130	1,480	760
5	1,210	2,350	280	2,060	1,280	2,150	3,380	2,560	1,480	1,440	1,350	880
6	1,330	1,920	400	2,080	1,470	2,630	3,330	2,670	1,500	1,650	1,580	1,040
7	1,590	1,640	540	1,880	1,550	2,940	3,100	2,440	1,780	1,720	1,550	950
8	1,580	1,290	770	1,800	1,640	2,480	3,000	2,080	1,490	1,100	1,770	880
9	1,370	1,500	1,070	1,620	1,600	2,770	3,010	2,100	1,620	1,480	1,410	930
10	1,340	2,230	980	1,380	1,560	2,800	2,820	2,200	1,430	1,200	1,180	950
11	1,190	2,050	1,060	1,460	1,510	2,520	2,600	2,190	1,460	1,040	1,270	920
12	940	1,500	1,350	1,520	1,520	2,300	2,020	2,090	1,300	920	1,360	870
13	1,440	1,360	1,380	1,500	1,450	2,170	2,050	2,310	910	930	1,440	1,570
14	1,470	940	1,370	1,430	1,440	1,910	2,150	2,240	890	960	1,280	1,240
15	1,570	520	1,360	1,500	1,540	1,760	1,890	2,050	860	1,200	1,130	1,260
16	1,580	430	1,460	1,320	1,500	1,810	1,870	2,170	810	1,690	1,140	950
17	1,810	150	1,440	1,140	1,560	2,100	2,040	1,860	1,440	1,150	1,180	840
18	1,500	200	1,350	950	1,690	2,270	2,080	1,560	2,290	880	1,450	1,060
19	1,220	330	1,290	960	1,600	3,120	1,870	1,840	1,580	1,030	1,370	920
20	1,470	480	1,280	990	1,440	3,610	1,800	1,800	1,190	1,140	1,120	940
21	1,370	940	1,340	990	1,220	3,500	1,650	1,380	1,020	960	1,060	990
22	1,780	2,500	1,450	1,060	1,250	3,200	1,550	1,520	1,080	870	950	830
23	1,900	2,250	1,440	1,140	1,450	2,900	1,570	1,750	1,120	860	960	780
24	1,850	2,010	1,600	1,290	1,640	2,900	1,740	1,490	930	840	880	950
25	1,670	1,670	1,680	1,350	1,600	3,100	1,830	1,270	940	830	900	850
26	1,520	1,680	1,510	1,340	1,630	3,200	1,860	1,070	820	760	730	900
27	2,010	1,670	1,480	1,330	1,730	3,400	1,840	1,260	780	680	750	1,040
28	1,700	200	1,530	1,320	1,680	3,500	2,200	1,580	830	690	750	920
29	2,060	90	1,420	1,320	1,670	3,700	2,540	1,630	940	700	730	860
30	1,690	120	1,530	1,200	------	4,000	2,790	1,600	870	740	920	1,340
31	2,020	------	1,720	1,050	------	4,100	------	1,610	------	940	940	------
Total	47,240	37,820	35,660	44,030	43,440	84,540	73,850	60,270	37,900	32,460	36,650	28,880
Mean	1,524	1,261	1,150	1,420	1,498	2,727	2,462	1,944	1,263	1,047	1,182	963
Ac-ft	93,700	75,010	70,730	87,330	86,160	167,700	146,500	119,500	75,170	64,380	72,690	57,280

Calendar year 1955: Max 15,700 Min 90 Mean 1,652 Ac-ft 1,196,000
Water year 1955-56: Max 4,100 Min 90 Mean 1,538 Ac-ft 1,116,000

Note.--Stage-discharge relation affected by ice Nov. 14 to Mar. 23.

Bazille Creek near Niobrara, Nebr.

Location.--Lat 42°45'00", long 97°56'10", in NE¼ sec. 18, T. 32 N., R. 5 W., on downstream side of right pier of bridge on State Highway 12, 2½ miles upstream from mouth and 4½ miles east of Niobrara.

Drainage area.--440 sq mi, approximately.

Records available.--May 1952 to September 1956. Records for October 1931 to September 1932, published in WSP 731, have been found to be unreliable and should not be used.

Gage.--Water-stage recorder for stages above 4.2 ft. Wire-weight gage read once daily. Datum of gage is 1,214.83 ft above mean sea level, unadjusted. Prior to Dec. 16, 1952, wire-weight gage at present site and datum.

Extremes.--Maximum discharge observed during year, 237 cfs July 15 (gage height, 3.41 ft); maximum gage height, 5.68 ft Mar. 2 (backwater from ice); minimum daily discharge, 7.7 cfs Aug. 31, Sept. 1, 3.

1952-56: Maximum discharge, 26,100 cfs June 6, 1954 (gage height, 11.51 ft), from rating curve extended above 2,000 cfs on basis of contracted-opening determination of peak flow at 11.36 ft; minimum daily, 7.2 cfs Aug. 27, 1955.

Flood of June 19, 1951, reached a stage of 11.36 ft, from floodmarks (discharge, 24,400 cfs on basis of contracted-opening determination of peak flow).

Remarks.--Records fair except those for periods of ice effect, which are poor. Discharge measurements generally made twice a week. Minor diversions for irrigation above station.

Revisions (water years).--WSP 1279: 1952(P). See also Records available.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	34	40	19	53	55	57	101	74	35	18	19	7.7
2	43	37	18	53	52	152	116	66	28	18	27	8.1
3	61	19	16	62	48	217	220	72	34	18	17	7.7
4	45	35	12	66	48	169	195	53	31	19	15	8.1
5	42	34	18	66	48	195	138	61	37	26	15	9.8
6	38	20	23	57	48	152	111	62	59	20	13	13
7	40	19	26	42	48	85	91	53	37	34	32	16
8	37	31	28	29	50	46	79	52	37	19	18	15
9	40	45	28	42	53	162	81	50	32	16	12	13
10	37	45	27	53	66	103	74	52	32	16	11	11
11	34	43	26	64	72	17	81	79	24	15	11	11
12	37	43	26	61	72	11	72	89	20	14	10	11
13	32	40	26	61	77	89	74	61	18	27	10	15
14	32	40	26	70	79	105	72	61	16	19	10	16
15	42	38	26	46	85	68	66	52	16	154	8.9	19
16	42	24	26	10	68	109	59	48	13	79	11	16
17	37	16	28	40	68	122	52	46	18	35	10	16
18	37	26	26	53	48	174	52	43	32	26	45	15
19	42	32	26	55	76	89	53	45	23	22	38	14
20	38	48	26	59	72	101	50	43	23	27	24	16
21	37	52	24	57	85	101	52	40	15	17	20	15
22	35	52	19	50	85	99	53	43	20	16	17	13
23	40	45	14	43	74	91	52	43	15	16	15	14
24	38	34	23	38	66	59	48	42	14	15	13	16
25	38	28	37	32	77	68	40	35	10	13	12	16
26	40	34	48	34	55	74	48	38	37	11	9.8	15
27	37	11	50	41	76	72	48	37	19	9.8	9.8	10
28	38	10	57	45	59	64	66	34	14	8.9	10	8.5
29	40	18	52	45	59	23	66	40	17	11	8.9	13
30	40	18	31	42	------	45	77	35	12	9.3	8.5	22
31	42	------	40	59	------	70	------	34	------	11	7.7	------
Total	1,215	977	872	1,528	1,869	2,989	2,387	1,583	738	760.0	488.6	400.9
Mean	39.2	32.6	28.1	49.3	64.4	96.4	79.6	51.1	24.6	24.5	15.8	13.4
Ac-ft	2,410	1,940	1,730	3,030	3,710	5,930	4,730	3,140	1,460	1,510	969	795

Calendar year 1955: Max 778 Min 7.2 Mean 54.9 Ac-ft 39,760
Water year 1955-56: Max 220 Min 7.7 Mean 43.2 Ac-ft 31,350

Peak discharge (base, 1,000 cfs).--No peak above base.
Note.--Stage-discharge relation affected by ice Nov. 3, 6, 7, Nov. 14 to Mar. 22, Mar. 29, 30.

Lewis and Clark Lake near Yankton, S. Dak.
(Formerly published as Gavins Point Reservoir near Yankton)

Location.--Lat 42°51', long 97°29', in SW¼ sec. 7, T. 33 N., R. 1 W., in powerhouse of dam on Missouri River, 3¾ miles southwest of Yankton, 11.9 miles upstream from James River, 38.8 miles downstream from Niobrara River, and at mile 846.5. Prior to Dec. 9, 1955, at temporary location on wall of intake structure unit 3.

Drainage area.--279,500 sq mi (approximately).

Records available.--July 1955 to September 1956. Prior to October 1955, published as Gavins Point Reservoir near Yankton.

Gage.--Water-stage recorder. Datum of gage is at mean sea level, datum of 1929. Prior to Dec. 9, 1955, recorder at temporary location on wall of intake structure unit 3.

Extremes.--Maximum contents during year, 414,200 acre-ft Mar. 4, 6 (elevation, 1,205.9 ft); minimum, 46,630 acre-ft Nov. 1 (elevation, 1,186.1 ft).

1955-56: Maximum contents, that of Mar. 4, 6, 1956; minimum since initial filling, 61,950 acre-ft Apr. 23, 1956 (elevation, 1,188.1 ft).

Remarks.--Reservoir is formed by an earth-fill dam; closure made and storage began during July 1955. Total capacity is 541,300 acre-ft between elevations 1,170 and 1,210 ft. Active capacity, 385,100 acre-ft between elevations 1,195 and 1,210 ft. Inactive storage below elevation 1,195 ft, 156,200 acre-ft. Figures given herein represent total contents. The spillway consists of 14 taintor gates, each 40 ft wide by 30 ft high; spillway capacity, 280,000 cfs (elevation, 1,210 ft). Crest of spillway is at elevation 1,180 ft. Power generation is scheduled for eventual use of 3 power tunnels; capacity, 35,000 cfs (elevation, 1,210 ft). Water is used for flood control, navigation, power, and incidental uses.

Cooperation.--Elevations and capacity table furnished by Corps of Engineers.

Month-end elevation and total contents, water year October 1955 to September 1956

Date	Elevation (feet)†	Contents (acre-feet)	Change in contents (acre-feet)
Sept.30	1,187.5	56,990	-
Oct. 31	1,186.6	50,150	-6,840
Nov. 30	1,189.2	72,480	+22,330
Dec. 31	1,197.1	196,600	+124,100
Calendar year 1955	-	-	-
Jan. 31	1,202.3	316,000	+119,400
Feb. 29	1,205.5	402,700	+86,700
Mar. 31	1,190.8	91,040	-311,700
Apr. 30	1,189.4	74,650	-16,390
May 31	1,190.1	82,380	+7,730
June 30	1,203.2	339,400	+257,000
July 31	1,204.0	360,800	+21,400
Aug. 31	1,203.5	347,400	-13,400
Sept.30	1,204.4	371,800	+24,400
Water year 1955-56	-	-	+314,800

† Elevation at 12 p.m.

Missouri River at Yankton, S. Dak.

Location.--Lat 42°52', long 97°24', between sec. 18, T. 93 N., R. 55 W., and sec. 13, T. 93 N., R. 56 W., on downstream end of left pier of Meridian Highway Bridge on U. S. Highway 281 in Yankton, 5.8 miles upstream from James River, 6.1 miles downstream from Lewis and Clark Lake, and at mile 840.4.

Drainage area.--279,500 sq mi, approximately.

Records available.--November 1930 to September 1956. 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 1,159.68 ft above mean sea level, datum of 1929. Prior to Sept. 20, 1932, chain gage at present site and datum.

Average discharge.--25 years (1931-56), 26,590 cfs (19,250,000 acre-ft per year).

Extremes.--Maximum discharge during year, 47,000 cfs Aug. 24 (gage height, 5.05 ft); minimum daily, 7,500 cfs Jan. 14; minimum gage height, -0.27 ft Nov. 22.

1930-56: Maximum discharge, 480,000 cfs Apr. 13, 1952 (gage height, 15.5 ft); maximum gage height, 15.5 ft Apr. 13, 14, 1952; minimum daily discharge, 2,700 cfs Nov. 15, 16, 1940; minimum gage height, -0.78 ft Dec. 15, 1948.

Maximum stage known, 30.5 ft Apr. 5, 1881 (ice jam), present datum.

Remarks.--Records excellent except those for periods of ice effect, which are good. Discharge measurements generally made 2 or 3 times a week during open water and once a week during ice period. Flow regulated by Lewis and Clark Lake (see preceding page). Many diversions above station for irrigation.

Revisions.--WSP 761: Drainage area.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	32,400	26,500	11,500	8,700	8,200	10,400	29,400	28,400	28,900	29,200	31,700	33,000
2	32,800	23,300	11,700	9,100	8,200	10,200	28,800	28,400	29,400	28,400	31,900	33,900
3	33,400	20,500	11,800	9,500	8,200	10,100	29,200	29,500	29,300	26,000	32,300	33,800
4	32,600	17,300	10,500	9,400	8,200	9,820	29,400	29,500	30,000	26,000	32,400	34,300
5	33,000	14,900	9,500	9,100	8,200	10,600	29,100	29,600	29,800	26,600	32,200	33,300
6	33,000	12,100	9,000	8,500	8,200	12,400	29,300	29,100	29,200	24,400	32,500	32,700
7	32,800	10,900	8,800	8,800	8,200	13,900	29,200	28,900	28,400	26,600	32,600	32,900
8	32,100	10,600	8,700	8,800	8,200	15,300	29,000	29,000	28,600	28,200	33,600	33,500
9	31,500	10,900	8,500	8,600	8,200	17,200	28,900	29,100	28,500	29,600	34,400	34,300
10	30,800	11,000	8,400	8,400	8,200	17,200	27,700	28,800	28,000	30,600	33,300	34,100
11	30,900	10,700	8,300	8,400	8,200	18,100	26,900	28,000	28,400	30,600	33,100	32,600
12	30,900	10,400	8,100	8,500	8,200	22,600	27,200	28,000	29,900	30,400	33,100	34,700
13	31,500	10,400	8,100	8,500	8,200	26,600	27,700	28,400	30,600	30,500	32,800	33,200
14	31,200	10,200	8,000	7,500	9,600	30,000	28,000	28,000	31,600	30,800	32,300	34,900
15	31,400	9,740	8,000	8,000	10,500	30,800	28,300	28,000	32,400	30,500	32,700	34,300
16	31,500	10,100	8,000	8,100	10,800	30,200	28,600	27,500	32,000	29,000	33,200	33,500
17	31,500	10,900	9,400	8,200	11,000	29,800	28,800	27,200	31,900	28,000	32,800	33,600
18	31,900	10,200	10,100	8,300	11,000	29,800	29,100	27,600	31,200	28,300	31,900	33,600
19	32,900	10,400	10,300	8,300	11,000	30,100	29,200	28,800	30,900	28,600	31,200	33,800
20	33,200	10,400	10,300	8,400	10,500	28,700	29,200	29,100	31,900	28,800	31,900	34,000
21	33,300	10,100	10,300	8,500	10,000	28,300	29,200	29,000	32,700	28,700	32,200	34,100
22	33,600	9,460	10,000	8,600	11,900	31,400	28,900	31,000	31,100	28,600	32,400	33,200
23	33,500	9,240	8,800	8,700	11,200	28,800	28,900	30,700	29,600	29,900	34,100	33,600
24	32,200	9,150	8,000	8,800	10,900	31,300	30,000	30,400	30,500	31,900	37,400	34,600
25	30,900	8,880	8,000	8,300	11,800	30,100	29,600	30,800	30,000	33,900	34,000	34,700
26	32,600	9,120	8,000	8,200	11,300	31,200	29,400	29,600	28,000	34,400	34,600	34,500
27	31,900	9,150	8,000	8,200	11,700	30,900	29,200	30,000	25,200	35,300	34,000	34,600
28	33,300	9,300	8,000	8,200	11,300	30,700	30,000	29,300	27,500	35,400	34,400	34,400
29	33,700	9,500	8,300	8,200	10,600	30,900	30,000	28,800	28,700	35,300	34,600	35,300
30	32,000	10,000	8,200	8,200	------	30,600	28,800	28,600	28,900	34,900	33,700	35,300
31	29,600	------	8,200	8,100	------	30,000	------	28,700	------	33,200	32,900	------
Total	997,900	355,340	280,800	263,100	281,700	738,020	867,000	897,800	893,100	932,600	‡1,026	‡1,018.3
Mean	32,190	11,840	9,058	8,487	9,714	23,810	28,900	28,960	29,770	30,080	33,100	33,940
Ac-ft	‡1,979	704,800	557,000	521,900	558,700	‡1,464	‡1,720	‡1,781	‡1,771	‡1,850	‡2,035	‡2,020

Calendar year 1955:	Max	38,000	Min	7,000	Mean	22,460	Ac-ft	16,260,000
Water year 1955-56:	Max	37,400	Min	7,500	Mean	23,370	Ac-ft	16,960,000

‡ Expressed in thousands.

Note.--Stage-discharge relation affected by ice Nov. 28 to Dec. 1, Dec. 4 to Feb. 25.

James River at New Rockford, N. Dak.

Location.--Lat 47°41'05", long 99°07'30", on line between secs. 32 and 33, T. 149 N., R. 66 W., on right bank 90 ft downstream from bridge on U. S. Highway 281 at New Rockford and 7 miles upstream from small tributary.

Drainage area.--596 sq mi, of which about 190 sq mi is probably noncontributing.

Records available.--August 1950 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 1,500.00 ft above mean sea level, datum of 1929. Prior to Aug. 8, 1951, wire-weight gage at same site and datum.

Average discharge.--6 years, 6.92 cfs (5,010 acre-ft per year).

Extremes.--Maximum discharge during year, 306 cfs Apr. 16 (gage height, 8.70 ft); no flow during several months.

1950-56: Maximum discharge, 840 cfs Apr. 12, 1951 (gage height, 9.20 ft); no flow during several months of each year.

Maximum stage known since at least 1925, about 13 ft in April 1948, from information by local resident. Flood in April 1950 reached a stage of 11.3 ft, from floodmarks.

Remarks.--Records fair.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		(*)					0	59	13	9.0	0.9	0.1
2							0	*58	13	8.1	.8	.1
3							0	55	13	9.0	.7	.1
4	(*)						0	52	13	8.7	.6	.1
5							0	47	12	8.1	.5	.1
6							0	43	31	7.6	.3	.1
7							0	40	*25	7.7	.3	.1
8							0	36	22	9.0	.3	.1
9							0	35	21	8.4	.2	.1
10							0	34	20	8.1	.2	0
11							*0	*36	19	7.9	.2	0
12							0	35	18	7.3	.2	0
13							*0	33	17	6.7	.2	0
14							2	31	17	6.4	.2	0
15							*23	30	16	5.6	.2	0
16							*206	29	16	4.9	.1	0
17							181	28	16	4.3	.1	0
18							160	27	16	*3.9	.1	0
19							*148	26	15	3.6	.1	*0
20							142	24	15	3.3	.1	0
21							138	23	16	3.2	*.1	0
22							127	22	15	3.0	.1	0
23							117	21	15	2.8	0	0
24							111	21	15	2.6	0	0
25						(*)	*103	20	15	2.3	0	0
26							96	18	14	2.0	0	0
27					(*)		86	15	12	1.7	0	0
28			(*)				76	15	*11	1.6	0	*0
29		(*)					69	17	11	1.4	0	0
30				(*)	------		66	15	11	1.2	0	0
31		------			------		------	*13	------	1.1	.1	------
Total	0	0	0	0	0	0	1,851	958	483	160.5	6.6	0.9
Mean	0	0	0	0	0	0	61.7	30.9	16.1	5.18	0.21	0.03
Ac-ft	0	0	0	0	0	0	3,670	1,900	958	318	13	1.8

Calendar year 1955: Max 74 Min 0 Mean 4.66 Ac-ft 3,370
Water year 1955-56: Max 206 Min 0 Mean 9.45 Ac-ft 6,860

Peak discharge (base, 200 cfs).--Apr. 16 (3:15 p.m.) 306 cfs (8.70 ft).
* Discharge measurement or observation of no flow made on this day.
Note.--Discharge Apr. 20 to May 12 computed on basis of once-daily wire-weight-gage readings.

James River near Pingree, N. Dak.

Location.--Lat 47°08'30", long 98°47'00", in SW¼SW¼ sec. 3, T. 142 N., R. 64 W., on right bank 500 ft upstream from dam at outlet of DePuy Marsh, 6¼ miles southeast of Pingree, and 6¼ miles northeast of Buchanan.

Drainage area.--1,580 sq mi, approximately, of which about 440 sq mi is probably noncontributing.

Records available.--October 1952 to September 1956.

Gage.--Water-stage recorder and flat-crested rubble-masonry control. Datum of gage is 1,400.00 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 175 cfs June 6 (gage height, 37.32 ft); no flow for many days; minimum gage height, 33.13 ft Mar. 20-24.

1952-56: Maximum discharge, 237 cfs May 4, 1955, due to strong wind effect (gage height, 37.25 ft); no flow for many days each year; minimum gage height, that of Mar. 20-24, 1956.

Remarks.--Records fair. Estimated leakage through dam (control) included. Flow regulated by Jim and Arrowood Lakes (combined capacity, 16,000 acre-ft).

Rating table, water year 1955-56 (gage height, in feet, and discharge, in cubic feet per second)

36.0	0.1	36.8	15
36.4	.2	36.9	35
36.5	.4	37.0	62
36.6	1.3	37.1	92
36.7	5.3	37.3	166

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							0	83	18	10	0.2	0.2
2							0	110	6.6	6.6	.2	.2
3							0	116	12	5.9	.3	.2
4	(*)						0	*106	8.4	6.6	.3	.2
5							0	102	3.1	7.3	.2	.2
6							0	110	77	5.9	.2	.2
7							0	89	146	12	.2	.1
8							0	35	116	24	.4	.1
9							0	110	106	22	.3	.1
10							0	83	89	14	.2	.1
11							0	120	77	11	.2	.1
12							*0	92	86	9.0	.2	.1
13							0	102	83	5.9	.2	.1
14							0	*89	71	2.9	.2	.1
15							*0	89	59	3.7	.2	.1
16							0	86	40	2.9	.2	.2
17							0	48	40	**2.1	.2	.1
18							0	48	42	2.5	.2	.1
19							0	16	40	2.5	.2	**.1
20							0	33	33	1.5	.2	.1
21							0	20	22	1.3	.1	.1
22							0	30	30	.9	.2	.1
23							0	12	28	.6	.1	.1
24							0	8.1	15	.9	.1	.1
25						(*)	.1	8.1	8.1	.2	.1	.1
26							.2	24	15	.8	.1	.1
27							7.3	10	12	.5	.1	.1
28			(*)				*40	20	2.9	.4	**.1	**.1
29							62	42	**2.9	.2	.1	.1
30		(*)		(*)	------		*74	65	12	**.4	.1	.1
31	(*)	------			------		------	*74	------	.4	.4	------
Total	0	0	0	0	0	0	183.6	1,980.2	1,301.0	164.9	6.0	3.7
Mean	0	0	0	0	0	0	6.12	63.9	43.4	5.32	0.19	0.12
Ac-ft	0	0	0	0	0	0	364	3,930	2,580	327	12	7.3

Calendar year 1955:	Max	125	Min	0	Mean	7.39	Ac-ft	5,350
Water year 1955-56:	Max	146	Min	0	Mean	9.98	Ac-ft	7,220

* Discharge measurement or observation of no flow made on this day.

** Field estimate made on this day.

Jamestown Reservoir near Jamestown, N. Dak.

Location.--Lat 46°55'50", long 98°42'25", in SW$\frac{1}{4}$NW$\frac{1}{4}$ sec. 24, T. 140 N., R. 64 W., at Jamestown Dam on James River, 1.7 miles north of Jamestown Post Office and 4 miles upstream from Pipestem Creek.

Drainage area.--1,670 sq mi, approximately, of which about 460 sq mi is probably noncontributing.

Records available.--November 1953 to September 1956.

Gage.--Water-stage recorder. Reference point used below elevation 1,410.00 ft.

Extremes.--Maximum contents during year, 16,450 acre-ft July 9-23 (elevation, 1,422.1 ft); minimum, 7,410 acre-ft Mar. 9 (elevation, 1,413.9 ft).
1953-56: Maximum contents, that of July 9-23, 1956.

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 between elevations 1,400 ft (sill of outlet) and 1,454 ft (crest of spillway). Dead storage below elevation 1,400 ft, 820 acre-ft. Maximum design pool, 389,600 acre-ft (elevation, 1,464.4 ft). Figures given herein represent total contents. Reservoir is used for flood control and municipal supply.

Cooperation.--Record of elevation and contents furnished by Bureau of Reclamation.

Month-end elevation and contents, water year October 1955 to September 1956

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept.30	1,415.11	8,420	-
Oct. 31	1,414.73	8,080	-340
Nov. 30	1,414.46	7,850	-230
Dec. 31	1,414.27	8,680	+830
Calendar year 1955	-	-	+5,190
Jan. 31	1,414.1	7,530	-1,150
Feb. 29	1,414.0	7,440	-90
Mar. 31	1,415.3	8,600	+1,160
Apr. 30	1,415.6	8,890	+290
May 31	1,419.1	12,590	+3,700
June 30	1,421.8	16,030	+3,440
July 31	1,422.0	16,300	+270
Aug. 31	1,421.6	15,760	-540
Sept.30	1,421.3	15,350	-410
Water year 1955-56	-	-	+6,930

Note.--During winter months the elevations are interpolated between weekly readings.

Pipestem Creek near Buchanan, N. Dak.

Location.--Lat 47°03'59", long 98°55'07", at north line of sec. 4, T. 141 N., R. 65 W., on left bank 30 ft downstream from bridge on county road and 4½ miles west of Buchanan.

Drainage area.--925 sq mi, of which about 450 sq mi is probably noncontributing.

Records available.--March 1950 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 1,467.01 ft above mean sea level, datum of 1929. Prior to July 11, 1950, wire-weight gage at same site and datum.

Average discharge.--6 years, 15.8 cfs (11,440 acre-ft per year).

Extremes.--Maximum discharge during year, 560 cfs June 7 (gage height, 7.06 ft); no flow for many days; minimum gage height, 2.12 ft Oct. 13.

1950-56: Maximum discharge, 4,480 cfs Apr. 17, 1950 (gage height, 10.77 ft); maximum gage height, 11.89 ft Apr. 9, 1950 (backwater from ice); no flow at times.

Remarks.--Records good except those for Mar. 19 to Apr. 12, which are poor. Records of chemical analyses for the water year 1956 are given in WSP 1451.

Rating tables, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 9		Apr. 10 to Sept. 30			
2.0	0	2.2	0.2	3.5	55
2.1	.1	2.3	1.6	4.0	91
2.2	.6	2.5	5.6	5.0	186
		2.7	12	6.0	329
		3.0	27	7.0	545

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.1	0.2	0.1			0	2	24	*87	15	3.0	4.1
2	.1	.2	.1			0	**2	24	59	13	2.7	3.4
3	.1	.2	.1			0	5	24	44	13	2.7	2.9
4	.1	.2	.1			0	10	*22	36	13	2.9	2.1
5	.1	.2	.1			0	15	20	30	14	2.9	2.1
6	.1	.1	.1			0	10	20	157	14	2.5	2.3
7	.1	.1	.1			0	5	18	*504	14	2.9	2.3
8	.1	.1	.1			0	5	17	*334	15	6.5	2.3
9	.1	.1	0			0	5	15	139	16	3.2	2.3
10	.1	.1	0			0	15	18	80	14	2.5	2.5
11	.1	.1	0			0	*21	*17	57	11	2.3	2.3
12	.1	.1	0			0	*27	16	44	9.7	2.1	2.5
13	.1	.1	0			0	*45	15	36	8.9	2.0	2.7
14	.1	.1	0			0	50	15	30	8.2	1.8	2.9
15	.1	.1	0			0	*61	12	26	6.8	1.6	3.4
16	.1	.1	0			0	51	12	24	5.9	1.4	3.2
17	.1	.1	0			0	71	11	22	*6.2	1.3	2.9
18	.1	.1	0			0	93	9.7	22	5.4	1.3	2.5
19	.1	.1	0			2	*93	9.3	20	5.2	1.3	*2.5
20	.1	.1	0			10	77	7.9	19	4.9	1.1	2.3
21	.1	.1	0			50	63	7.6	18	5.2	1.1	2.1
22	.1	.1	0			*20	53	7.3	17	5.6	.7	2.0
23	.1	.1	0			8	46	7.0	14	5.4	.7	1.8
24	.1	.1	0			6	41	7.3	13	5.2	.6	1.8
25	.1	.1	0			*9	36	7.0	12	4.3	.4	1.6
26	.1	.1	0			8	33	6.5	12	3.8	.6	1.4
27	.1	.1	*0	(*)	(*)	7	*31	6.5	11	3.4	.6	1.3
28	.2	.1	0			5	28	104	10	3.6	*.7	**1.0
29	.2	.1	0			3	26	270	*9.7	3.6	1.0	1.1
30	.2	*.1	0		------	2	24	386	17	*3.6	2.3	1.1
31	*.2	------	0		------	2	------	154	------	3.4	7.0	------
Total	3.5	3.5	0.8	0	0	132	1,044	1,290.1	1,903.7	260.3	63.7	68.7
Mean	0.11	0.12	0.03	0	0	4.3	34.8	41.6	63.5	8.40	2.05	2.29
Ac-ft	6.9	6.9	1.6	0	0	262	2,070	2,560	3,780	516	126	136

Calendar year 1955: Max 400 Min 0 Mean 10.9 Ac-ft 7,920
Water year 1955-56: Max 504 Min 0 Mean 13.0 Ac-ft 9,470

Peak discharge (base, 200 cfs).--May 30 (6 a.m.) 516 cfs (6.88 ft); June 7 (4 p.m.) 560 cfs (7.06 ft).

* Discharge measurement or observation of no flow made on this day.

** Field estimate made on this day.

Note.--Stage-discharge relation affected by ice Nov. 6 to Apr. 14 (no gage-height record Jan. 22 to Apr. 12; discharge estimated on basis of 5 discharge measurements, 1 field estimate, 3 observations of no flow, weather records, records for James River at Jamestown, and for Mar. 19 to Apr. 12, the ground-water level in recorder well).

James River at Jamestown, N. Dak.

Location.--Lat 46°53'45", long 98°41'28", in NW¼SW¼ sec. 31, T. 140 N., R. 63 W., on right bank 80 ft downstream from Asylum Bridge at southeast corner of Jamestown and 2.5 miles downstream from Pipestem Creek.

Drainage area.--2,840 sq mi, approximately, of which about 950 sq mi is probably noncontributing.

Records available.--June 1928 to August 1933, August 1937 to September 1939, March 1943 to September 1956 in reports of Geological Survey. June 1928 to September 1934, March to May 1935 in Corps of Engineers report "James and Sheyenne River basins, North Dakota and South Dakota Water Supply and Sewage Disposal."

Gage.--Water-stage recorder. Datum of gage is 1,375.27 ft above mean sea level, datum of 1929. Prior to Oct. 1, 1949, staff, tape, or wire-weight gages at bridge 80 ft upstream; 1928-35 at datum 5.00 ft lower, and 1937-49 at present datum.

Average discharge.--21 years (1928-34, 1937-39, 1943-56), 56.8 cfs (41,120 acre-ft per year); median of yearly mean discharges, 25 cfs (18,100 acre-ft per year).

Extremes.--Maximum discharge during year, 937 cfs June 6 (gage height, 8.86 ft); minimum, 1.5 cfs Jan. 13, 14; minimum gage height, 1.48 ft Oct. 1.

1928-35, 1937-39, 1943-56: Maximum discharge, 6,390 cfs May 13, 1950 (gage height, 15.82 ft); no flow at times in 1933.

Remarks.--Records good. Flow regulated by Arrowood and Jim Lakes and Jamestown Reservoir (combined capacity, 246,000 acre-ft).

Revisions (water years).--WSP 1209: Drainage area. WSP 1239: 1938(M), 1943-45.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.1	3.1	*1.7	2.0	2.2	2.0	21	34	*213	25	8.8	11
2	3.3	2.9	1.9	2.0	2.2	2.3	19	33	129	23	9.6	13
3	3.2	2.7	1.9	2.2	2.2	2.2	18	32	87	24	12	11
4	*3.3	2.9	1.7	2.2	2.2	2.2	18	*32	64	23	9.2	8.4
5	3.3	3.1	2.0	2.2	2.0	2.3	24	30	53	22	7.6	6.9
6	3.6	3.1	2.0	2.3	2.0	2.3	21	29	*589	22	5.9	5.9
7	3.6	3.1	2.0	2.2	2.0	2.3	17	27	578	26	5.6	5.0
8	3.3	3.3	1.9	2.0	2.0	2.3	25	25	*593	29	5.3	4.4
9	3.1	3.6	1.9	2.0	2.0	2.5	27	29	422	29	4.7	4.1
10	3.3	3.1	2.0	1.7	2.0	2.5	*27	48	214	26	4.7	3.8
11	3.6	3.3	2.0	1.7	2.0	2.3	32	*34	127	23	4.7	3.8
12	3.8	3.3	2.2	1.6	1.9	2.3	68	32	85	21	6.6	4.1
13	4.1	2.9	2.2	1.7	2.0	2.5	56	29	63	*19	6.6	4.1
14	4.1	2.5	2.2	1.7	2.0	5.6	56	26	51	17	5.6	4.4
15	4.1	2.9	2.2	1.7	2.0	5.0	45	24	41	16	4.7	5.0
16	4.1	2.5	2.3	1.7	2.0	3.3	43	23	38	15	4.1	6.2
17	3.3	2.3	2.2	1.9	2.2	3.3	42	22	37	14	3.6	5.6
18	3.1	2.3	2.2	1.9	2.2	3.3	45	22	34	13	3.6	5.9
19	3.1	2.5	2.2	1.9	2.0	6.6	*86	21	32	13	2.9	*5.9
20	3.3	2.2	2.3	2.0	2.0	*33	101	21	30	13	2.9	5.9
21	3.6	2.3	2.3	2.0	2.2	70	91	19	29	13	2.9	5.9
22	3.3	2.5	2.3	2.0	2.2	50	75	18	39	12	2.7	4.4
23	3.1	2.2	*2.3	2.0	2.2	104	64	18	38	11	2.5	4.1
24	3.1	1.9	2.2	2.0	2.2	50	56	19	32	10	2.5	4.4
25	3.3	2.0	2.0	2.2	2.2	*45	52	18	29	10	2.7	4.4
26	3.1	2.0	2.0	*2.0	2.0	51	46	18	27	10	2.7	4.1
27	3.1	1.9	2.2	2.0	*2.0	41	*42	19	25	9.2	2.7	2.9
28	*3.3	1.9	2.2	2.0	1.9	26	39	28	23	10	*4.1	*2.7
29	3.3	1.9	2.2	1.9	2.0	19	37	94	*21	9.6	4.7	2.3
30	3.6	1.9	2.2	2.0	------	19	35	311	27	*13	7.3	2.5
31	3.6	------	2.2	2.2	------	22	------	405	------	10	13	------
Total	106.1	78.1	65.1	60.9	60.0	587.1	1,328	1,540	3,770	530.8	166.5	162.1
Mean	3.42	2.60	2.10	1.96	2.07	18.9	44.3	49.7	126	17.1	5.37	5.40
Ac-ft	210	155	129	121	119	1,160	2,630	3,050	7,480	1,050	330	322

Calendar year 1955: Max 507 Min 1.3 Mean 18.2 Ac-ft 13,170
Water year 1955-56: Max 593 Min 1.6 Mean 23.1 Ac-ft 16,760

* Discharge measurement made on this day.

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., on left bank 80 ft downstream from bridge on State Highway 13, half a mile west of La Moure, and 12 miles upstream from Cottonwood Creek.

Drainage area.--5,740 sq mi, approximately, of which about 2,800 sq mi is probably noncontributing.

Records available.--April to July 1903 (gage-height record only), April 1950 to September 1956. Gage-height records 1902-11 are contained in reports of U. S. Weather Bureau.

Gage.--Water-stage recorder and rubble-masonry control. Datum of gage is 1,290.00 ft above mean sea level, datum of 1929. 1902-08, 1909-11, staff gages at site 80 ft upstream at two different datums. Apr. 19, 1950, to Sept. 2, 1951, wire-weight gage on bridge 80 ft upstream at present datum.

Average discharge.--6 years (1950-56), 79.3 cfs (57,410 acre-ft per year).

Extremes.--Maximum discharge during year, 1,150 cfs June 9 (gage height, 9.38 ft); no flow for part of day Sept. 30, result of upstream wind.

1950-56: Maximum discharge, 5,730 cfs May 16, 1950 (gage height, 15.34 ft); no flow for part of day, Sept. 30, 1956.

A long time local resident says flood of May 16, 1950, was the highest since 1882, with stage in either 1942 or 1943 being almost as high due to large ice jam.

Remarks.--Records good above 20 cfs and fair below. Flow regulated by Arrowood and Jim Lakes and Jamestown Reservoir (combined capacity, 246,000 acre-ft).

Revisions.--WSP 1209: Drainage area.

Rating table, water year 1955-56 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Jan. 28 to Mar. 2)

7.0	1	7.7	121
7.1	5	8.0	250
7.2	12	8.5	555
7.3	25	9.0	915
7.4	43	9.4	1,160
7.5	64		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	14	15	8	8	6	7	80	60	192	54	19	10
2	10	15	8	7	6	7	82	64	382	47	*25	21
3	14	14	8	7	6	8	85	62	388	45	32	22
4	10	14	8	7	6	8	64	54	266	54	25	18
5	17	19	8	8	6	8	58	58	192	*56	22	19
6	16	9	8	8	6	9	62	56	158	60	24	19
7	11	14	8	7	6	8	56	51	*136	72	22	21
8	8	14	8	8	6	8	56	47	625	60	25	18
9	12	16	8	8	6	8	64	62	1,110	49	19	18
10	12	16	8	7	7	8	*80	*47	1,100	51	21	19
11	18	16	8	7	7	8	99	56	901	56	19	15
12	12	12	8	7	7	8	109	54	618	58	19	14
13	16	12	10	6	8	8	121	56	394	56	19	17
14	7	12	11	6	7	8	171	58	288	47	18	12
15	10	12	8	6	7	8	187	60	205	45	15	15
16	16	11	8	6	7	8	179	60	162	41	17	17
17	14	10	8	5	7	10	147	47	140	39	17	12
18	12	10	8	5	7	11	136	49	125	39	15	14
19	15	10	*8	5	7	12	121	37	128	37	14	10
20	14	10	7	5	7	17	*115	47	99	35	15	9
21	10	11	7	5	6	*24	99	39	93	34	14	11
22	17	11	7	5	*7	30	115	43	87	32	16	15
23	15	11	8	*5	6	41	115	34	82	30	12	15
24	*10	10	8	5	7	82	96	37	72	24	9	11
25	12	9	8	6	6	151	106	39	80	22	11	12
26	11	10	8	6	6	187	*87	45	87	34	12	10
27	16	10	8	6	7	196	82	34	74	27	12	*10
28	12	9	8	6	7	147	69	41	56	22	14	10
29	16	*8	8	6	6	96	69	77	64	21	12	4
30	7	8	8	6	------	72	60	115	56	25	12	3
31	9	------	8	6	------	74	------	102	------	24	15	------
Total	393	358	250	195	190	1,277	2,970	1,691	8,360	1,296	541	421
Mean	12.7	11.9	8.1	6.3	6.6	41.2	99.0	54.5	279	41.8	17.5	14.0
Ac-ft	780	710	496	387	377	2,530	5,890	3,350	16,580	2,570	1,070	835

Calendar year 1955:	Max 597	Min 5	Mean 38.0	Ac-ft 27,530
Water year 1955-56:	Max 1,110	Min 3	Mean 49.0	Ac-ft 35,580

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* Discharge measurement made on this day.

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., near center of span on downstream side of highway bridge, three-quarters of a mile northwest of Columbia, 2½ miles upstream from Chicago and North Western Railway bridge, and 3½ miles upstream from Elm River.

Drainage area.--7,050 sq mi, approximately.

Records available.--October 1945 to September 1956.

Gage.--Wire-weight gage read once daily below about 9 ft and twice daily above. Datum of gage is 1,274.54 ft above mean sea level, datum of 1929. Supplementary staff gage at same datum on right bank, an eighth of a mile from bridge and 50 ft downstream from highway, is used at high stages when bridge approach is flooded.

Average discharge.--11 years, 124 cfs (89,770 acre-ft per year); median of yearly mean discharges, 70 cfs (50,700 acre-ft per year).

Extremes.--Maximum discharge during year, 237 cfs June 22, 23 (gage height, 8.93 ft); no flow for many days.

1945-56: Maximum discharge, 5,420 cfs May 24, 25, 1950 (gage height, 16.89 ft, from graph based on gage readings); maximum daily reverse flow, 1,860 cfs Apr. 8, 1952 (backwater from Elm River).

Remarks.--Records fair except those for period of ice effect, which are poor. Frequent backwater and occasional reverse flow caused by Elm River during most years. Records of chemical analyses for the water year 1956 are given in WSP 1451.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		(*)				0	0.5	58	13	190	2.2	
2						0	1.0	56	11	180	1.9	
3						0	.5	59	9	169	1.8	
4						0	*0	60	7	165	1.6	
5	(*)					0	1.0	61	4.8	165	1.7	
6						0	.5	62	3.8	167	1.8	
7						0	0	64	*6	181	1.4	
8						0	0	66	30	179	*1.2	
9						0	0	82	67	176	1.0	
10						0	0	103	87	173	.9	
11						0	*0	127	93	173	.7	
12						0	1.0	137	102	171	.5	
13						0	1.5	145	105	164	.4	
14						*0	2.0	152	108	152	.3	
15					(*)	0	2.5	157	116	138	.2	
16						0	3.0	*164	141	129	.2	
17						0	3.4	172	173	118	.2	
18				(*)		0	3.3	174	192	107	.2	(*)
19						0	3.4	172	204	89	0	
20						0	3.6	174	219	*79	0	
21			(*)			*0	3.8	175	230	74	0	
22						0	4.4	172	237	71	0	
23						1.0	5	152	235	64	0	
24						2.0	7	112	230	58	0	
25						3.0	*10	60	229	48	0	
26						2.5	22	24	229	41	0	
27						*1.8	44	20	*225	32	0	
28						1.5	65	23	223	22	*0	
29						1.0	64	17	220	10	0	
30		(*)			------	.5	59	16	208	5	0	
31		------			------	0	------	14	------	3.3	0	------
Total	0	0	0	0	0	13.3	311.4	3,030	3,957.6	3,493.3	18.2	0
Mean	0	0	0	0	0	0.43	10.4	97.7	132	113	0.59	0
Ac-ft	0	0	0	0	0	26	618	6,010	7,850	6,930	36	0

Calendar year 1955: Max 143 Min 0 Mean 17.9 Ac-ft 12,970
Water year 1955-56: Max 237 Min 0 Mean 29.6 Ac-ft 21,470

* Discharge measurement or observation of no flow made on this day.

Note.--Stage-discharge relation affected by ice Mar. 23 to Apr. 16.

Elm River at Westport, S. Dak.

Location.--Lat 45°39'20", long 98°29'50", in SW¼NW¼ sec. 12, T. 125 N., R. 64 W., on right bank 12 ft downstream from bridge on U. S. Highway 281, half a mile north of Westport, three-quarters of a mile upstream from Chicago, Milwaukee, St. Paul and Pacific Railroad bridge, 9½ miles downstream from Willow Creek, and 30½ miles upstream from mouth.

Drainage area.--1,680 sq mi, approximately.

Records available.--October 1945 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 1,309.3 ft above mean sea level, datum of 1929. Prior to Aug. 6, 1951, and Apr. 8 to Sept. 9, 1952, wire-weight gage and Aug. 6, 1951, to Apr. 7, 1952, water-stage recorder, at present site and datum.

Average discharge.--11 years, 45.7 cfs (33,090 acre-ft per year); median of yearly mean discharges, 30 cfs (21,700 acre-ft per year).

Extremes.--Maximum discharge during year, 111 cfs Apr. 15 (gage height, 5.56 ft); maximum gage height, 5.57 ft Mar. 22 (backwater from ice); minimum discharge, 0.1 cfs Oct. 3-5 (gage height, 4.05 ft).

1945-56: Maximum discharge, 7,520 cfs Apr. 8, 1952 (gage height, 20.10 ft, from floodmark); no flow for many days most years.

Remarks.--Records good except those for period of ice effect, which are poor. Flow regulated for Aberdeen municipal water supply by Elm Lake and other small reservoirs (combined capacity, about 16,000 acre-ft).

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 22 to July 4)

4.0	0	4.5	7
4.1	.3	4.7	16
4.2	1.0	5.0	43
4.3	2.2	5.5	103
4.4	4.2		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.2	*2.1	3.0	2.0	1.0	1.6	50	12	2.0	2.6	9	1.8
2	.2	1.8	3.0	2.0	1.0	1.6	60	14	1.8	2.8	11	1.7
3	.1	2.0	3.0	2.0	1.0	1.6	30	14	3.0	3.2	10	1.5
4	.1	2.1	3.0	1.8	1.0	1.6	*23	12	2.2	5	9	1.7
5	*.1	2.2	3.0	1.8	1.0	1.4	25	12	1.1	5	8	2.1
6	.2	1.5	3.0	1.8	1.0	1.4	35	12	1.1	6	9	1.6
7	11	1.7	3.0	1.8	1.5	1.2	20	12	*4.6	6	8	1.2
8	15	1.8	3.0	1.8	6	1.0	32	12	3.8	6	*8	1.0
9	14	2.0	3.0	1.6	8	1.0	33	17	3.6	6	8	1.4
10	14	3.1	2.5	1.4	8	1.0	36	16	3.2	6	8	1.6
11	12	7	2.5	1.4	7	1.2	*42	16	2.1	6	8	1.8
12	11	9	2.5	1.4	7	1.6	40	14	1.0	6	9	1.5
13	10	10	2.5	1.4	7	*2.2	55	12	.7	6	8	2.1
14	10	10	2.5	1.4	7	2.5	70	11	.6	7	3.8	1.4
15	9	12	2.5	1.4	6	2.8	82	11	.7	7	3.2	1.1
16	7	15	2.5	1.4	*4	3.0	83	*12	.9	4.2	3.2	1.0
17	6	13	2.5	1.2	3	5	69	7	1.1	2.6	3.4	1.7
18	4.2	10	2.3	1.2	2.5	6	58	7	.7	2.4	3.4	*22
19	4.6	8	2.3	1.2	2.5	7	52	7	.3	2.1	3.4	22
20	9	7	2.3	1.2	2.5	9	48	7	.2	*2.2	3.4	22
21	5	6	*2.3	1.0	2.5	*18	42	6	.8	2.2	3.4	20
22	3.4	5	2.3	.8	2.5	20	37	4.5	.7	2.2	5	15
23	3.0	4	2.3	.5	2.2	15	30	3.2	.3	2.4	5	8
24	2.6	3	2.3	.5	2.0	8	19	2.2	.3	2.4	4.8	8
25	2.8	2.5	2.3	.8	1.8	6	*20	1.5	.8	2.2	4.5	8
26	2.6	1.5	2.3	1.0	1.8	9	21	1.6	2.4	2.2	4.5	9
27	2.4	1.1	2.3	1.0	1.6	*20	20	2.8	*2.4	4.8	4.2	9
28	2.4	.7	2.3	1.0	1.6	13	16	12	2.4	3.8	*3.8	8
29	2.0	.5	2.0	1.0	1.6	12	13	9	2.6	3.2	3.2	8
30	1.8	*2.2	2.0	1.0	------	12	12	10	2.4	6	3.0	7
31	1.8	------	2.0	1.0	------	12	------	7	------	7	3.0	------
Total	167.5	147.8	78.3	40.8	95.6	198.7	1,173	296.8	49.8	132.5	181.2	192.2
Mean	5.40	4.93	2.53	1.32	3.30	6.41	39.1	9.57	1.66	4.27	5.85	6.41
Ac-ft	332	293	155	81	190	394	2,330	589	99	263	359	381

Calendar year 1955: Max 394 Min 0.1 Mean 19.5 Ac-ft 14,140
Water year 1955-56: Max 83 Min 0.1 Mean 7.53 Ac-ft 5,470

Peak discharge (base, 100 cfs).--Apr. 15 (7 p.m.) 111 cfs (5.56 ft).
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 15 to Apr. 12.

James River near Stratford, S. Dak.

Location.--Lat 45°14'30", long 98°23'30", in NE¼NE¼NE¼ sec. 3, T. 120 N., R. 63 W., on right bank 30 ft downstream from highway bridge, 6¾ miles southwest of Stratford, and 8¾ miles upstream from Mud Creek.

Drainage area.--9,990 sq mi, approximately.

Records available.--March 1950 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 1,254.29 ft above mean sea level, datum of 1929. Prior to May 17, 1950, wire-weight gage at site 20½ miles upstream at different datum. May 17, 1950, to Aug. 5, 1951, wire-weight gage at present site and datum.

Average discharge.--6 years, 117 cfs (84,700 acre-ft per year).

Extremes.--Maximum discharge during year, 177 cfs July 6 (gage height, 9.55 ft); no flow for many days.

1950-56: Maximum discharge, 5,580 cfs May 14 or 15, 1950, estimated on basis of records at site 20½ miles upstream; maximum gage height, 18.13 ft Apr. 19, 20, 1952; no flow for many days each year.

Remarks.--Records good above 50 cfs and fair below.

Rating table, water year 1955-56 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 19 to May 1, June 1-7, Aug. 10 to Sept. 8)

3.9	0	5.0	11
4.1	.2	6.0	32
4.2	.5	7.0	56
4.3	1.1	8.0	98
4.5	3.3	10.0	205

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							0	43	86	170	45	0.9
2		(*)					0	45	69	172	41	.6
3							0	48	55	172	38	.6
4							0	55	46	172	35	.6
5	(*)						*0	61	39	172	32	.3
6							0	64	*35	172	29	.3
7							0	65	31	176	26	.2
8							0	65	28	173	25	.2
9							0	63	25	168	*23	.1
10							0	63	23	164	22	.1
11							0	65	20	162	20	0
12							*0	67	17	160	19	0
13							0	72	15	159	18	0
14						(*)	0	80	13	157	17	0
15					(*)		4.8	*87	16	154	15	0
16							14	96	21	152	14	0
17							19	105	32	150	12	0
18				(*)			24	114	42	*146	11	*0
19							31	121	55	142	11	0
20							35	127	67	137	10	0
21			(*)			(*)	37	133	79	128	9	0
22							41	138	92	118	7	0
23							46	142	102	108	6	0
24							48	146	113	97	4.6	0
25							48	147	124	86	3.3	0
26							47	149	133	76	2.6	0
27						(*)	46	148	*142	69	2.0	0
28							*45	148	152	63	*1.7	0
29							45	140	162	58	1.3	0
30		(*)			------		44	125	167	53	.9	0
31		------			------		------	105	------	48	.9	------
Total	0	0	0	0	0	0	574.8	3,027	2,001	4,134	502.3	3.9
Mean	0	0	0	0	0	0	19.2	97.6	66.7	133	16.2	0.13
Ac-ft	0	0	0	0	0	0	1,140	6,000	3,970	8,200	996	7.7

Calendar year 1955: Max	185	Min	0	Mean	30.4	Ac-ft	22,010
Water year 1955-56: Max	176	Min	0	Mean	28.0	Ac-ft	20,310

* Discharge measurement or observation of no flow made on this day.

James River at Ashton, S. Dak.

Location.--Lat 44°59'55", long 98°28'50", in NW¼NE¼ sec. 36, T. 118 N., R. 64 W., near center of span on downstream side of highway bridge, half a mile east of Ashton, 6 miles upstream from Snake Creek, and 14 miles upstream from Turtle Creek.

Drainage area.--11,000 sq mi, approximately.

Records available.--October 1945 to September 1956.

Gage.--Wire-weight gage read once daily. Datum of gage is 1,244.4 ft above mean sea level, datum of 1929. Prior to June 24, 1947, chain gage at same site and datum.

Average discharge.--11 years, 170 cfs (123,100 acre-ft per year); median of yearly mean discharges, 120 cfs (86,900 acre-ft per year).

Extremes.--Maximum discharge during year, 204 cfs July 7 (gage height, 5.57 ft); no flow for many days.

1945-56: Maximum discharge, 5,170 cfs May 18, 19, 1950; maximum gage height, 19.59 ft (corrected) Apr. 23, 24, 1952; maximum daily reverse flow, 1,500 cfs Apr. 10, 1952 (backwater from Snake and Turtle Creeks).

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. Occasional backwater and reverse flow caused by Snake and Turtle Creeks during most years.

Revisions (water years).--WSP 1209: 1947.

Rating tables, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 21 to May 9, June 25-27)

Oct. 1 to July 7				July 8 to Sept. 30			
1.2	0	3.5	24	0.95	0	3.0	26
1.4	.4	4.0	38	1.0	.3	3.5	39
1.6	1.0	4.5	62	1.2	1.7	4.0	59
2.0	2.7	5.0	119	1.5	4.1	4.5	88
2.4	6	5.6	208	2.0	9	5.0	130
3.0	14			2.5	16	5.6	208

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							1	41	156	a155	70	4.4
2							2	42	146	169	67	a3.6
3		(*)					2.8	42	a124	180	62	a2.8
4							a2.6	42	102	a196	51	2.1
5	(*)						2.4	42	*85	193	a49	2.3
6							*2.0	a45	62	188	47	1.8
7							1.5	48	48	204	*40	1.4
8							a1.2	52	40	a202	45	1.3
9							.9	58	34	199	39	a.6
10							1.1	60	a28	193	35	0
11							1.1	60	23	190	30	0
12							*.9	61	21	186	a27	.6
13							.6	a61	18	180	23	.5
14						(*)	.7	*62	15	186	18	.4
15					(*)		a1.2	64	16	a180	16	0
16							1.7	66	15	174	13	0
17				(*)			1.4	74	a15	*170	12	*0
18							.8	78	15	167	15	0
19							.4	92	17	163	a13	0
20						(*)	1.4	a104	20	160	11	0
21			(*)				1.4	116	29	156	11	0
22							a16	125	42	a147	10	0
23							24	130	56	138	10	0
24							27	138	a68	132	9	0
25							*30	144	80	126	8	0
26						(*)	33	126	*86	116	a7	0
27							37	a146	100	107	6	0
28							38	186	119	98	*6	0
29							a39	180	125	a91	5	0
30		(*)			------		40	a174	140	84	4.0	0
31		------			------		------	168	------	76	4.2	------
Total	0	0	0	0	0	0	320.7	2,827	1,845	4,906	763.2	21.8
Mean	0	0	0	0	0	0	10.7	91.2	61.5	158	24.6	0.73
Ac-ft	0	0	0	0	0	0	636	5,610	3,660	9,730	1,510	43

Calendar year 1955:	Max 194	Min 0	Mean 33.4	Ac-ft 24,200
Water year 1955-56:	Max 204	Min 0	Mean 29.2	Ac-ft 21,190

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* Discharge measurement or observation of no flow made on this day.
a No gage-height record; discharge interpolated.
Note.--Stage-discharge relation affected by ice Mar. 17 to Apr. 2.

West Branch Snake Creek near Athol, S. Dak.

Location.--Lat 45°03'20", long 98°44'10", in SE¼NE¼ sec. 11, T. 118 N., R. 66 W., on left bank at upstream side of highway bridge, 3 miles downstream from confluence of Nixon River and Perry Creek and 7½ miles northwest of Athol.
Drainage area.--1,430 sq mi, approximately.
Records available.--March 1950 to September 1956.
Gage.--Water-stage recorder. Altitude of gage is 1,325 ft (by barometer). Prior to May 1, 1951, wire-weight gage at site half a mile upstream at datum 4.78 ft higher.
Average discharge.--6 years, 13.4 cfs (9,700 acre-ft per year).
Extremes.--Maximum discharge during year, 8 cfs June 17 (gage height, 7.44 ft); no flow for many days.
1950-56: Maximum discharge, about 2,200 cfs Apr. 9, 1952 (gage height, 16.42 ft, backwater from ice); no flow for many days each year.
Remarks.--Records poor.

Discharge, in cubic feet per second, water year October 1955 to September 1956

June 17	0.7
18	.2

Note.--Flow occurred only on days listed above. Observations of no flow made from 1 to 3 times a month.

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
June 1956	0.9	0.7	0	0.03	1.8
Calendar year 1955	-	250	0	4.18	3,020
Water year 1955-56	-	.7	0	.002	1.8

Peak discharge (base, 75 cfs).--No peak above base.

Snake Creek near Ashton, S. Dak.

Location.--Lat 44°59'55", long 98°32'25", in NW¼NE¼ sec. 33, T. 118 N., R. 64 W., on right bank 25 ft downstream from highway bridge, 2 miles west of Ashton, 2 3/4 miles east of Athol, 7 miles downstream from West Branch Snake Creek, and 7¼ miles upstream from mouth.
Drainage area.--2,650 sq mi, approximately.
Records available.--October 1955 to September 1956.
Gage.--Water-stage recorder. Datum of gage is 1,257.5 ft above mean sea level, datum of 1929.
Extremes.--Maximum discharge during year, 16 cfs June 29 (gage height, 5.57 ft); no flow for many days.
Remarks.--Records fair.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						0	1.0	0.2	0	13		
2						0	.2	.2	0	11		
3						0	2.6	.1	0	9		
4						0	6	.1	0	7		
5						0	5	.1	*0	5		
6						0	*7	.1	.3	2.2		
7						0	7	.1	2.4	.8	(*)	
8						0	7	.2	3.2	.3		
9						0	7	.1	3.0	.2		
10						0	6	.1	2.8	.2		
11						0	6	.1	2.3	.2		
12						0	*5	0	1.5	.2		
13						0	4.6	0	.8	.2		
14	(*)					*0	3.6	*.1	.8	.2		
15					(*)	0	2.7	0	1.4	.1		
16						0	2.0	0	1.6	.1		
17				(*)		0	1.5	0	1.7	.1		(*)
18						0	1.3	0	1.7	**.1		
19						0	1.0	0	1.8	0		
20						*0	.8	0	2.0	0		
21			(*)			0	.5	0	2.4	0		
22						0	.3	0	2.8	0		
23						0	.2	0	2.5	0		
24						0	*.3	0	3.2	0		
25						0	.2	0	7	0		
26						*0	.2	0	*9	0		
27						.1	.1	0	13	0		
28						.2	.2	0	15	0	(*)	
29						.4	.2	0	15	0		
30		(*)			------	.6	.2	0	14	0		
31		------			------	1.3	------	0	------	0		------
Total	0	0	0	0	0	2.6	79.7	1.5	111.2	49.9	0	0
Mean	0	0	0	0	0	0.08	2.66	0.05	3.71	1.61	0	0
Ac-ft	0	0	0	0	0	5.2	158	3.0	221	99	0	0

Calendar year 1955:	Max -	Min -	Mean -	Ac-ft -
Water year 1955-56:	Max 15	Min 0	Mean 0.67	Ac-ft 486

Peak discharge (base, 75 cfs).--No peak above base.
* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
Note.--Stage-discharge relation affected by ice Mar. 20-25.

Turtle Creek near Tulare, S. Dak.

Location.--Lat 44°44', long 98°35', in SE¼SE¼ sec. 25, T. 115 N., R. 65 W., near center of span on downstream side of highway bridge, 4 miles west of Tulare and 9 miles downstream from Wolf Creek.

Drainage area.--1,120 sq mi, approximately.

Records available.--August 1953 to September 1956 (discontinued).

Gage.--Wire-weight gage read once daily. Altitude of gage is 1,300 ft (by barometer).

Extremes.--Maximum discharge during year, 7 cfs Apr. 6; maximum gage height, 4.65 ft June 22; no flow for many days.
1953-56: Maximum discharge, 419 cfs Mar. 13, 1955 (gage height, 8.90 ft, from graph based on gage readings); no flow for many days each year.

Remarks.--Records fair except those for period of ice effect, which are poor.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0	0.2	0.2	0.2	0.2	3.7	1.1	0.3	1.2	0.2	
2		0	.2	.2	.2	.2	3.4	1.1	.3	1.1	.3	
3		*0	.2	.2	.2	.3	3.3	1.1	.3	1.0	.4	
4		0	.2	.2	.2	.3	3.2	1.0	.2	.8	.4	
5		0	.2	.2	.2	.3	5	1.0	.2	.8	.6	
6	(*)	0	.2	.2	.2	.3	*7	.9	*.1	.7	*.6	
7		0	.2	.2	.2	.3	5	.9	.1	.6	.6	
8		0	.3	.2	.2	.3	4.4	.9	0	.4	.6	
9		0	.2	.2	.2	.3	3.5	.9	0	.4	.6	
10		0	.2	.3	.2	.3	3.1	.9	0	.3	.5	
11		0	.2	.2	.2	.3	3.8	.9	0	.3	.5	
12		0	.2	.3	.2	.3	*3.4	.8	0	.2	.4	
13		0	.2	.3	.1	*.3	3.1	.8	0	.2	.4	
14		0	.2	.3	*.1	.2	3.0	.8	0	.2	.4	
15		.1	.2	.2	.1	.3	3.8	*.9	0	.1	.3	
16		.2	.2	*.2	.1	.4	4.2	.9	.1	*0	.3	
17		.3	.2	.2	.1	.7	3.4	.9	.3	0	.2	(*)
18		.3	.2	.2	.1	.7	2.7	.7	.9	.1	.1	
19		.3	*.2	.2	.1	.7	3.1	.7	1.6	0	0	
20		.3	.2	.2	.1	*.7	2.5	.5	2.8	0	0	
21		.3	.2	.2	.1	1.2	2.0	.4	3.8	.1	0	
22		.3	.2	.2	.1	1.8	1.2	.6	4.2	0	0	
23		.3	.2	.2	.1	2.1	*1.0	.4	3.6	0	0	
24		.3	.2	.2	.1	2.3	.9	.3	3.1	0	0	
25		.3	.2	.2	.1	2.9	.9	.3	2.9	0	0	
26		.3	.2	.2	.1	*4.2	.9	.3	2.6	0	0	
27		.3	.2	.2	.1	4.6	.9	.3	2.2	0	*0	
28		.3	.2	.2	.2	4.1	.9	.3	1.7	0	0	
29		*.2	.2	.2	.2	3.7	1.0	.4	1.6	0	0	
30		.2	.2	.2	------	2.9	1.1	.4	1.4	.2	0	
31		------	.2	.2	------	2.6	------	.4	------	.1	0	------
Total	0	4.3	6.3	6.6	4.3	39.8	85.4	21.8	34.3	8.8	7.4	0
Mean	0	0.14	0.20	0.21	0.15	1.28	2.85	0.70	1.14	0.28	0.24	0
Ac-ft	0	8.5	12	13	8.5	79	169	43	68	17	15	0

Calendar year 1955:	Max	364	Min	0	Mean	6.66	Ac-ft	4,820
Water year 1955-56:	Max	7	Min	0	Mean	0.60	Ac-ft	433

Peak discharge (base, 50 cfs).--No peak above base.

* Discharge measurement or observation of no flow made on this day.

Note.--Stage-discharge relation affected by ice Jan. 18 to Mar. 11.

Turtle Creek at Redfield, S. Dak.

Location.--Lat 44°53'00", long 98°30'45", in SW¼SE¼ sec. 3, T. 116 N., R. 64 W., on left bank 15 ft downstream from bridge on U. S. Highway 281, at north edge of Redfield, and 6¾ miles upstream from mouth.

Drainage area.--1,540 sq mi, approximately.

Records available.--October 1945 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 1,259.3 ft above mean sea level, datum of 1929. Prior to May 25, 1951, wire-weight gage at same site and datum.

Average discharge.--11 years, 27.3 cfs (19,760 acre-ft per year); median of yearly mean discharges, 7 cfs (5,100 acre-ft per year).

Extremes.--Maximum discharge during year, 51 cfs June 17 (gage height, 5.20 ft); minimum, 0.1 cfs for several days.
1945-56: Maximum discharge, 6,420 cfs Apr. 10, 1952 (gage height, 15.51 ft); no flow for many days during most years.

Remarks.--Records good except those based on wire-weight-gage readings, which are poor. Some regulation at times by Lake Redfield 1½ miles upstream from station (capacity, 1,570 acre-ft).

Rating table, water year 1955-56 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 18 to May 31)

3.8	0.1	4.3	4.7
3.9	.3	4.5	10
4.0	.8	4.8	23
4.1	1.7	5.2	51
4.2	3.0		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.2	0.2	0.1	0.2	0.3	0.3	10	1.0	1.1	0.6	0.2	0.2
2	.1	.2	.1	.2	.3	.3	12	2.7	.5	.3	.9	.2
3	.2	*.2	.1	.2	.3	.3	14	2.9	.3	.2	3.1	.2
4	.2	.2	.1	.2	.3	.3	16	2.4	1.2	.3	1.2	.3
5	*.2	.2	.1	.2	.3	.3	14	1.5	4.4	.3	.6	.2
6	.2	.2	.1	.2	.3	.3	*15	1.3	*3.5	.3	*.4	.2
7	.2	.2	.1	.2	.3	.3	8	1.5	.8	.2	.3	.3
8	.2	.2	.1	.2	.3	.3	7	1.6	1.2	.2	.3	.2
9	.2	.2	.1	.2	.3	.3	*6	1.8	.8	.2	.2	.2
10	.2	.2	.1	.2	.3	.3	6	1.0	.7	.2	.2	.2
11	.2	.2	.1	.2	.3	.3	5	2.0	.6	.1	.2	.2
12	.2	.2	.1	.2	.3	.3	5	1.7	.6	.1	.2	.2
13	.2	.2	.1	.3	.3	*.3	6	.8	.3	.1	.2	.2
14	.2	.2	.1	.3	*.3	.3	4.7	1.5	.4	.2	.2	.2
15	.2	.2	.1	.3	.3	.3	2.6	*1.6	13	.2	.2	.2
16	.2	.2	.1	.3	.3	.5	1.3	.8	42	.1	.2	.2
17	.2	.2	.1	*.3	.3	1.8	1.1	.8	45	*.2	.3	*.2
18	.2	.2	.1	.3	.3	1.8	.8	.5	23	.2	.5	.2
19	.2	.2	.1	.3	.3	1.1	.7	.3	9	.2	20	.2
20	.2	.1	.1	.3	.3	.9	.7	.2	8	.1	1.6	.2
21	.2	.1	.1	.3	.3	.8	.7	.2	19	.1	.6	.2
22	.2	.2	*.1	.3	.3	.6	.6	.2	12	8	.4	.2
23	.2	.2	.1	.3	.3	.6	*.6	.1	9	10	.3	.2
24	.2	.2	.1	.3	.3	.4	.6	.1	9	1.2	.2	.2
25	.2	.1	.2	.3	.3	.4	.8	.1	*4.9	.4	.2	.2
26	.2	.1	.2	.3	.3	.4	.7	.1	8	.2	.2	.2
27	.2	.1	.2	.3	.3	*2.4	.7	.2	8	.2	*.2	.2
28	.2	.1	.2	.3	.3	14	.4	.7	5	.2	.2	.2
29	.2	.1	.2	.3	.3	15	.3	1.3	4.9	.2	.2	.3
30	.2	*.1	.2	.3	------	11	.5	3.2	3.2	.6	.2	2.8
31	.2	------	.2	.3	------	8	------	2.8	------	.3	.3	------
Total	6.1	5.2	3.8	8.1	8.7	64.2	141.8	36.9	239.4	25.7	34.0	8.9
Mean	0.20	0.17	0.12	0.26	0.30	2.07	4.73	1.19	7.98	0.83	1.10	0.30
Ac-ft	12	10	7.5	16	17	127	281	73	475	51	67	18

Calendar year 1955:	Max	310	Min	0.1	Mean	7.12	Ac-ft	5,150
Water year 1955-56:	Max	45	Min	0.1	Mean	1.59	Ac-ft	1,150

Peak discharge (base, 50 cfs).--June 17 (4 a.m.) 51 cfs (5.20 ft).
* Discharge measurement made on this day.
Note.--Discharge computed from once-daily wire-weight-gage readings Nov. 4 to Mar. 15, June 6 to July 16 (doubtful or no gage-height record Nov. 26 to Mar. 12; discharge estimated on basis of 5 discharge measurements and records for Turtle Creek near Tulare).

James River near Redfield, S. Dak.

Location.--Lat 44°55'10", long 98°25'50", in SW¼NW¼ sec. 28, T. 117 N., R. 63 W., on right bank just downstream from highway bridge, 4½ miles northeast of Redfield and 5¼ miles downstream from Turtle Creek.

Drainage area.--14,800 sq mi, approximately.

Records available.--March 1950 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 1,236.3 ft above mean sea level, datum of 1929. Prior to July 26, 1951, wire-weight gage read once daily at same site and datum.

Average discharge.--6 years, 184 cfs (133,200 acre-ft per year).

Extremes.--Maximum discharge during year, 293 cfs May 27 (gage height, 5.53 ft); no flow for many days.

1950-56: Maximum discharge, 6,100 cfs Apr. 11, 1952 (gage height, 22.12 ft); no flow at times during most years.

Remarks.--Records poor. Low-water flow affected by wind at times.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						0	32	47	134	158	64	1.8
2						0	38	48	141	166	75	1.8
3		(*)				0	39	48	112	176	116	0
4						0	37	51	109	182	62	0
5	(*)					0	44	57	*77	180	50	0
6						0	*26	61	68	186	51	0
7						0	5	65	48	194	*46	.1
8						0	9	66	45	184	41	0
9						0	14	64	38	179	36	0
10						0	23	68	33	176	31	0
11						0	12	68	30	175	27	0
12						0	13	60	26	169	25	0
13						0	*13	57	23	163	19	0
14						*0	1.2	*64	*20	169	17	0
15					(*)	0	2	59	48	166	17	0
16						1	2.4	58	57	156	14	0
17				(*)		3	.6	61	74	*148	11	*0
18						4	2.7	68	65	140	7	0
19			(*)			6	4.2	83	48	135	7	0
20						**8	9	91	43	133	10	0
21						6	5	92	88	133	12	0
22						2	7	96	159	130	7	0
23						.5	10	107	109	131	5	0
24						.5	*25	122	95	125	8	0
25						1	23	137	100	118	10	0
26						**1	40	133	*91	108	6	0
27						3	45	172	101	92	*6	0
28						5	44	220	125	85	5	0
29						10	45	180	144	80	5	0
30		(*)			------	15	46	155	149	89	3.6	0
31		------			------	20	------	133	------	69	.4	------
Total	0	0	0	0	0	86.0	617.1	2,791	2,400	4,495	794.0	3.7
Mean	0	0	0	0	0	2.77	20.6	90.0	80.0	145	25.6	0.12
Ac-ft	0	0	0	0	0	171	1,220	5,540	4,760	8,920	1,570	7.3

Calendar year 1955: Max	500	Min	0	Mean	50.8	Ac-ft	36,770
Water year 1955-56: Max	220	Min	0	Mean	30.6	Ac-ft	22,190

* Discharge measurement or observation of no flow made on this day.

** Field estimate made on this day.

Note.--Stage-discharge relation affected by ice Mar. 12-31. Discharge computed from once-daily wire-weight-gage readings Oct. 12-27, Mar. 12 to May 12, Sept. 17-22.

James River at Huron, S. Dak.

Location.--Lat 44°21'55", long 98°11'45", in SW¼SE¼NE¼ sec. 6, T. 110 N., R. 61 W., on right bank 15 ft upstream from city dam at Huron, 135 ft downstream from Chicago and North Western Railway bridge, and 165 ft upstream from bridge on U. S. Highway 14.

Drainage area.--16,800 sq mi, approximately.

Records available.--August 1928 to June 1932, August 1943 to September 1956. Gage-height records collected at site about 100 ft downstream for period of open water each year July 1902 to June 1914 and for period March to June of years 1915-23 are contained in reports of U. S. Weather Bureau.

Gage.--Water-stage recorder and concrete dam. Datum of gage is 1,223.44 ft above mean sea level, datum of 1929. Aug. 29, 1928, to Mar. 15, 1929, staff gage 100 ft downstream at about same datum. Mar. 16, 1929, to Apr. 27, 1930, U. S. Weather Bureau staff gage and Apr. 28, 1930, to June 30, 1932, chain gage, on highway bridge at present datum. Aug. 3, 1943, to Oct. 17, 1951, staff gage at site 15 ft downstream at present datum (U. S. Weather Bureau staff or wire-weight gage on highway bridge used as supplementary high-water gage).

Average discharge.--14 years (1930-31, 1943-56), 249 cfs (180,300 acre-ft per year); median of yearly mean discharges, 190 cfs (138,000 acre-ft per year).

Extremes.--Maximum discharge during year, 984 cfs Aug. 4 (gage height, 8.76 ft); no flow for many days.

1928-32, 1943-56: Maximum discharge, 5,580 cfs Apr. 15, 1952 (gage height, 15.23 ft); no flow during long periods most years.

Maximum stage known, 19.8 ft between Apr. 11 and 13, 1881, from U. S. Weather Bureau publication. Flood of Mar. 22, 1922 reached a stage of 16.5 ft.

Remarks.--Records fair above 100 cfs and poor below. Some small diversions above station for water supplies. Stage and discharge affected by wind at times.

Revisions (water years).--WSP 1146: 1944, drainage area.

Rating table, water year 1955-56 (gage height, in feet, and discharge, in cubic feet per second)

7.58	0	7.8	60
7.6	2.0	7.9	111
7.65	11	8.2	335
7.7	23	8.5	650
7.75	39	9.0	1,310

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						0	43	31	123	178	88	15
2						0	64	51	60	150	126	12
3		(*)				0	99	60	111	150	*716	20
4	(*)					0	*83	*55	123	150	942	15
5						0	88	80	111	178	835	20
6						0	123	60	111	*150	546	13
7						0	88	43	164	236	430	4.2
8						0	83	12	99	193	392	11
9						0	73	66	88	178	327	1.2
10						0	60	62	78	164	276	13
11						0	*64	60	43	157	229	7
12						0	55	88	28	157	185	9
13						0	47	88	*64	164	*171	17
14						0	77	73	78	116	143	*4
15						*0	66	83	51	171	117	4
16						0	60	80	43	178	105	7
17				(*)	(*)	0	54	73	136	164	94	0
18						0	25	64	123	157	83	0
19						0	20	43	111	157	73	*0
20						0	9	51	88	143	60	0
21						0	25	60	68	136	51	0
22						*0	20	73	78	129	55	0
23						0	4.0	*64	78	105	47	0
24						0	0	51	111	136	31	0
25						9	3.2	51	111	94	17	0
26						28	1.4	88	99	*117	35	0
27						39	35	111	99	123	25	0
28						43	31	111	68	99	23	0
29		(*)				*31	25	193	78	83	*20	0
30					------	31	25	193	99	94	11	0
31		------			------	35	------	222	------	105	24	------
Total	0	0	0	0	0	216	1,450.6	2,420	2,722	4,512	6,277	172.4
Mean	0	0	0	0	0	7.0	48.4	78.1	90.7	146	202	5.75
Ac-ft	0	0	0	0	0	428	2,880	4,800	5,400	8,950	12,450	342

Calendar year 1955:	Max 809	Min 0	Mean 65.6	Ac-ft 47,480
Water year 1955-56:	Max 942	Min 0	Mean 48.6	Ac-ft 35,250

* Discharge measurement or observation of no flow made on this day.

Note.--Discharge computed from once-daily staff-gage readings May 23 to July 9.

Sand Creek near Alpena, S. Dak.

Location.--Lat 44°09'20", long 98°26'10", in NE¼NE¼ sec. 19, T. 108 N., R. 63 W., on left bank 5 ft downstream from highway bridge, 4 miles southwest of Alpena, 7 miles upstream from Chicago, Milwaukee, St. Paul and Pacific Railroad bridge, and 10½ miles upstream from interlink with Cain Creek.

Drainage area.--240 sq mi, approximately.

Records available.--March 1950 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 1,315 ft (by barometer). Prior to Sept. 17, 1951, wire-weight gage at same site and datum.

Average discharge.--6 years, 12.4 cfs (8,980 acre-ft per year).

Extremes.--Maximum discharge during year, 145 cfs Aug. 3 (gage height, 9.78 ft); no flow for many days.

1950-56: Maximum discharge, 1,130 cfs Apr. 3, 1952; maximum gage height, 14.1 ft Mar. 28, 1950 (backwater from ice), from graph based on gage readings; no flow for many days each year.

Remarks.--Records good except those for periods of ice effect, which are poor.

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Aug. 2-26)

5.9	0	7.2	7
6.0	.2	7.6	15
6.3	1.1	7.9	24
6.6	2.4	8.2	41
6.9	4.2	8.5	64

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						0	15	1.6			0	0.2
2						0	*20	2.0			2.4	.2
3	(*)	(*)				0	21	2.4			*61	.1
4						0	21	*2.6			12	.1
5						0	18	2.8			6	.2
6						0	23	2.8		(*)	3.3	.2
7						*0	16	2.7			*2.3	.2
8						0	15	2.6			2.4	.2
9						0	19	2.4			3.0	.1
10						0	15	2.2			3.0	.1
11						0	10	2.0			2.7	.1
12						0	*8	1.9			3.6	0
13						0	6	1.7	(*)		*3.3	.1
14						0	5	1.7			2.7	*0
15					(*)	0	4.2	1.6			8	0
16						0	3.3	1.4			11	0
17				(*)		0	2.6	1.2			9	0
18						0	2.1	1.0			6	0
19						0	*1.7	.9			5	0
20						*0	1.5	.8			3.9	0
21						0	1.3	.7			3.1	0
22			(*)			0	1.1	.6			2.5	0
23						0	1.1	*.5			1.9	0
24						1	1.1	.4			1.5	0
25						3	1.0	.3			1.1	0
26						5	1.0	.3		(*)	.9	0
27						10	1.0	.2			.7	0
28						5	1.0	.2			.6	0
29		(*)				*0	1.3	.2			.5	0
30					------	2	1.4	.1			*.4	0
31		------			------	8	------	0	------		.3	------
Total	0	0	0	0	0	34	238.7	41.8	0	0	164.1	1.8
Mean	0	0	0	0	0	1.1	7.96	1.35	0	0	5.29	0.06
Ac-ft	0	0	0	0	0	67	473	83	0	0	325	3.6

Calendar year 1955: Max 679 Min 0 Mean 7.51 Ac-ft 5,440
Water year 1955-56: Max 61 Min 0 Mean 1.31 Ac-ft 952

Peak discharge (base, 50 cfs).--Aug. 3 (3 a.m.) 145 cfs (9.78 ft).

* Discharge measurement or observation of no flow made on this day.

Note.--Stage-discharge relation affected by ice Mar. 19 to Apr. 2. Discharge computed on basis of once-daily wire-weight-gage readings Nov. 3 to Dec. 1, Dec. 22, Mar. 7, Mar. 19-26, and Mar. 30 to Apr. 10.

James River near Forestburg, S. Dak.

Location.--Lat 43°58'45", long 98°04'05", in SW¼SW¼NW¼ sec. 20, T. 106 N., R. 60 W., on right bank 5 ft downstream from highway bridge, 3¾ miles southeast of Forestburg, 4½ miles downstream from Chicago, Milwaukee, St. Paul and Pacific Railroad bridge, and 5¼ miles downstream from Sand Creek.

Drainage area.--18,600 sq mi, approximately.

Records available.--March 1950 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 1,205 ft (by barometer). Prior to Sept. 5, 1951, wire-weight gage at same site and datum.

Average discharge.--6 years, 273 cfs (197,600 acre-ft per year).

Extremes.--Maximum discharge during year, 920 cfs Aug. 6 (gage height, 7.19 ft); minimum daily, 0.1 cfs Nov. 28, 29; minimum gage height, 2.31 ft Oct. 13.

1950-56: Maximum discharge, 6,290 cfs Apr. 15-17, 1952 (gage height, 15.46 ft); no flow Mar. 1-5, 1950; minimum gage height, 2.14 ft Sept. 20, 1955.

Floods in March 1920 and March 1922 reached a stage of about 18 ft, from information by local residents.

Remarks.--Records good except those for periods of ice effect, which are poor.

Rating tables, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 30 to Nov. 4, Sept. 22-30)

Oct. 1 to May 15				May 16 to Sept. 30			
2.3	0.9	2.7	14	2.7	14	4.0	177
2.4	2.6	3.0	40	3.0	37	5.0	378
2.5	5	4.0	183	3.4	81	7.2	922
2.6	9	5.0	360				

Note.--Same as preceding table below 2.7 ft.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.4	2.0	0.5	4	2.5	2.5	94	27	223	76	85	32
2	2.4	*2.0	.5	3.5	2	2.5	165	33	189	96	108	28
3	*2.4	1.8	.5	3	2	2.5	185	*36	133	129	186	24
4	2.4	1.2	.5	3	2	2.5	*150	42	94	133	*527	20
5	2.2	1	.5	3	2	3	170	55	95	131	817	20
6	2.2	1.5	.5	3	2	4.5	257	61	102	*141	912	20
7	2.4	1	1	3	2	*5	183	62	101	175	840	20
8	2.6	1	1	3	2	5	228	58	108	196	757	20
9	3.0	1	.5	3	2	5	184	52	123	205	632	20
10	3.9	1	.5	3	2	4.5	152	51	94	199	510	18
11	3.9	1.5	1	3	2.5	5	*138	44	74	180	416	*15
12	3.0	1.5	1.5	3	2.5	5	124	54	62	167	371	11
13	1.8	1.5	1.5	3	2.5	5	110	64	*49	165	*329	8
14	1.8	1	1.5	3	3	5	100	76	39	160	294	8
15	1.8	1	2	3	*3	5	92	86	32	157	253	8
16	2.6	1	2	2.5	3	5	90	77	34	140	221	7
17	4.5	.5	2	*2.5	3	5	92	73	40	155	192	6
18	4.8	.5	2	2.5	3.5	5	82	71	46	163	172	6
19	3.9	.5	2	2.5	3.5	10	70	68	87	155	150	7
20	3.6	1	2.5	2.5	3.5	10	55	60	110	145	131	7
21	3.6	1	3	2.5	3.5	*12	44	53	104	138	113	6
22	2.8	1	*3.5	2.5	3.5	15	35	*47	87	129	96	6
23	2.6	1	3.5	2.5	4	20	28	48	71	121	83	4.8
24	2.8	1	4	2.5	4	25	25	52	63	*115	76	3.0
25	2.4	1	4.5	2.5	4	40	24	53	76	106	68	2.4
26	2.2	.5	4.5	2.5	4	80	23	50	98	107	61	2.4
27	2.8	.5	5	2.5	3.5	110	22	49	94	101	53	2.4
28	3.6	.1	5	2.5	3	75	19	61	89	100	46	2.4
29	3.3	*.1	5	2.5	3	50	18	87	81	106	*42	3.6
30	2.8	.2	5	2.5	------	60	18	118	72	102	38	3.6
31	2.2	------	4.5	2.5	------	65	------	187	------	89	35	------
Total	88.7	29.9	71.5	86.5	83.0	649.0	2,977	1,955	2,670	4,282	8,614	341.6
Mean	2.86	1.00	2.31	2.79	2.86	20.9	99.2	63.1	89.0	138	278	11.4
Ac-ft	176	59	142	172	165	1,290	5,900	3,880	5,300	8,490	17,090	678

Calendar year 1955: Max 1,160 Min 0.1 Mean 80.0 Ac-ft 57,890
Water year 1955-56: Max 912 Min 0.1 Mean 59.7 Ac-ft 43,340

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 5 to Mar. 31, Apr. 3-5 (wire-weight gage readings used Nov. 24 to Dec. 22; no gage-height record Nov. 25, Dec. 10-21).

Firesteel Creek near Mount Vernon, S. Dak.

Location.--Lat 43°46', long 98°15', in SW¼SW¼ sec. 26, T. 104 N., R. 62 W., near center of span on downstream side of highway bridge, 4½ miles north of Mount Vernon, 5¼ miles downstream from West Firesteel Creek, and 12 miles northwest of Mitchell.

Drainage area.--540 sq mi, approximately.

Records available.--September 1955 to September 1956.

Gage.--Wire-weight gage and crest-stage indicator; gage read once daily. Altitude of gage is 1,310 ft (from topographic map).

Extremes.--1955-56: Maximum discharge during water year, 174 cfs Aug. 6 (gage height, 4.6 ft, from floodmark); no flow for many days.

Remarks.--Records fair except those for periods of ice effect, which are poor. No flow during month of September 1955.

Rating table, Sept. 1, 1955, to Sept. 30, 1956, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.9	0	3.0	34
2.0	.4	3.5	56
2.1	1.1	4.0	87
2.2	2.7	4.3	120
2.3	4.8	4.6	174
2.5	12		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0				0.2	6	1.7	0	0	0	3.7
2	0	*0				.5	*19	*1.3	.1	0	.1	3.5
3	0	0				.8	17	1.3	.1	0	.1	3.5
4	0	0				1	26	.9	.1	0	0	2.9
5	.1	0				1	26	1.7	0	*0	.1	3.5
6	0	0				.9	18	1.7	0	0	45	1.5
7	.1	0				.9	19	1.4	0	0	*154	2.3
8	0	.1				.9	16	1.1	0	0	172	1.7
9	0	0				*.8	16	1.2	0	0	*154	1.5
10	0	.1				.6	*16	1.2	0	0	156	1.2
11	0	0				.4	14	.7	*0	0	152	*1.5
12	0	0				.2	13	.9	0	0	107	.7
13	0	0				.2	9	.6	0	0	82	3.3
14	0	0				.3	9	.6	0	0	*70	3.1
15	0	0			(*)	.4	7	.7	0	0	100	.8
16	0	0		(*)		.5	4.8	.5	0	0	112	.7
17	0	0				.6	3.1	.6	0	0	82	.6
18	0	0				.8	2.9	.4	0	0	57	.4
19	0	0				.9	*1.9	.4	0	0	45	.2
20	0	0				*1	1.5	.2	0	0	34	.2
21	0	0				1.5	1.2	*.2	0	0	29	.2
22	0	0	(*)			2	1.0	.2	0	0	26	.1
23	0	0				3	1.0	.1	0	0	17	.1
24	0	0				4	.8	.2	0	*0	16	0
25	0	0				4.3	.6	.1	0	0	14	.1
26	0	0				4.8	.7	.1	0	0	10	0
27	0	0				*5	.6	.1	0	0	10	0
28	0	*0				5	1.1	.2	0	0	*9	0
29	0	0				4	.6	.1	0	0	8	.2
30	0	0			------	3	1.7	.1	0	0	6	.2
31	0	------			------	3.3	------	0	------	.2	2.9	------
Total	0.2	0.2	0	0	0	52.8	254.5	20.5	0.3	0.2	1,670.2	37.7
Mean	0.01	0.01	0	0	0	1.70	8.48	0.66	0.01	0.01	53.9	1.26
Ac-ft	0.4	0.4	0	0	0	105	505	41	0.6	0.4	3,310	75

Calendar year 1955: Max - Min - Mean - Ac-ft -
Water year 1955-56: Max 172 Min 0 Mean 5.56 Ac-ft 4,040

Peak discharge (base, 100 cfs).--Aug. 6 (11 p.m.) 174 cfs (4.6 ft).

* Discharge measurement or observation of no flow made on this day.

Note.--Record began Sept. 1, 1955; no flow during month. Stage-discharge relation affected by ice Nov. 13 to Mar. 24, Mar. 28-30.

James River near Alexandria, S. Dak.

Location.--Lat 43°38', long 97°53', in NW¼NW¼ sec. 14, T. 102 N., R. 59 W., at downstream side of highway bridge, 1 mile upstream from Johnson Creek, 1 mile downstream from Enemy Creek, and 5 miles west of Alexandria.

Drainage area.--20,200 sq mi, approximately.

Records available.--July 1953 to September 1956.

Gage.--Wire-weight gage read once daily. Altitude of gage is 1,200 ft (from topographic map).

Extremes.--Maximum discharge, 770 cfs Aug. 8 (gage height, 8.20 ft); minimum daily, 2 cfs Jan. 16-24; minimum gage height, 4.15 ft Oct. 29.

1953-56: Maximum discharge, 2,300 cfs Mar. 12, 1955 (gage height, 12.40 ft, backwater from ice); minimum daily, that of Jan. 16-24, 1956; minimum gage height, that of Oct. 29, 1955.

Remarks.--Records fair above 100 cfs and poor below.

Rating tables, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 15 to May 15, June 5-15, Sept. 26-30)

Oct. 1 to June 21				June 22 to Sept. 30			
4.1	1.5	5.0	30	4.2	2.5	5.0	41
4.2	2.5	5.5	73	4.3	4.0	5.5	87
4.3	4.0	6.0	136	4.4	6	6.0	157
4.5	8	7.0	316	4.5	9	7.0	375
4.7	15			4.7	20	8.2	770

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.4	3.8	4.5	6	3	7	112	34	108	108	116	44
2	2.4	*4.0	4.5	6	3	7	118	*35	167	108	112	41
3	*3.4	4.4	4.5	6	3	7	*170	38	195	95	109	36
4	3.8	4.8	4.5	6	3	8	193	41	174	95	104	34
5	4.4	5	4.5	6	3	10	198	43	145	*111	126	31
6	3.4	5	5	6	3	12	204	50	116	84	307	28
7	3.4	5	5	6	4	*12	202	56	99	143	*616	26
8	3.1	5	5	5	4	12	206	61	88	196	760	24
9	3.6	6	5	4	4	12	209	64	82	194	760	22
10	3.6	6	5	4	4	12	211	68	86	179	721	21
11	3.4	6	5	4	4	12	*195	68	*83	179	644	*21
12	3.1	6	6	4	4	12	172	64	78	185	536	18
13	2.8	5	6	4	4.5	12	161	67	74	176	457	16
14	2.2	5	6	4	4.5	12	142	67	71	176	*400	14
15	2.3	6	6	3	4.5	12	121	69	69	166	368	12
16	2.3	6	6	*2	*4.5	13	105	70	63	159	312	11
17	2.3	6	6	2	5	14	97	71	56	155	264	9
18	2.4	6	6	2	5	15	94	72	51	155	232	8
19	2.6	6	7	2	5	16	83	73	51	152	192	7
20	2.6	6	7	2	5	18	84	75	51	151	164	6
21	3.1	6	7	2	5	*20	80	*75	50	146	143	5
22	3.4	6	*7	2	5	25	73	74	77	140	129	4.4
23	3.0	5	7	2	5	35	66	69	107	129	115	4.2
24	3.0	5	7	2	6	45	61	65	104	*123	100	3.8
25	3.6	5	7	3	6	60	54	62	93	115	92	3.6
26	3.7	5	7	3	6	73	49	60	83	111	78	3.4
27	3.7	5	8	3	6	*80	43	60	83	106	70	3.4
28	3.1	4.5	8	3	6	85	41	60	91	103	*66	3.2
29	2.8	*4.5	7	3	6	94	38	58	108	102	58	3.1
30	3.4	4.5	6	3	------	99	37	58	112	118	51	3.0
31	3.4	------	6	3	------	105	------	62	------	119	47	------
Total	95.7	157.5	185.5	113	131.0	956	3,619	1,889	2,815	4,279	8,249	466.1
Mean	3.09	5.25	5.98	3.6	4.52	30.8	121	60.9	93.8	138	266	15.5
Ac-ft	190	312	368	224	260	1,900	7,180	3,750	5,580	8,490	16,360	924

Calendar year 1955:	Max 2,170	Min 2.2	Mean 130	Ac-ft 94,030
Water year 1955-56:	Max 760	Min 2	Mean 62.7	Ac-ft 45,540

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 12 to Mar. 25.

James River near Scotland, S. Dak.

Location.--Lat 43°11'00", long 97°37'55", in SW¼SW¼ sec. 30, T. 97 N., R. 57 W., on left bank 50 ft upstream from highway bridge, 500 ft upstream from Dawson Creek, and 5 miles northeast of Scotland.

Drainage area.--21,550 sq mi, approximately.

Records available.--September 1928 to September 1956.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 1,165 ft (by barometer). Prior to Dec. 1, 1934, chain gage at highway bridge 50 ft downstream at same datum. Dec. 1, 1934, to Sept. 27, 1948, water-stage recorder at site 50 ft upstream at same datum.

Average discharge.--28 years, 342 cfs (247,600 acre-ft per year); median of yearly mean discharges, 240 cfs (174,000 acre-ft per year).

Extremes.--Maximum discharge during year, 955 cfs Aug. 11 (gage height, 5.96 ft); minimum, 5 cfs Oct. 13, Sept. 28; minimum gage height, 1.23 ft Oct. 2.

1928-56: Maximum discharge, 10,800 cfs May 15, 1942; maximum gage height, 16.23 ft Apr. 23, 1952; no flow for many days.

Remarks.--Records good except those for periods of ice effect or indefinite stage-discharge relation, which are poor.

Revisions (water years).--WSP 786: Drainage area. WSP 956: 1937-38. WSP 1279: 1932, 1948.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12	11	9	18	15	23	164	76	75	90	103	78
2	10	12	11	19	16	23	173	72	66	115	104	64
3	13	13	11	20	16	24	234	82	60	139	100	52
4	14	12	11	19	16	26	*316	87	82	146	103	45
5	13	11	10	19	16	28	333	80	122	148	104	41
6	13	11	10	19	16	*34	314	75	150	148	105	*40
7	13	11	11	20	16	33	312	78	160	161	143	36
8	11	*11	12	21	*16	27	297	73	160	189	*359	30
9	10	e10	13	21	16	24	279	65	140	173	579	26
10	9	e12	14	20	17	22	*275	73	121	*144	674	25
11	8	e13	15	20	17	22	262	86	112	148	904	24
12	7	14	15	19	18	21	258	98	102	154	874	25
13	6	14	16	18	18	21	241	97	94	164	712	24
14	7	12	16	17	19	24	218	102	96	172	*605	22
15	6	13	16	16	20	28	204	97	89	167	528	21
16	6	11	16	15	20	30	187	87	85	166	484	20
17	*7	11	16	*15	20	38	*170	88	81	167	445	19
18	6	11	16	15	21	55	152	81	82	*170	411	18
19	6	11	17	15	21	60	132	*84	84	160	379	*17
20	6	12	19	15	21	*65	*120	85	84	150	322	15
21	7	12	20	14	21	80	115	80	84	142	e270	12
22	6	12	19	14	22	110	109	88	*79	132	e220	10
23	8	11	20	14	22	125	112	94	82	126	e200	10
24	7	12	20	13	22	130	102	87	82	121	181	9
25	9	11	20	13	22	150	*90	75	81	*114	161	8
26	9	10	21	13	22	175	85	67	84	106	137	7
27	9	9	21	14	22	*200	88	67	84	99	126	6
28	12	8	*21	14	22	218	90	68	84	100	116	6
29	12	*9	21	14	22	203	92	64	87	98	109	6
30	11	9	20	14	------	*192	90	64	88	94	96	6
31	10	------	18	15	------	200	------	76	------	96	82	------
Total	283	339	495	513	552	2,411	5,614	2,496	2,880	4,299	9,736	722
Mean	9.1	11.3	16.0	16.5	19.0	77.8	187	80.5	96.0	139	314	24.1
Ac-ft	561	672	982	1,020	1,090	4,780	11,140	4,950	5,710	8,530	19,310	1,430

Calendar year 1955: Max 2,140 Min 6 Mean 175 Ac-ft 126,900
Water year 1955-56: Max 904 Min 6 Mean 82.9 Ac-ft 60,180

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* Discharge measurement made on this day.

e Stage-discharge relation indefinite; discharge estimated on basis of weather records and records for nearby stations.

Note.--Stage-discharge relation affected by ice Nov. 26 to Mar. 27, Mar. 31.

Vermillion River near Wakonda, S. Dak.

Location.--Lat 42°59'20", long 96°57'50", in SW¼NW¼ sec. 2, T. 94 N., R. 52 W., on left bank 40 ft downstream from bridge on State Highway 19, 3½ miles downstream from Frog Creek, 7¼ miles southeast of Wakonda, and 16½ miles downstream from Turkey Ridge Creek.

Drainage area.--1,680 sq mi, approximately.

Records available.--October 1945 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 1,150.9 ft above mean sea level (levels by Corps of Engineers). Prior to Sept. 2, 1954, wire-weight gage and crest-stage indicator at site 40 ft upstream at same datum. Since Dec. 27, 1951, supplementary staff gage on relief bridge.

Average discharge.--11 years, 129 cfs (93,390 acre-ft per year).

Extremes.--Maximum discharge during year, 156 cfs June 8; maximum gage height, 5.90 ft Apr. 6; no flow for many days.

1945-56: Maximum discharge, 3,790 cfs June 21, 1954 (includes 1,850 cfs bypass flow from levee breaks); maximum gage height, 16.63 ft June 13, 1947, from graph based on gage readings; no flow at times during 1951, 1956.

Remarks.--Records good except those for period of backwater from temporary dam and/or ice, which are poor. During periods of high stage, part of flow leaves main channel through levee breaks and bypasses gage through two relief openings on left bank.

Rating table, water year 1955-56, except period of backwater from temporary dam and/or ice (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 2-4, June 7-9, July 11-18)

3.1	0	4.0	19
3.2	.7	4.5	43
3.3	1.8	5.0	74
3.5	4.8	6.0	154
3.7	9		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.8	1.6	1.6	1.2	0.4	1.0	25	13	4.3	3.7	0.8	0.6
2	.8	*1.6	1.4	1.8	.5	1.5	45	12	3.8	3.4	1.1	.4
3	.8	1.5	1.2	2.0	.8	2.0	55	16	3.7	3.1	1.0	.1
4	.8	1.4	1.5	2.2	.8	3.0	*67	21	3.7	2.8	.8	0
5	1.0	1.3	2.0	2.5	.4	4.0	*91	20	3.2	2.2	.7	*0
6	.8	1.2	2.2	3.0	.3	*4.5	129	19	3.5	*1.7	.8	.2
7	.4	1.1	2.0	3.0	.3	4.5	128	20	*70	2.6	1.1	.2
8	.3	1.1	1.5	2.5	*.4	4.0	86	17	118	2.8	*.7	0
9	0	*1.1	1.0	2.0	.4	4.0	60	15	56	3.1	.5	0
10	.1	1.5	1.0	2.0	.4	4.0	*55	*13	66	3.1	.3	0
11	.2	1.8	.8	1.8	.4	3.5	46	14	96	3.7	.2	0
12	*.5	1.8	.8	1.6	.4	3.0	40	13	81	3.7	3.6	0
13	0	1.8	1.0	1.4	.4	2.5	34	12	*57	*5	43	0
14	.1	1.8	1.2	1.2	.4	2.0	30	88	53	12	*43	*0
15	.1	1.8	.6	1.0	.4	2.0	28	66	62	13	46	0
16	.3	1.8	*.6	1.0	.4	2.0	24	46	50	9	80	0
17	.3	2.0	.6	.8	.4	2.5	20	*32	40	28	50	0
18	.3	2.2	.6	.5	.4	3.0	20	24	34	13	33	*0
19	*.6	2.2	.6	*.5	.4	3.0	*17	18	28	7	22	0
20	.8	2.2	.6	.5	.4	*3.0	16	15	24	*4.3	17	0
21	.9	2.2	.6	.5	.4	3.0	15	12	19	4.0	13	*0
22	1.0	*2.2	.8	.5	.4	2.8	14	11	17	3.5	10	0
23	1.1	2.2	1.0	.5	.4	2.5	13	9	16	2.1	7	0
24	1.2	2.2	1.4	.8	.4	2.5	12	8	12	1.7	5	0
25	1.5	2.2	1.8	1.0	.4	3.0	11	*6	10	1.4	3.2	0
26	1.6	2.2	2.0	1.2	.4	4.0	11	5	9	1.0	2.9	*0
27	1.7	2.2	*2.0	1.2	.4	10	11	5	*8	.8	1.9	0
28	1.8	2.2	2.0	1.2	.4	15	12	5	6	.8	1.4	0
29	1.9	2.0	2.0	1.0	.6	*40	13	5	4.8	.7	*1.1	0
30	1.8	1.8	1.2	.5	------	35	13	6	4.2	.4	1.0	0
31	1.7	------	1.0	.5	------	30	------	4.3	------	.7	.7	------
Total	25.2	54.2	38.6	41.4	12.5	206.8	1,141	570.3	963.2	144.3	392.8	1.5
Mean	0.81	1.81	1.25	1.34	0.43	6.67	38.0	18.4	32.1	4.65	12.7	0.05
Ac-ft	50	108	77	82	25	410	2,260	1,130	1,910	286	779	3.0

Calendar year 1955: Max 1,010 Min 0 Mean 31.2 Ac-ft 22,610
Water year 1955-56: Max 129 Min 0 Mean 9.81 Ac-ft 7,120

Peak discharge (base, 1,000 cfs).--No peak above base.
* Discharge measurement or observation of no flow made on this day.
Note.--Stage-discharge relation affected by backwater from temporary dam and/or ice Oct. 20 to Apr. 1 (discharge computed from once-daily wire-weight-gage readings Dec. 13-16, Jan. 7 to Feb. 12).

Big Sioux River at Watertown, S. Dak.

Location.--Lat 44°56'30", long 97°08'50", in SW¼SW¼NW¼ sec. 13, T. 117 N., R. 53 W., near center of span on upstream side of highway bridge, 1 mile downstream from inlet-outlet to Lake Kampeska, 2½ miles northwest of Watertown, and 8½ miles upstream from Willow Creek.

Drainage area.--1,800 sq mi, approximately, of which about 1,400 sq mi is probably noncontributing.

Records available.--October 1945 to September 1956.

Gage.--Wire-weight gage read once daily. Crest-stage indicator since Mar. 3, 1953. Altitude of gage is 1,710 ft (from river-profile map). Prior to Jan. 15, 1947, staff gage at same site and datum.

Average discharge.--11 years, 38.1 cfs (27,580 acre-ft per year).

Extremes.--Maximum discharge during year, 194 cfs June 22 (gage height, 5.80 ft); no flow for many days.

1945-56: Maximum discharge observed, 2,220 cfs Apr. 9, 1952; maximum gage height observed, 10.35 ft Apr. 4, 1952 (backwater from ice); no flow for many days each year.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. Water is stored naturally offstream in Lake Kampeska (capacity, 35,500 acre-ft) during periods when river is rising and then naturally released, in part, when river is falling.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.3	0.3	(*)			0	10	0.3	4.0	a42	15	19
2	a.3	*.5				0	15	1.3	6	39	29	a15
3	.4	.4				0	*20	1.9	a8	35	68	a12
4	*.3	.4				0	30	1.7	10	a34	89	8
5	.5	.4				0	20	1.5	15	32	a87	12
6	.4	a.4				0	16	a1.3	26	28	85	12
7	.2	.4				0	12	1.1	18	35	83	10
8	.2	.6				0	8	1.3	*17	a32	103	6
9	a.2	.8				0	4.8	6	14	30	*98	a6
10	.2	.7				0	*3.0	2.7	a16	25	90	6
11	.2	a.6				0	2.4	12	18	25	88	7
12	.2	.6				0	2.4	6	15	23	a110	6
13	.6	a.6				0	2.1	a8	9	27	132	7
14	.3	.5				0	1.9	10	4.8	28	128	6
15	.3	.4				*0	a2.0	7	23	a24	108	6
16	a.4	.3				0	2.1	*12	31	20	98	a4
17	.5	.3			(*)	0	2.1	7	a40	18	93	2.4
18	.3	.3		(*)		0	2.1	7	51	15	80	*3.0
19	a.3	.3				0	2.1	3.3	61	15	a75	2.1
20	a.3	.3	(*)			0	1.7	a1.5	46	15	69	3.0
21	a.3	.2				0	1.3	.4	63	14	63	1.1
22	a.3	.2				*0	a1.2	.3	170	*9	58	1.1
23	a.3	.1				0	1.1	.1	162	12	49	a9
24	.3	0				0	.8	.3	a125	7	44	17
25	.4	0				1	1.7	.3	89	4.8	39	9
26	.3	0				3	*1.5	1.3	87	3.6	a38	1.3
27	.3	0				5	a2.5	a5	68	3.6	36	1.0
28	.4	0				5	3.6	14	*56	2.7	32	1.7
29	.3	0				4	a2.0	78	53	a5	*32	1.0
30	a.2	0			------	3	.6	24	45	8	28	a.8
31	.2	------			------	5	------	12	------	17	42	------
Total	9.7	9.6	0	0	0	26	176.0	228.6	1,350.8	628.7	2,189	195.5
Mean	0.31	0.32	0	0	0	0.8	5.87	7.37	45.0	20.3	70.6	6.52
Ac-ft	19	19	0	0	0	52	349	453	2,680	1,250	4,340	388

Calendar year 1955: Max 170 Min 0 Mean 5.68 Ac-ft 4,110
Water year 1955-56: Max 170 Min 0 Mean 13.2 Ac-ft 9,550

Peak discharge (base, 400 cfs).--No peak above base.

* Discharge measurement or observation of no flow made on this day.

a No gage-height record; discharge interpolated or estimated on basis of weather records and records for nearby stations.

Note.--Stage-discharge relation affected by ice Nov. 14 to Apr. 8 (scattered days of no gage-height record).

Big Sioux River near Brookings, S. Dak.

Location.--Lat 44°11', long 96°45', in NW¼NW¼ sec. 8, T. 108 N., R. 49 W., near center of span at downstream side of highway bridge, 1½ miles downstream from Deer Creek and 9½ miles southeast of Brookings.

Drainage area.--4,420 sq mi, approximately, of which about 1,970 sq mi is probably noncontributing.

Records available.--August 1953 to September 1956.

Gage.--Wire-weight gage and crest-stage indicator; gage read once daily. Altitude of gage is 1,545 ft (by barometer).

Extremes.--Maximum discharge during year, 287 cfs Aug. 8 (gage height, 4.0 ft, from graph based on gage readings); maximum gage height, 4.42 ft Mar. 24, 25 (backwater from ice); no flow for many days.

1953-56: Maximum discharge, 1,970 cfs Mar. 22, 1954 (gage height, 9.79 ft); no flow for many days during 1956.

Remarks.--Records fair except those for periods of ice effect, which are poor.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.5	4.4	2.5	87
1.6	8	3.0	140
1.8	20	3.5	202
2.0	37	4.0	287

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6	14	4	3	(*)	0	25	44	23	57	26	49
2	6	*13	4	3		*0	*35	46	24	48	a32	46
3	6	14	4	3		0	50	*46	a24	40	37	a46
4	6	14	3	3		0	70	44	*25	32	42	46
5	6	14	3	4		0	*90	42	28	32	67	a45
6	5	12	3	3		0	100	39	24	a31	a70	45
7	5	10	3	2		0	120	39	26	31	124	a45
8	5	10	3	2		*0	140	39	a35	31	243	45
9	5	12	3	2		0	149	39	41	31	*212	45
10	4.8	16	3	2		0	157	39	38	*28	240	43
11	4.8	16	3	2		0	140	40	33	31	255	a42
12	*5	14	3	2		0	*136	44	a33	32	236	a42
13	4.8	12	3	2		0	113	47	33	32	216	41
14	4.8	10	3	2		0	110	47	33	32	198	*39
15	4.8	9	3	1		1	105	49	a32	32	164	41
16	4.8	8	2	1		2	89	*47	32	31	*149	a38
17	5	8	2	1		2	84	50	32	a29	140	35
18	5	8	2	0		2	69	51	a43	27	124	a34
19	*7	9	2	0		3	a66	33	*54	25	115	33
20	6	10	2	0		5	*63	33	64	23	100	a32
21	6	10	2	0		7	63	a32	76	20	91	32
22	6	9	3	0		10	57	31	72	19	81	29
23	7	8	4	0		15	55	a30	64	18	a75	28
24	8	7	4	0		20	54	a28	52	17	69	a27
25	8	6	3	0		20	*51	26	44	16	63	26
26	9	6	2	0		15	49	26	54	*15	60	a25
27	10	5	*2	0		15	48	26	61	15	58	a24
28	12	4	2	0		10	45	26	69	15	58	23
29	14	3	2	0		10	42	30	81	13	*55	23
30	15	*3	2	0	------	15	42	26	67	15	a54	a23
31	15	------	2	0	------	20	------	25	------	24	52	------
Total	216.8	294	86	38	0	172	2,417	1,164	1,317	842	3,506	1,092
Mean	6.99	9.8	2.8	1.2	0	5.5	80.6	37.5	43.9	27.2	113	36.4
Ac-ft	430	583	171	75	0	341	4,790	2,310	2,610	1,670	6,950	2,170

Calendar year 1955:	Max	1,100	Min	1.6	Mean	45.7	Ac-ft	33,070
Water year 1955-56:	Max	255	Min	0	Mean	30.5	Ac-ft	22,100

Peak discharge (base, 1,000 cfs).--No peak above base.

* Discharge measurement or observation of no flow made on this day.

a No gage-height record; discharge interpolated or estimated on basis of weather records and records for nearby stations.

Note.--Stage-discharge relation affected by ice Nov. 1, 3-8, Nov. 10 to Apr. 8 (no gage-height record Nov. 23-29, Dec. 1-9).

Big Sioux River near Dell Rapids, S. Dak.

Location.--Lat 43°47'25", long 96°44'45", in NW¼NW¼ sec. 29, T. 104 N., R. 49 W., on right bank at downstream side of highway bridge, a quarter of a mile downstream from confluence of divided channels, 1¾ miles upstream from nearest tributary, and 3 miles southwest of Dell Rapids.

Drainage area.--5,060 sq mi, approximately, of which about 1,970 sq mi is probably noncontributing.

Records available.--May 1948 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 1,455 ft (by barometer). Prior to Nov. 11, 1949, wire-weight gage at same site; prior to Oct. 1, 1951, at datum 0.04 ft lower.

Average discharge.--8 years, 306 cfs (221,500 acre-ft per year).

Extremes.--Maximum discharge during year, 1,750 cfs July 14 (gage height, 8.65 ft); minimum daily, 2.2 cfs Jan. 31 to Feb. 3; minimum gage height, 1.69 ft Jan. 21-25.

1948-56: Maximum discharge, 15,400 cfs Apr. 5, 1952 (gage height, 14.85 ft); minimum daily, 2 cfs Jan. 25-27, Jan. 30 to Feb. 1, Feb. 11-13, 1950; minimum gage height, that of Jan. 21-25, 1956.

Remarks.--Records good except those for period of ice effect, which are poor. Discharge measurements generally made every two weeks during winter and weekly during remainder of year.

Rating tables, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 17-20, 26, Dec. 10 to Jan. 15)

Oct. 1 to Mar. 14				Mar. 15 to Sept. 30			
1.6	2.1	2.2	7	3.0	20	4.0	256
1.8	2.7	2.3	9	3.1	33	5.0	546
2.0	4.0	2.4	12	3.3	70	6.0	836
2.1	5	2.5	18	3.6	144		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.7	12	9	6	2.2	4.5	64	70	30	66	33	66
2	2.8	12	8	6	2.2	5	68	70	36	70	38	62
3	3.4	12	5	5	2.2	5	108	70	36	48	38	58
4	3.7	14	4.6	4.8	2.5	5	93	72	82	52	38	54
5	4.0	16	4.1	4.6	3.0	5	152	72	64	50	43	54
6	3.9	14	3.9	4.5	3.2	4.0	136	70	50	43	43	52
7	3.9	13	3.9	3.9	3.5	3.5	113	70	36	54	47	54
8	4.2	15	4.0	3.8	3.8	3.0	171	75	33	45	227	52
9	4.5	16	3.9	3.6	3.8	3.0	242	66	32	42	398	50
10	4.4	16	3.7	3.4	3.8	3.0	219	70	30	40	442	45
11	4.4	15	3.7	3.3	3.5	3.0	174	72	30	40	358	47
12	3.8	15	3.7	3.2	3.5	3.0	177	93	33	42	331	45
13	3.8	15	3.8	3.3	3.5	4.0	188	77	33	66	346	43
14	3.9	14	3.8	3.1	3.2	5	174	79	33	778	320	43
15	4.2	13	3.7	3.0	3.2	5	149	77	32	216	279	43
16	4.5	12	3.7	2.9	3.0	6	128	72	30	98	270	42
17	4.7	11	3.7	2.8	3.0	6	110	66	32	72	247	40
18	5	11	3.7	2.8	3.0	7	106	60	40	62	202	42
19	6	11	3.8	2.7	3.0	8	100	54	43	50	174	40
20	6	12	3.8	2.6	3.2	10	93	52	47	45	149	42
21	7	12	3.8	2.5	3.2	15	84	47	47	42	136	40
22	7	13	3.8	2.5	3.2	25	79	45	47	38	121	35
23	6	12	4.1	2.4	3.5	35	75	43	152	35	110	35
24	5	12	4.5	2.4	3.5	45	79	43	174	32	110	35
25	5	12	4.7	2.4	3.5	55	72	43	118	32	100	33
26	4.7	12	5	2.4	3.5	60	72	38	88	29	91	33
27	5	12	6	2.4	3.5	65	66	38	72	25	86	33
28	9	11	6	2.3	4.0	60	66	38	66	23	84	29
29	13	10	5	2.3	4.0	50	72	35	58	24	82	29
30	12	10	6	2.3	------	45	72	33	56	38	77	32
31	12	------	6	2.2	------	55	------	28	------	35	68	------
Total	169.5	385	142.4	101.4	94.2	608.0	3,502	1,838	1,660	2,332	5,088	1,308
Mean	5.47	12.8	4.59	3.27	3.25	19.6	117	59.3	55.3	75.2	164	43.6
Ac-ft	336	764	282	201	187	1,210	6,950	3,650	3,290	4,630	10,090	2,590

Calendar year 1955:	Max 1,200	Min 2.7	Mean 64.8	Ac-ft 46,930
Water year 1955-56:	Max 788	Min 2.2	Mean 47.1	Ac-ft 34,180

Peak discharge (base, 1,000 cfs).--July 14 (1:30 p.m.) 1,750 cfs (8.65 ft).

Note.--Stage-discharge relation affected by ice Feb. 2 to Mar. 31 (no gage-height record Feb. 2-19, and only scattered wire-weight gage readings Feb. 20 to Mar. 26; discharge estimated on basis of 5 discharge measurements, weather records, and records for nearby stations).

Skunk Creek near Sioux Falls, S. Dak.

Location.--Lat 43°32'35", long 96"48'30", in NW¼NW¼ sec. 23, T. 101 N., R. 50 W., on left bank at downstream side of bridge on U. S. Highway 16, 600 ft upstream from nearest tributary, 2½ miles upstream from mouth, and 4 miles west of Sioux Falls.

Drainage area.--520 sq mi, approximately.

Records available.--May 1948 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 1,418 ft (by barometer). Prior to Oct. 24, 1949, wire-weight gage at same site and datum.

Average discharge.--8 years, 58.1 cfs (42,060 acre-ft per year).

Extremes.--Maximum discharge during year, 781 cfs June 4 (gage height, 5.02 ft); minimum, 0.3 cfs Oct. 15; minimum gage height, 2.21 ft July 1.

1948-56: Maximum discharge, 5,770 cfs Mar. 29, 1952 (gage height, 12.16 ft); no flow at times during 1951, 1954-55; minimum gage height, 2.08 ft Sept. 16, 1955.

Remarks.--Records good except those for period of ice effect, which are poor.

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Nov. 6-14, May 22 to June 4, June 10 to July 3, July 18 to Aug. 3, Aug. 15, 16)

2.2	0.2	2.8	22
2.3	.5	3.0	44
2.4	1.1	3.4	118
2.5	3.5	3.8	226
2.6	8	4.3	431

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.5	0.6	0.6	0.7	0.4	0.6	23	6	0.9	0.8	26	5
2	.7	.6	.6	.7	.4	.8	*25	6	.8	.8	23	5
3	.9	.6	.6	.7	.4	1.0	39	8	.8	.7	*22	7
4	1.0	.7	.6	.7	.4	1.0	26	8	*413	.7	16	5
5	.8	.8	.6	.7	.4	1.0	27	8	*366	.8	9	5
6	.6	.6	.6	.8	.4	1.0	28	6	91	.7	8	5
7	.5	.6	.6	.8	.4	1.0	22	6	46	2.6	8	4.0
8	.4	.6	.6	.8	.4	1.0	17	*4.5	24	12	*21	3.2
9	.5	*.7	.6	.8	.4	1.1	12	4.0	16	13	81	2.9
10	.5	.7	.6	.8	.4	1.1	8	3.5	10	*8	123	2.6
11	.4	.7	.6	.8	.4	1.1	8	5	8	66	188	2.0
12	*.4	.8	.6	*.8	.4	1.1	8	8	*6	123	341	2.9
13	.4	.8	.5	.8	.4	1.1	*6	16	3.5	40	359	*1.7
14	.4	.7	.5	.8	*.4	1.1	6	17	2.9	16	183	4.0
15	.3	.8	.5	.8	.4	*1.1	6	11	4.3	11	*118	4.0
16	.4	.7	*.5	.7	.4	1.1	6	8	7	39	91	2.9
17	.4	.6	.4	.6	.4	1.1	6	6	7	75	72	1.5
18	.4	.6	.4	.6	.4	1.5	5	4.0	39	116	56	1.7
19	.4	.7	.4	.6	.4	2	4.0	2.0	16	97	43	1.3
20	.4	.8	.4	.6	.4	3	*3.5	1.7	*6	77	36	1.1
21	.5	.9	.4	.6	.4	*4	3.5	1.5	2.6	64	*27	1.2
22	.5	*1.1	.4	.6	.4	35	2.9	*2.3	1.7	48	22	.9
23	.7	1.0	.5	.6	.4	20	2.3	1.7	1.1	39	19	.7
24	.6	.9	.6	.6	.4	20	2.3	1.3	1.0	28	14	.6
25	.6	.9	.7	.6	.4	25	2.3	1.2	.9	*21	12	.7
26	*.5	.9	.7	.6	.4	*55	*2.3	1.1	.9	17	10	.9
27	.6	.8	.7	.6	.4	35	2.0	1.1	*.8	16	8	.7
28	.6	.6	.7	.6	.4	*20	2.0	1.2	.7	14	8	.5
29	.6	.6	.7	.6	.4	18	3.5	1.1	.8	9	8	.5
30	.6	.6	.7	.5	------	20	4.5	1.0	.7	10	6	.4
31	.6	------	.7	.4	------	20	------	.9	------	25	6	------
Total	16.7	22.0	17.6	20.9	11.6	295.8	313.1	153.1	1,079.4	991.1	1,964	74.9
Mean	0.54	0.73	0.57	0.67	0.40	9.54	10.4	4.94	36.0	32.0	63.4	2.50
Ac-ft	33	44	35	41	23	587	621	304	2,140	1,970	3,900	149

Calendar year 1955:	Max	600	Min	0	Mean	10.3	Ac-ft	7,430
Water year 1955-56:	Max	413	Min	0.3	Mean	13.6	Ac-ft	9,850

Peak discharge (base, 500 cfs).--June 4 (8:30 p.m.) 781 cfs (5.02 ft); Aug. 12 (6:30 p.m.) 680 cfs (4.79 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 18 to Mar. 31. Discharge computed from once-daily wire-weight-gage readings Jan. 10 to Mar. 21, Apr. 3-7.

Big Sioux River at Sioux Falls, S. Dak.

Location.--Lat 43°30', long 96°44', in S½ sec. 32, T. 101 N., R. 49 W., on left bank 5 ft downstream from highway bridge, 0.25 mile downstream from Great Northern Railway bridge, 1 mile southwest of Sioux Falls, and 3 miles downstream from Skunk Creek.

Drainage area.--5,750 sq mi, approximately, of which about 1,970 sq mi is probably noncontributing.

Records available.--August 1943 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 1,392.83 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Sept. 11, 1954, wire-weight gage and crest-stage indicator at same site and datum. Since Mar. 4, 1953, wire-weight gage on bypass canal.

Average discharge.--13 years, 412 cfs (298,300 acre-ft per year).

Extremes.--Maximum discharge during year, 895 cfs July 15 (gage height, 4.03 ft); minimum, 0.6 cfs Oct. 16 (gage height, 1.50 ft).

1943-56: Maximum combined discharge, 13,500 cfs Apr. 7, 1952; maximum for main channel only, 11,000 cfs Apr. 7, 1952 (gage height, 14.50 ft, from graph based on gage readings); maximum daily for bypass canal, 2,800 cfs Apr. 6, 1952; minimum, 0.4 cfs Sept. 15, 1955 (gage height, 1.43 ft).

Remarks.--Records good except those for period of ice effect, which are poor. During periods of high stage, part of flow leaves channel above gage and bypasses gage through a bypass canal which returns to main channel at a point about 8 miles below gage. There was no flow through the bypass canal during the water year 1956.

Revisions (water years).--WSP 1086: Drainage area. WSP 1146: 1948 (maximum gage heights only)

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 4, 5, July 15, Aug. 10-16)

1.4	0	2.3	68
1.5	1.0	2.5	107
1.6	4.0	3.0	252
1.7	8	3.5	467
1.9	21	4.0	738
2.1	39		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.3	1.0	5	3.5	2	5	92	73	27	51	72	68
2	1.0	.9	5	3.5	2	7	*109	72	25	55	65	75
3	9	2.5	4.5	3.5	2	9	136	79	24	60	*65	66
4	3.7	3.1	4	4	2	9	106	72	290	52	60	62
5	2.8	3.1	3.5	5	2.5	9	153	70	*609	49	54	58
6	1.9	2.5	3.5	5	2.5	8	167	68	*218	39	63	62
7	1.0	1.9	3.5	5	3	7	136	63	144	60	68	60
8	2.2	2.2	3	4.5	3	6	155	*63	82	75	*68	55
9	2.5	*4.9	3	4	3.5	4	181	62	65	60	216	55
10	3.1	14	3	3.5	3.5	3	225	63	58	*51	400	54
11	1.9	12	3	3	3.5	2.5	202	60	48	53	606	52
12	*1.3	10	3	*3	3.5	2.5	172	60	*38	184	615	51
13	.8	9	3	3	3.5	3	*168	92	38	99	716	49
14	.8	6	3	3	*3.5	3.5	175	82	34	82	535	48
15	.8	4.5	3	3	3.5	*4	170	75	28	690	*418	48
16	.7	5	*3	2.5	3.5	4	153	72	33	267	355	47
17	1.9	5	3	2.5	3	5	136	59	40	175	301	42
18	2.2	6	2.5	2.5	3	5	126	54	79	181	309	44
19	1.9	7	2.5	2	3	6	117	55	68	170	232	43
20	2.5	8	2.5	2	4	6	*109	52	*54	126	199	42
21	2.2	7	3	2	4	*7	105	48	38	124	*167	42
22	1.9	*7	3.5	2	4	15	99	*42	49	103	153	40
23	3.7	7	3.5	2.5	4	50	88	44	47	74	131	40
24	2.8	6	4	2.5	4.5	70	82	42	77	62	117	38
25	2.2	6	4	2.5	4.5	90	81	39	126	*68	114	38
26	*3.7	7	4	3	4	*100	*79	36	103	51	112	37
27	2.5	6	4	3	3	95	77	24	*84	48	96	36
28	.9	5	4	3	3	*80	77	27	66	42	79	34
29	1.3	5	3.5	2.5	3	70	77	23	57	38	88	34
30	1.3	5	3.5	2	------	80	75	30	49	48	82	33
31	1.0	------	3.5	2	------	85	------	27	------	72	66	------
Total	66.8	169.6	107.0	95.0	94.0	850.5	3,828	1,728	2,698	3,309	6,622	1,453
Mean	2.15	5.65	3.45	3.06	3.24	27.4	128	55.7	89.9	107	214	48.4
Ac-ft	132	336	212	188	186	1,690	7,590	3,430	5,350	6,560	13,130	2,880

Calendar year 1955: Max 1,100 Min 0.6 Mean 74.9 Ac-ft 54,210
Water year 1955-56: Max 716 Min 0.7 Mean 57.4 Ac-ft 41,680

Peak discharge (base, 2,600 cfs).--No peak above base.

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 14 to Mar. 31. Discharge computed from once-daily wire-weight-gage readings Dec. 19 to Feb. 13.

Rock River near Rock Valley, Iowa

Location (revised).--Lat 43°12'05", long 96°20'15", in NE¼NE¼ sec. 25, T. 97 N., R. 47 W., on downstream side of bridge on U. S. Highway 18, 1.8 miles west of Rock Valley and 16.4 miles upstream from mouth.

Drainage area.--1,600 sq mi (revised).

Records available.--June 1948 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 1,216.00 ft above mean sea level (Iowa Highway Commission benchmark). Prior to Aug. 13, 1952, wire-weight gage (June 4, 1949, to Aug. 12, 1952, supplementary water-stage recorder operating above 6.2 ft gage height) at same site and datum.

Average discharge.--8 years, 335 cfs (242,500 acre-ft per year).

Extremes.--Maximum discharge during year, 1,160 cfs July 2 (gage height, 7.59 ft); minimum daily, 1.2 cfs Feb. 1-19.

1948-56: Maximum discharge, 19,200 cfs June 21, 1954; maximum recorded gage height, 15.99 ft June 8, 1953; minimum daily discharge, 1 cfs Mar. 16-26, 1951.

Flood in 1897 reached a stage of 17.0 ft (discharge not determined), from information by Iowa Highway Commission.

Remarks.--Records good except those for periods of ice effect, which are poor.

Rating table, water year 1955-56, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 1-22)

4.3	2.8	5.0	108
4.4	7.5	5.5	250
4.6	27	6.0	425
4.8	64	7.0	840

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.2	21	5.4	3.0	1.2	3.5	334	*68	46	84	73	137
2	4.0	21	5.4	3.0	1.2	6.0	*342	75	42	*838	*95	147
3	*5.4	*10	4.4	3.0	1.2	8.0	393	97	38	357	95	79
4	5.4	22	3.6	*3.2	1.2	10	373	121	*42	217	75	60
5	5.9	23	3.6	3.2	1.2	12	345	137	44	*147	66	*50
6	6.9	19	3.8	3.2	1.2	*10	328	142	44	106	212	42
7	6.9	12	*3.8	3.2	*1.2	12	274	134	46	113	360	34
8	7.5	19	3.8	3.2	1.2	10	232	113	40	104	178	28
9	8.9	23	3.8	3.2	1.2	8.0	208	106	33	99	131	27
10	8.2	25	3.8	3.2	1.2	6.0	184	97	28	86	113	23
11	8.2	26	3.8	3.2	1.2	5.0	178	104	25	82	489	21
12	8.2	27	3.8	3.2	1.2	4.5	160	104	22	77	485	19
13	8.2	27	3.7	3.2	1.2	5.0	147	99	20	75	525	19
14	8.9	14	3.6	3.2	1.2	5.0	134	97	19	111	625	15
15	9.6	14	3.4	3.0	1.2	6.0	121	90	16	410	409	14
16	9.6	6.9	3.4	3.0	1.2	7.0	108	144	14	453	268	13
17	10	9.6	3.4	2.8	1.2	8.0	99	144	13	226	196	13
18	10	9.6	3.2	2.8	1.2	12	93	118	13	139	150	12
19	11	14	3.2	2.6	1.2	14	86	97	13	104	124	12
20	12	22	3.2	2.6	1.4	15	82	96	99	84	104	12
21	13	23	3.0	2.4	1.4	50	75	77	139	68	90	11
22	13	25	3.0	2.2	1.6	100	71	66	95	56	82	13
23	13	8.9	3.2	2.0	1.6	200	62	62	60	48	73	16
24	13	13	3.2	1.8	1.8	125	60	58	255	40	64	16
25	15	14	3.0	1.6	2.0	70	58	52	345	34	54	15
26	16	17	3.0	1.6	2.0	40	58	48	190	32	52	15
27	17	6.9	3.0	1.6	2.5	60	58	48	113	28	46	13
28	20	7.5	3.0	1.4	2.5	300	52	42	75	27	44	13
29	19	6.9	3.0	1.4	3.0	275	44	40	56	25	38	14
30	19	6.4	3.0	1.4	------	185	68	36	44	25	36	15
31	20	------	3.0	1.4	------	220	------	34	------	121	38	------
Total	336.0	493.7	109.5	79.8	42.6	1,792.0	4,827	2,736	2,029	4,416	5,390	918
Mean	10.8	16.5	3.53	2.57	1.47	57.8	161	88.3	67.6	142	174	30.6
Cfsm	0.0068	0.010	0.0022	0.0016	0.00092	0.036	0.101	0.055	0.042	0.089	0.109	0.019
In.	0.008	0.01	0.003	0.002	0.001	0.04	0.11	0.06	0.05	0.10	0.13	0.02
Ac-ft	666	979	217	158	84	3,550	9,570	5,430	4,020	8,760	10,690	1,820

Calendar year 1955: Max 2,000 Min 2.2 Mean 81.0 Cfsm 0.051 In. 0.67 Ac-ft 58,660
Water year 1955-56: Max 838 Min 1.2 Mean 63.3 Cfsm 0.040 In. 0.53 Ac-ft 45,940

Peak discharge (base, 2,000 cfs).--No peak above base.

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 3, 14-19, Nov. 23 to Mar. 31 (no gage-height record Dec. 8-17, 19-22, 24-29, 31, Jan. 1, 2, 6-11, 13-20, 22-26, 28-31, Feb. 1, 2, 4-6, 8, 9, 11-16, 18-23, 25-29, Mar. 1, 3-5, 9, 12, 13, 15-19, 21, 22, 24; discharge estimated on basis of 4 discharge measurements, weather records, engineers' and observer's notes and records for stations on nearby streams).

Dry Creek at Hawarden, Iowa

Location (revised).--Lat 42°59'45", long 96°28'15", in NE¼NE¼ sec. 2, T. 91 N., R. 48 W., on left bank 6 ft downstream from bridge on State Highway 10 at east edge of Hawarden and 1.7 miles upstream from mouth.

Drainage area.--48.4 sq mi (revised).

Records available.--June 1948 to September 1956.

Gage.--Water-stage recorder and concrete control. Datum of gage is 1,170.42 ft above mean sea level, datum of 1929 (Corps of Engineers benchmark). Prior to Oct. 30, 1949, wire-weight gage at same site and datum.

Average discharge.--8 years, 9.32 cfs (6,750 acre-ft per year).

Extremes.--Maximum discharge during year, 152 cfs July 31 (gage height, 8.09 ft); no flow for many days.

1948-56: Maximum discharge, 10,900 cfs June 7, 1953 (gage height, 17.57 ft), from rating curve extended above 860 cfs on basis of contracted-opening determination of peak flow; no flow at times.

Flood in September 1926 reached a stage of 18.0 ft (discharge not determined) and flood in 1934 reached a stage of 15.8 ft (discharge not determined), from information by Iowa Highway Commission.

Remarks.--Records good except those for period of ice effect, which are poor.

Rating table, water year 1955-56, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

5.1	0	5.6	4.4
5.2	.2	5.7	7.0
5.3	.8	6.0	21
5.4	1.5	6.3	39
5.5	2.7		

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0.1			0	0.4	2.0	*0.7	0.2	0	28	
2	0	.1			0	.5	*2.0	.7	.2	0	*5.5	
3	*.1	*.1		(*)	0	.5	5.0	1.2	.1	0	2.1	
4	.1	.1			0	.7	1.4	1.1	.3	0	15	
5	.1	.1			0	1.0	1.1	1.0	*.1	*0	16	(*)
6	.1	.1			0	*1.1	1.1	.8	.9	0	17	
7	.1	.1	(*)		*0	.5	1.0	.6	.5	.5	37	
8	.1	.1			0	.2	.8	.6	.3	5.0	7.0	
9	.1	.1			0	.2	.6	.5	.1	1.4	2.4	
10	0	.1			0	.2	.7	.5	0	.6	1.5	
11	0	.1			0	.1	.6	.6	0	.6	1.1	
12	0	.2			0	.1	.5	.5	0	.8	.9	
13	0	.2			0	.1	.3	.5	0	2.6	1.5	
14	0	.1			0	.1	.4	.5	0	1.1	1.5	
15	0	.1			0	.1	.3	.5	0	.6	1.1	
16	0	0			0	.2	.3	.3	0	.3	.8	
17	0	0			0	.3	.3	.3	0	.1	.6	
18	.1	0			0	.4	.3	.2	0	.1	.4	
19	.1	0			0	.5	.3	.2	0	.1	.3	
20	.1	0			0	2.5	.3	.1	0	.1	.2	
21	.1	0			0	2.0	.3	.1	0	0	.1	
22	.1	0			0	1.5	.3	.1	0	0	.1	
23	.1	0			0	10	.3	.1	0	0	0	
24	.1	0			0	5.0	.3	.1	0	0	0	
25	.1	0			0	5.0	.3	.1	2.3	0	0	
26	.1	0			0	4.0	.4	.1	8.7	0	0	
27	.1	0			0	2.0	.5	.2	.8	0	0	
28	.1	0			.1	1.0	.5	.1	.6	0	0	
29	.1	0			.3	1.0	.6	.1	.3	0	0	
30	.1	0			-----	1.0	.8	.5	.1	0	0	
31	.1	-----			-----	1.1	-----	.3	-----	46	0	-----
Total	2.1	1.7	0	0	0.4	43.3	23.6	13.2	15.5	59.9	140.1	0
Mean	0.07	0.06	0	0	0.01	1.40	0.79	0.43	0.52	1.93	4.52	0
Cfsm	0.0014	0.0012	0	0	0.00021	0.029	0.016	0.0089	0.011	0.040	0.093	0
In.	0.002	0.001	0	0	0.0003	0.03	0.02	0.01	0.01	0.05	0.11	0
Ac-ft	4.2	3.4	0	0	0.8	86	47	26	31	119	278	0

Calendar year 1955:	Max	74	Min	0	Mean	1.44	Cfsm	0.030	In.	0.41	Ac-ft 1,040
Water year 1955-56:	Max	37	Min	0	Mean	0.82	Cfsm	0.017	In.	0.23	Ac-ft 595

Peak discharge (base, 300 cfs).--No peak above base.

* Discharge measurement or observation of no flow made on this day.

Note.--Stage-discharge relation affected by ice Nov. 14 to Mar. 30 (no gage-height record Dec. 5, 6, 8-16, 18-26, Dec. 28 to Jan. 2, Jan. 4, 6-11, 13-16, 18-25, Jan. 27 to Feb. 28, Mar. 1-4, 7-11, 13-19, 25, 28, 30; discharge estimated on basis of 1 discharge measurement, weather records, and records for nearby stations).

Big Sioux River at Akron, Iowa

Location.--Lat 42°49'40", long 96°33'50", in W½ sec. 31, T. 93 N., R. 48 W., on left bank 300 ft downstream from highway bridge in Akron and 2¼ miles upstream from Union Creek.

Drainage area.--9,030 sq mi, approximately, of which about 1,970 sq mi is probably noncontributing.

Records available.--October 1928 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 1,118.90 ft above mean sea level, datum of 1929. Prior to Dec. 3, 1934, chain gage at bridge 300 ft upstream at same datum.

Average discharge.--28 years, 852 cfs (616,800 acre-ft per year).

Extremes.--Maximum discharge during year, 1,840 cfs July 17 (gage height, 8.13 ft); minimum, 24 cfs Nov. 8 (gage height, 1.59 ft).

1928-56: Maximum discharge, 33,000 cfs Apr. 1, 1952, from rating curve extended above 20,000 cfs on basis of velocity-area study; maximum gage height, 19.95 ft June 22, 1954; minimum daily discharge, 7 cfs Feb. 26-28, 1936.

Remarks.--Records good except those for period of ice effect, which are fair. Discharge measurements generally made every two weeks during winter and weekly during remainder of year.

Revisions.--WSP 1389: Drainage area. Figures of discharge in cubic feet per second per square mile and runoff in inches for the water year 1955 published in WSP 1389 were erroneously computed on basis of drainage area of 8,851 sq mi. Corrected figures based on revised drainage area of 7,060 sq mi (contributing area) are given below:

Month	Cubic feet per second per square mile	Runoff in inches
October 1954	0.043	0.05
November	.038	.04
December	.025	.03
Calendar year 1954	.115	2.11
January 1955	.023	.03
February	.012	.01
March	.171	.20
April	.092	.10
May	.054	.06
June	.033	.04
July	.019	.02
August	.010	.01
September	.0058	.006
Water year 1954-55	.044	.60

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	42	53	30	38	31	55	503	230	122	222	293	195
2	42	55	33	38	32	70	558	236	121	193	276	195
3	45	49	34	38	32	65	604	260	120	444	262	254
4	47	52	35	37	33	60	604	272	116	543	266	209
5	68	56	36	37	34	55	601	282	303	421	274	190
6	67	55	35	37	35	55	598	295	756	331	254	175
7	55	48	34	37	35	50	569	293	658	297	287	168
8	65	43	33	36	34	50	526	266	596	313	443	157
9	66	61	33	37	35	55	484	264	435	333	405	146
10	59	63	33	37	34	60	448	256	311	306	348	145
11	56	64	33	36	34	60	413	254	236	260	410	138
12	55	63	33	34	32	55	403	246	191	246	616	135
13	53	65	33	34	30	60	405	256	160	226	1,190	135
14	49	47	34	35	29	65	400	256	148	197	1,310	129
15	49	45	34	34	29	65	372	266	135	252	1,390	115
16	51	40	32	33	30	65	350	338	122	692	1,210	109
17	52	40	30	32	30	70	343	387	120	1,740	979	106
18	53	40	30	32	30	70	324	343	120	1,220	818	108
19	54	45	29	32	30	75	306	280	112	784	685	104
20	56	50	29	32	30	75	293	248	195	552	575	97
21	55	55	30	32	30	80	280	222	182	467	506	97
22	54	60	30	30	32	90	264	197	236	413	443	98
23	56	55	31	29	33	95	254	179	230	362	390	97
24	56	55	32	29	35	120	246	165	186	322	345	95
25	57	50	32	29	35	150	244	157	165	278	313	95
26	56	55	31	28	34	230	236	150	821	256	289	90
27	57	50	34	29	34	326	236	146	493	228	258	84
28	58	45	35	30	34	345	224	140	306	213	240	81
29	60	40	35	30	40	459	234	143	291	195	226	81
30	57	35	35	30	------	670	232	140	258	184	215	86
31	54	------	36	30	------	581	------	133	------	188	200	------
Total	1,704	1,534	1,014	1,032	946	4,381	11,554	7,300	8,245	12,678	15,716	3,914
Mean	55.0	51.1	32.7	33.3	32.6	141	385	235	275	409	507	130
Cfsm	0.0078	0.0072	0.0046	0.0047	0.0046	0.020	0.055	0.033	0.039	0.058	0.072	0.018
In.	0.009	0.008	0.005	0.005	0.005	0.02	0.06	0.04	0.04	0.07	0.08	0.02
Ac-ft	3,380	3,040	2,010	2,050	1,880	8,690	22,920	14,480	16,350	25,150	31,170	7,760

Calendar year 1955: Max 4,520 Min 29 Mean 260 Cfsm 0.037 In. 0.50 Ac-ft 188,400
Water year 1955-56: Max 1,740 Min 28 Mean 191 Cfsm 0.027 In. 0.36 Ac-ft 138,900

Peak discharge (base, 3,500 cfs).--No peak above base.

Note.--Stage-discharge relation affected by ice Nov. 15 to Mar. 26.

Missouri River at Sioux City, Iowa

Location (revised).--Lat 42°29'10", long 96°24'45", in NW¼SE¼ sec. 16, T. 29 N., R. 9 E., sixth principal meridian, on right bank on upstream side of bridge on U. S. Highway 77 at Sioux City, 2.0 miles downstream from Big Sioux River.

Drainage area.--314,600 sq mi, approximately.

Records available.--October 1897 to September 1956 in reports of Geological Survey (October 1897 to September 1928 and October 1931 to September 1938, monthly discharge only, based on record for station at Williston, N. Dak., in Circular 108). January 1879 to December 1890 (monthly discharges only) in House Document 238, 73d Congress, 2d session. Gage-height records collected in this vicinity September 1878 to December 1899 are contained in reports of Missouri River Commission and since July 1889 are contained in reports of U. S. Weather Bureau.

Gage.--Water-stage recorder. Datum of gage is 1,076.96 ft above mean sea level, datum of 1929. Sept. 2, 1878, to Dec. 31, 1905, staff, cable, and chain gages at various locations within 1.7 miles of present site and at various datums. Jan. 1, 1906, to Feb. 14, 1935, chain gage at present site and datum.

Average discharge.--21 years (1928-31, 1938-56), 30,050 cfs (21,760,000 acre-ft per year).

Extremes.--Maximum discharge during year, 38,900 cfs Aug. 18 (gage height, 7.10 ft); minimum daily, 8,100 cfs Nov. 26, Jan. 31; minimum gage height, -1.44 ft Nov. 25.

1928-31, 1938-56: Maximum discharge, 441,000 cfs Apr. 14, 1952; maximum gage height, 24.28 ft Apr. 14, 1952; minimum discharge, 2,500 cfs Dec. 29, 1941; minimum gage height observed, -3.34 ft Dec. 27, 1946.

Remarks.--Records good except those for periods of ice effect, which are fair. Flow partly regulated by upstream main stem reservoirs. Discharge measurements generally made 6 times a month, 3 times a month during winter.

Revisions (water years).--WSP 716: 1929-30. WSP 876: Drainage area.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	31,200	29,800	9,400	8,800	8,800	11,300	28,600	30,900	28,900	30,200	33,400	34,000
2	31,200	27,200	10,500	8,550	8,800	11,300	28,600	29,200	28,900	30,900	33,700	32,600
3	31,600	24,200	12,000	9,300	8,800	12,700	31,200	28,900	29,800	30,900	32,300	32,600
4	32,000	21,500	11,300	9,400	8,800	11,900	30,900	29,800	29,800	28,300	31,200	32,600
5	32,600	18,000	10,700	9,500	8,800	11,500	30,600	29,500	29,800	27,400	31,200	32,300
6	32,600	15,700	9,800	9,500	8,800	11,300	30,900	29,200	30,900	27,100	31,600	32,000
7	32,600	12,900	9,800	9,450	8,800	12,100	29,500	28,900	30,600	26,800	32,300	30,600
8	32,000	10,900	9,400	9,300	8,700	13,500	28,000	29,200	29,200	27,100	32,600	30,900
9	31,200	10,200	8,800	9,300	8,700	14,100	28,300	29,200	28,600	28,300	32,300	32,000
10	31,200	10,000	8,500	9,300	8,600	16,300	28,300	29,500	29,200	28,900	33,700	33,000
11	31,200	10,000	8,400	9,300	8,800	18,500	28,300	29,800	28,900	31,000	33,000	33,000
12	30,900	10,000	8,300	9,300	9,000	19,800	28,600	29,500	28,900	34,300	33,000	33,000
13	30,900	9,900	8,300	9,200	8,900	21,000	29,200	28,900	29,800	31,600	33,700	34,000
14	31,200	9,750	8,300	9,200	8,800	27,800	29,500	29,200	31,200	30,900	34,400	33,400
15	31,600	9,900	8,250	9,000	8,800	33,700	29,800	28,900	31,200	32,300	34,800	35,400
16	31,600	9,000	8,250	8,800	8,800	32,600	29,800	28,600	32,300	31,200	35,100	35,400
17	31,600	8,800	8,500	8,550	8,900	30,600	29,500	28,600	32,300	30,600	35,400	35,100
18	31,600	8,800	9,200	8,500	9,000	30,900	29,200	28,900	32,600	30,900	36,500	35,400
19	31,600	8,800	9,600	8,400	9,100	30,900	29,200	29,200	32,600	29,500	34,400	35,400
20	32,600	10,000	10,200	8,400	9,300	32,000	29,500	30,600	32,000	28,300	33,000	35,100
21	32,600	11,000	10,300	8,400	9,400	31,200	29,200	30,900	32,600	27,700	34,000	34,800
22	32,600	10,900	10,400	8,500	9,600	32,300	29,500	30,600	34,000	28,000	33,700	34,800
23	33,000	9,900	10,500	8,700	9,800	31,600	29,800	30,200	32,300	28,300	33,000	33,700
24	33,000	8,400	10,400	9,000	10,200	28,000	30,200	31,600	29,200	29,200	33,700	33,000
25	32,600	8,250	10,200	9,200	10,500	29,500	31,200	29,800	30,600	30,600	33,400	33,700
26	31,600	8,100	9,500	9,400	11,000	29,500	31,600	30,200	33,000	33,000	32,600	33,400
27	32,600	8,850	9,250	9,300	11,300	30,900	31,600	29,500	29,800	33,700	33,400	34,400
28	32,300	8,500	9,000	9,300	11,300	31,200	31,600	29,500	27,100	34,000	33,400	34,400
29	32,000	8,600	8,800	9,200	11,300	29,800	31,200	29,800	27,700	34,400	34,400	34,400
30	32,000	8,800	8,600	9,000	------	28,900	31,200	29,500	29,800	34,400	34,800	35,100
31	31,600	------	8,800	8,100	------	29,200	------	28,900	------	34,400	35,100	------
Total	988,900	366,650	293,250	279,150	271,400	735,900	894,600	917,000	913,600	944,200	‡1,039.1	‡1,009.5
Mean	31,900	12,220	9,460	9,005	9,359	23,740	29,820	29,580	30,450	30,460	33,520	33,650
Ac-ft	‡1,961	727,200	581,700	553,700	538,300	‡1,460	‡1,774	‡1,819	‡1,812	‡1,873	‡2,061	‡2,002

Calendar year 1955:	Max	36,500	Min	6,200	Mean	22,230	Ac-ft	16,090,000
Water year 1955-56:	Max	36,500	Min	8,100	Mean	23,640	Ac-ft	17,160,000

Peak discharge (base, 80,000 cfs).--No peak above base.

‡ Expressed in thousands.

Note.--Stage-discharge relation affected by ice Nov. 17-21, Nov. 28 to Mar. 2.

Yellowstone River near Canyon Hotel, Yellowstone National Park

Location.--Lat 44°43', long 110°30', 0.5 mile upstream from Upper Falls and Canyon ranger station and 1¼ miles south of Canyon Hotel.

Drainage area.--1,160 sq mi, approximately.

Records available.--June 1913 to September 1951 (no winter records), discontinued.

Gage.--Water-stage recorder. Altitude of gage is 7,620 ft (from topographic map). Prior to Oct. 11, 1916, staff gages at site 900 ft upstream at different datums.

Extremes.--1913-51: Maximum discharge observed, 8,550 cfs (discharge measurement) June 27, 1918 (gage height, 4.50 ft); minimum not determined.

Remarks.--No diversion or artificial regulation above station.

Revisions.--WSP 701: Drainage area. Revised figures of discharge, in cubic feet per second, for the water year 1916, superseding those published in WSP 436, are given herewith:

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
1916		1916-Con.		1916-Con.		1916-Con.	
Aug. 12	3,800	Aug. 17	3,300	Aug. 22	2,800	Aug. 27	2,400
13	3,700	18	3,200	23	2,700	28	2,400
14	3,600	19	3,100	24	2,600	29	2,300
15	3,500	20	3,000	25	2,500	30	2,300
16	3,400	21	2,900	26	2,500	31	2,300

Month	Maximum	Minimum	Mean	Runoff in acre-feet
August 1916................	4,560	2,300	3,410	210,000

Tower Creek at Tower Falls, Yellowstone National Park

Location.--Lat 44°54', long 110°23', just upstream from Tower Falls, a quarter of a mile upstream from mouth and 2 miles southeast of Camp Roosevelt.

Drainage area.--51 sq mi, approximately.

Records available.--September 1922 to November 1943 (discontinued).

Gage.--Staff gage. Altitude of gage is 6,400 ft (from topographic map). Prior to Sept. 26, 1931, staff gage at site 25 ft downstream at datum 2.22 ft lower. Sept. 26, 1931, to July 11, 1933, staff gage at site 75 ft downstream at different datum. July 12, 1933, to Oct. 13, 1934, staff gage at described site at datum 0.50 ft higher.

Average discharge.--20 years (1923-43), 47.2 cfs.

Extremes.--1922-43: Maximum discharge observed, 642 cfs May 30, 1925, from rating curve extended above 400 cfs; maximum gage height, 6.27 ft May 28, 1928, site and datum then in use; minimum discharge observed, 5.6 cfs Mar. 17, 1934 (discharge measurement).

Remarks.--No regulation or diversion above station.

Revisions.--Revised figures of discharge, in cubic feet per second, for the water years 1924, 1926-28, and 1931, superseding those published in WSP 586, 626, 646, 666, and 716, are given herewith:

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
1923		1925-Con.		1927-Con.		1931	
Nov. 12-26	†b17	Dec. 1-31	†b25	Dec. 29	b25	July 9	36
Dec. 1-31	†b15			30	b20	10	36
		1926		31	b20	11	34
1924		Jan. 1-15	†b22			12	33
Jan. 1-31	†b12	Nov. 17-30	†b20	1928		13	32
Feb. 1-29	†b12	Dec. 1-31	†b20	Jan. 1-31	†b20	14	32
Mar. 1-31	†b12			Feb. 1-29	†b20	15	31
Apr. 1-30	†b12	1927		Mar. 1-18	†b20	16	30
		Dec. 5-21	†b25	19-27	†b25	17	29
1925		27	b25			18	29
Nov. 8-30	†b25	28	b25	1930			
				Nov. 2-13	†b27		

† Average for period indicated.
b Stage-discharge relation affected by ice.

Month	Maximum	Minimum	Mean	Per square mile	Runoff	
					Inches	Acre-feet
November 1923........................	27		19.2	0.376	0.42	1,140
December.............................	-		15.0	.294	.34	922
January 1924.........................	-		12.0	.235	.27	738
February.............................	-		12.0	.235	.25	690
March................................	-		12.0	.235	.27	738
April................................	-		12.0	.235	.26	714
Water year 1923-24..................	369		34.4	.674	9.17	25,010
Calendar year 1924..................	369		35.1	.688	9.34	25,480
November 1925........................	30		25.8	.506	.56	1,540
December.............................	-		25.0	.490	.57	1,540
Calendar year 1925..................	642		75.6	1.48	20.13	54,700
January 1926.........................	-		22.0	.431	.50	1,350
Water year 1925-26..................	272		47.2	.925	12.57	34,150
November 1926........................	-		20.7	.406	.45	1,230
December.............................	-		20.0	.392	.45	1,230
Calendar year 1926..................	272		45.8	.898	12.20	33,160
Water year 1926-27..................	583		72.7	1.43	19.34	52,630
December 1927........................	-		25.2	.494	.57	1,550
Calendar year 1927..................	583		76.0	1.49	20.20	54,980
January 1928.........................	-		20.0	.392	.45	1,230
February.............................	-		20.0	.392	.42	1,150
March................................	-		22.1	.433	.50	1,360
Water year 1927-28..................	637		70.4	1.38	18.76	51,060
Calendar year 1928..................	-		67.7	1.33	18.04	49,090
November 1930........................	-		25.9	.508	.57	1,540
Calendar year 1930..................	250		38.3	.751	10.20	27,740
July 1931............................	48	25	32.6	.639	.74	2,010
Water year 1930-31..................	250		33.8	.663	9.01	24,450
Calendar year 1931..................	250		32.0	.627	8.52	23,120

Gardiner River at Mammoth, Yellowstone National Park

Location.--Lat 44°59', long 110°41', on left bank a quarter of a mile downstream from footbridge on Mount Everts trail, half a mile upstream from Boiling River, 0.9 mile northeast of Mammoth, and 3¾ miles (revised) upstream from mouth.

Drainage area.--198 sq mi (revised).

Records available.--September 1922 to October 1938 (discontinued). Published as "near Mammoth Hot Springs" prior to Oct. 1, 1923, and as "at Mammoth Hotel" Oct. 1, 1923, to Sept. 30, 1937.

Gage.--Water-stage recorder. Altitude of gage is 5,680 ft (from topographic map). Prior to June 10, 1927, staff gage at site a quarter of a mile upstream at different datum. June 10 to July 29, 1927, staff gage at described site and datum.

Average discharge.--13 years (1925-38), 158 cfs.

Extremes.--1924-25: Maximum daily discharge during water year, 1,500 cfs June 22; minimum not determined.

1922-38: Maximum discharge, 1,790 cfs May 28, 1928 (gage height, 3.59 ft); minimum recorded, 31 cfs Apr. 7, 1928; minimum gage height, 0.51 ft Apr. 3, 1931.

Remarks.--No diversion or regulation above station. Records not equivalent to those for station near Mammoth, 1¼ miles downstream.

Revisions.--Revised figures of discharge, in cubic feet per second, for water years 1924-25, and 1933, superseding those published in WSP 586, 606, and 746, are given herewith. Complete table of daily discharge is given for water year 1925, but only revised figures for other water years.

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
1924		1924-Con.		1924-Con.		1924-Con.	
Sept.12	140	Sept.18	100	Sept.24	85	Sept.30	80
13	110	19	110	25	85		
14	100	20	100	26	85	1933	
15	90	21	90	27	85	Feb.1-28	†50
16	85	22	85	28	85	Mar.1-31	†60
17	90	23	85	29	85	Apr.1-15	†60

† Average for period indicated.

Note.--Doubtful or no gage-height record Sept. 12-30, 1924, Feb. 1 to Apr. 15, 1933; discharge estimated on basis of weather records and records for Yellowstone River at Corwin Springs.

Month	Maximum	Minimum	Mean	Per square mile	Runoff	
					Inches	Acre-feet
September 1924	200	80	102	0.515	0.58	6,090
Water year 1923-24	566	-	144	.727	9.86	104,300
Calendar year 1924	566	-	138	.697	9.51	100,400
February 1933	-	-	50.0	.253	.26	2,780
March	-	-	60.0	.303	.35	3,690
April	-	-	80.0	.404	.45	4,760
Water year 1932-33	998	-	149	.741	10.21	107,800
Calendar year 1933	998	-	148	.747	10.13	107,000

Discharge, in cubic feet per second, water year October 1924 to September 1925

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	80	95	80	70	70	70	85	160	1,010	578	203	133
2	85	95					85	200	918	523	203	133
3	85	95					85	270	828	496	203	139
4	85	95					90	290	679	496	203	139
5	85	95					90	320	584	496	203	146
6	80	100					95	514	548	444	195	173
7	80	110					90	417	514	419	195	159
8	85	100					95	360	497	395	188	146
9	80	90	70				100	346	497	371	188	152
10	85	80					105	333	531	348	188	139
11	80	75			70		120	432	566	326	188	*139
12	85	75			75		125	497	602	326	180	133
13	80	75			80		150	480	621	305	180	139
14	80	75			75		200	531	640	285	211	139
15	75	80			65	75	200	566	660	285	195	133
16	75	90			70	75	240	566	679	265	180	133
17	90				75	80	290	679	700	265	173	127
18	100				75	85	220	741	720	265	166	127
19	100				75	85	190	805	828	265	166	159
20	90				70	80	170	918	1,010	265	159	127
21	85				70	85	160	962	*1,130	246	159	133
22	85					80	150	1,010	1,500	246	152	133
23	85					80	140	940	850	246	146	133
24	85					85	130	1,010	694	246	146	139
25	85					85	125	1,030	664	228	139	139
26	85					90	120	985	635	211	146	146
27	90					95	125	985	606	211	159	146
28	85	80				85	125	962	635	211	159	146
29	90				-	90	130	1,060	606	211	146	152
30	90				------	85	130	1,100	606	211	139	146
31	90	-----			-----	95	-----	1,010	------	203	*133	------
Total	2,640	2,655	2,250	2,170	1,990	2,415	4,160	20,479	21,558	9,888	5,391	4,228
Mean	85.2	88.5	72.6	70	71.1	77.9	139	661	719	319	174	141
Cfsm	0.430	0.447	0.367	0.354	0.359	0.393	0.702	3.34	3.63	1.61	0.879	0.712
In.	0.50	0.50	0.42	0.41	0.37	0.45	0.78	3.85	4.05	1.86	1.01	0.79
Ac-ft	5,240	5,270	4,460	4,300	3,950	4,790	8,250	40,600	42,800	19,600	10,700	8,390

Calendar year 1924: Max 566 Min - Mean 138 Cfsm 0.697 In. 9.51 Ac-ft 100,400
Water year 1924-25: Max 1,500 Min - Mean 219 Cfsm 1.11 In. 14.99 Ac-ft 158,400

* Discharge measurement made on this day.

Note.--Doubtful or no gage-height record Oct. 1, to May 5, June 22, 23; discharge estimated on basis of weather records and records for Yellowstone River at Corwin Springs.

White River near Chadron, Nebr.

Location.--Lat 42°50', long 103°07', in sec. 18, T. 33 N., R. 49 W., 20 ft downstream from bridge on U. S. Highway 20, 2 miles downstream from Dead Horse Creek and 6 miles west of Chadron.

Drainage area.--750 sq mi, approximately.

Records available.--October 1931 to September 1943 (discontinued) in reports of U. S. Geological Survey. April to September 1931 in reports of State engineer.

Gage.--Chain gage on upstream side of bridge. Prior to Dec. 7, 1934, water-stage recorder at same site and datum.

Average discharge.--12 years, 26.4 cfs.

Extremes.--1931-43: Maximum discharge, 3,690 cfs May 12, 1942 (gage height, 18.07 ft), from rating curve extended above 1,900 cfs; no flow for several days in many years.

Revisions.--The figures of maximum discharge for some water years have been revised, as shown in the following table. They supersede figures published in the water-supply papers indicated:

WSP	Water year	Date	Discharge (cfs)	Gage height (feet)
761	1932	Apr. 24, 1932	1,680	16.8
761	1933	Apr. 21, 1933	1,680	16.8
896	1940	Sept. 6, 1940	1,700	16.82

Remarks.--Many diversions above station for irrigation.

Revisions.--Revised figures of discharge, in cubic feet per second, for the water year 1932, superseding those published in WSP 731 are given herewith:

Aug. 14, 1932..........	204
15, 1932..........	209

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
August 1932..................	-	209	0	17.8	1,100
Water year 1931-32.........	-	1,290	0	26.2	19,000

Niobrara River at Dunlap, Nebr.

Location.--Lat 42°28', long 102°56', in sec. 27, T. 29 N., R. 48 W., a quarter of a mile upstream from highway bridge at Dunlap and three-quarters of a mile upstream from Cottonwood Creek.

Drainage area.--1,550 sq mi, approximately.

Records available.--October 1930 to September 1942 (discontinued).

Gage.--Water-stage recorder. Altitude of gage is 3,870 ft (from topographic map). Prior to Nov. 17, 1936, staff gage on downstream side of highway bridge, 1,270 ft downstream, at different datum.

Average discharge.--12 years, 41.0 cfs.

Extremes.--1930-42: Maximum discharge, 2,890 cfs Sept. 4, 1937 (gage height, 9.8 ft, from floodmarks), from rating curve extended above 150 cfs on basis of slope-area determination of peak flow; maximum gage height, 10.04 ft May 13, 1942; minimum daily discharge, 0.6 cfs Aug. 2-4, 1936.

Revisions.--Figures of maximum discharge for the water years 1931 and 1932 have been revised to 374 cfs Aug. 6, 1931 (gage height, 4.7 ft, observed) and 890 cfs May 6, 1932 (gage height, 8.00 ft, observed), superseding those published in WSP 716 and 731, respectively.

Remarks.--Many diversions above station for irrigation.

Revisions.--Revised figures of discharge, in cubic feet per second, for periods in the water years 1931 and 1932, superseding those published in WSP 716 and 731, are given herewith:

Aug. 6, 1931..........	374
May 6, 1932..........	655

Month	Maximum	Minimum	Mean	Runoff in acre-feet
August 1931......................	374	6	38.4	2,360
Water year 1930-31............	374	-	50.1	36,260
May 1932.........................	655	36	71.5	4,400
Water year 1931-32............	655	1	35.1	25,500

Measurements of streamflow in the Missouri River basin above Sioux City, Iowa, made at points other than regular gaging stations are given in the following table. Most of these measurements were made during periods of base flow when streamflow is primarily from ground-water storage. Measurements believed to have been made under base-flow conditions are identified by an asterisk (*) to the left of the discharge figure. These measurements when correlated with the simultaneous discharge of a nearby stream where continuous records are available will give a picture of the low-flow potentiality of stream. The column headed "Measured previously" shows the water years in which measurements were made at the same, or practically the same, site.

Determinations of peak flow at points other than regular gaging stations are given in a separate table on page 405.

Discharge measurements made at points other than gaging stations in the Missouri River basin above Sioux City, Iowa, during the water year 1956

Boulder River basin, Mont.

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
Rock Creek...	Boulder River	SE¼ sec. 20, T. 6 N., R. 7 W., ¼ mile above mouth and 14 miles west of basin.	11.4	1946-55	Oct. 3	a0.5
					Apr. 19	7.6
					May 18	64.4
					June 12	13.5

Gallatin River basin, Mont.

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
South Cottonwood Creek.	Gallatin River.	NE¼ sec. 34, T. 3 S., R. 5 E., at Wortman Ranch, 6½ miles southeast of Gallatin Gateway, at former gaging station.	22.5	1951-53	Apr. 27	16.9
					May 23	122
					June 13	117
					July 11	35.3
East Gallatin River.	....do.......	SE¼ sec. 24, T. 2 S., R. 6 E., just below bridge on U. S. Highway 10, 6 miles east of Bozeman, at former gaging station.	49.5	1951-53	Apr. 26	77.6
					May 22	173
					June 13	32.4
					July 10	15.7

Yellowstone River basin

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
Bennie Pierre Creek.	Yellowstone River.	NE¼ sec. 15, T. 48 N., R. 105 W., 300 ft east of North Dakota-Montana State line.	210	1954-55	Oct. 19	*0.10
Charbonneau Creek.	....do.......	At bridge on county road on west line of sec. 31, T. 151 N., R. 103 W., ½ mile south of Cartwright, N. Dak.	230	1954-55	Oct. 19	*.13
					Apr. 27	*.47
					June 7	*.12
					July 13	*.32
					Aug. 8	*.05
					Sept.13	*.04

Painted Woods Creek basin, N. Dak.

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
Unnamed creek	Painted Woods Creek.	At culvert on county road on east line of sec. 35, T. 155 N., R. 103 W., 4½ miles north of U. S. Highway 2 and 7½ miles east of State line.	0.3	1955	Mar. 20	0.5
					Apr. 20	0
					June 12	0
					June 29	0
					July 25	0
					Aug. 22	0
Painted Woods Creek.	Missouri River.	At bridge on county road on north line of sec. 1, T. 154 N., R. 103 W., 4 miles north of U. S. Highway 2 and 8 miles east of State line.	19	1955	Mar. 20	27.4
					Apr. 26	0
					June 12	0
					June 29	0
					July 25	0
					Aug. 22	0
Unnamed creek	Painted Woods Creek.	At culvert on county road on west line of sec. 21, T. 155 N., R. 102 W., 6.2 miles north of U. S. Highway 2 and 10½ miles east of State line.	7.0	1955	Mar. 20	2
					Apr. 26	0
					June 12	0
					June 29	0
					July 25	0
					Aug. 22	0

Sand Creek basin, N. Dak.

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
Sand Creek...	Missouri River.	At bridge on U. S. Highway 2, in NW¼SE¼ sec. 22, T. 154 N., R. 101 W., 1½ miles west of post office at Williston.	39	1955	Mar. 20	14.1
					Apr. 26	*.15
					June 29	*.03
					July 12	*.01
					Aug. 22	0

Little Muddy Creek basin, N. Dak.

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
Little Muddy Creek.	Missouri River.	At bridge on county road on south line of sec. 32, T. 159 N., R. 100 W., 2½ miles southwest of Appam.	239	1954-55	Oct. 18	0.21
East Fork Little Muddy Creek.	Little Muddy Creek.	At bridge on county road on east line of sec. 33, T. 157 N., R. 99 W., 9 miles north of Springbrook.	81	1953-55	Oct. 20	*.40
					Apr. 26	*.62
					May 16	*.97
					July 10	*.35
					Aug. 7	*.41
					Sept.12	*.21

* Base flow.
a Estimated.

Discharge measurements made at points other than gaging stations in the Missouri River basin above Sioux City, Iowa, during the water year 1956--Continued

Little Muddy Creek basin, N. Dak.--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
East Fork Little Muddy Creek.	Little Muddy Creek.	At bridge on county road on west line of sec. 8, T. 156 N., R. 100 W., 8½ miles northwest of Springbrook.	149	1954-55	Oct. 20 Apr. 26 May 16 July 10 Aug. 8 Sept.12	*0.69 *1.95 *1.99 *.78 *.64 *.28

Little Missouri River basin, N. Dak.

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
Unnamed creek	Sheep Creek..	At culvert on U. S. Highway 10 in NW¼SE¼ sec. 29, T. 140 N., R. 101 W., 3.6 miles east of Medora.	-	1955	Oct. 27 Mar. 19 Apr. 19 June 14 July 9 Aug. 17 Sept.27	0 .55 0 0 0 0 0
Do........	....do.......	At culvert on road in Theodore Roosevelt National Park near center of sec. 19, T. 140 N., R. 101 W., 2¾ miles east of Medora.	-	1955	Oct. 28 Mar. 19 Apr. 19 June 14 July 9 July 26 Aug. 29 Sept.27	0 .21 0 0 0 0 0 0
Jules Creek..	Little Missouri River.	At bridge on road in Theodore Roosevelt National Park in NW¼ sec. 33, T. 141 N., R. 101 W., 5¾ miles north of Medora.	-	1955	Oct. 28 Mar. 19 Apr. 19 June 14 July 9 July 26 Aug. 29 Sept.27	0 .37 0 0 0 0 .005 0

Knife River basin, N. Dak.

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
Knife River..	Missouri River.	At bridge on State Highway 22, in NW¼ sec. 6, T. 143 N., R. 95 W., 0.4 mile north of Manning.	204	1953-55	Oct. 12 Apr. 20 May 22 June 21 Aug. 2 Sept.21	*0.09 *1.53 *.86 *.05 15.4 *.005
Crooked Creek	Knife River..	At bridge on State Highway 22 on west line of sec. 31, T. 143 N., R. 95 W., 4.7 miles south of Manning.	108	1953-55	Oct. 12 Apr. 20 May 22 June 21 Aug. 2 Sept.21	*.41 *.71 *.44 *.37 4.32 *.44
Knife River..	Missouri River.	At bridge on State Highway 8 on west line of sec. 10, T. 142 N., R. 92 W., at west edge of Marshall.	754	1953-55	Oct. 12 Apr. 20 May 22 June 21 Aug. 2 Sept.21	*.98 *8.26 *4.14 *1.65 82.8 *3.45
Little Knife River.	Knife River..	At bridge in Hebron, 3 blocks south of railroad depot, in SW¼ sec. 33, T. 140 N., R. 90 W.	41	1954-55	Oct. 14 May 4 May 31 July 18 Aug. 17 Sept.20	*.01 *.21 *.12 *.04 0 0
North Fork Spring Creek.	Spring Creek.	At bridge on county road on west line of sec. 13, T. 145 N., R. 95 W., 1 mile northwest of Killdeer.	29	1953-55	Oct. 12	*.05
Spring Creek.	Knife River..	SW¼ sec. 27, T. 145 N., R. 94 W., 400 ft below Lake Ilo spillway and 1 mile west of Dunn Center.	135	1953-55	Oct. 12 Apr. 20 May 22 June 21 Aug. 2 Sept.21	*.04 *.06 *.11 *.11 *.11 *.02
Do........	....do.......	At bridge on State Highway 8 at southwest corner of sec. 19, T. 145 N., R. 91 W., at northeast corner of Halliday.	306	1953-55	Oct. 12 Apr. 20 May 22 June 21 Aug. 2 Sept.21	*2.25 *4.58 *2.27 *3.40 5.45 *.10
Otter Creek..	....do.......	At bridge on county road in NW¼ sec. 34, T. 144 N., R. 87 W., 0.1 mile above mouth and 4 miles east of Beulah.	132	1953-55	May 4 May 22 June 26 July 19 Aug. 16 Sept.20	*6.01 *2.55 5.19 *1.72 *.44 *.55

* Base flow.

Discharge measurements made at points other than gaging stations in the Missouri River basin above Sioux City, Iowa, during the water year 1956--Continued

Painted Woods Creek basin, N. Dak.

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
Painted Woods	Missouri River.	At bridge on county road in SE¼ sec. 27, T. 144 N., R. 81 W., 5½ miles southeast of Washburn.	-	1953-55	Oct. 21 May 3 July 16 Aug. 13 Sept. 11	*0.20 8.46 *1.27 *2.35 *.10

Square Butte Creek basin, N. Dak.

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
Square Butte Creek.	Missouri River.	At bridge on State Highway 25 at sec. corner 14, 15, 22, 23, T. 124 N., R. 84 W., in Center.	-		Mar. 21 Mar. 27 Apr. 5 Apr. 10 May 5 Aug. 2 Aug. 15	70.0 7.22 40.3 20.3 *3 0 *2
Unnamed creek	Square Butte Creek	At culvert, on State Highway 25, on south line of sec. 13, T. 142 N., R. 84 W., 2 miles east of Center.	12.6	1955	Mar. 21 Mar. 27 Apr. 2 Apr. 5 May 5 May 29 July 3 Aug. 2 Aug. 15 Aug. 30	40 5 1.5 4.75 0 0 5 0 0 0
Do........	Unnamed creek	At culvert on State Highway 25 on south line of sec. 13, T. 142 N., R. 84 W., 1.7 miles east of Center.	-	1955	Mar. 21 Mar. 24 Apr. 2 Apr. 5 Apr. 10 May 5 May 29 July 3 Aug. 2 Aug. 15 Aug. 30	.83 2.62 .5 .5 .5 .01 0 .5 0 0 .002
Square Butte Creek.	Missouri River.	At bridge on county road on east side of sec. 24, T. 142 N., R. 84 W., 2 miles southeast of Center.	75	1955	Mar. 27 July 3 Aug. 15	238 2 3
Unnamed creek	Square Butte Creek.	At culvert on State Highway 25, on south line of sec. 15, T. 142 N., R. 83 W., 5¾ miles east of Center.	-	1955	Mar. 21 Mar. 22 Apr. 10 May 5 May 29 July 3 Aug. 2 Aug. 15	25 3.45 .5 0 0 .15 0 0
Square Butte Creek.	Missouri River.	At bridge on State Highway 25, in NE¼ sec. 4, T. 140 N., R. 82 W., 4 miles northwest of Harmon.	234	1953-55	May 5 June 30 Aug. 2 Aug. 30 Sept. 11	10.5 10.4 3.68 2.28 1.94

Burnt Creek basin, N. Dak.

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
Unnamed creek	Burnt Creek..	At culvert on U. S. Highway 83, 0.2 mile south of sec. corner 14, 15, 22, 23, T. 141 N., R. 80 W. and 2 miles west of Baldwin.	-		Mar. 16 Mar. 21 Mar. 25 May 26 June 7 July 2 July 9	0 15 25 0 0 0 0
Do........	....do.......	At culvert on U. S. Highway 83, in SW¼SW¼ sec. 35, T. 141 N., R. 80 W., 3½ miles southwest of Baldwin.	-		Mar. 21 Mar. 25 May 29 June 7 June 30 July 9	5 10 0 0 .05 0

Heart River basin, N. Dak.

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
Unnamed creek	Heart River..	At culvert on State Highway 22, on west line of sec. 22, T. 139 N., R. 96 W., 3 miles south of Dickinson.	-	1955	Oct. 28 Mar. 2 June 5 July 26 Aug. 20 Sept. 27	0 .14 0 0 0 0
Green River..	....do.......	At bridge on State Highway 22, on west line of sec. 10, T. 140 N., R. 96 W., 6 miles north of Dickinson.	264	1953-55	Oct. 12 Apr. 20 May 22 June 21 Aug. 2 Sept. 21	*.70 2.07 *1.43 *.70 12.5 *.64

* Base flow.

Discharge measurements made at points other than gaging stations in the Missouri River basin above Sioux City, Iowa, during the water year 1956--Continued

Heart River basin, N. Dak.--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
Antelope Creek.	Heart River..	At bridge on State Highway 22, on west line of sec. 34, T. 138 N., R. 96 W., 11 miles south of Dickinson.	72	1955	Oct. 28	0
					Mar. 2	0
					June 5	0
					July 26	0
					Aug. 1	10.0
					Aug. 20	0
					Sept.27	0
Unnamed creek	Antelope Creek.	At culvert on State Highway 22, on west line of sec. 22, T. 137 N., R. 96 W., 14½ miles south of Dickinson.	14	1955	Oct. 26	0
					Mar. 2	20.3
					June 5	0
					June 30	10.9
					July 25	0
					Aug. 20	0
					Sept.27	0
Do........	....do.......	At culvert on State Highway 22, on west line of sec. 10, T. 137 N., R. 96 W., 13 miles south of Dickinson.	23	1955	Oct. 27	0
					Mar. 2	8.37
					June 5	0
					June 30	22.4
					July 25	0
					Aug. 20	0
					Sept.27	0
Antelope Creek.	Heart River..	At bridge on county road in NE¼ sec. 5, T. 138 N., R. 94 W., 4 miles south of Gladstone.	228	1953-55	Oct. 13	*.12
					Apr. 20	*2.93
					May 22	*1.25
					June 21	*.12
					July 20	*.08
					Aug. 17	*.28
					Sept.27	*.08
Government Creek.	....do.......	At bridge on county road on north line of sec. 5, T. 138 N., R. 92 W., 5.4 miles south of Richardton.	31	1950,1955	Oct. 26	0
					Mar. 3	68.8
					Mar. 22	2.5
					May 31	0
					June 14	0
					July 17	0
					Aug. 17	0
					Sept.18	0
Heart River..	Missouri River.	S½ sec. 11, T. 137 N., R. 84 W., 10 miles south of Judson.	-		Jan. 12	39.2

Apple Creek basin, N. Dak.

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
West Branch Long Lake Creek.	Long Lake Creek.	At culvert on State Highway 34, in north line of sec. 30, T. 135 N., R. 75 W., 5.9 miles east of Hazelton.	17.4	1955	Mar. 16	0
					Mar. 20	0
					Apr. 23	0
					May 21	0
					June 6	314
					June 7	10.0
					June 8	.15
					July 3	0
					July 6	0
					July 24	0
					Aug. 21	0
					Sept. 6	0

Little Heart River basin, N. Dak.

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
Little Heart River.	Missouri River.	At bridge on U. S. Highway 6, in SE¼ sec. 16, T. 137 N., R. 81 W., 4.3 miles north of St. Anthony.	189	1953-55	Apr. 25	*1.64
					May 25	*.77
					June 30	3.52
					July 26	*.43
					Aug. 23	*.20
					Sept.11	*.22

Cannonball River basin, N. Dak.

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
Cannonball River.	Missouri River.	At bridge on State Highway 22, in SE½ sec. 4, T. 135 N., R. 97 W., ½ mile south of New England.	284	1953-55	Oct. 25	*0.28
					May 21	*.25
					June 26	*.28
					July 24	*.16
					Aug. 20	*.35
					Sept.27	*.11
Thirty Mile Creek.	Cannonball River.	At bridge on State Highway 21, in SE¼ sec. 36, T. 134 N., R. 91 W., 3 miles north of Bentley.	249	1953-55	Oct. 21	*.45
					Apr. 24	*2.55
					May 23	*2.10
					June 25	*.29
					July 23	2.28
					Aug. 21	*1.70
					Sept.20	*1.09
Unnamed creek	Louise Creek.	At culvert on county road in SW¼ sec. 34, T. 134 N., R. 86 W., 2 miles north of Brisbane.	-		Mar. 24	.5
					Apr. 25	0
					May 25	0
					July 2	0
					July 12	0

* Base flow.

Discharge measurements made at points other than gaging stations in the Missouri River basin above Sioux City, Iowa, during the water year 1956--Continued

Cannonball River basin, N. Dak.--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
Unnamed creek	Louise Creek.	At culvert on State Highway 21, in NW¼ sec. 7, T. 134 N., R. 85 W., 1.3 miles southwest of Lark.	-		Mar. 16	1.5
					Mar. 17	5.41
					Mar. 19	.2
					Apr. 25	0
					May 25	0
					July 2	0
					July 12	0
Do........	....do.......	At culvert on State Highway 21, on section lines 2-11, T. 134 N., R. 85 W., 3.4 miles east of Lark.	-		Mar. 16	0
					Mar. 17	63.4
					Mar. 20	25
					Apr. 25	*.2
					May 25	*.01
					July 2	0
					July 12	0
Louise Creek.	Cannonball River.	At Northern Pacific Ry. bridge, in SW¼NE¼ sec. 4, T. 134 N., R. 84 W., 0.7 mile west of Flasher.	-	1954-55	Mar. 19	176
					Mar. 20	761
					Mar. 21	476
					Mar. 22	93.1
					Apr. 25	2.22
					May 25	*.23
					July 2	0
					July 12	*.006
					Sept.13	0

Beaver Creek basin, N. Dak.

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
Spring Creek.	Beaver Creek.	At bridge on county road on east line of sec. 28, T. 133 N., R. 76 W., 2½ miles north of Linton.	31	1954-55	Mar. 20	6.13
					Mar. 21	13.4
					Apr. 23	*1.67
					May 21	*1.70
					June 6	712
					June 7	5
					June 22	4
					July 3	*2.33
					July 6	5
					July 24	1.32
					Aug. 21	1.31
					Sept.18	1.41
Sand Creek...	....do.......	At bridge on county road on north line of sec. 3, T. 133 N., R. 77 W., 4.2 miles west of Temvik.	19	1955	Mar. 16	.005
					Mar. 20	.5
					Mar. 21	19.2
					Apr. 23	0
					May 21	0
					June 6	10
					June 7	1
					July 6	0
					July 24	0
					Aug. 21	0
					Sept. 6	0

Spring Creek basin, S. Dak.

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
Spring Creek.	Missouri River.	NW¼ sec. 17, T. 127 N., R. 76 W., just below dam, ½ mile south of Herried.	-	1955	Oct. 10	0
					Apr. 23	*2.72
					May 16	*2.41
					July 24	0
					Aug. 7	0
					Aug. 21	0
					Sept. 6	0
					Sept.18	0

Grand River basin, S. Dak.

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
Crooked Creek	North Fork Grand River.	At bridge on U. S. Highway 85, at west line of sec. 34, T. 23 N., R. 6 E., 5¼ miles north of Ludlow.	-	1951,1955	Oct. 18	0
					Apr. 25	.0005
					May 22	0
					June 21	0
					July 17	0
					Aug. 9	2
					Aug. 29	.002
					Sept.25	0
Wide Sandy Creek.	Sand Creek...	At bridge on U. S. Highway 85, at east line of sec. 19, T. 18 N., R. 25 E., 4½ miles south of Buffalo.	-		Oct. 18	*.10
					Mar. 6	.2
					Mar. 20	5.04
					Apr. 25	*.13
					May 22	*.01
					June 22	0
					July 12	0
					Aug. 9	0
					Aug. 29	*.008
					Sept.25	*.005
Sand Creek	South Fork Grand River.	At bridge on State Highway 8, in SW¼NE¼ sec. 35, T. 19 N., R. 6 E., 9½ miles east of Buffalo.	-		July 25	*.38

* Base flow.

Discharge measurements made at points other than gaging stations in the Missouri River basin above Sioux City, Iowa, during the water year 1956--Continued

Grand River basin, S. Dak.--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
Bull Creek...	South Fork Grand River.	At bridge on U. S. Highway 85, at north line of sec. 31, T. 21 N., R. 6 E., 6½ miles southwest of Ludlow.	-	1955	Oct. 18 Apr. 25 May 22 June 21 July 17 July 25 Aug. 9 Aug. 29 Sept.25	*0.17 *.44 *.39 *.52 19.2 *.20 2 18 *.12
South Fork Grand River.	Grand River..	NE¼ sec. 26, T. 20 N., R. 11 E., 3 miles east and 10 miles north of Prairie City.	-		July 25	*6.04
Do........	....do.......	NE¼ sec. 13, T. 19 N., R. 13 E., 6 miles north of Bison.	-		July 26	*6.58
Grand River..	Missouri River.	On east line of sec. 8, T. 20 N., R. 18 E., 8 miles north of Athboy.	-		July 26	10.6
Do........	....do.......	SE¼ sec. 19, T. 20 N., R. 20 E., 18 miles south of Morrestown.	-		July 19	19.5
Do........	....do.......	SW¼ sec. 18, T. 20 N., R. 23 E., 16 miles south of McIntosh.	-		July 19	15.0
Stink Creek..	Grand River..	NW¼ sec. 23, T. 21 N., R. 24 E., 1½ miles west of Bullhead.	-		July 19	.20
Grand River..	Missouri River.	At south line of sec. 28, T. 20 N., R. 27 E., 1 mile south of Little Eagle.	-		July 18	18.3
Snake Creek..	Grand River..	At bridge on U. S. Highway 12, in NW¼ sec. 30, T. 19 N., R. 29 E., 5 miles southwest of Wakpala.	-		July 18	2.54
Unnamed tributary.	Snake Creek..	At bridge on State Highway 8, in NE¼ sec. 31, T. 18 N., R. 29 E., 8¾ miles southwest of Mobridge.	0.15		Mar. 17 Mar. 20 Mar. 24 Mar. 27 Apr. 24 May 22 June 12 July 24 Aug. 23	.10 .20 .02 .02 0 0 0 0 0
Unnamed creek	Unnamed tributary.	At bridge on State Highway 8, in SW¼ sec. 29, T. 18 N., R. 29 E., 8½ miles southwest of Mobridge.	-		Mar. 17 Mar. 24 Mar. 27 Apr. 24 May 22 June 12 July 24 Aug. 23	1.0 .1 1.1 0 0 0 0 0
Claymore Creek.	Grand River..	At bridge on State Highway 8, in SE¼ sec. 28, T. 18 N., R. 29 E., 7 miles southwest of Mobridge.	2.18		Mar. 17 Mar. 20 Mar. 24 Mar. 27 Apr. 24 May 22 June 14 Aug. 23	6.45 1.74 .40 .81 .002 0 0 0
Missouri River tributary, S. Dak.						
Unnamed tributary.	Missouri River.	NW¼ sec. 1, T. 17 N., R. 29 E., 6 miles south of Mobridge.	0.28		Mar. 17 Mar. 20 Mar. 27 Apr. 24 May 22 June 12 July 24 Aug. 30	0.12 .5 .05 0 0 0 0 0
Moreau River basin, S. Dak.						
Sand Creek...	South Fork Moreau River.	At bridge on U. S. Highway 85, on east line of sec. 18, T. 15 N., R. 5 E., ¾ mile south of Redig.	-		Apr. 25 May 22 June 22 July 17 Aug. 9 Aug. 29 Sept.25	0 *.06 *.04 0 .20 *.004 0
Thunder Butte Creek.	Moreau River.	At bridge on State Highway 73, on west line of sec. 4, T. 16 N., R. 16 E., 6 miles southeast of Chance.	-		Oct. 18 Apr. 26 May 23 June 25 July 18 Aug. 7 Aug. 30 Sept.26	0 *.04 *.01 0 0 0 0 0

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* Base flow.

Discharge measurements made at points other than gaging stations in the Missouri River basin above Sioux City, Iowa, during the water year 1956--Continued

Cheyenne River basin, S. Dak.

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
Red Canyon Creek.	Cheyenne River.	SE¼NW¼ sec. 32, T. 8 S., R. 3 E., at bridge on U. S. Highway 18, about 500 ft above mouth and 2 miles northeast of Edgemont.	-		Apr. 9 May 21 July 25 Sept. 6	a0.2 a.1 0 0
Sand Creek...	....do.......	SE¼SW¼ sec. 31, T. 8 S., R. 8 E., at highway bridge in Smithwick.	-		Oct. 18 Apr. 10 May 22 July 26 Sept. 5	*a.01 .14 a.1 0 0
Spring Creek.	....do.......	SW¼SW¼ sec. 12, T. 2 S., R. 4 E., at bridge on U. S. Highway 16, ½ mile above Sunday Gulch and 3½ miles south of Hill City.	-		Oct. 17 May 21 July 25 Sept. 7	*.04 2.80 0 0
Sunday Gulch.	Spring Creek.	NE¼SW¼ sec. 12, T. 2 S., R. 4 E., at culvert on U. S. Highway 16, about 600 ft above mouth and 3 miles south of Hill City.	5.72		Mar. 23	.71
Palmer Creek.	....do.......	SE¼NW¼ sec. 27, T. 1 S., R. 5 E., at culvert on U. S. Highway 16, 1½ miles above mouth and 3½ miles east of Hill City.	8.24		Mar. 23	1.48
Pleasant Valley Creek.	Morris Creek.	SE¼SW¼ sec. 16, T. 4 N., R. 7 E., at highway bridge, 3 miles above mouth and 8 miles east of Tilford.	-		Mar. 27 Apr. 24 Aug. 31	0 0 0
Chicken Creek	Redwater Creek.	SE¼SE¼ sec. 22, T. 7 N., R. 1 E., 3½ miles above mouth and 11 miles southwest of Belle Fourche.	-	1954,1955	Oct. 18 June 29 Aug. 1	*.29 *a.1 0
Whitewood Creek.	Belle Fourche River.	SE¼SW¼ sec. 22, T. 6 N., R. 4 E., at bridge on U. S. Highway 14, about ½ mile below Chicago and North Western Ry. bridge and 1 mile east of Whitewood.	-		Oct. 18 Apr. 18 July 17 Sept.18	*16.0 *20.0 *15.8 *12.5
Spring Creek.	....do.......	SE¼NE¼ sec. 13, T. 6 N., R. 5 E., at bridge on State Highway 79, 5¾ miles northeast of Sturgis.	-		Apr. 4 May 15 June 28 Aug. 30	1.73 *1.33 *.75 *.67
Unnamed tributary.	Cherry Creek.	SW¼ sec. 21, T. 10 N., R. 17 E., at culvert on State Highway 73, 15¼ miles south of Faith.	.60		Mar. 19 Mar. 21 May 14	2.20 .73 0
Do........	....do.......	SW¼ sec. 3, T. 10 N., R. 17 E., at bridge on State Highway 73, 12¼ miles south of Faith.	4.58		Mar. 19 May 14 June 25	11.1 0 7.96
Beaver Creek.	....do.......	SW¼ sec. 3, T. 11 N., R. 17 E., at bridge on State Highway 73, 6 miles south of Faith.	-		Mar. 19 Mar. 21 May 15	53.5 33.8 a.05

Bad River basin, S. Dak.

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
Buffalo Creek	South Fork Bad River.	SE¼ sec. 7, T. 1 S., R. 20 E., at bridge on U. S. Highway 16, 1 mile above confluence with Cottonwood Creek and 7 miles east of Cottonwood.	-	1955	May 15 June 11 June 26 July 10 July 24 Aug. 7 Aug. 20 Sept.10	16.5 0 0 *3.99 0 217 *a.02 0

Mush Creek basin, S. Dak.

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
Mush Creek...	Missouri River.	NE¼ sec. 16, T. 110 N., R. 78 W., at bridge on State Highway 34, 7½ miles east of Pierre.	14.6	1955	Mar. 1 Mar. 5 Mar. 17 Mar. 19 Mar. 21 Aug. 8 Aug. 11	a0.01 0 0 9.31 3.50 0 0

Missouri River tributaries, S. Dak.

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
Unnamed tributary.	Missouri River.	NE¼ sec. 15, T. 110 N., R. 78 W., at culvert on State Highway 34, 8 miles east of Pierre.	0.42	1955	Mar. 1 Mar. 5 Mar. 17 Mar. 19 Mar. 21 Aug. 8	0 a.1 a.5 a.5 a.1 0
Do........	....do.......	NW¼ sec. 13, T. 110 N., R. 78 W., at culvert on State Highway 34, 9½ miles east of Pierre.	.20	1955	Mar. 1 Mar. 5 Mar. 17 Mar. 19 Mar. 21 Aug. 11	0 a.5 .80 .93 .08 0

* Base flow.
a Estimated.

Discharge measurements made at points other than gaging stations in the Missouri River basin above Sioux City, Iowa, during the water year 1956--Continued

Missouri River tributaries, S. Dak.--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
Unnamed tributary.	Missouri River.	SW¼ sec. 28, T. 110 N., R. 76 W., at culvert on State Highway 34, 19½ miles east of Pierre.	1.64	1955	Mar. 5 Mar. 17 Mar. 19 Mar. 21 Aug. 8 Aug. 15	0 3.06 9.01 2.67 0 0

Medicine Creek basin (lower), S. Dak.

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
North Fork Medicine Creek.	Medicine Creek.	SE¼ sec. 29, T. 106 N., R. 79 W., at bridge on U. S. Highway 83, 2¾ miles northwest of Vivian.	45.9		Mar. 17 Mar. 19 Mar. 23 Mar. 26 May 29 Aug. 9 Aug. 15 Sept.12	0 15.9 19.7 11.2 0 0 0 0
Unnamed tributary.	....do.......	SE¼ sec. 5, T. 107 N., R. 79 W., at culvert on U. S. Highway 83, 12¼ miles northwest of Vivian.	.30		Mar. 17 Mar. 19 Mar. 26 May 29 Aug. 9 Aug. 15 Sept.12	0 1.19 1.08 0 0 0 0
Do........	Unnamed tributary.	NW¼ sec. 33, T. 107 N., R. 79 W., at bridge on U. S. Highway 83, 8 miles northwest of Vivian.	8.62		Mar. 17 Mar. 19 Mar. 23 Mar. 26 May 29 Aug. 9 Aug. 15 Sept.12	0 45.8 3.58 3.30 0 0 0 0

Crow Creek basin, S. Dak.

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
Elm Creek....	Crow Creek...	Between secs. 7 and 18, T. 107 N., R. 69 W., at bridge on State Highway 34, 9 miles northwest of Gann Valley.	-	1955	May 23 June 13 July 6 July 27 Aug. 16 Aug. 30 Sept.11	*0.53 0 0 0 1.37 *.28 *a.01

White River basin

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
Soldiers Creek.	White River..	Sec. 3, T. 31 N., R. 53 W., 0.4 mile upstream from boundary fence of Fort Robinson Military Reservation and 6 miles west of Crawford, Nebr.	b45		1955 June 25	 †4.0
Chadron Creek.	....do.......	Sec. 36, T. 32 N., R. 49 W., 100 ft south of entrance to Chadron State Park, 200 ft from State Highway 19, and 8 miles south of Chadron, Nebr.	b16		1955 May 16	 ‡50.0
Unnamed tributary.	Cain Creek...	SE¼NW¼ sec. 12, T. 4 S., R. 14 E., at bridge on State Highway 40, 300 ft below Chicago, Milwaukee, St. Paul and Pacific RR. bridge and ½ mile east of Imlay, S. Dak.	14.0	1955	Apr. 14 July 10 Aug. 8 Aug. 10	0 0 35.2 0
Do........	White River..	N½ sec. 28, T. 2 S., R. 16 E., at culvert on U. S. Highway 16A, 8¼ miles northwest of Conata, S. Dak.	.17	1955	Mar. 8 Apr. 14 July 10 Aug. 8	a.1 0 0 a.01
Do........	....do.......	SE¼ sec. 27, T. 3 S., R. 18 E., at culvert on U. S. Highway 16A, 2½ miles northeast of Interior, S. Dak.	.14	1955	Mar. 8 Apr. 14 July 10 Aug. 8	a.1 0 0 a.03
Bear in the Lodge Creek.	....do.......	SW¼ sec. 12, T. 41 N., R. 38 W., at highway from Wanblee to Headlee Ranch, 7 miles southwest of Wanblee, S. Dak.	-	1951, 1954-55	Oct. 17 May 16 June 12 June 27 July 10 July 24 Aug. 8 Aug. 21 Sept.11	*3.36 21.5 *6.77 *3.38 *2.74 *1.46 63.2 15.2 *7.51

* Base flow.
† Erroneously listed with determinations of peak discharge in WSP 1389.
‡ Erroneously listed as 500 cfs with determinations of peak discharge in WSP 1389.
a Estimated.
b Approximately.

Discharge measurements made at points other than gaging stations in the Missouri River basin above Sioux City, Iowa, during the water year 1956--Continued

White River basin--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
Unnamed tributary.	South Fork White River.	NW¼ sec. 25, T. 39 N., R. 29 W., at culvert on U. S. Highway 83, 3¼ miles northwest of Mission, S. Dak.	2.62		Mar. 19	29.8
					Mar. 20	3.20
					Mar. 22	.59
					Apr. 25	a.2
					May 29	0
					Aug. 9	.06
					Aug. 21	0
					Sept.11	0
Horse Creek..	....do.......	SW¼ sec. 36, T. 40 N., R. 29 W., at culvert on U. S. Highway 83, 6¾ miles northwest of Mission, S. Dak.	6.05		Mar. 19	7.77
					Mar. 20	1.32
					Mar. 22	.23
					Apr. 25	a.1
					May 29	0
					Aug. 9	0
					Aug. 21	0
					Sept.11	0
Unnamed tributary.	....do.......	NE¼ sec. 26, T. 41 N., R. 29 W., at bridge on U. S. Highway 83, 5 miles south of White River, S. Dak.	9.50		Mar. 19	5.76
					Mar. 21	3.81
					Apr. 25	0
					May 29	0
					Aug. 9	0
					Sept.11	0

Niobrara River basin, Nebr.

Cottonwood Creek.	Niobrara River.	NE¼ sec. 16, T. 29 N., R. 48 W., at bridge on State Highway 19, 2 miles northwest of Dunlap.	b83	1951,1953	July 5	12.4

James River basin

James River..	Missouri River.	At bridge on U. S. Highway 52, on south line of sec. 10, T. 148 N., R. 72 W., 5 miles southwest of Manfred, N. Dak.	-	1955	Apr. 13	125
					Apr. 18	*5
					Apr. 28	*2
					May 11	*2
					June 6	*3
					Aug. 9	0
					Aug. 20	0
Unnamed creek	James River..	At bridge on county road on west line of sec. 7, T. 148 N., R. 72 W., 8 miles southwest of Manfred, N. Dak.	-	1955	Apr. 13	3
					Apr. 18	*2
					June 6	*2.5
					June 25	0
					Aug. 9	0
					Aug. 20	0
Do........	....do.......	At culvert on U. S. Highway 52, on north line of sec. 18, T. 148 N., R. 71 W., 3½ miles south of Manfred, N. Dak.	-	1955	Apr. 13	12.2
					Apr. 18	4.54
					May 11	.2
					June 6	0
					Aug. 9	0
					Aug. 20	0
Rocky Run Creek.	....do.......	At bridge on county road on east line of sec. 21, T. 148 N., R. 66 W., 5 miles southeast of New Rockford, N. Dak.	-	1955	Nov. 1	0
					Dec. 28	0
					Jan. 30	0
					Apr. 18	41.9
					Apr. 27	3.66
					May 11	0
Unnamed creek	Minneapolis Flats Creek.	At culvert on county road on east line of sec. 6, T. 139 N., R. 65 W., 3½ miles west of Eldridge, N. Dak.	-	1955	Mar. 20	0
					Apr. 10	1
					Apr. 20	0
					May 11	*.1
					June 1	*1
					June 4	*.05
					June 6	27.2
					June 7	6.16
					June 29	*.2
					July 13	*.05
					Aug. 3	0
					Aug. 28	0
Do........	James River..	At culvert on U. S. Highway 281, on west line of sec. 24, T. 139 N., R. 64 W., 3½ miles south of Jamestown, N. Dak.	-		June 7	131
Beaver Creek.	....do.......	At bridge on county road on west line of sec. 20, T. 138 N., R. 64 W., 2 miles northwest of Sydney, N. Dak.	-	1955	Mar. 20	1.83
					Apr. 10	1.5
					Apr. 19	*.94
					May 11	2
					June 1	10
					June 6	436
					June 7	308
					June 8	121
					July 5	1
					July 13	4
					Aug. 3	*.2
					Aug. 28	0

* Base flow.
a Estimated.
b Approximately.

Discharge measurements made at points other than gaging stations in the Missouri River basin above Sioux City, Iowa, during the water year 1956--Continued

James River basin--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
Unnamed creek	Buffalo Creek	At bridge on county road on west line of sec. 1, T. 137 N., R. 65 W., 3½ miles southwest of Sydney, N. Dak.	-	1955	Apr. 10 Apr. 19 May 11 June 1 June 6 June 7 June 8 July 13 Aug. 3 Aug. 28	1 0 3 2 112 336 15.3 0 0 0
Bear Creek...	James River..	At bridge on State Highway 1 on east line of sec. 8, T. 121 N., R. 59 W., 3 miles north of Oakes, N. Dak.	-	1954-55	Oct. 24	*.01
Unnamed tributary.	Elm River....	NE¼ sec. 3, T. 127 N., R. 66 W., at culvert on highway, 12¼ miles northeast of Leola, S. Dak.	14.7		Mar. 14 Mar. 21 Mar. 28 Apr. 5 Apr. 25 May 16 June 7 June 28 July 20 Sept.18	0 0 0 a.2 0 .26 .09 0 0 0
Maple River..	....do.......	At bridge on county road on north line of sec. 22, T. 129 N., R. 62 W., 4½ miles southeast of Ellendale, N. Dak.	-	1954-55	Oct. 24 Apr. 26 June 7 July 5 Aug. 2 Aug. 27	.08 5.17 *1.34 *.17 1.18 0
Do........	....do.......	NE¼SW¼NW¼ sec. 11, T. 127 N., R. 64 W., at dam on Maple River in city park at west edge of Frederick, S. Dak.	552	1955	Oct. 5 Mar. 14 Mar. 21 Mar. 28 Apr. 5 May 16 June 7 June 28 July 19 Aug. 8 Aug. 29 Sept.18	0 0 0 0 23.8 5.26 2.15 *.10 0 0 0 0
Snake Creek..	James River..	Between sec. 35, T. 120 N., R. 65 W., and sec. 2, T. 119 N., R. 65 W., at bridge on State Highway 20, 2½ miles west of Northville, S. Dak.	-	1955	Oct. 5 May 15 June 6 July 18 Aug. 9 Aug. 28 Sept.18	0 .53 .15 .19 .05 0 0
Rock Creek...	....do.......	Between secs. 17 and 18, T. 103 N., R. 59 W., at highway bridge, 1¼ miles above mouth and 3½ miles east of Mitchell, S. Dak.	-	1955	Oct. 3 May 21 June 11 July 5 July 24 Aug. 14 Aug. 28 Sept.11	0 .08 0 0 0 2.71 0 0
Enemy Creek..	....do.......	SW¼ sec. 15, T. 102 N., R. 59 W., at highway bridge, ½ mile above mouth and 6¼ miles west of Alexandria, S. Dak.	-	1955	Nov. 2 Dec. 22 Jan. 17 Mar. 7 Mar. 21 Mar. 27 Apr. 2 May 2 May 21 June 11 July 5 July 24 Aug. 28 Sept.11	0 a.1 0 a.2 2.72 4.69 4.95 1.41 *.72 *.07 *.24 *.08 *.22 *.20
Unnamed tributary.	Dry Creek....	NE¼ sec. 27, T. 99 N., R. 60 W., at culvert on highway, 3¾ miles southeast of Parkston, S. Dak.	3.19		Feb. 27 Mar. 27 Apr. 4 July 25 Aug. 8	0 a.02 .72 0 0

* Base flow.
a Estimated.

Discharge measurements made at points other than gaging stations in the Missouri River basin above Sioux City, Iowa, during the water year 1956--Continued

James River basin--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
Dry Creek....	James River..	NE¼ sec. 29, T. 99 N., R. 59 W., at highway bridge, 7½ miles southeast of Parkston, S. Dak.	37.0		Feb. 27	0
					Mar. 21	3.06
					Mar. 27	2.53
					Apr. 4	8.88
					July 25	0
					Aug. 8	0
South Branch Dry Creek.	Dry Creek....	NW¼ sec. 33, T. 99 N., R. 59 W., at highway bridge, 8¼ miles southeast of Parkston, S. Dak.	17.1		Feb. 27	0
					Mar. 21	0
					Mar. 26	.71
					Apr. 4	3.46
					July 25	0
					Aug. 8	0
Dry Creek....	James River..	SE¼ sec. 21, T. 99 N., R. 59 W., at highway bridge, 8½ miles southeast of Parkston, S. Dak.	76.8		Feb. 27	0
					Mar. 21	4.36
					Mar. 27	4.56
					Apr. 4	15.0
					July 25	0
					Aug. 8	0

Vermillion River basin, S. Dak.

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
Saddlerock Creek.	Long Creek...	SE¼ sec. 14, T. 97 N., R. 51 W., at highway bridge, 9¾ miles northwest of Beresford.	26.3	1955	Mar. 2	0
					Apr. 5	0
					Apr. 13	0
					June 5	0
					July 25	0
					Aug. 8	0

Big Sioux River basin, S. Dak.

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
Big Sioux River.	Missouri River.	NW¼ sec. 34, T. 121 N., R. 52 W., at highway bridge, 9½ miles southeast of Waubay.	53.8	1955	Mar. 15	0
					Mar. 22	0
					Apr. 11	21.8
					Apr. 26	3.71
					May 16	9.50
					June 8	4.34
					June 28	*1.67
					July 22	*.08
					Aug. 9	8.15
					Aug. 29	*.16
					Sept.18	0
Unnamed tributary.	Big Sioux River.	NW¼ sec. 30, T. 121 N., R. 51 W., at culvert on U. S. Highway 81, 11¼ miles southeast of Waubay.	1.27		Mar. 15	0
					Mar. 22	0
					Apr. 3	5.16
					Apr. 11	a.2
					Apr. 26	0
					May 16	0
					June 8	0
					June 28	0
					July 22	0
					Aug. 9	0
					Aug. 29	0
					Sept.18	0
Do........	....do.......	SE¼ sec. 25, T. 121 N., R. 52 W., at culvert on highway, 11½ miles southeast of Waubay.	6.60		Mar. 15	0
					Mar. 22	0
					Apr. 3	31.6
					Apr. 11	4.89
					Apr. 26	0
					May 16	a.04
					June 8	0
					June 28	0
					July 22	0
					Aug. 9	.26
					Aug. 29	0
					Sept.18	0
Pee Monkey Run.	....do......	N½ sec. 29, T. 113 N., R. 50 W., at bridge on State Highway 28, 2½ miles east of Estelline.	25.4		Mar. 2	0
					Mar. 22	0
					Apr. 2	21.2
					Apr. 10	2.57
					June 19	4.96
					June 20	2.14
					July 26	0
					Aug. 4	21.1
North Deer Creek.	....do......	SE¼ sec. 35, T. 112 N., R. 50 W., at bridge on U. S. Highway 77, 9¾ miles southeast of Estelline.	48.3		Mar. 2	0
					Mar. 22	0
					Apr. 3	9.23
					Apr. 10	2.21
					June 19	31.2
					June 20	11.0
					July 26	0
					Aug. 4	91.2

* Base flow.
a Estimated.

The following table contains determinations of peak discharge made at crest stage by indirect methods or by current meter or computed from rating curve at points other than regular gaging stations.

Determinations of peak discharge during water year October 1955 to September 1956

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Date	Discharge (cfs)
Unnamed creek	Burnt Creek..	At culvert on U. S. Highway 83, 0.2 mile south of section corners 14, 15, 22, 23, T. 141 N., R. 80 W., 2 miles west of Baldwin, N. Dak.	-		July 7	73.4
Do........	....do.......	At culvert on U. S. Highway 83, in SW¼SW¼ sec. 35, T. 141 N., R. 80 W., 3½ miles southwest of Baldwin, N. Dak.	-		June 30 July 7	380 247
West Branch Long Lake Creek.	Long Lake Creek.	At culvert on State Highway 34, on north line of sec. 30, T. 135 N., R. 75 W., 5.9 miles east of Hazelton, N. Dak.	-		June 6	798
Unnamed creek	Missouri River.	At county road in SE¼ sec. 31, T. 137 N., R. 79 W., 2 miles northwest of Huff, N. Dak.	-		June 5	1,890
Spring Creek.	Beaver Creek.	At bridge on county road on east line of sec. 28, T. 133 N., R. 76 W., 2½ miles north of Linton.	31		June 6	2,790
Pine Creek...	Hat Creek....	NW¼ sec. 15, T. 10 S., R. 4 E., at bridge on State Highway 87, 11½ miles north of Ardmore, S. Dak.	5.47		June 17	1,110
Mush Creek...	Missouri River.	NE¼ sec. 16, T. 110 N., R. 78 W., at bridge on State Highway 34, 7½ miles east of Pierre, S. Dak.	14.6	1955	Aug. 10	3,620
Unnamed tributary.	....do.......	NE¼ sec. 15, T. 110 N., R. 78 W., at culvert on State Highway 34, 8 miles east of Pierre, S. Dak.	.42	1955	Aug. 10	705
Do........	....do.......	NW¼ sec. 13, T. 110 N., R. 78 W., at culvert on State Highway 34, 9½ miles east of Pierre, S. Dak.	.20	1955	Aug. 10	172
Do........	....do.......	SW¼ sec. 28, T. 110 N., R. 76 W., at culvert on State Highway 34, 19½ miles east of Pierre, S. Dak.	1.64	1955	Aug. 7-8	976
Unnamed creek	James River..	At culvert on U. S. Highway 281 on west line of sec. 24, T. 139 N., R. 64 W., 3½ miles south of Jamestown, N. Dak.	-		June 6	360
Unnamed tributary.	West Fork Vermillion River.	SW¼ sec. 36, T. 109 N., R. 56 W., 13½ miles north of Howard, S. Dak.	.87		June 4	817
Do........	....do.......	NW¼ sec. 12, T. 108 N., R. 56 W., at culvert on highway, 12 miles north of Howard, S. Dak.	2.56		June 4	780
Do........	....do.......	Between NE¼ sec. 10 and NW¼ sec. 11, T. 107 N., R. 56 W., at culvert on highway, 5¾ miles north of Howard, S. Dak.	28.9		June 4	380
West Fork Vermillion River.	Vermillion River.	SE¼ sec. 2, T. 106 N., R. 56 W., at bridge on State Highway 34 at Howard, S. Dak.	85.6		June 5	420

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