1971

Water Resources Data for North Dakota

Part 1. Surface Water Records

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

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

CALENDAR FOR WATER YEAR 1971

OCTOBER 1970

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
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25	26	27	28	29	30	31

NOVEMBER 1970

S	M	T	W	T	F	S
1	2	3	4	5	6	7
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29	30					

DECEMBER 1970

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JANUARY 1971

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31						

FEBRUARY 1971

S	M	T	W	T	F	S
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28						

MARCH 1971

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APRIL 1971

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MAY 1971

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30	31					

JUNE 1971

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JULY 1971

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18	19	20	21	22	23	24
25	26	27	28	29	30	31

AUGUST 1971

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8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

SEPTEMBER 1971

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

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North Dakota State Water Commission
North Dakota Highway Department
Oliver County, North Dakota
Corps of Engineers, U.S. Army
Bureau of Reclamation, U.S. Department of the Interior
International Joint Commission, U.S. Department of State
Fish and Wildlife Service, U.S. Department of the Interior
Soil Conservation Service, U.S. Department of Agriculture

Water resources records, 1971, for North Dakota are in the following reports of the U.S. Geological Survey:

1. Water Resources Data for North Dakota
   Part 1: Surface Water Records

2. Water Resources Data for North Dakota
   Part 2: Water Quality Records

Copies of this report may be obtained from
District Chief, Water Resources Division
U.S. Geological Survey
Room 348 - Federal Building
Bismarck, N. Dak. 58501

1972

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PART 1. SURFACE-WATER RECORDS

INTRODUCTION

Surface-water records for the 1971 water year for North Dakota including records of streamflow for reservoir storage at gaging stations, partial-record stations, and miscellaneous sites, are given in this report and their locations shown in figure 1. Records for a few pertinent gaging stations in bordering States are also included. The records were collected and computed by the Water Resources Division of the U.S. Geological Survey under the direction of R. C. Williams, district chief. These data represent that portion of the National Water Data System collected by the U.S. Geological Survey and cooperating State and Federal agencies in North Dakota.

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

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

COOPERATION

The U.S. Geological Survey and organizations of the State of North Dakota have had cooperative agreements for the systematic collection of surface-water records since 1903. Organizations that supplied data are acknowledged in station descriptions. Organizations that assisted in collecting data through cooperative agreements with the Survey are:

North Dakota State Water Commission
M. W. Hoisveen, Chief Engineer.

North Dakota State Highway Department
W. R. Hjelle, Commissioner.

Oliver County Board of Commissioners
William R. Van Oosting, Chairman.

Assistance in the form of funds or services was given by other Federal agencies:

Corps of Engineers, U.S. Army
International Joint Commission, U.S. Department of State
Soil Conservation Service, U.S. Department of Agriculture
Bureau of Sport Fisheries and Wildlife, U.S. Department of the Interior
Bureau of Reclamation, U.S. Department of the Interior

DEFINITION OF TERMS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

SPECIAL NETWORKS AND PROGRAMS

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

DOWNSTREAM ORDER AND STATION NUMBERS

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

As an added means of identification, each gaging station and partial-record station has been assigned a station number. These are in the same downstream order used in this report. In assigning station numbers, no distinction is made between partial-record stations and continuous-record gaging stations; therefore, the station number for a partial-record station indicates downstream order postion in a list made up of both types of stations. Gaps are left in the numbers to allow for new stations that may be established; hence, the numbers are not consecutive. The complete 8-digit number for each station, such as 06330000, includes the part number "06" and a 6-digit station number, just to the left of the station name. In this report, the records are listed in downstream order by parts. All records for a drainage basin encompassing more than one State could be arranged in downstream order by assembling pages from the various State reports by station number to include all records in the basin.

EXPLANATION OF SURFACE-WATER DATA

Collection and Computation of Data

The base data collected at gaging stations consists of records of stage and measurement of discharge of streams or canals, and stage,

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

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

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

At some stream-gaging stations the stage-discharge relation is affected by ice in the winter, and it becomes impossible to compute the discharge in the usual manner. Discharge for periods of ice effect is computed on the basis of the gage-height record and occasional winter discharge measurements, consideration being given to

the available information on temperature and precipitation, notes by gage observers and hydrologists, and comparable records of discharge for other stations in the same or nearby basins.

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

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

For some gaging stations there are periods when no gage-height record is obtained or the recorded gage height is so faulty that it cannot be used to compute daily discharge or contents. This happens when the recorder stops or otherwise fails to operate properly, intakes are plugged, the float is frozen in the well, or for various other reasons. For such periods, the daily discharges are estimated on the basis of recorded range in stage, adjoining good record, discharge measurements, weather records, and comparisons with other station records from the same or nearby basins. Likewise, daily contents may be estimated on the basis of operator's log, adjoining good record, inflow-outflow studies, and other information.

The data in this report generally comprise a description of the station and tabulations of basic data. For gaging stations on streams or canals a table showing the daily discharge and monthly and yearly discharge is given. For gaging stations on lakes and reservoirs a monthly summary table of stage and contents or a table showing the daily contents is given. Tables of daily mean gage heights are included for some streamflow stations and for some reservoir stations. Records are published for the water year, which begins on October 1 and ends on September 30. A calendar for the 1971 water year is shown on the reverse side of the front cover to facilitate finding the day of the week for any date.

The description of the gaging station gives the location, drainage area, period of record, type and history of gages, average discharge, extremes of discharge or contents, and general remarks. The location of the gaging station and the drainage area are obtained from the most accurate maps available. River mileage, given under "LOCATION" for some stations, is that determined and used by the Corps of Engineers or other agencies. Periods for which there are published records for the present station or for stations generally

equivalent to the present one are given under "PERIOD OF RECORD." The type of gage currently in use, the datum of the present gage above mean sea level, and a condensed history of types, locations, and datums of previous gages used during the period of record are given under "GAGE." In references to datum of gage, the phrase "mean sea level" denotes "Sea Level Datum of 1929" as used by the Topographic Division of the Geological Survey, unless otherwise qualified. The average discharge for the number of years indicated is given under "AVERAGE DISCHARGE"; it is not given for stations having fewer than 5 complete years of record or for stations where changes in water development during the period of record cause the figure to have little significance. In addition, the median of yearly mean discharges is given for stream-gaging stations having 10 or more complete years of record if the median differs from the average by more than 10 percent. The maximum discharge (or contents) and the maximum gage height, the minimum discharge if there is little or no regulation (or the minimum contents), and the minimum gage height if it is significant are given under "EXTREMES." The minimum daily discharge is given if there is extensive regulation (also the minimum discharge and gage height if they are abnormally low). In the first paragraph headed "Current year:" the data given are for the complete current water year unless otherwise specified. In the second paragraph under "EXTREMES" headed "Period of record:" the data given are for the period of record given in PERIOD OF RECORD paragraph. Reliable information concerning major floods that occurred outside the period of record is given in the third or last paragraph under "EXTREMES." Unless otherwise qualified, the maximum discharge (or contents) corresponds to the crest stage obtained by the use of a water-stage recorder (grapic or digital), a crest-stage gage, or a nonrecording gage read at the time of the crest. If the maximum gage height did not occur at the same time as the maximum discharge or contents, it is given separately. Information pertaining to the accuracy of the discharge records, to conditions that affect the natural flow at the gaging station, and availability of Water Quality records, is given under "REMARKS"; for reservoir stations information on the dam forming the reservoir, the capacity, outlet works and spillway, and purpose and use of the reservoir, is also given under "REMARKS."

Previously published records of some stations have been found to be in error on the basis of data or information later obtained. Revisions of such records are usually published along with the current records in one of the annual or compilation reports. In order to make it easier to find such revised records, a paragraph headed "REVISIONS (WATER YEARS)" has been added to the description of all stations for which revised records have been published. Listed therein are all reports in which revisions have been published, each followed by the water years for which figures are revised in that report. In listing the water years only one number

is given; for instance, 1933 stands for the water year October 1, 1932, to September 30, 1933. If no daily, monthly, or annual figures of discharge were revised, that fact is brought out by notations after the year date 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 stream-gaging stations where they serve a useful purpose and the dates of applicability can be easily identified.

Skeleton capacity tables are published for all reservoirs for which records of contents are published on a daily basis.

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

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

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

or diversion, if the drainage area includes large noncontributing areas, or if the average rainfall on the drainage basin is usually less than 20 inches.

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

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

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

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

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

Accuracy of Data

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

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

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

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

Publications

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

annual and special reports published as water-supply papers.

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

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

Other Data Available

Data collected at partial-record stations and at miscellaneous sites are given in three tables at the end of the surface-water records in this report. The first is a table of discharge measurements at low-flow partial-record stations, the second is a table of annual maximum stage and discharge at crest-stage stations, and the third is a table of discharge measurements at miscellaneous sites.

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

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

Hydrologic Conditions

Precipitation was below normal in the central and south central part of the state and above normal elsewhere. Streamflow varied from near normal to well above normal in the same pattern.

Some flooding occurred in the extreme northeastern and southwestern parts of the state owing to the excessive snowmelt during the spring breakup and severe thunderstorms during the summer.

Reservoirs in the state were above the desired operating levels at the end of the year.

For two key gaging stations, a comparison of monthly and yearly mean discharges for the 1971 water year with the median discharge for the 30 years (1931-60) is shown in figure 2.

SELECTED REFERENCES

Carter, R. W., and Davidian, Jacob, 1968, General procedure for gaging streams; U.S. Geol. Survey Techniques of Water-Resources Inv., book 3, chap. A 6, 13 p.

Corbett, D. M. and others, 1943, Stream-gaging procedure, a manual describing methods and practices of the Geological Survey: U.S. Geol. Survey Water-Supply Paper 888, 245 p.

Langbein, W. B., and Iseri, K. T., 1960, General introduction and hydrologic definitions: U.S. Geol. Survey Water-Supply Paper 1541-A, 29 p.

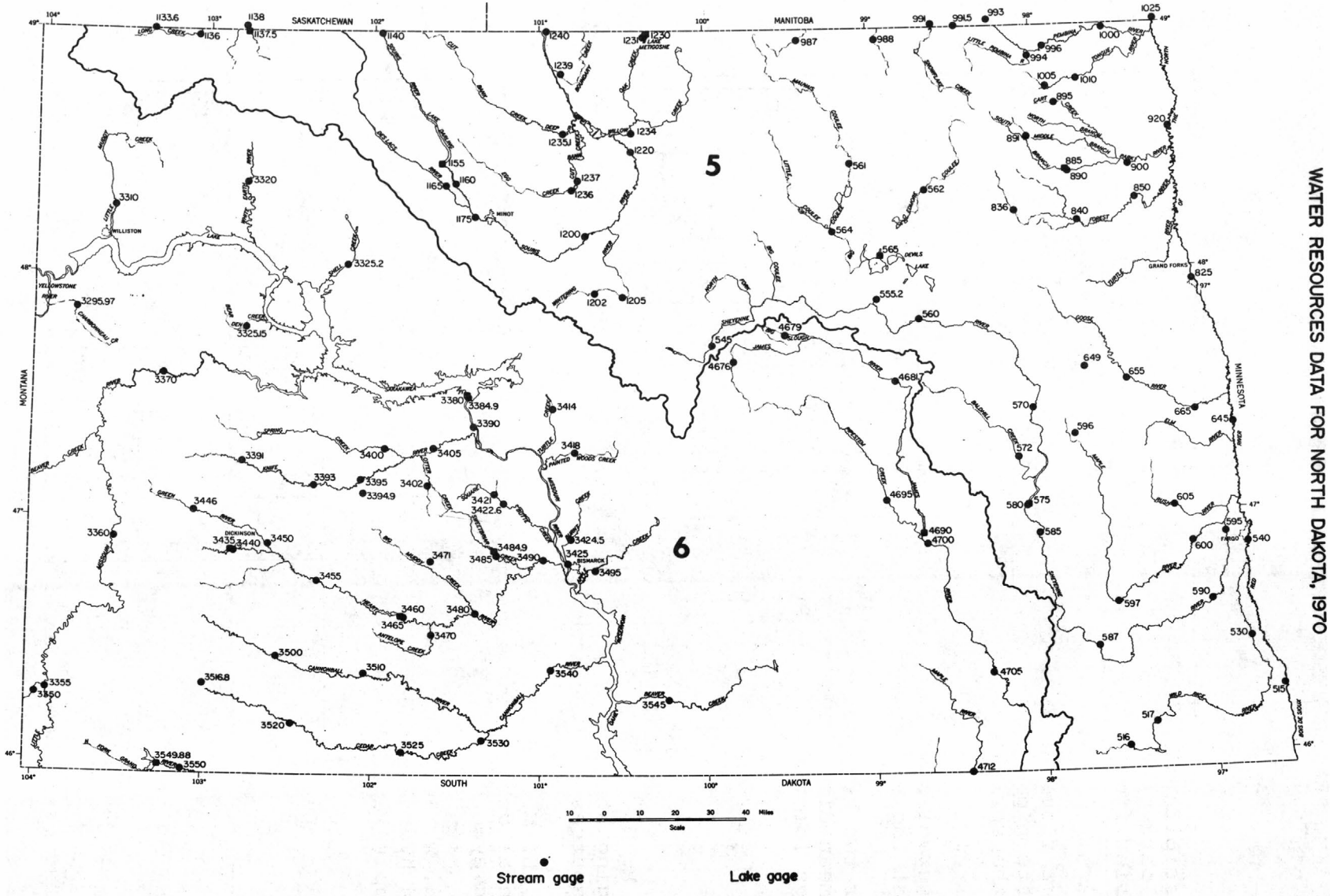

FIGURE 1.--Locations of lake and stream gaging stations.

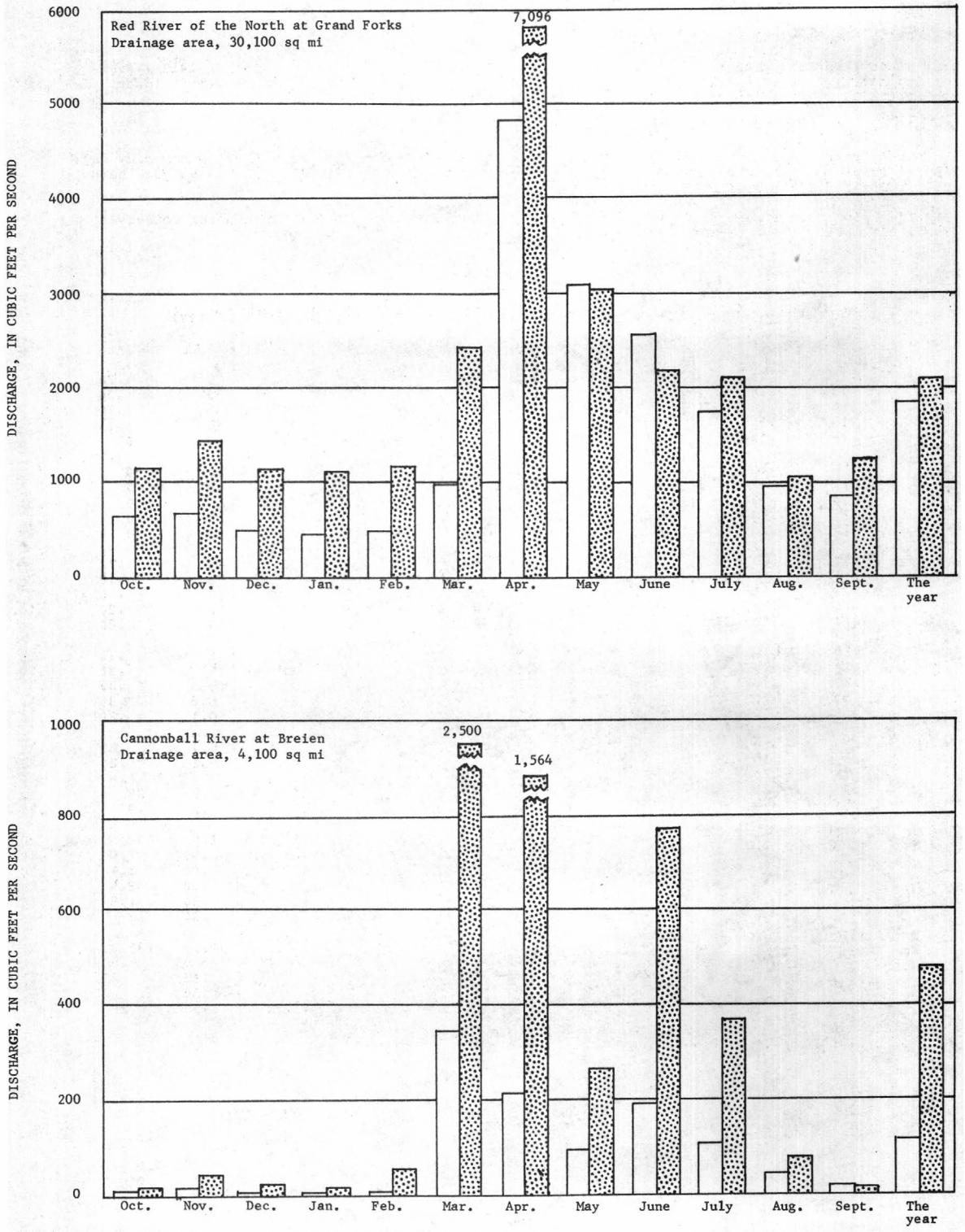

FIGURE 2.--RUNOFF DURING 1971 WATER YEAR COMPARED WITH MEDIAN RUNOFF FOR PERIOD 1931-60 FOR TWO REPRESENTATIVE GAGING STATIONS.

05050000 Bois de Sioux River near White Rock, S. Dak.

LOCATION.--Lat 45°51'45", long 96°34'25", in SW¼SW¼ sec.27, T.128 N., R.47 W., Roberts County, on left bank just downstream from Big Slough Outlet, 300 ft downstream from White Rock Dam, 4 miles south of White Rock, and 5 miles northwest of Wheaton, Minn.

DRAINAGE AREA.--1,160 sq mi, approximately.

PERIOD OF RECORD.--October 1941 to current year.

GAGE.--Water-stage recorder. Datum of gage is 960.00 ft above mean sea level, adjustment of 1912 (levels by Corps of Engineers). Prior to Jan. 14, 1943, nonrecording gage at same site at datum 0.11 ft lower. Jan. 15, 1943, to Sept. 30, 1963, water-stage recorder at same site at datum 0.11 ft lower.

AVERAGE DISCHARGE.--30 years, 82.9 cfs (60,060 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 188 cfs, June 26 (gage height, 5.93 ft); no flow for many days. Period of record: Maximum discharge, 3,770 cfs, occurred during period Apr. 19-21, 1969 (gage height, 15.07 ft, from floodmark); no flow at times in most years.

REMARKS.--Records poor. Flow regulated by Lake Traverse-Bois de Sioux Flood Control and Water Conservation Project (available capacity for flood control, 137,000 acre-ft).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1		.10	.10			0	8.0	5.8	4.8	115	.30	20
2		.10	.10			0	7.5	5.8	7.2	100	.30	22
3		.10	.10			0	5.0	5.8	14	85	.30	27
4		.10	.10			0	4.0	5.8	17	65	.10	13
5		.10	.10			0	3.5	5.8	23	48	0	22
6		.10	.10			0	3.0	5.6	19	32	0	13
7		.10	.10			0	8.0	5.4	10	28	0	11
8		.10	.10			0	15	5.1	7.5	24	0	4.8
9		.20	.10			0	28	4.8	22	25	0	6.1
10		.20	.10			0	13	4.8	81	23	0	3.8
11		.20	.10			.10	2.4	4.8	86	23	.10	5.1
12		.20	.10			.20	2.4	4.6	57	21	.10	3.0
13		.20	.10			.50	2.4	4.6	54	19	.10	8.5
14		.20	.10			1.0	2.4	4.6	52	20	.20	.70
15		.20	.10			1.5	2.4	4.6	51	19	.20	.10
16		.20	.10			2.7	2.4	4.4	40	18	.20	.20
17		.20	.10			3.0	2.2	4.6	26	19	.30	.20
18		.20	.10			3.2	2.2	4.4	22	16	.30	.10
19		.20	.10			3.4	2.2	4.4	21	6.8	.30	.10
20		.20	.10			3.6	2.2	4.6	16	6.1	.20	.10
21		.20	.10			3.8	2.4	4.4	31	5.1	.20	.10
22		.20	.10			4.0	2.1	4.4	101	5.1	.20	.20
23		.10	.10			3.5	2.1	4.4	174	3.0	1.4	.20
24		.10	.10			3.5	2.0	4.4	180	2.0	26	.10
25		.10	.10			4.0	1.9	4.4	184	1.0	43	.10
26		.10	.10			4.5	1.9	4.4	187	1.0	32	.20
27		.10	.10			5.0	1.9	4.4	185	.80	7.9	.20
28		.10	0			5.5	2.4	4.4	122	.80	6.4	.20
29		.10	0		------	6.0	3.8	4.4	150	.50	2.4	.20
30		.10	0		------	7.5	5.4	4.4	135	.50	1.8	.30
31		------	0		------	8.0	------	4.4	------	.30	12	------
TOTAL	0	4.40	2.70	0	0	74.50	144.1	148.7	2,079.5	733.00	136.30	162.60
MEAN	0	.15	.087	0	0	2.40	4.80	4.80	69.3	23.6	4.40	5.42
MAX	0	.20	.10	0	0	8.0	28	5.8	187	115	43	27
MIN	0	.10	0	0	0	0	1.9	4.4	4.8	.30	0	.10
AC-FT	0	8.7	5.4	0	0	148	286	295	4,120	1,450	270	323

CAL YR 1970 TOTAL 780.80 MEAN 2.14 MAX 38 MIN 0 AC-FT 1,550
WTR YR 1971 TOTAL 3,485.80 MEAN 9.55 MAX 187 MIN 0 AC-FT 6,910

05051500 Red River of the North at Wahpeton, N. Dak.

LOCATION.--Lat 46°15'55", long 96°35'40", in NE¼ sec.8, T.132 N., R.47 W., Richland County, on left bank in Wahpeton, 800 ft downstream from confluence of Bois de Sioux and Otter Tail Rivers and at mile 548.6.

DRAINAGE AREA.--4,010 sq mi, approximately.

PERIOD OF RECORD.--April 1942 to current year. Gage-height records collected in this vicinity since 1917 are contained in reports of U.S. Weather Bureau.

GAGE.--Water-stage recorder and concrete and wooden dam. Datum of gage is 942.97 ft above mean sea level. Prior to Aug. 6, 1943, U.S. Weather Bureau nonrecording gage 800 ft upstream, converted to present datum. Aug. 6, 1943, to Oct. 27, 1950, nonrecording gage at present site and datum.

AVERAGE DISCHARGE.--28 years (1943-71), 526 cfs (381,100 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 927 cfs Mar. 18 (gage height, 6.74 ft, backwater from ice); minimum, 56 cfs Nov. 23 (gage height, 3.07 ft); minimum gage height, 3.05 ft Oct. 19.
Period of record: Maximum discharge, 9,200 cfs Apr. 10, 1969 (gage height, 16.34 ft); minimum, 8 cfs Aug. 25, 1961 (gage height, 2.26 ft); minimum gage height, 1.76 ft Sept. 8, 9, 1969 (gates open).
A stage of 17.0 ft (discharge, 10,500 cfs) occurred in the spring of 1897 and has not been exceeded since.

REMARKS.--Records good. Flow regulated by Orwell Reservoir (capacity, 14,100 acre-ft at elevation 1,070 ft above mean sea level, adjustment of 1912); Lake Traverse (capacity, 137,000 acre-ft), available for flood control; numerous other controlled lakes and ponds, and several powerplants.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	83	103	105	150	110	210	650	531	326	436	236	130
2	122	96	110	150	110	205	555	459	321	435	239	126
3	136	97	110	150	110	200	400	438	312	480	244	120
4	140	161	110	145	135	195	500	484	334	632	243	189
5	142	209	110	145	150	190	551	522	356	530	240	160
6	130	217	110	145	140	210	570	523	348	497	240	159
7	91	220	130	145	137	250	433	515	336	517	242	157
8	89	221	135	145	136	240	445	500	328	521	240	153
9	72	226	150	145	135	205	709	471	259	503	239	146
10	78	225	155	145	135	180	794	452	228	507	243	139
11	73	243	155	145	135	164	808	422	266	566	247	157
12	70	222	155	145	120	180	772	407	304	659	213	185
13	72	213	165	145	110	214	686	406	340	682	164	186
14	70	206	165	140	120	308	610	405	357	648	154	186
15	68	201	165	130	120	510	568	389	353	617	150	224
16	69	249	160	130	120	639	550	326	344	593	145	231
17	69	217	160	130	120	755	513	207	338	526	145	217
18	67	206	155	125	120	874	500	225	305	404	153	194
19	66	200	140	122	130	872	493	309	276	400	141	177
20	69	198	150	118	140	781	491	316	336	406	97	165
21	83	199	160	128	130	756	476	314	376	390	94	169
22	81	131	160	126	120	626	496	306	340	388	90	169
23	88	76	160	120	125	549	530	281	327	390	89	165
24	88	150	165	110	130	531	523	249	359	387	87	167
25	92	140	170	110	140	497	493	250	369	379	86	159
26	94	110	170	110	160	449	483	259	397	384	91	158
27	95	85	165	110	190	429	463	269	413	385	92	155
28	94	85	163	110	190	424	421	290	408	374	96	159
29	92	100	160	110	------	435	407	284	447	315	100	162
30	95	100	155	110	------	477	526	294	466	255	149	172
31	99	------	150	110	------	600	------	321	------	237	152	------
TOTAL	2,777	5,106	4,573	4,049	3,718	13,155	16,416	11,424	10,269	14,443	5,141	5,036
MEAN	89.6	170	148	131	133	424	547	369	342	466	166	168
MAX	142	249	170	150	190	874	808	531	466	682	247	231
MIN	66	76	105	110	110	164	400	207	228	237	86	120
AC-FT	5,510	10,130	9,070	8,030	7,370	26,090	32,560	22,660	20,370	28,650	10,200	9,990

CAL YR 1970 TOTAL 115,566.9 MEAN 317 MAX 1,400 MIN 9.9 AC-FT 229,200
WTR YR 1971 TOTAL 96,107.0 MEAN 263 MAX 874 MIN 66 AC-FT 190,600

05051600 Wild Rice River near Rutland, N. Dak.

LOCATION.--Lat 46°01'20", long 97°30'40", in SE¼SE¼ sec.36, T.130 N., R.55 W., Sargent County, on right bank 1,000 ft upstream from bridge on county highway, 2 miles south of Rutland, and 10 miles upstream from Lake Tewaukon.

DRAINAGE AREA.--546 sq mi, of which about 250 sq mi is probably noncontributing.

PERIOD OF RECORD.--October 1959 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,197.73 ft above mean sea level. Prior to Dec. 12, 1960, non-recording gage at same site and datum.

AVERAGE DISCHARGE.--12 years, 10.8 cfs (7,820 acre-ft); median of yearly mean discharges, 6.8 cfs (4,900 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 70 cfs Mar. 16 (gage height, 4.04 ft, backwater from ice); no flow for several months.
Period of record: Maximum discharge, 1,270 cfs Apr. 8, 1969 (gage height, 8.77 ft, backwater from ice); maximum gage height, 8.78 ft Apr. 8 (backwater from ice); no flow for several months each year.

REMARKS.--Records fair.

REVISIONS.--WSP 1728: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						0	6.2	.87	.29	.29		
2						0	7.7	.73	.11	.34		
3						0	6.6	.73	.05	.08		
4						0	9.2	.66	.62	0		
5						0	8.3	.66	.94	0		
6						0	9.0	.66	.73	0		
7						0	8.5	.60	.66	0		
8						0	7.4	.39	.49	0		
9						0	6.6	.39	.39	0		
10						0	7.4	.29	.39	0		
11						1.0	6.1	.17	.73	0		
12						5.0	2.9	.08	.80	0		
13						7.0	2.8	.05	1.3	0		
14						2.0	2.8	.03	1.3	0		
15						20	3.2	.01	.94	0		
16						49	2.7	0	.66	0		
17						30	2.1	0	.49	0		
18						29	2.1	0	.39	0		
19						25	2.5	0	.08	0		
20						22	1.8	0	0	0		
21						10	1.7	0	0	0		
22						11	1.3	0	.08	0		
23						14	1.1	0	.01	0		
24						13	.80	.05	.08	0		
25						18	.73	0	.17	0		
26						10	.73	0	.17	0		
27						9.6	1.1	0	.11	0		
28						8.5	1.3	0	.03	0		
29					------	7.2	1.3	0	.17	0		
30					------	7.7	1.1	0	.39	0		
31		------			------	7.2	------	.08	------	0		------
TOTAL	0	0	0	0	0	306.2	117.06	6.45	12.57	.71	0	0
MEAN	0	0	0	0	0	9.88	3.90	.21	.42	.014	0	0
MAX	0	0	0	0	0	49	9.2	.87	1.3	.34	0	0
MIN	0	0	0	0	0	0	.73	0	0	0	0	0
AC-FT	0	0	0	0	0	607	232	13	25	.8	0	0

CAL YR 1970 TOTAL 1,615.46 MEAN 4.43 MAX 30 MIN 0 AC-FT 3,200
WTR YR 1971 TOTAL 442.99 MEAN 1.21 MAX 49 MIN 0 AC-FT 879

PEAK DISCHARGE (BASE, 30 CFS).--March 16 (70 cfs); March 25 (0800) 40 cfs (3.57 ft).

05051700 Wild Rice River near Cayuga, N. Dak.

LOCATION.--Lat 46°07'30", long 97°21'40", on line between secs.29 and 30, T.131 N., R.53 W., Sargent County, on left bank 20 ft downstream from county highway bridge, 1.2 miles downstream from Shortfoot Creek, 2.5 miles downstream from Crooked Creek, and 3.5 miles northeast of Cayuga.

DRAINAGE AREA.--955 sq mi, of which about 390 sq mi is probably noncontributing.

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

GAGE.--Water-stage recorder. Datum of gage is 1,095.64 ft above mean sea level (levels by Bureau of Reclamation). Prior to Oct. 9, 1957, nonrecording gage 0.8 mile upstream at different datum.

AVERAGE DISCHARGE.--15 years, 20.9 cfs (15,140 acre-ft per year); median of yearly mean discharges, 10 cfs (7,200 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 55 cfs Mar. 14 (gage height, 4.02 ft, backwater from ice); maximum gage height, 4.28 ft, Feb. 5, backwater from ice); no flow for many days.
Period of record: Maximum discharge, 1,710 cfs Apr. 12, 1969 (gage height, 9.32 ft); maximum gage height, 10.90 ft Apr. 7, 1969 (backwater from ice); no flow at times each year.

REMARKS.--Records good. Some regulation by Fish and Wildlife Service reservoirs, of which Lake Tewaukon is the largest. Small diversions for irrigation. Records of chemical analyses for the water year 1971 are published in Part 2 of this report.

REVISIONS.--WSP 1728: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0	.01	.01			0	4.8	.33	.01	.02	.04	.01
2	0	.01	.01			0	5.0	.19	.01	.01	.02	0
3	0	.01	.01			.01	6.5	.02	.01	.01	.01	0
4	0	.01	.01			.10	8.2	.02	.01	.01	.01	.01
5	0	.01	.01			.05	7.0	.10	.01	.01	0	0
6	0	.01	0			0	6.2	.06	.01	.73	0	0
7	0	.01	0			0	5.5	.01	.01	.01	0	0
8	0	.01	0			0	4.8	.01	.01	.04	0	0
9	0	.01	0			0	4.0	.01	.01	.10	0	0
10	0	.01	0			.10	4.0	.01	.01	1.1	0	0
11	0	.01	0			1.0	3.0	.01	.01	2.0	0	0
12	0	.01	0			1.2	2.4	.01	.01	1.8	0	0
13	0	.01	0			10	2.1	.01	.01	1.6	0	0
14	0	.01	0			40	2.0	.01	.01	2.1	0	0
15	0	.01	0			30	1.8	.01	.01	2.4	0	0
16	0	.01	0			25	1.5	.01	.01	2.8	0	0
17	0	.01	0			10	1.2	.01	.01	2.8	0	0
18	0	.01	0			6.0	1.2	.01	.01	3.0	0	0
19	0	.01	0			5.5	.98	.01	.01	3.6	0	0
20	0	.01	0			5.0	.78	.01	.01	3.6	0	0
21	0	.01	0			3.8	.58	.01	.01	3.6	0	0
22	0	.01	0			1.8	.33	.01	.01	3.0	0	0
23	0	.01	0			2.0	.14	.01	.01	2.8	0	0
24	0	.01	0			1.5	.04	.01	.01	2.8	0	0
25	.01	.01	0			1.2	.01	.01	.01	2.6	0	0
26	.01	.01	0			1.2	.01	.01	.01	2.0	0	0
27	.01	.01	0			1.1	.06	.01	.01	1.4	0	0
28	.01	.01	0			.78	.19	.01	.01	.98	0	0
29	.01	.01	0		------	.58	.33	.01	.02	.88	0	.01
30	.01	.01	0		------	3.0	.33	.01	.04	.40	.02	.02
31	.01	------	0		------	6.2	------	.01	------	.33	.04	------
TOTAL	.07	.30	.05	0	0	157.12	74.98	.97	.34	48.53	.14	.05
MEAN	.002	.010	.002	0	0	5.07	2.50	.031	.011	1.57	.005	.002
MAX	.01	.01	.01	0	0	40	8.2	.33	.04	3.6	.04	.02
MIN	0	.01	0	0	0	0	.01	.01	.01	.01	0	0
AC-FT	.1	.6	.1	0	0	312	149	1.9	.7	96	.3	.1

CAL YR 1970 TOTAL 2,675.49 MEAN 7.33 MAX 156 MIN 0 AC-FT 5,310
WTR YR 1971 TOTAL 282.55 MEAN .77 MAX 40 MIN 0 AC-FT 560

05053000 Wild Rice River near Abercrombie, N. Dak.

LOCATION.--Lat 46°28'05", long 96°47'00", in NE¼NE¼ sec.36, T.135 N., R.49 W., Richland County, on right bank 420 ft upstream from bridge on county highway, 0.75 mile upstream from rubble masonry dam which serves as control, 3.2 miles northwest of Abercrombie, and 7 miles downstream from Antelope Creek.

DRAINAGE AREA.--2,080 sq mi, of which about 590 sq mi is probably noncontributing.

PERIOD OF RECORD.--April 1932 to current year. Monthly discharge only for some periods, published in WSP 1308.

GAGE.--Water-stage recorder and masonry control. Datum of gage is 907.94 ft above mean sea level. Prior to Dec. 7, 1939, nonrecording gage at site 420 ft downstream at datum 5.0 ft lower. Dec. 7, 1939, to Nov. 24, 1952, nonrecording gage at site 0.75 mile downstream at present datum.

AVERAGE DISCHARGE.--39 years, 70.7 cfs (51,220 acre-ft per year); median of yearly mean discharges, 29 cfs (21,000 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 508 cfs July 4 (gage height, 4.18 ft); maximum gage height, 5.40 ft Mar. 18, backwater from ice); no flow Oct. 1 to Mar. 12.
Period of record: Maximum discharge, 9.540 cfs Apr. 11, 1969 (gage height, 24.58 ft); no flow at times most years.
Flood in spring of 1897 reached a stage of 27.5 ft, present site and datum, from floodmarks pointed out by local residents.

REMARKS.--Records good. Some regulation by Fish and Wildlife Service reservoirs, of which Lake Tewaukon is the largest. Some small diversions for irrigation.

REVISIONS (WATER YEARS).--WSP 1388: 1939, 1941(M). WSP 1728: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						0	110	21	6.0	6.0	2.2	1.6
2						0	50	20	7.0	6.0	1.9	1.2
3						0	75	24	8.6	25	1.7	.76
4						0	68	28	10	348	1.4	4.1
5						0	66	29	10	443	1.2	4.4
6						0	65	27	10	236	.98	7.0
7						0	62	20	15	163	.69	11
8						0	62	19	18	147	.55	32
9						0	52	18	17	111	.36	35
10						0	50	16	20	83	.42	33
11						0	47	14	34	57	.48	28
12						0	45	13	43	51	.36	22
13						1.0	41	11	42	88	.30	15
14						60	33	11	38	102	.21	11
15						147	27	10	33	81	.14	8.0
16						95	28	9.3	27	55	.09	7.5
17						201	28	8.0	24	40	.08	6.5
18						395	28	7.0	20	29	.10	4.4
19						360	25	6.0	18	25	.17	3.1
20						300	26	5.2	17	23	.17	1.7
21						280	24	4.4	14	24	.14	1.3
22						200	23	3.8	13	25	.10	.98
23						190	22	4.4	11	23	.08	.69
24						185	21	5.2	12	19	.08	.55
25						180	20	5.2	11	15	.06	.36
26						127	18	4.4	10	11	.04	.21
27						115	20	3.8	8.0	7.5	.04	.14
28						110	21	3.3	6.5	5.6	.02	.12
29					------	90	21	3.3	8.0	4.4	.06	.12
30					------	110	21	3.3	9.3	3.6	.48	.21
31		------			------	135	------	4.4	------	2.8	1.4	------
TOTAL	0	0	0	0	0	3,281.0	1,199	362.0	520.4	2,259.9	16.00	241.94
MEAN	0	0	0	0	0	106	40.0	11.7	17.3	72.9	.52	8.06
MAX	0	0	0	0	0	395	110	29	43	443	2.2	35
MIN	0	0	0	0	0	0	18	3.3	6.0	2.8	.02	.12
AC-FT	0	0	0	0	0	6,510	2,380	718	1,030	4,480	32	480

CAL YR 1970 TOTAL 13,055.92 MEAN 35.8 MAX 541 MIN 0 AC-FT 25,900
WTR YR 1971 TOTAL 7,880.24 MEAN 21.6 MAX 443 MIN 0 AC-FT 15,630

PEAK DISCHARGE (BASE, 300 CFS).--MARCH 18 (400 CFS); JULY 4 (2400) 508 CFS (4.18 FT).

05054000 Red River of the North at Fargo, N. Dak.

LOCATION.--Lat 46°51'40", long 96°47'00", in NW¼NE¼ sec.18, T.139 N., R.48 W., Cass County, at city waterplant on 4th St. S. in Fargo, 25 miles upstream from mouth of Sheyenne River and at mile 453.0.

DRAINAGE AREA.--6,800 sq mi, approximately.

PERIOD OF RECORD.--May 1901 to current year. Published as "at Moorhead, Minn." 1901. Monthly discharge only for some periods, published in WSP 1308.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 861.8 ft above mean sea level. Oct. 1, 1960, to Sept. 30, 1962, water-stage recorder at present site at datum 5.6 ft higher. Since Oct. 1, 1960, auxiliary water-stage recorder 2 miles upstream. See WSP 1728 or 1913 for history of changes prior to Oct. 1, 1960.

AVERAGE DISCHARGE (UNADJUSTED).--70 years, 533 cfs (386,200 acre-ft per year); median of yearly mean discharges, 440 cfs (319,000 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 1,910 cfs July 7 (gage height, 15.87 ft); no flow Oct. 1, 2 (gage height, 12.77 ft).
Period of record: Maximum discharge, 25,300 cfs Apr. 15, 1969 (gage height, 37.34 ft); no flow for many days in each year for period 1932-41, Sept. 30, Oct. 1, 2, 1970.
Flood of Apr. 7, 1897 reached a stage of 39.1 ft, present datum (discharge, 25,000 cfs) at site 1.5 miles downstream.

REMARKS.--Records good. Flow regulated by Orwell Reservoir (capacity, 14,100 acre-ft at elevation 1,070 ft above mean sea level, adjustment of 1912); Lake Traverse (capacity, 137,000 acre-ft, available for flood control); other controlled lakes and ponds and several powerplants. Some small diversions for municipal supply. Figures of daily discharge do not include diversion by cities of Fargo and Moorhead. Records of chemical analyses for water year 1971 are published in Part 2 of this report.

REVISION (WATER YEARS).--WSP 1308: 1902-4, 1906-7, 1910-14, 1916, 1918, 1924. WSP 1388: 1905-6, 1917-20(M), 1935(M), 1938-39(M), 1943.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0	107	94	145	125	122	905	430	310	475	257	111
2	1.8	107	94	145	125	133	764	475	310	489	213	125
3	23	107	94	140	125	148	732	510	316	489	199	122
4	39	104	94	140	125	165	764	475	332	612	194	489
5	59	101	94	140	125	208	692	436	356	1,190	194	1,150
6	84	94	94	140	125	227	620	449	339	1,850	194	788
7	101	129	91	140	125	213	676	489	344	1,750	194	496
8	111	177	88	140	130	199	820	503	350	1,440	181	310
9	107	213	91	140	135	203	1,100	496	344	1,200	181	218
10	98	213	98	140	140	236	1,200	475	350	977	177	181
11	81	218	107	140	140	251	1,000	462	316	828	186	177
12	65	222	120	140	140	257	878	449	272	772	181	160
13	59	222	125	140	135	236	836	416	272	692	181	148
14	57	241	130	140	135	232	796	398	299	804	181	156
15	57	208	133	140	135	232	716	398	327	905	165	177
16	57	165	137	140	125	288	628	386	356	844	125	177
17	52	160	140	140	125	392	575	362	442	772	107	177
18	33	213	140	140	115	708	552	356	598	684	104	194
19	26	232	135	140	105	1,030	503	283	462	620	107	203
20	23	232	130	145	105	1,320	489	222	374	496	111	190
21	21	222	130	150	105	1,430	468	241	339	416	118	177
22	21	199	135	145	110	1,280	462	310	339	404	114	169
23	32	169	140	140	115	1,140	442	362	410	386	84	160
24	50	111	145	135	120	1,000	449	339	436	374	91	156
25	70	104	150	130	125	941	468	316	392	368	76	160
26	91	104	150	125	135	860	475	288	374	368	73	160
27	91	125	150	125	130	844	468	270	380	356	73	160
28	98	141	155	125	125	820	496	251	380	350	68	165
29	98	125	155	130	------	748	482	262	468	344	65	169
30	98	104	155	125	------	772	436	277	475	339	73	160
31	98	------	150	125	------	905	------	316	------	304	104	------
TOTAL	1,901.8	4,869	3,844	4,270	3,505	17,540	19,892	11,702	11,062	21,898	4,371	7,385
MEAN	61.3	162	124	138	125	566	663	377	369	706	141	246
MAX	111	241	155	150	140	1,430	1,200	510	598	1,850	257	1,150
MIN	0	94	88	125	105	122	436	222	272	304	65	111
AC-FT	3,770	9,660	7,620	8,470	6,950	34,790	39,460	23,210	21,940	43,430	8,670	14,650
+	704	702	738	756	757	722	682	877	820	818	1,190	760
ADJUSTED FOR DIVERSION IN ACRE-FEET BY CITIES OF FARGO AND MOORHEAD												
MEAN	72.7	174	136	150	139	578	675	392	382	720	160	259
AC-FT	3,770	9,660	7,620	8,470	6,950	34,790	39,460	23,210	21,940	43,430	8,670	14,650

	OBSERVED						ADJUSTED			
CAL YR: TOTAL	140,668.0	MEAN	385	MAX	2,390	MIN	0	AC-FT	279,000	MEAN 400 AC-FT 289,400
WTR YR: TOTAL	112,239.8	MEAN	308	MAX	1,850	MIN	0	AC-FT	222,600	MEAN 321 AC-FT 232,100

+ Diversion in acre-feet by cities of Fargo and Moorhead.

05054500 Sheyenne River above Harvey, N. Dak.

LOCATION.--Lat 47°42'10", long 99°56'55", in SW¼SE¼ sec.24, T.149 N., R.73 W., Wells County, on right bank just downstream from county road, 2 miles upstream from unnamed tributary and 4.5 miles south of Harvey.

DRAINAGE AREA.--424 sq mi, of which about 270 sq mi is probably noncontributing.

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

GAGE.--Water-stage recorder. Datum of gage is 1,547.30 ft above mean sea level.

AVERAGE DISCHARGE.--16 years, 5.16 cfs (3,740 acre-ft per year); median of yearly mean discharges, 3.6 cfs (2,600 acre-ft per year).

EXTREMES.--Current year: Maximum discharge during year, 300 cfs Apr. 2 (gage height, 10.25 ft, backwater from ice); maximum gage height, 10.30 ft Apr. 1 (backwater from ice); minimum discharge, no flow Mar. 16; minimum gage height, 3.78 ft Aug. 30.
Period of record: Maximum discharge, 410 cfs Mar. 15, 1966 (gage height, 9.21 ft); maximum gage height, 10.30 ft Apr. 1, 1971 (backwater from ice); no flow at times most years.

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

REVISIONS.--WSP 1728: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.3	2.8	1.2	.70	.02	.40	150	36	4.7	26	4.3	1.1
2	1.3	3.4	1.1	.60	.02	.40	270	33	4.2	21	3.9	1.0
3	1.3	3.7	1.1	.50	.02	.50	170	30	3.8	19	3.8	.98
4	1.4	3.2	1.1	.40	.02	3.0	100	27	8.9	19	3.4	1.1
5	1.4	2.8	1.0	.40	.02	2.0	65	24	67	16	3.2	2.0
6	1.3	2.7	1.0	.30	.02	1.5	100	22	51	13	2.9	1.6
7	1.4	2.6	1.0	.30	.02	1.0	155	21	51	12	2.8	1.5
8	1.4	2.5	.90	.20	.02	1.0	145	19	86	10	2.4	1.3
9	1.5	2.5	.90	.20	.02	1.0	137	17	103	8.8	2.2	1.3
10	1.5	2.4	.90	.20	.02	1.0	118	17	103	7.6	2.0	1.2
11	1.7	2.4	.90	.10	.02	1.0	112	17	97	6.9	1.8	1.2
12	1.7	2.3	.80	.10	.02	4.0	126	16	91	7.5	1.7	1.1
13	1.7	2.2	.80	.10	.02	2.0	104	14	82	6.5	1.6	1.1
14	1.7	2.2	.80	.10	.06	1.5	90	13	74	6.0	1.5	1.1
15	1.7	2.2	.80	.10	.10	1.0	78	12	72	5.6	1.5	1.1
16	1.7	2.1	.70	.08	.30	.80	73	11	67	7.6	1.4	1.1
17	1.8	2.1	.70	.06	.50	.70	70	11	83	9.0	1.3	1.2
18	1.8	2.1	.70	.06	.30	.60	69	10	80	7.6	1.3	1.3
19	1.8	2.0	.70	.04	.20	.60	64	10	63	6.7	1.3	1.3
20	1.8	2.0	.60	.04	.20	.50	64	9.5	54	6.2	1.3	1.4
21	2.0	1.8	.60	.04	.20	.50	59	8.7	51	5.7	1.2	1.4
22	1.9	1.7	.60	.04	.20	.50	55	8.2	47	5.7	1.2	1.4
23	1.9	1.6	.60	.04	.30	.50	50	8.2	43	5.6	1.1	1.4
24	2.0	1.5	.60	.04	.50	.50	45	8.1	43	5.4	1.1	1.4
25	2.3	1.4	.60	.04	1.0	.70	42	8.2	41	5.3	1.1	1.5
26	2.5	1.4	.60	.04	.70	1.0	40	6.9	38	4.9	1.0	1.5
27	2.2	1.3	.60	.04	.50	2.0	41	6.1	30	5.1	1.0	1.5
28	2.2	1.3	.60	.04	.40	5.0	44	5.6	27	5.1	1.0	1.6
29	2.5	1.2	.60	.04	------	15	42	5.1	26	4.9	.98	1.7
30	2.5	1.2	.70	.04	------	40	38	4.8	28	4.9	.90	1.7
31	2.5	------	.70	.04	------	100	------	5.0	------	4.8	.94	------
TOTAL	55.70	64.60	24.50	5.02	5.72	190.20	2,716	444.40	1,619.60	279.40	57.12	40.08
MEAN	1.80	2.15	.79	.16	.20	6.14	90.5	14.3	54.0	9.01	1.84	1.34
MAX	2.5	3.7	1.2	.70	1.0	100	270	36	103	26	4.3	2.0
MIN	1.3	1.2	.60	.04	.02	.40	38	4.8	3.8	4.8	.90	.98
AC-FT	110	128	49	10.0	11	377	5,390	881	3,210	554	113	79

CAL YR 1970 TOTAL 1,667.87 MEAN 4.57 MAX 54 MIN .15 AC-FT 3,310
WTR YR 1971 TOTAL 5,502.34 MEAN 15.1 MAX 270 MIN .15 AC-FT 10,910

PEAK DISCHARGE (BASE, 15 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
4- 2	--	--	300	6- 9	1300	8.25	78
6- 5	1830	8.17	75	6-17	0800	8.43	90

05055520 Big Coulee near Fort Totten, N. Dak.

LOCATION.--Lat 47°52'57", long 98°58'02", in NE¼SW¼ sec.22, T.151 N., R.65 W., Benson County, on right bank 30 ft upstream from culvert in county highway, 7 miles south of Fort Totten.

DRAINAGE AREA.--23.2 sq mi of which about 15.5 sq mi is probably noncontributing.

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

GAGE.--Water-stage recorder. Concrete culvert control.

AVERAGE DISCHARGE.--6 years, 2.03 cfs (1,470 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 144 cfs Apr. 7 (gage height, 5.56 ft); minimum discharge, 0.22 cfs Sept. 4 (gage height, 0.92 ft).
Period of record: Maximum discharge, 270 cfs Apr. 10, 1969 (gage height, 8.46 ft, from floodmark); no flow Dec. 25-29, 1965.

REMARKS.--Records fair.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.31	1.7	.46	.47	.49	.56	2.4	4.8	2.2	3.6	.81	.46
2	.31	1.3	.46	.48	.49	.56	2.3	4.6	2.1	2.9	.71	.36
3	.36	1.1	.46	.48	.49	.56	2.3	4.5	2.0	2.7	.66	.31
4	.36	.99	.46	.48	.49	.56	2.4	4.3	2.0	1.9	.61	.99
5	.41	.87	.46	.48	.49	.56	4.8	4.2	2.6	1.5	.51	2.1
6	.56	.87	.46	.48	.49	.56	13	4.1	2.5	1.7	.51	.99
7	.46	.87	.46	.48	.49	.56	92	3.9	2.5	6.7	.46	.66
8	.46	.87	.46	.48	.49	.56	113	3.8	2.4	5.5	.46	.61
9	.56	.87	.46	.48	.49	.58	53	3.6	2.4	5.2	.41	.46
10	.56	.81	.46	.48	.49	.58	29	3.4	2.3	3.2	.41	.51
11	.56	.81	.46	.48	.49	.58	18	3.3	2.3	2.2	.41	.46
12	.61	.81	.46	.48	.49	.60	11	3.2	1.8	10	.41	.41
13	.61	.71	.46	.48	.49	.60	7.2	3.1	1.3	7.1	.46	.36
14	.61	.56	.46	.48	.50	.60	5.8	3.0	.99	7.7	.46	.36
15	.61	.56	.46	.48	.50	.60	4.9	3.0	2.1	4.8	.36	.31
16	.56	.56	.40	.48	.50	.65	4.7	2.9	9.7	2.9	.36	.36
17	.51	.61	.47	.48	.50	.65	4.4	2.9	6.9	2.0	1.3	.46
18	.56	.76	.47	.49	.50	.65	5.3	2.8	6.0	3.5	.76	.51
19	.66	.66	.47	.49	.50	.65	7.7	2.8	4.0	3.1	.61	.51
20	.61	.66	.47	.49	.52	.65	7.2	2.8	2.8	2.0	.56	.51
21	.61	.61	.47	.49	.52	.65	6.8	2.7	2.2	1.6	.56	.66
22	.71	.54	.47	.49	.52	.65	5.7	2.8	1.8	1.4	.51	.66
23	.71	.53	.47	.49	.52	.65	4.9	3.0	2.3	1.2	.46	.71
24	.71	.52	.47	.49	.54	.65	4.3	3.0	4.1	.99	.41	.56
25	.81	.51	.47	.49	.54	.70	4.1	2.9	3.4	.76	.31	.56
26	.87	.50	.47	.49	.54	.70	3.8	2.8	3.7	.71	.46	.56
27	.99	.50	.47	.49	.54	.75	4.3	2.7	4.0	.99	.41	.66
28	.93	.50	.47	.49	.56	.75	4.9	2.6	3.6	.81	.31	.71
29	.81	.48	.47	.49	------	.78	4.7	2.5	4.2	1.3	.41	.87
30	1.1	.48	.47	.49	------	1.7	4.8	2.4	4.6	.99	.41	.76
31	1.3	------	.47	.49	------	2.1	------	2.3	------	.81	.46	------
TOTAL	19.80	22.12	14.35	15.01	14.17	21.95	438.7	100.7	94.79	91.76	15.95	18.41
MEAN	.64	.74	.46	.48	.51	.71	14.6	3.25	3.16	2.96	.51	.61
MAX	1.3	1.7	.47	.49	.56	2.1	113	4.8	9.7	10	1.3	2.1
MIN	.31	.48	.40	.47	.49	.56	2.3	2.3	.99	.71	.31	.31
AC-FT	39	44	28	30	28	44	870	200	188	182	32	37

CAL YR 1970 TOTAL 756.29 MEAN 2.07 MAX 38 MIN .18 AC-FT 1,500
WTR YR 1971 TOTAL 867.71 MEAN 2.38 MAX 113 MIN .31 AC-FT 1,720

PEAK DISCHARGE (BASE, 10 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
4- 7	1330	5.56	144	7-12	0600	2.30	19
6-16	0300	2.15	17				

05056000 Sheyenne River near Warwick, N. Dak.

LOCATION.--Lat 47°48'20", long 98°42'57", on south quarter of line between secs.15 and 16, T.150 N., R.63 W., Eddy County, on left bank on downstream side of county highway bridge, 3.3 miles south of Warwick.

DRAINAGE AREA.--2,070 sq mi, approximately, of which about 1,310 sq mi is probably noncontributing (includes 227 sq mi in closed basins).

PERIOD OF RECORD.--October 1949 to current year. Monthly discharge only for some periods, published in WSP 1308.

GAGE.--Water-stage recorder and rubble masonry control. Altitude of gage is 1,370 ft (by barometer).

AVERAGE DISCHARGE.--22 years, 50.9 cfs (36,880 acre-ft per year); median of yearly mean discharges, 42 cfs (30,400 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 2,360 cfs Apr. 12 (gage height, 6.55 ft); minimum, 1.3 cfs Aug. 20; minimum gage height, 2.10 ft Oct. 2-4.
Period of record: Maximum discharge, 4,660 cfs Apr. 14, 1969 (gage height, 7.51 ft); maximum gage height, 7.83 ft Apr. 18, 1956; no flow Aug. 7 to Sept. 1, Sept. 3-9, 1961.

REMARKS.--Records fair. Records of chemical analyses and water temperatres for water year 1971 are published in Part 2 of this report. Records include flow of spring which enters below gage and just above control. Discharge measurements of spring inflow, in cubic feet per second, made during the year are listed below.

REVISIONS (WATER YEARS).--WSP 1438: 1952(m). WSP 1728: Drainage area.

Oct. 28	1.2	Feb. 3	1.3
Dec. 3	1.2	Mar. 3	1.3
30	1.3	May 13	1.0

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.1	7.0	5.4	4.1	2.1	2.5	22	155	15	195	17	5.4
2	3.5	9.8	5.4	4.1	2.1	2.5	22	145	12	188	15	6.1
3	3.0	11	4.8	4.1	2.1	2.5	21	132	15	163	13	9.8
4	3.0	9.8	4.8	4.1	2.1	3.0	25	128	19	148	13	12
5	3.0	7.9	4.8	4.1	2.1	3.0	92	119	21	135	12	26
6	3.0	7.9	4.8	3.5	2.1	3.0	230	113	21	125	9.8	40
7	3.0	9.8	4.8	3.5	2.1	3.0	485	104	32	110	8.8	42
8	3.0	9.8	4.8	3.5	2.1	3.0	1,000	95	37	113	7.0	37
9	3.0	8.8	4.8	3.5	2.1	3.0	1,300	87	132	125	6.1	32
10	3.0	8.8	4.8	3.5	2.1	3.0	2,050	84	263	98	4.8	25
11	2.5	8.8	4.1	3.5	2.1	3.0	2,330	78	272	76	4.1	21
12	3.0	8.8	4.1	3.5	2.1	3.0	2,320	73	255	68	5.4	17
13	5.4	8.8	4.1	3.5	1.7	3.5	2,150	70	222	87	7.0	17
14	5.4	8.8	4.1	3.5	1.7	4.1	1,800	65	195	125	7.0	19
15	3.5	8.8	3.5	3.5	1.7	3.5	1,210	60	195	110	6.1	21
16	3.5	7.9	3.5	3.0	2.1	3.0	805	58	207	73	3.0	21
17	3.5	7.9	3.5	3.0	2.1	3.0	598	51	255	56	4.1	21
18	3.5	7.9	3.5	3.0	2.1	3.5	490	42	272	49	2.5	20
19	3.5	8.8	3.5	3.0	2.1	3.5	445	40	259	51	1.7	17
20	3.5	8.8	4.1	3.0	2.1	4.1	426	37	230	63	1.3	15
21	3.5	8.8	4.1	3.0	2.1	4.1	368	35	207	51	1.7	15
22	3.5	7.9	4.1	3.0	2.1	4.1	298	35	199	40	1.7	13
23	4.1	7.9	4.1	3.0	2.1	4.1	285	35	195	34	2.1	13
24	4.8	7.0	4.1	2.5	2.5	4.1	276	37	199	30	3.0	13
25	4.8	7.0	4.1	2.5	2.5	4.1	242	35	195	26	7.9	13
26	3.5	6.1	4.1	2.5	2.5	4.8	211	34	195	24	15	13
27	4.8	6.1	4.1	2.5	2.1	4.8	199	30	191	25	12	13
28	4.8	5.4	4.1	2.5	2.1	4.8	191	26	195	21	7.9	12
29	4.8	5.4	4.1	2.5	------	5.4	180	22	203	20	4.8	9.8
30	5.4	5.4	4.1	2.1	------	12	169	21	199	20	3.5	8.8
31	6.1	------	4.1	2.1	------	28	------	20	------	19	4.1	------
TOTAL	119.0	242.9	132.3	98.7	58.8	143.0	20,240	2,066	4,907	2,468	212.4	547.9
MEAN	3.84	8.10	4.27	3.18	2.10	4.61	675	66.6	164	79.6	6.85	18.3
MAX	6.1	11	5.4	4.1	2.5	28	2,330	155	272	195	17	42
MIN	2.5	5.4	3.5	2.1	1.7	2.5	21	20	12	19	1.3	5.4
AC-FT	236	482	262	196	117	284	40,150	4,100	9,730	4,900	421	1,090

CAL YR 1970 TOTAL 13,035.56 MEAN 35.7 MAX 421 MIN .96 AC-FT 25,860
WTR YR 1971 TOTAL 31,236.00 MEAN 85.6 MAX 2,330 MIN 1.3 AC-FT 61,960

PEAK DISCHARGE (BASE, 200 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
4-12	0500	6.55	2,360	6-18	1000	3.25	276
6-10	2400	3.27	280				

05056100 Mauvais Coulee near Cando, N. Dak.

LOCATION.--Lat 48°26'53", long 99°06'08", in SE¼NE¼SE¼ sec.1, T.157 N., R.66 W., Towner County, on left bank 0.3 mile upstream from highway bridge, about 4 miles upstream from West Fork, 5.5 miles southeast of Cando, and 7 miles northeast of Maza.

DRAINAGE AREA.--387 sq mi, of which about 10 sq mi is probably noncontributing.

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

GAGE.--Water-stage recorder. Datum of gage is 1,445 ft above mean sea level (unadjusted). Prior to July 2, 1957, nonrecording gage at present site and datum.

AVERAGE DISCHARGE.--15 years, 15.0 cfs (10,870 acre-ft per year); median of yearly mean discharges, 5.6 cfs (4,100 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 1,130 cfs Apr. 14 (gage height, 9.17 ft); no flow Dec. 31 to Apr. 6.
Period of record: Maximum discharge, 2,500 cfs Apr. 14, 1969 (gage height, 11.16 ft); no flow at times each year.
Flood of June 16, 1954, reached a stage of 9.83 ft, and flood of Apr. 20, 1956, reached a stage of 10.71 ft, from floodmarks set by local resident.

REMARKS.--Records good.

REVISIONS.--WSP 1728: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.83	.73	.28				0	131	10	12	21	.80
2	.83	.75	.28				0	118	9.8	12	20	.80
3	.82	.74	.26				0	102	9.0	14	18	.77
4	.82	.71	.24				0	92	12	20	16	.77
5	.81	.71	.22				0	78	18	23	15	.90
6	.80	.70	.21				0	68	18	43	13	.82
7	.79	.69	.21				10	59	15	129	12	.78
8	.78	.68	.20				170	53	15	183	12	.71
9	.77	.65	.18				182	48	15	157	11	.61
10	.77	.65	.16				155	45	15	140	9.6	.56
11	.76	.66	.14				167	40	15	135	8.9	.46
12	.75	.68	.12				202	38	14	136	8.0	.40
13	.74	.68	.10				501	36	13	137	7.9	.34
14	.73	.66	.10				1,020	33	13	138	6.8	.34
15	.72	.68	.10				1,030	30	13	134	5.9	.28
16	.71	.67	.08				848	28	14	127	4.7	.24
17	.70	.67	.08				725	26	12	119	4.7	.31
18	.69	.68	.08				635	24	11	111	3.7	.32
19	.67	.66	.06				584	23	12	103	2.8	.43
20	.66	.67	.06				525	22	11	94	2.4	.65
21	.64	.61	.04				448	20	11	84	2.2	.53
22	.63	.59	.02				408	21	11	76	1.9	.57
23	.62	.56	.02				378	21	9.6	70	1.6	.58
24	.60	.52	.02				323	21	10	61	1.4	.61
25	.58	.48	.02				275	21	8.7	48	.71	.63
26	.59	.44	.01				232	19	14	42	1.3	.64
27	.59	.30	.01				201	17	19	38	1.4	.66
28	.60	.30	.01				178	16	19	33	1.5	.70
29	.59	.30	.01		------		159	15	17	28	1.4	.74
30	.64	.29	.01		------		146	12	13	25	1.0	.78
31	.64	------	0		------		------	11	------	23	.69	-----
TOTAL	21.87	18.11	3.33	0	0	0	9,502	1,288	397.1	2,495	218.50	17.73
MEAN	.71	.60	.11	0	0	0	317	41.5	13.2	80.5	7.05	.59
MAX	.83	.75	.28	0	0	0	1,030	131	19	183	21	.90
MIN	.58	.29	0	0	0	0	0	11	8.7	12	.69	.24
AC-FT	43	36	6.6	0	0	0	18,850	2,550	788	4,950	433	35

CAL YR 1970 TOTAL 12,582.54 MEAN 34.5 MAX 474 MIN 0 AC-FT 24,960
WTR YR 1971 TOTAL 13,961.64 MEAN 38.3 MAX 1,030 MIN 0 AC-FT 27,690

PEAK DISCHARGE (BASE, 24 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
4-14	2100	9.17	1,130	7- 8	0915	4.98	197

05056200 Edmore Coulee near Edmore, N. Dak.

LOCATION.--Lat 48°20'14", long 98°39'33", on line between secs.17 and 18, T.156 N., R.62 W., Ramsey County, on left downstream wingwall of bridge on county highway, 11 miles southwest of Edmore and about 13 miles from Sweetwater Lake.

DRAINAGE AREA.--382 sq mi, of which about 100 sq mi is probably noncontributing.

PERIOD OF RECORD.--April to June 1956, June 1957 to current year.

GAGE.--Water-stage recorder. Prior to June 26, 1957, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--14 years (1957-71) 11.8 cfs (8,550 acre-ft per year); median of yearly mean discharges, 8.7 cfs (6,300 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 646 cfs Apr. 13 (gage height, 5.89 ft); no flow for several months. Period of record: Maximum discharge, 875 cfs Apr. 23, 1956 (gage height, 6.30 ft, backwater from ice); maximum gage height, 6.63 ft Mar. 25, 1966 (backwater from ice); no flow for several months each year.

REMARKS.--Records fair.

REVISIONS.--WSP 1728: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1							0	41	2.1	3.1	15	2.4
2							0	37	1.8	3.2	19	2.0
3							0	34	1.5	3.3	24	1.6
4							0	30	1.4	3.1	28	1.2
5							0	26	2.2	2.6	31	.90
6							1.1	24	2.0	1.9	33	.60
7							5.0	21	2.0	4.3	35	.40
8							90	19	2.4	3.7	36	.31
9							50	18	3.0	3.1	36	.18
10							250	16	3.4	2.4	36	.14
11							506	14	3.3	1.7	36	.14
12							594	12	3.0	1.4	35	.10
13							633	11	2.5	1.2	36	.10
14							563	10	2.1	1.4	35	.06
15							479	9.4	2.6	1.3	33	.03
16							403	8.1	2.8	1.2	30	.01
17							340	7.1	2.5	1.0	40	0
18							308	6.3	1.9	.95	29	0
19							270	5.9	1.2	.90	27	0
20							230	5.5	.75	.80	24	0
21							203	5.0	.90	.71	22	0
22							180	4.8	1.6	.59	19	0
23							160	4.7	2.4	.59	16	0
24							139	4.4	2.5	.85	13	0
25							121	4.2	2.2	1.4	10	0
26							99	3.8	2.8	2.5	8.2	0
27							83	3.5	2.6	3.3	6.6	0
28							68	3.1	2.5	3.9	4.9	0
29					------		54	2.7	2.7	4.9	3.7	0
30					------		48	2.5	3.0	6.6	3.2	0
31		------			------		------	2.5	------	10	2.8	------
TOTAL	0	0	0	0	0	0	5,877.1	396.5	67.65	77.89	727.4	10.17
MEAN	0	0	0	0	0	0	196	12.8	2.26	2.51	23.5	.34
MAX	0	0	0	0	0	0	633	41	3.4	10	40	2.4
MIN	0	0	0	0	0	0	0	2.5	.75	.59	2.8	0
AC-FT	0	0	0	0	0	0	11,660	786	134	154	1,440	20

CAL YR 1970 TOTAL 1,845.52 MEAN 5.06 MAX 108 MIN 0 AC-FT 3,660
WTR YR 1971 TOTAL 7,156.71 MEAN 19.6 MAX 633 MIN 0 AC-FT 14,200

PEAK DISCHARGE (BASE, 50 CFS).--APRIL 13 (1200) 646 CFS (5.89 FT).

05056400 Big Coulee near Churchs Ferry, N. Dak.

LOCATION.--Lat 48°10'40", long 99°13'15", in NW¼NW¼ sec.12, T.154 N., R.67 W., Benson County, on downstream side of right abutment of bridge on U.S. Highway 281, 1 mile downstream from Little Coulee and 6 miles south of Churchs Ferry.

DRAINAGE AREA.--2,510 sq mi, approximately, of which about 690 sq mi is probably noncontributing.

PERIOD OF RECORD.--March 1950 to current year. Prior to October 1960, published as Mauvais Coulee near Churchs Ferry.

GAGE.--Water-stage recorder. Datum of gage is 1,432.65 ft above mean sea level. Prior to June 21, 1950, reference marks, and June 21, 1950, to July 17, 1956, nonrecording gage at former bridge on U.S. Highway 281, 0.1 mile upstream, at datum 0.70 ft higher.

AVERAGE DISCHARGE.--21 years, 26.9 cfs (19,490 acre-ft per year); median of yearly mean discharges, 0.9 cfs (650 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 488 cfs Apr. 27 (gage height, 4.25 ft); no flow Dec. 4 to Apr. 4. Period of record: Maximum discharge, 964 cfs Apr. 27, 1969 (gage height, 6.49 ft); no flow at times each year.

REMARKS.--Records good except those for the winter period, which are fair. Flow affected by many lakes on the mainstem and tributaries. Records of chemical analyses for the water year 1971 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	41	30	.50				0	458	309	245	163	35
2	46	30	.02				0	455	299	245	160	34
3	50	30	.01				0	445	295	239	157	32
4	42	28	0				0	438	309	230	153	36
5	40	28	0				5.0	435	315	222	149	47
6	41	28	0				10	428	303	226	143	37
7	43	28	0				20	425	313	249	139	35
8	43	26	0				60	415	309	224	136	39
9	39	26	0				100	408	301	228	135	33
10	41	26	0				90	415	285	236	131	31
11	34	24	0				80	413	291	228	123	28
12	29	24	0				65	403	291	228	118	18
13	33	24	0				55	400	287	215	113	18
14	32	22	0				60	390	281	213	107	19
15	30	22	0				65	375	285	212	88	17
16	29	22	0				107	373	287	213	86	15
17	29	21	0				291	363	279	215	91	17
18	32	20	0				355	375	271	213	84	14
19	31	20	0				395	365	271	208	81	12
20	27	18	0				428	360	267	203	75	12
21	30	16	0				455	358	267	201	70	13
22	29	14	0				458	353	265	198	69	12
23	31	10	0				463	360	265	196	63	12
24	31	5.0	0				470	363	267	188	57	12
25	29	4.0	0				475	350	261	175	57	12
26	29	3.0	0				475	335	259	175	52	11
27	29	2.0	0				480	321	255	175	48	11
28	31	1.0	0				478	303	253	174	45	11
29	31	1.0	0		------		468	293	255	172	45	11
30	31	.50	0		------		458	313	251	168	45	11
31	30	------	0		------		------	317	------	165	35	------
TOTAL	1,063	553.50	.53	0	0	0	6,866.0	11,805	8,446	6,479	3,018	645
MEAN	34.3	18.5	.017	0	0	0	229	381	282	209	97.4	21.5
MAX	50	30	.50	0	0	0	480	458	315	249	163	47
MIN	27	.50	0	0	0	0	0	293	251	165	35	11
AC-FT	2,110	1,100	1.1	0	0	0	13,620	23,420	16,750	12,850	5,990	1,280

CAL YR:	TOTAL	29,643.88	MEAN	81.2	MAX	396	MIN	0	AC-FT	58,800
WTR YR:	TOTAL	38,876.03	MEAN	107	MAX	480	MIN	0	AC-FT	77,110

05056500 Devils Lake near Devils Lake, N. Dak.

LOCATION.--Lat 48°04'00", long 98°56'07", in SW¼ sec.18, T.153 N., R.64 W., Ramsey County, at Lakewood, on east bank of Creel Bay, 4.5 miles southwest of city of Devils Lake. Creel Bay, which is 0.5 mile wide, is an arm of Devils Lake and extends 2 miles to the north of the lake.

DRAINAGE AREA.--3,130 sq mi, approximately, of which about 1,000 sq mi is probably noncontributing.

PERIOD OF RECORD.--1867, 1879, 1883, 1887, 1890, 1896 (one gage height for each year), 1901-63 (fragmentrary), 1964 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,400.00 ft above mean sea level; gage readings have been reduced to elevations above mean sea level. June 23, 1950, to June 6, 1963, nonrecording gage at present site and datum. See WSP 1913 for history of changes prior to June 23, 1950.

EXTREMES.--Current year: Maximum elevation, 1,421.10 ft July 12; minimum, 1,418.81 ft Mar. 3.
Period of record: Maximum elevation observed, 1,438.40 ft in 1867, present datum; minimum observed, 1,400.87 ft Oct. 24, 1940.
The lake level was about elevation 1,446 ft about 1830 and lower thereafter, according to the tree growth noted 1885-89. Reference is Geological Survey monograph, volume XXV, the Glacial History of Lake Agassiz by Warren Upham.

REMARKS.--Elevation at gage frequently affected by wind. Records of chemical analyses for water year 1971 are published in Part 2 of this report.

REVISIONS.--WSP 1913: Drainage area.

MONTHEND ELEVATION, IN FEET, AT 2400, OCTOBER 1970 TO SEPTEMBER 1971

Oct. 31.....	1,418,94	Jan. 31.....	1,418.93	Apr. 30.....	1,419.61	July 31.....	1,420.89
Nov. 30.....	1,418.93	Feb. 28.....	1,418.84	May 31.....	1,420.16	Aug. 31.....	1,420.73
Dec. 31.....	1,418.91	Mar. 31.....	1,418.92	June 30.....	1,420.91	Sept.30.....	1,420.88

05057000 Sheyenne River near Cooperstown, N. Dak.

LOCATION.--Lat 47°26'01", long 98°01'43", in NE¼NE¼SE¼ sec.27, T.146 N., R.58 W., Griggs County, on right bank 150 ft downstream from county bridge and 5 miles east of Cooperstown.

DRAINAGE AREA.--6,470 sq mi, approximately, of which about 5,200 sq mi is probably noncontributing (includes about 3,800 sq mi in closed basins).

PERIOD OF RECORD.--October 1944 to current year. Monthly discharge only for some periods, published in WSP 1308.

GAGE.--Water-stage recorder. Datum of gage is 1,271.04 ft above mean sea level (Corps of Engineers benchmark). Prior to Aug. 3, 1950, nonrecording gage at site 150 ft upstream at same datum.

AVERAGE DISCHARGE.--27 years, 101 cfs (73,170 acre-ft per year); median of yearly mean discharges, 75 cfs (54,300 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 2,310 cfs Apr. 17 (gage height, 16.31 ft); minimum daily discharge, 7.0 cfs Feb. 2-10.
Period of record: Maximum discharge, 7,830 cfs Apr. 17, 1950 (gage height, 18.69 ft); no flow at times.

REMARKS.--Records good. Records of chemical analyses for the water year 1971 are published in Part 2 of this report.

REVISIONS.--WSP 1728: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18	25	16	12	7.5	14	470	340	96	324	55	10
2	16	26	17	11	7.0	13	367	318	93	302	51	11
3	13	27	17	11	7.0	13	302	302	88	284	49	16
4	13	30	17	11	7.0	12	300	285	89	269	45	24
5	12	31	17	11	7.0	12	230	267	94	253	42	31
6	12	31	18	11	7.0	11	275	248	96	242	40	45
7	10	30	18	11	7.0	11	420	234	94	230	38	64
8	8.7	28	18	11	7.0	11	576	220	97	214	36	52
9	8.4	28	17	10	7.0	11	898	206	96	191	33	55
10	8.7	28	17	10	7.0	11	1,020	196	93	170	31	60
11	9.8	27	17	10	7.5	11	1,240	183	92	156	29	55
12	15	25	17	10	7.5	12	1,330	170	92	150	26	51
13	20	20	17	10	7.5	13	1,340	160	104	156	25	50
14	17	16	16	9.5	7.5	15	1,370	151	130	179	25	44
15	17	23	16	9.5	8.0	25	1,570	144	188	165	24	39
16	18	21	15	9.5	9.0	25	2,020	138	233	142	22	35
17	17	22	15	9.5	9.0	35	2,280	129	254	121	22	32
18	16	22	15	9.0	9.0	35	2,170	123	258	117	21	28
19	16	21	15	9.0	9.0	45	2,030	116	249	131	20	25
20	17	20	14	9.0	9.0	45	1,850	111	237	144	16	24
21	17	18	13	9.0	9.0	40	1,570	108	240	148	15	22
22	18	21	13	9.0	9.5	38	1,310	106	344	131	14	23
23	18	21	13	9.0	10	35	1,060	113	377	108	14	24
24	18	20	13	8.5	10	30	850	125	437	96	15	25
25	20	18	13	8.5	12	30	683	130	456	91	15	23
26	22	16	13	8.0	15	30	567	123	449	87	16	23
27	22	17	12	8.0	15	35	487	114	428	80	16	22
28	21	16	12	8.0	14	38	430	108	364	72	13	22
29	21	16	12	8.0	------	40	392	105	349	66	12	20
30	22	16	12	8.0	------	172	363	99	360	61	11	20
31	24	------	11	7.5	------	490	------	97	------	56	11	------
TOTAL	505.6	680	466	295.5	248.0	1,358	29,770	5,269	6,577	4,936	802	975
MEAN	16.3	22.7	15.0	9.53	8.86	43.8	992	170	219	159	25.9	32.5
MAX	24	31	18	12	15	490	2,280	340	456	324	55	64
MIN	8.4	16	11	7.5	7.0	11	230	97	88	56	11	10
AC-FT	1,000	1,350	924	586	492	2,690	59,050	10,450	13,050	9,790	1,590	1,930

CAL YR 1970 TOTAL 35,856.9 MEAN 98.2 MAX 944 MIN 8.4 AC-FT 71,120
WTR YR 1971 TOTAL 51,882.1 MEAN 142 MAX 2,280 MIN 7.0 AC-FT 102,900

PEAK DISCHARGE (BASE, 200 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
3-31	2100		494	4-17	1100	16.31	2,310
4-10	1600	13.13	1,260	6-26	1730	8.21	477

05057200 Baldhill Creek near Dazey, N. Dak.

LOCATION.--Lat 47°13'45", long 98°07'28", in NW¼SE¼SW¼ sec.2, T.143 N., R.59 W., Barnes County, on left bank 500 ft upstream from bridge on county highway, 4.5 miles northeast of Dazey, and 14 miles upstream from mouth.

DRAINAGE AREA.--691 sq mi, of which about 340 sq mi is probably noncontributing.

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

GAGE.--Water-stage recorder. Prior to Nov. 9, 1956, nonrecording gage 500 ft downstream at same datum.

AVERAGE DISCHARGE.--15 years, 14.2 cfs (10,290 acre-ft per year); median of yearly mean discharges, 11 cfs (8,000 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 305 cfs Mar. 31 (gage height, 6.20 ft, backwater from ice); minimum, 0.03 cfs Jan. 11, 12 (gage height, 1.95 ft).
Period of record: Maximum discharge, 2,510 cfs Apr. 11, 1969 (gage height, 10.90 ft, backwater from ice); maximum gage height, 11.21 ft Apr. 10, 1969 (backwater from ice); no flow at times.

REMARKS.--Records good except those for the winter period, which are fair.

REVISIONS.--WSP 1728: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.5	10	6.0	1.2	.16	2.3	175	17	13	22	3.5	2.3
2	3.5	11	6.3	1.2	.16	2.1	225	17	12	18	3.3	4.0
3	3.5	9.9	7.1	1.1	.16	2.0	200	16	12	17	3.2	3.8
4	3.5	8.9	5.5	.90	.16	2.0	250	16	22	16	2.5	4.0
5	3.5	8.2	4.5	.66	.19	1.9	215	15	49	14	2.3	5.2
6	3.0	7.6	3.9	.54	.21	1.9	200	14	36	13	2.1	6.0
7	3.0	7.3	3.8	.40	.21	1.7	175	14	29	13	1.8	5.1
8	3.0	7.0	3.6	.33	.21	1.4	160	13	25	12	1.5	3.9
9	3.5	6.8	3.5	.27	.20	1.3	138	13	23	10	1.4	3.4
10	3.5	6.6	3.3	.11	.21	1.3	130	13	32	9.2	1.5	3.0
11	3.5	6.5	3.1	.07	.21	1.6	101	12	31	8.9	1.3	2.6
12	3.5	6.4	3.0	.16	.21	10	101	11	27	11	1.3	2.3
13	4.0	6.4	3.0	.16	.21	20	72	11	24	12	1.4	2.0
14	5.0	6.0	2.5	.27	.21	25	51	11	22	10	1.4	1.8
15	5.0	6.5	2.2	.11	.24	10	44	10	21	8.1	1.4	1.9
16	5.5	6.5	2.0	.11	.48	15	41	9.3	21	7.7	1.4	2.0
17	5.5	6.5	1.8	.11	2.0	35	36	9.6	21	6.8	1.3	1.9
18	6.0	6.5	1.7	.11	1.6	45	37	9.0	19	6.4	1.3	1.9
19	6.0	6.5	1.6	.16	1.3	55	36	8.7	18	6.5	1.5	1.9
20	6.0	6.0	1.4	.11	1.0	44	33	8.5	16	6.4	1.4	2.0
21	6.5	6.0	1.2	.11	1.0	40	29	8.3	16	5.9	1.5	2.0
22	6.5	5.5	1.1	.27	1.0	30	27	9.0	15	5.7	1.4	2.0
23	7.0	5.5	1.0	.16	1.2	20	24	20	16	5.4	1.2	2.1
24	7.0	6.0	1.0	.16	1.6	25	21	25	20	4.9	2.0	2.0
25	7.5	6.0	.94	.21	2.0	30	19	22	20	5.2	1.6	1.7
26	8.0	5.5	1.0	.11	2.5	35	18	18	20	6.6	1.5	1.7
27	10	5.5	.99	.11	3.5	35	18	16	20	5.0	1.4	2.2
28	11	5.5	.91	.11	3.0	40	18	13	18	3.8	1.2	2.8
29	9.9	6.0	.98	.16	------	49	17	13	22	3.6	1.2	2.5
30	9.5	6.0	1.1	.21	------	158	18	12	24	3.5	1.5	2.7
31	9.3	------	1.1	.21	------	253	------	13	------	3.6	1.6	------
TOTAL	175.7	204.6	81.12	9.90	25.13	993.5	2,629	417.4	664	281.2	52.9	82.7
MEAN	5.67	6.82	2.62	.32	.90	32.0	87.6	13.5	22.1	9.07	1.71	2.76
MAX	11	11	7.1	1.2	3.5	253	250	25	49	22	3.5	6.0
MIN	3.0	5.5	.91	.07	.16	1.3	17	8.3	12	3.5	1.2	1.7
AC-FT	349	406	161	20	50	1,970	5,210	828	1,320	558	105	164

CAL YR 1970 TOTAL 5,346.42 MEAN 14.6 MAX 304 MIN .90 AC-FT 10,600
WTR YR 1971 TOTAL 5,617.15 MEAN 15.4 MAX 253 MIN .07 AC-FT 11,140

PEAK DISCHARGE (BASE, 60 CFS).--MARCH 19, 61 CFS; MARCH 31, 305 CFS.

05057500 Lake Ashtabula at Baldhill Dam, N. Dak.

LOCATION.--Lat 47°02'00", long 98°05'00", in NW¼ sec.18, T.141 N., R.58 W., Barnes County, at Baldhill Dam on Sheyenne River, 8 miles northwest of Valley City.

DRAINAGE AREA.--7,470 sq mi, approximately, of which about 5,560 sq mi is probably noncontributing (includes 3,800 sq mi in closed basins).

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

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

EXTREMES.--Current year: Maximum contents, 79,896 acre-ft Apr. 20 (elevation, 1,267.62 ft); minimum, 49,235 acre-ft Mar. 31 (elevation, 1,261.83 ft).
Period of record: Maximum contents, 91,400 acre-ft May 14, 1950 (elevation, 1,269.46 ft); mimimum since reservoir first reached spillway level, 6,660 acre-ft Aug. 11-14, 1950 (elevation, 1,245.13 ft).

REMARKS.--Reservoir is formed by an earth-fill dam, 1,650 ft long; storage began on July 30, 1949; dam completed September 1949. Usable capacity, 69,100 acre-ft between invert of outlet conduit, elevation, 1,238.0 ft, and normal pool level, elevation, 1,266.0 ft. Dead storage below elevation 1,238.0 ft, 1,500 acre-feet. Maximum pool elevation, 1,273.2 ft, capacity, 116,500 acre-ft. Low flows are controlled by 2 sluice gates 3 ft in diameter. The spillway crest is 120 ft long at elevation 1,252.0 ft, surmounted by 3 taintor gates, each 15 ft high and 40 ft long. The reservoir is operated for flood control and to increase low-water flow.

COOPERATION.--Records furnished by Corps of Engineers.

REVISIONS (WATER YEARS).--WSP 1238: 1950(M). WSP 1728: Drainage area.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	1,265.27	66,512	
Oct. 31	1,265.25	66,400	-112
Nov. 30	1,265.28	66,540	+140
Dec. 31	1,264.95	64,725	-1,815
CAL YR 1970	--	--	-2,275
Jan. 31	1,264.60	62,800	-1,925
Feb. 28	1,263.43	56,630	-6,170
Mar. 31	1,261.83	49,235	-7,395
Apr. 30	1,266.14	71,400	+22,165
May 31	1,266.40	72,880	+1,480
June 30	1,266.48	73,340	+460
July 31	1,265.90	70,040	-3,300
Aug. 31	1,265.57	68,190	-1,850
Sept. 30	1,265.50	67,800	-390
WTR YR 1971	--	--	+1,288

05058000 Sheyenne River below Baldhill Dam, N. Dak.

LOCATION.--Lat 47°01'50", long 98°05'50", in NW¼ sec.18, T.141 N., R.58 W., Barnes County, on right bank 600 ft downstream from Baldhill Dam, 8 miles northwest of Valley City, and at mile 270.5.

DRAINAGE AREA.--7,470 sq mi, approximately, of which about 5,560 sq mi is probably noncontributing (includes 3,800 sq mi in closed basins).

PERIOD OF RECORD.--October 1949 to current year. Monthly discharge only for some periods, published in WSP 1308.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,200.00 ft above mean sea level.

AVERAGE DISCHARGE (UNADJUSTED).--22 years, 116 cfs (84,040 acre-ft per year); median of yearly mean discharges, 83 cfs (60,100 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 1,830 cfs Apr. 20 (gage height, 29.75 ft); minimum, 0.04 cfs Nov. 7 (gage height, 25.11 ft), by temporary closing of gates.
Period of record: Maximum discharge, 4,580 cfs Apr. 19, 1969 (gage height, 35.47 ft); no flow at times in 1950, 1952-53, 1969-70.
Maximum discharge of Apr. 27 and 28, 1948, about 4,600 cfs.

REMARKS.--Records good. Flow completely regulated by Lake Ashtabula (see station 05057500). Records prior to 1955 do not include releases at Baldhill Dam to the fish-rearing ponds of the Fish and Wildlife Service.

REVISIONS.--WSP 1728: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.2	14	40	40	41	218	218	374	103	516	49	18
2	8.5	14	41	40	42	214	139	368	103	641	49	18
3	9.2	14	42	40	42	210	24	297	103	641	48	18
4	9.8	14	42	40	42	206	27	202	103	602	40	18
5	11	14	41	40	42	218	28	210	103	402	34	18
6	11	14	41	40	42	214	27	218	103	361	35	18
7	12	7.9	41	40	42	214	28	223	117	313	35	17
8	13	14	41	40	42	218	28	218	146	251	36	18
9	11	7.2	41	40	42	232	28	223	149	177	37	18
10	8.5	8.5	41	40	41	237	28	223	149	156	38	20
11	8.5	8.5	41	40	99	223	29	223	181	152	39	20
12	9.8	8.8	41	40	142	214	30	163	214	152	33	20
13	11	8.8	40	40	142	214	105	139	214	149	18	20
14	11	8.5	40	40	134	210	292	128	218	131	15	20
15	10	8.5	40	41	101	223	409	110	214	94	17	20
16	10	8.5	40	41	1.1	223	567	110	210	94	17	20
17	10	8.5	40	41	83	210	1,010	107	214	94	16	20
18	11	8.5	40	41	128	214	1,150	105	246	96	15	20
19	11	18	40	41	131	214	1,400	105	313	76	15	20
20	11	41	40	41	134	214	1,800	107	313	46	15	20
21	11	41	40	41	131	218	1,790	92	313	46	16	20
22	12	40	40	41	131	223	1,770	72	313	46	17	20
23	13	36	40	41	128	223	1,760	72	313	47	16	28
24	13	38	40	41	170	218	1,750	85	302	47	16	41
25	13	41	40	41	210	210	1,740	103	307	47	17	41
26	13	41	40	41	210	206	1,720	103	313	47	16	41
27	13	40	40	41	218	206	1,190	103	313	46	16	41
28	13	40	40	41	214	206	620	103	307	46	17	41
29	15	40	40	41	------	206	508	105	307	45	17	41
30	14	40	40	41	------	206	374	107	374	48	16	41
31	14	------	40	41	------	206	------	105	------	49	15	------
TOTAL	349.5	646.2	1,253	1,257	2,925.1	6,668	20,589	4,903	6,678	5,658	780	736
MEAN	11.3	21.5	40.4	40.5	104	215	686	158	223	183	25.2	24.5
MAX	15	41	42	41	218	237	1,800	374	374	641	49	41
MIN	8.2	7.2	40	40	1.1	206	24	72	103	45	15	17
AC-FT	693	1,280	2,490	2,490	5,800	13,230	40,840	9,730	13,250	11,220	1,550	1,460
(+)	0	0	0	0	0	0	0	0	245	160	0	0
*ADJ MEAN	11.3	21.5	40.4	40.5	104	215	686	158	227	185	25.2	24.5
*ADJ AC-FT	693	1,280	2,490	2,490	5,800	13,230	40,840	9,730	13,500	11,380	1,550	1,460

			OBSERVED						ADJUSTED		
CAL YR 1970	TOTAL	45,583.1	MEAN	125	MAX	1,220	MIN 1.1	AC-FT	90,410	MEAN	125	AC-FT	90,730
WTR YR 1971	TOTAL	52,442.8	MEAN	144	MAX	1,800	MIN 1.1	AC-FT	104,000	MEAN	144	AC-FT	104,400

\+ Diversion equivalent in acre-feet from Lake Ashtabula by U.S. Fish and Wildlife Service.
* Adjusted for diversion from Lake Ashtabula by U.S. Fish and Wildlife Service.

05058500 Sheyenne River at Valley City, N. Dak.

LOCATION.--Lat 46°54'50", long 98°00'30", in SE¼NW¼ sec.28, T.140 N., R.58 W., Barnes County, on left bank 100 ft downstream from College Dam in Valley City, and at mile 253.0.

DRAINAGE AREA.--7,810 sq mi, approximately, of which about 5,700 sq mi is probably noncontributing (includes 3,800 sq mi in closed basins).

PERIOD OF RECORD.--March to August 1919, March to June 1938, August 1938 to current year. Records for July 1938, published in WSP 855, have been found to be unreliable and should not be used.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,199.27 ft above mean sea level. March to August 1919, nonrecording gage at site half a mile upstream at different datum. March to Oct. 13, 1938, nonrecording gage at present site and datum.

AVERAGE DISCHARGE (UNADJUSTED).--33 years (1938-71), 119 cfs (86,220 acre-ft per year); median of yearly mean discharges, 97 cfs (70,300 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 1,820 cfs Apr. 21 (gage height, 10.27 ft, backwater from ice); minimum, 7.9 cfs Oct. 3 (gage height, 2.79 ft).
Period of record: Maximum discharge, 4,580 cfs Apr. 28, 1948 (gage height, 17.51 ft); maximum gage height, 17.62 ft Apr. 19, 1969; no flow during several periods in 1938-41.

REMARKS.--Records good except those for the winter period, which are poor. Flow completely regulated by Lake Ashtabula 13 miles upstream (see station 05057500). Small diversion above station for municipal supply.

REVISIONS (WATER YEARS).--WSP 1388: 1939(M). WSP 1728: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	18	47	38	39	232	240	396	114	524	45	25
2	14	18	47	38	38	230	179	415	113	661	44	61
3	8.9	16	44	38	38	226	49	328	109	695	43	31
4	13	15	42	38	38	217	30	229	141	690	43	27
5	15	14	42	34	38	221	30	208	142	497	40	27
6	14	16	40	34	38	228	32	217	117	392	35	22
7	11	15	40	36	39	228	34	220	116	329	33	18
8	12	14	40	36	39	245	36	220	167	260	32	16
9	15	14	40	36	38	299	33	225	148	177	38	15
10	13	14	40	38	36	292	33	229	156	141	39	16
11	14	12	40	36	40	267	38	227	167	141	36	16
12	18	11	38	36	100	377	34	187	217	153	38	18
13	16	11	38	36	150	393	55	132	214	147	35	17
14	13	11	38	36	150	402	233	121	213	146	27	17
15	10	11	38	33	140	284	394	99	214	83	18	18
16	9.1	11	38	38	110	249	516	105	212	96	17	18
17	11	12	38	38	21	277	810	110	210	95	17	19
18	15	12	38	38	124	292	1,160	107	236	101	18	19
19	14	12	38	38	205	280	1,240	106	310	99	18	19
20	15	20	38	38	195	254	1,720	103	318	63	16	19
21	15	43	38	38	191	251	1,810	105	334	43	17	19
22	17	42	38	38	190	250	1,790	92	339	43	17	19
23	15	47	38	38	179	246	1,780	111	328	42	15	19
24	15	47	38	38	178	235	1,770	106	353	41	17	22
25	18	46	38	38	249	232	1,760	114	329	41	15	34
26	15	43	38	39	261	235	1,750	116	324	39	15	39
27	14	43	38	39	251	244	1,490	113	330	43	15	41
28	13	43	38	39	238	239	709	111	325	42	15	40
29	14	44	38	39	------	246	580	111	347	44	15	41
30	16	46	38	39	------	249	405	111	379	42	15	45
31	17	------	38	39	------	241	------	119	------	44	16	------
TOTAL	432.0	721	1,222	1,157	3,353	8,161	20,740	5,193	7,022	5,954	804	757
MEAN	13.9	24.0	39.4	37.3	120	263	691	168	234	192	25.9	25.2
MAX	18	47	47	39	261	402	1,810	415	379	695	45	61
MIN	8.9	11	38	33	21	217	30	92	109	39	15	15
AC-FT	857	1,430	2,420	2,290	6,650	16,190	41,140	10,300	13,930	11,810	1,590	1,500

CAL YR 1970 TOTAL 47,537.5 MEAN 130 MAX 1,310 MIN 5.3 AC-FT 94,290
WTR YR 1971 TOTAL 55,516.0 MEAN 152 MAX 1,810 MIN 8.9 AC-FT 110,100

05058700 Sheyenne River at Lisbon, N. Dak.

LOCATION.--Lat 46°26'49", long 97°40'44", on line between secs.1 and 2, T.134 N., R.56 W., Ransom County, on left bank 150 ft downstream from dam at State fish hatchery at north edge of city of Lisbon, 3 miles upstream from Timber Coulee, and at mile 162.1.

DRAINAGE AREA.--8,190 sq mi, approximately, of which about 5,700 sq mi is probably noncontributing (includes 3,800 sq mi in closed basins).

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

GAGE.--Water-stage recorder. Datum of gage is 1,066.64 ft above mean sea level.

AVERAGE DISCHARGE.--15 years, 141 cfs (102,200 acre-ft per year); median of yearly mean discharges, 120 cfs (86,900 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 1,850 cfs Apr. 28 (gage height, 9.67 ft); minimum, 4.8 cfs Oct. 3 (gage height, 2.13 ft).
Period of record: Maximum discharge, 4,380 cfs Apr. 24, 1969 (gage height, 16.54 ft); no flow Sept. 19-21, Oct. 23, 24, 1956, Aug. 16, 1961.

REMARKS.--Records good. Flow regulated by Lake Ashtabula 108.5 miles upstream (see station 05057500). Records of chemical analyses and water temperatures for the water year 1970 are published in Part 2 of this report.

REVISIONS.--WSP 1728: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10	31	51	40	45	220	405	718	128	385	49	16
2	8.8	31	53	40	45	240	415	548	130	392	48	14
3	5.6	34	51	40	40	230	379	486	132	500	46	15
4	5.6	39	49	38	40	210	324	465	132	631	48	25
5	6.4	37	42	38	40	210	262	403	136	665	46	49
6	8.3	34	41	38	40	210	177	279	154	658	46	48
7	7.3	30	37	38	40	210	134	229	187	594	44	34
8	9.3	28	37	38	40	210	123	220	156	472	43	30
9	12	27	41	38	45	200	108	220	141	373	38	27
10	10	27	44	38	45	210	117	218	165	300	37	25
11	9.9	30	44	36	45	230	112	213	174	211	34	21
12	10	30	41	36	40	380	82	213	172	183	31	18
13	14	28	41	36	40	520	70	213	174	163	37	16
14	14	22	41	36	45	580	62	205	200	156	35	14
15	16	24	41	34	45	620	58	156	209	150	34	14
16	18	22	41	34	50	630	115	143	209	143	32	14
17	24	22	41	34	50	570	358	119	297	122	31	16
18	27	21	42	34	55	480	493	111	240	98	31	16
19	21	21	42	34	55	430	762	113	211	98	26	17
20	18	21	44	36	55	440	1,080	115	211	98	22	17
21	16	22	42	36	65	460	1,240	111	303	100	20	18
22	17	16	42	40	140	430	1,540	113	467	96	17	18
23	16	18	40	45	180	410	1,760	132	364	79	16	18
24	18	15	40	45	100	370	1,810	150	424	62	20	18
25	27	16	40	50	150	325	1,820	167	382	57	16	18
26	32	30	40	50	260	300	1,820	172	380	54	14	20
27	24	57	40	45	220	295	1,840	141	366	54	14	21
28	22	53	40	45	200	305	1,840	136	346	51	13	21
29	23	53	40	45	------	340	1,680	130	359	49	17	31
30	30	51	40	45	------	385	988	126	380	49	19	44
31	30	------	40	45	------	400	------	130	------	49	19	------
TOTAL	510.2	890	1,308	1,227	2,215	11,050	21,974	6,895	7,329	7,092	943	673
MEAN	16.5	29.7	42.2	39.6	79.1	356	732	222	244	229	30.4	22.4
MAX	32	57	53	50	260	630	1,840	718	467	665	49	49
MIN	5.6	15	37	34	40	200	58	111	128	49	13	14
AC-FT	1,010	1,770	2,590	2,430	4,390	21,920	43,590	13,680	14,540	14,070	1,870	1,330

CAL YR 1970 TOTAL 59,446.8 MEAN 163 MAX 1,240 MIN 5.2 AC-FT 117,900
WTR YR 1971 TOTAL 62,106.2 MEAN 170 MAX 1,840 MIN 5.6 AC-FT 123,200

05059000 Sheyenne River near Kindred, N. Dak.

LOCATION.--Lat 46°37'35", long 97°00'05", in NE¼NW¼ sec.5, T.136 N., R.50 W., Richland County, on right bank 25 ft downstream from Burlington Northern Railway bridge, 1.5 miles southeast of Kindred, and at mile 68.1.

DRAINAGE AREA.--8,800 sq mi, approximately, of which about 5,780 sq mi is probably noncontributing (includes 3,800 sq mi in closed basins).

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

GAGE.--Water-stage recorder. Datum of gage is 925.55 ft above mean sea level, datum of 1929. July 1949 to Sept. 30, 1962, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--22 years, 187 cfs (135,500 acre-ft per year); median of yearly mean discharges, 130 cfs (94,200 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 1,750 cfs Apr. 30 (gage height, 11.46 ft); minimum discharge, 30 cfs Oct. 5-6.
Period of record: Maximum discharge, 4,690 cfs Apr. 15, 1969 (gage height, 21.03 ft); maximum gage height, 21.54 ft Apr. 14, 1969; minimum discharge, 13 cfs Nov. 13, 1955, Aug. 22-24, 1959; minimum gage height 2.71 ft Aug. 20, 22, 1963.
Spring flood in 1947 or 1948 reached a stage of 22.1 ft, from floodmarks (discharge, about 3,600 cfs).

REMARKS.--Records good. Flow regulated to a large degree by Lake Ashtabula 202 miles upstream (see station 05057500) and several small reservoirs. Records of water temperatures for the water year 1971 are pubished in Part 2 of this report.

REVISIONS.--WSP 1728: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	32	62	43	58	60	60	465	1,720	213	450	92	57
2	32	62	45	56	60	75	495	1,440	213	450	86	53
3	31	62	48	54	60	110	500	988	211	460	83	54
4	31	62	50	53	60	190	480	754	207	480	83	206
5	31	62	50	53	60	290	475	631	234	500	81	151
6	31	63	55	54	60	280	465	577	232	552	77	161
7	32	62	60	55	60	285	430	541	219	637	74	99
8	33	62	60	55	60	285	390	469	205	660	72	84
9	34	63	50	55	60	290	350	397	215	651	71	88
10	34	63	50	55	62	300	310	361	238	563	69	83
11	34	64	50	55	66	320	293	341	225	485	68	71
12	35	62	50	55	65	320	280	335	211	418	67	64
13	35	62	48	55	65	350	232	330	225	358	65	58
14	35	60	45	55	64	320	213	322	229	305	63	54
15	35	55	45	55	70	300	191	313	225	269	63	49
16	34	60	45	55	70	380	181	308	229	245	64	43
17	45	65	45	55	70	500	167	287	282	229	64	41
18	46	65	45	55	70	650	161	249	350	219	63	38
19	40	65	43	60	65	695	207	232	375	207	61	37
20	41	60	42	65	60	700	387	215	370	191	61	37
21	45	55	43	65	60	690	559	201	360	167	59	38
22	51	50	45	62	60	600	790	197	320	161	57	37
23	53	45	45	60	60	530	981	199	330	159	55	39
24	52	45	45	60	62	500	1,180	203	380	155	53	41
25	52	40	47	60	63	495	1,380	205	450	153	51	46
26	52	40	48	60	62	470	1,540	217	500	140	49	47
27	52	40	50	60	60	460	1,630	227	490	122	47	53
28	52	40	50	60	55	450	1,690	240	480	112	45	54
29	52	40	50	60	------	435	1,720	238	470	105	47	57
30	57	40	50	60	------	430	1,740	217	460	100	49	68
31	62	------	55	60	------	440	------	213	------	97	54	------
TOTAL	1,281	1,676	1,497	1,780	1,749	12,200	19,882	13,167	9,148	9,800	1,993	2,008
MEAN	41.3	55.9	48.3	57.4	62.5	394	663	425	305	316	64.3	66.9
MAX	62	65	60	65	70	700	1,740	1,720	500	660	92	206
MIN	31	40	42	53	55	60	161	197	205	97	45	37
AC-FT	2,540	3,320	2,970	3,530	3,470	24,200	39,440	26,120	18,150	19,440	3,950	3,980

CAL YR 1970 TOTAL 70,047 MEAN 192 MAX 1,220 MIN 31 AC-FT 138,900
WTR YR 1971 TOTAL 76,181 MEAN 209 MAX 1,740 MIN 31 AC-FT 151,100

05059500 Sheyenne River at West Fargo, N. Dak.

LOCATION.--Lat 46°53'28", long 96°54'24", in SE¼SE¼ sec.31, T.140 N., R.49 W., Cass County, on right bank at downstream side of county highway bridge, 1 mile north of West Fargo, 3 miles upstream from Maple River, and at mile 24.5.

DRAINAGE AREA.--8,870 sq mi, approximately, of which about 5,780 sq mi is probably noncontributing (includes 3,800 sq mi in closed basins).

PERIOD OF RECORD.--March to November 1902 (gage heights only), April 1903 to October 1905, March to August 1919, September 1929 to current year. Published as "at or near Haggart" 1902-7, 1919. Records for March to November 1902 and November 1905 to June 1907, published in WSP 100, 171, 207, and 245, have been found to be unreliable and should not be used. Monthly discharge only for some periods, published in WSP 1308.

GAGE.--Water-stage recorder. Datum of gage is 877.19 ft above mean sea level. June 27, 1933 to September 1969 on left bank about 600 ft downstream on unimproved channel at same datum. See WSP 1728 or 1913 for history of changes prior to June 27, 1933.

AVERAGE DISCHARGE.--44 years (1903-5, 1929-71) 163 cfs (118,100 acre-ft per year); median of yearly mean discharges, 140 cfs (101,000 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 1,800 cfs May 1 (gage height, 14.63 ft; minimum, 31 cfs Aug. 20 (gage height, 3.85 ft).
Period of record: Maximum discharge, 3,110 cfs Apr. 4, 1966; maximum gage height, 21.70 ft Apr. 16, 17, 1969 (backwater from Red and/or Maple Rivers); minimum discharge, 2.0 cfs Dec. 14, 1936 (gage height, 1.90 ft).

REMARKS.--Records good. Flow regulated to a large degree by Lake Ashtabula (see station 05057500).

REVISIONS (WATER YEARS).--WSP 1388: 1904(M). WSP 1728: Drainage area. See also "PERIOD OF RECORD."

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	44	62	38	51	63	54	435	1,780	238	464	100	51
2	41	64	39	52	63	53	439	1,780	234	450	96	52
3	38	62	40	54	63	59	462	1,530	232	448	92	57
4	36	61	44	53	64	58	469	1,120	236	453	88	102
5	36	61	53	51	65	56	475	842	233	453	86	158
6	35	62	58	51	65	56	482	699	249	468	84	178
7	34	61	61	51	64	97	497	645	257	532	80	167
8	34	61	58	52	63	267	489	598	245	598	76	136
9	33	61	55	52	64	316	486	527	229	628	76	96
10	33	61	54	53	67	299	465	455	228	611	75	78
11	33	62	52	53	69	277	431	405	264	555	75	80
12	34	63	51	53	71	264	365	385	262	488	74	73
13	35	64	51	52	66	260	315	375	238	430	72	66
14	33	60	46	51	64	256	268	364	233	381	70	61
15	34	55	47	51	68	280	242	360	253	335	66	57
16	34	54	47	51	67	345	218	355	251	298	64	54
17	34	55	47	52	68	380	197	351	260	265	63	50
18	33	59	49	53	69	488	180	338	270	252	62	47
19	36	62	49	53	66	572	169	296	329	238	64	45
20	36	61	48	55	62	620	181	264	354	224	64	42
21	39	61	47	58	59	664	140	243	373	208	62	41
22	37	59	49	63	58	685	550	223	381	185	61	40
23	42	57	50	62	55	650	785	234	332	169	61	40
24	45	46	50	62	56	591	994	231	346	162	61	40
25	52	46	50	62	55	537	1,190	230	430	160	57	39
26	52	47	52	63	54	525	1,360	232	479	157	52	40
27	52	42	52	62	53	509	1,530	240	488	148	48	40
28	51	43	52	62	52	492	1,650	251	500	133	46	42
29	50	41	52	62	------	485	1,710	263	497	121	45	43
30	49	37	52	62	------	471	1,750	272	482	111	45	45
31	50	------	51	62	------	443	------	257	------	104	49	------
TOTAL	1,225	1,690	1,544	1,724	1,753	11,109	18,924	16,145	9,403	10,229	2,114	2,060
MEAN	39.5	56.3	49.8	55.6	62.6	358	631	521	313	330	68.2	68.7
MAX	52	64	61	63	71	685	1,750	1,780	500	628	100	178
MIN	33	37	38	51	52	53	140	223	228	104	45	39
AC-FT	2,430	3,350	3,060	3,420	3,480	22,030	37,540	32,020	18,650	20,290	4,190	4,090

CAL YR 1970 TOTAL 77,075 MEAN 211 MAX 1,100 MIN 33 AC-FT 152,900
WTR YR 1971 TOTAL 77,920 MEAN 213 MAX 1,780 MIN 33 AC-FT 154,600

05059600 Maple River near Hope, N. Dak.

LOCATION.--Lat 47°19'30", long 97°47'25", in NW¼NW¼ sec.4, T.144 N., R.56 W., Steele County, 100 ft downstream from box culvert on State Highway 38, 500 feet east of the intersection of State Highways 32 and 38, and 3 miles west of Hope.

DRAINAGE AREA.--20.2 sq mi, of which about 2.8 sq mi is probably noncontributing.

PERIOD OF RECORD.--October 1964 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,296.62 ft above mean sea level.

AVERAGE DISCHARGE.--7 years, 4.29 cfs (3,110 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 145 cfs Apr. 2 (gage height, 4.52 ft, backwater from ice); maximum gage height, 4.60 ft Mar. 14 (backwater from ice); no flow for several months.
Period of record: Maximum discharge, 734 cfs June 10, 1968 (gage height, 4.78 ft); maximum gage height, 5.46 ft Mar. 15, 1968 (backwater from ice); no flow for several months each year.

REMARKS.--Records fair.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						0	15	.48	1.5	16		
2						0	98	.43	.90	13		
3						0	81	.43	.58	18		
4						0	25	.43	.83	14		
5						0	20	.43	1.2	9.0		
6						0	15	.43	1.5	5.8		
7						0	14	.39	3.3	3.6		
8						0	13	.32	5.8	1.9		
9						0	10	.32	6.1	1.5		
10						0	7.1	.29	5.2	.76		
11						0	4.7	.20	4.1	.53		
12						.20	3.1	.14	3.4	.53		
13						.20	2.1	.14	2.2	.23		
14						.48	1.7	.11	1.3	.20		
15						.20	1.3	.09	.90	.11		
16						.20	1.2	.07	.76	0		
17						.48	1.0	.05	.53	0		
18						2.5	1.0	.03	.32	0		
19						6.1	3.4	.01	.20	0		
20						10	2.7	.01	.14	0		
21						8.1	3.3	.01	14	0		
22						8.1	3.1	.01	43	0		
23						4.0	2.2	.20	34	0		
24						2.1	1.7	.83	103	0		
25						.83	1.2	2.1	60	0		
26						.70	1.0	3.4	46	0		
27						2.5	.83	5.6	37	0		
28						15	.76	4.7	27	0		
29					------	10	.70	3.8	25	0		
30					------	15	.58	2.7	26	0		
31		------			------	15	------	1.9	------	0		------
TOTAL	0	0	0	0	0	101.69	335.67	30.05	455.76	85.16	0	0
MEAN	0	0	0	0	0	3.28	11.2	.97	15.2	2.75	0	0
MAX	0	0	0	0	0	15	98	5.6	103	18	0	0
MIN	0	0	0	0	0	0	.58	.01	.14	0	0	0
AC-FT	0	0	0	0	0	202	666	60	904	169	0	0

CAL YR 1970 TOTAL 1,712.44 MEAN 4.69 MAX 274 MIN 0 AC-FT 3,400
WTR YR 1971 TOTAL 1,008.33 MEAN 2.76 MAX 103 MIN 0 AC-FT 2,000

PEAK DISCHARGE (BASE, 50 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
4- 3	--	--	145	6-24	0800	3.49	143
6-21	2300	3.27	104				

05059700 Maple River near Enderlin, N. Dak.

LOCATION.--Lat 46°37'18", long 97°34'25", on west line sec.2, T.136 N., R.55 W., Ransom County, on left bank 25 ft downstream from county highway bridge, 1 mile downstream from South Branch 1.2 miles east of Enderlin.

DRAINAGE AREA.--843 sq mi, of which about 47 sq mi is probably noncontributing.

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

GAGE.--Water-stage recorder. Datum of gage is 1,056.72 ft above mean sea level. Sept. 21, 1956 to June 9, 1969, recording gage on right bank at same datum. Prior to Sept. 20, 1956, nonrecording gage at site 25 ft upstream at same datum.

AVERAGE DISCHARGE.--15 years, 36.6 cfs (26,520 acre-ft per year); median of yearly mean discharges, 18 cfs (13,000 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 207 cfs Mar. 24 (gage height, 5.58 ft, backwater from ice); maximum gage height, 5.70 ft Mar. 20 (backwater from ice); minimum daily discharge, 1.7 cfs Feb. 6-8, 12, and Aug. 27; minimum gage height, 3.39 ft Aug. 26-28.
Period of record: Maximum discharge, 5,750 cfs Apr. 11, 1969 (gage height, 13.55 ft); minimum, 0.1 cfs Dec. 7-9, 1963; minimum gage height, 1.90 ft Oct. 5, 1956.

REMARKS.--Records good.

REVISIONS.--WSP 1728: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.5	3.5	4.1	2.3	2.0	1.9	73	18	24	53	10	2.2
2	4.9	4.1	4.5	2.3	2.0	10	67	18	22	52	7.6	1.9
3	4.1	4.5	4.5	2.5	1.9	10	52	17	20	43	5.5	2.0
4	4.1	4.9	4.5	2.3	1.8	4.9	97	18	20	37	4.9	4.5
5	4.1	4.5	3.5	2.3	1.8	4.1	83	18	19	33	4.9	2.6
6	3.8	4.5	3.5	2.5	1.7	3.5	83	16	18	29	4.5	2.3
7	3.3	4.9	3.5	2.5	1.7	3.8	71	15	17	30	4.5	2.2
8	3.3	4.9	3.8	2.5	1.7	3.5	73	14	15	26	4.9	2.2
9	3.3	4.9	3.3	2.5	1.8	3.3	75	12	13	24	4.5	2.2
10	3.0	6.2	3.3	2.3	1.8	3.3	81	12	11	24	4.1	2.2
11	3.0	6.9	3.5	2.3	1.8	4.9	72	11	12	22	3.3	2.2
12	3.0	6.2	3.5	2.3	1.7	25	61	9.7	11	26	3.0	2.6
13	3.8	5.5	3.3	2.3	1.8	60	47	9.7	10	26	2.8	2.2
14	3.8	5.5	2.8	2.0	1.9	95	41	8.3	9.0	25	2.6	2.3
15	4.5	5.5	2.8	2.0	1.9	80	37	6.9	7.5	24	2.6	2.3
16	3.5	4.9	2.8	2.0	1.9	50	33	4.1	4.9	25	2.5	2.3
17	3.0	4.9	2.8	2.0	1.9	60	30	3.5	19	26	2.3	2.3
18	3.3	4.9	2.8	2.0	1.9	65	27	3.0	10	26	2.5	2.3
19	4.5	4.9	2.5	2.0	1.9	80	27	2.8	6.2	24	2.3	2.5
20	6.2	4.9	2.3	2.2	1.9	120	26	2.8	4.5	24	2.0	2.5
21	5.5	5.5	2.3	2.2	1.9	110	25	2.5	4.7	22	2.0	2.5
22	3.8	8.3	2.5	2.2	1.9	100	24	3.0	14	19	2.0	2.3
23	3.0	4.9	2.3	2.0	1.9	105	22	13	14	19	2.0	2.3
24	3.0	4.1	2.3	2.0	2.0	110	18	23	17	18	2.3	2.5
25	3.3	4.1	2.3	2.2	2.2	70	17	26	20	17	1.8	2.6
26	3.3	4.1	2.3	2.0	2.0	61	16	26	17	13	1.8	2.6
27	3.0	3.8	2.2	2.0	1.8	59	17	24	15	13	1.7	2.5
28	2.3	4.1	2.2	2.2	2.0	59	20	25	30	12	1.8	2.3
29	2.5	4.1	2.2	2.3	------	65	20	26	67	13	2.3	2.2
30	2.8	4.1	2.3	2.0	------	67	19	24	65	11	2.0	2.8
31	2.8	------	2.3	2.0	------	90	------	24	------	11	2.0	------
TOTAL	113.3	148.1	92.8	68.2	52.5	1,584.2	1,354	436.3	536.8	767	103.0	72.4
MEAN	3.65	4.94	2.99	2.20	1.88	51.1	45.1	14.1	17.9	24.7	3.32	2.41
MAX	6.2	8.3	4.5	2.5	2.2	120	97	26	67	53	10	4.5
MIN	2.3	3.5	2.2	2.0	1.7	1.9	16	2.5	4.5	11	1.7	1.9
AC-FT	225	294	184	135	104	3,140	2,690	865	1,060	1,520	204	144

CAL YR 1970 TOTAL 20,455.9 MEAN 56.0 MAX 2,160 MIN 1.4 AC-FT 40,570
WTR YR 1971 TOTAL 5,328.6 MEAN 14.6 MAX 120 MIN 1.7 AC-FT 10,570

PEAK DISCHARGE (BASE, 100 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
3-13	--	--	105	3-24	--	--	207
3-20	--	--	170	4- 4	0800	5.05	148

05060000 Maple River near Mapleton, N. Dak.

LOCATION.--Lat 46°51'40", long 97°06'10", in SW¼SE¼ sec.10, T.139 N., R.51 W., Cass County, on left bank 25 ft upstream from dam, 3 miles southwest of Mapleton, and 14 miles upstream from mouth.

DRAINAGE AREA.--1,450 sq mi, of which about 71 sq mi is probably noncontributing.

PERIOD OF RECORD.--April 1944 to current year. Prior to October 1958, published as "at Mapleton."

GAGE.--Water-stage recorder and rubble masonry dam. Altitude of gage is about 898 ft (estimated on basis of comparison with gage at former site). Prior to Oct. 1, 1958, nonrecording gage at site 3 miles downstream at different datum.

AVERAGE DISCHARGE.--27 years, 61.8 cfs (44,770 acre-ft per year); median of yearly mean discharges, 28 cfs (20,300 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 778 cfs Mar. 19 (gage height, 6.82 ft, backwater from ice); no flow Jan. 31 to Feb. 26.
Period of record: Maximum discharge, 7,000 cfs Apr. 11, 1969 (gage height, 14.00 ft); no flow at times in most years.

REMARKS.--Records good. Some small diversions for irrigation.

REVISIONS (WATER YEARS).--WSP 1175: 1947(M). WSP 1728: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	15	4.9	.90	0	.06	316	42	35	141	18	3.7
2	15	17	5.2	.90	0	.17	136	42	36	150	17	1.2
3	13	16	5.2	.90	0	.28	152	41	36	164	17	1.4
4	12	16	5.2	.90	0	.73	209	37	37	152	16	14
5	11	18	5.2	.90	0	1.2	276	35	46	136	15	143
6	10	17	4.3	.81	0	1.5	306	33	42	114	14	244
7	8.1	17	3.8	.81	0	1.5	272	32	36	93	13	164
8	6.1	17	3.8	.57	0	1.6	299	32	35	74	12	97
9	5.2	19	3.6	.38	0	1.8	279	32	32	61	11	59
10	5.5	19	3.2	.28	0	1.9	200	27	30	51	8.6	32
11	5.8	16	2.8	.20	0	1.8	154	23	27	44	6.8	20
12	5.8	15	2.2	.28	0	1.9	143	26	26	41	5.4	14
13	6.5	15	1.8	.50	0	3.0	136	25	25	35	4.3	7.7
14	6.5	11	1.4	.73	0	9.7	126	23	23	32	3.5	3.0
15	7.7	13	1.0	.50	0	13	108	22	21	30	2.5	1.7
16	7.7	13	.81	.50	0	8.5	93	20	20	27	1.9	1.4
17	6.9	13	.73	.50	0	60	76	20	21	26	1.2	1.2
18	6.9	13	.73	.50	0	280	69	17	25	26	.26	1.1
19	7.7	13	.65	.50	0	530	60	17	36	27	.19	1.2
20	8.5	13	.57	.44	0	680	54	18	33	28	.02	1.2
21	7.3	9.7	.57	.38	0	470	53	17	30	26	.03	1.2
22	6.9	8.9	.57	.38	0	420	51	16	30	25	.12	1.4
23	7.3	8.9	.57	.38	0	350	46	19	27	25	.26	1.4
24	7.7	6.9	.57	.33	0	380	43	21	31	23	.50	1.4
25	8.1	6.1	.65	.33	0	375	41	23	39	23	.50	1.4
26	8.5	6.1	.90	.33	0	327	39	29	42	21	.80	1.6
27	9.3	5.2	.90	.33	.01	345	37	34	74	21	.90	1.7
28	11	4.3	.90	.28	.06	398	41	34	89	20	1.1	2.1
29	12	4.0	.90	.24	------	455	41	32	82	20	1.2	2.7
30	12	4.3	.90	.08	------	546	39	30	97	20	.90	3.7
31	13	------	.90	0	------	736	------	32	------	19	5.8	------
TOTAL	279.0	370.4	65.42	15.06	.07	6,400.64	3,895	851	1,163	1,695	179.78	830.4
MEAN	9.00	12.3	2.11	.49	.003	206	130	27.5	38.8	54.7	5.80	27.7
MAX	20	19	5.2	.90	.06	736	316	42	97	164	18	244
MIN	5.2	4.0	.57	0	0	.06	37	16	20	19	.02	1.1
AC-FT	553	735	130	30	.1	12,700	7,730	1,690	2,310	3,360	357	1,650

CAL YR 1970 TOTAL 47,523.39 MEAN 130 MAX 3,100 MIN 0 AC-FT 94,260
WTR YR 1971 TOTAL 15,744.77 MEAN 43.1 MAX 736 MIN 0 AC-FT 31,230

PEAK DISCHARGE (BASE, 300 CFS).--Mar. 19 (778 cfs); Mar. 31 (1130) 762 cfs (5.88 ft).

05060500 Rush River at Amenia, N. Dak.

LOCATION.--Lat 47°01'00", long 97°12'50", in sec.24, T.141 N., R.52 W., Cass County, on left bank on downstream side of bridge on State Highway 18, 0.6 mile north of Amenia.

DRAINAGE AREA.--116 sq mi.

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

GAGE.--Water-stage recorder. Datum of gage is about 935 ft above mean sea level. See WSP 1913 for history of changes prior to June 10, 1961.

AVERAGE DISCHARGE.--25 years, 8.15 cfs (5,900 acre-ft per year); median of yearly mean discharges, 5.4 cfs (3,900 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 97 cfs Apr. 2 (gage height, 6.20 ft, backwater from ice); maximum gage height, 8.80 ft Mar. 15 (backwater from ice); no flow for many months.
Period of record: Maximum discharge, 1,690 cfs Apr. 10, 1969; maximum gage height, 12.15 ft Mar. 23, 1966 (backwater from ice); no flow at times each year.

REMARKS.--Records fair.

REVISIONS.--WSP 1728: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.16	1.2	.50			0	50	5.4	5.8	2.7		
2	.12	2.2	.40			0	65	5.4	4.7	2.7		
3	.14	2.7	.30			0	60	6.4	4.7	1.9		
4	.16	2.4	.30			0	50	5.4	5.6	1.7		
5	.18	2.0	.30			0	45	4.0	6.0	1.1		
6	.10	1.7	.25			0	40	3.0	4.5	.80		
7	.10	1.4	.25			0	35	3.0	4.7	.60		
8	.09	1.5	.25			0	30	3.2	3.3	.40		
9	.06	1.3	.25			0	26	3.7	3.3	.26		
10	.12	1.2	.20			0	25	2.9	3.1	.24		
11	.16	1.1	.15			0	18	2.6	2.5	.20		
12	.18	.99	.10			0	15	2.4	2.3	.26		
13	.24	.99	.10			0	13	2.0	2.1	.24		
14	.26	.87	.10			.50	12	1.9	1.8	.24		
15	.28	.76	.05			5.0	9.6	1.8	1.7	.22		
16	.24	.76	.05			55	6.6	1.6	1.5	.18		
17	.26	.76	.05			50	6.0	1.4	1.3	.16		
18	.24	.81	.05			45	5.4	1.7	1.1	.12		
19	.24	.81	.02			45	4.7	1.9	.93	.16		
20	.22	.81	.01			30	2.7	2.0	.87	.14		
21	.22	.81	0			20	3.3	1.7	.76	.09		
22	.28	.75	0			20	4.0	1.7	.81	.09		
23	.28	.70	0			20	2.7	4.9	.67	.08		
24	.22	.70	0			15	2.2	15	.99	.07		
25	.26	.70	0			10	2.7	32	1.2	.04		
26	.30	.60	0			30	2.2	38	1.7	.03		
27	.39	.60	0			50	2.9	24	2.4	.03		
28	.36	.55	0			60	3.4	15	2.3	.04		
29	.36	.50	0		------	65	4.3	9.4	3.1	.02		
30	.59	.50	0		------	60	4.3	7.1	3.1	.02		
31	.76	------	0		------	55	------	5.3	------	0		------
TOTAL	7.57	32.67	3.68	0	0	635.50	551.0	215.8	78.83	14.83	0	0
MEAN	.24	1.09	.12	0	0	20.5	18.4	6.96	2.63	.48	0	0
MAX	.76	2.7	.50	0	0	65	65	38	6.0	2.7	0	0
MIN	.06	.50	0	0	0	0	2.2	1.4	.67	0	0	0
AC-FT	15	65	7.3	0	0	1,260	1,090	428	156	29	0	0

CAL YR 1970 TOTAL 6,178.08 MEAN 16.9 MAX 320 MIN 0 AC-FT 12,250
WTR YR 1971 TOTAL 1,539.88 MEAN 4.22 MAX 65 MIN 0 AC-FT 3,050

PEAK DISCHARGE (BASE, 27 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
3-16	--	--	about 60	5-25	2000	4.56	45
4- 2	--	--	97				

05064500 Red River of the North at Halstad, Minn.

LOCATION.--Lat 47°21'10", long 96°50'50", on line between secs.24 and 25, T.145 N., R.49 W., Traill County, on left bank on upstream side of highway bridge, 0.5 mile west of Halstad, 2.5 miles downstream from Wild Rice River, and at mile 375.2.

DRAINAGE AREA.--21,800 sq mi, approximately (includes 3,800 sq mi in closed basins).

PERIOD OF RECORD.--April 1936 to June 1937 (no winter records), April 1942 to September 1960 (spring and summer months only), May 1961 to current year.

GAGE.--Water-stage recorder. Datum of gage is 826.65 ft above mean sea level. Prior to July 17, 1961, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--10 years, 1,800 cfs (1,304,000 acre-ft per year); median of yearly mean discharges, 1,640 cfs (1,188,000 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 5,480 cfs Apr. 1 (gage height, 15.62 ft, backwater from ice); minimum, 117 cfs Oct. 4 (gage height, 2.00 ft).
Period of record: Maximum discharge, 35,700 cfs Apr. 18, 1969 (gage height, 38.29 ft); minimum discharge observed, 5.4 cfs Oct. 8, 9, 12-14, 1936.
Flood in 1897 reached a stage of about 38.5 ft.

REMARKS.--Records good. Some regulation by many controlled lakes and reservoirs on tributaries.

REVISIONS (WATER YEARS).--WSP 1388: 1936, 1950. WSP 1728: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	150	326	305	235	180	280	5,400	2,800	955	1,190	664	194
2	139	349	295	235	185	280	5,190	2,800	971	1,170	619	208
3	132	367	280	235	185	290	4,290	2,790	936	1,170	555	236
4	126	394	270	235	190	300	3,700	2,760	936	1,190	504	272
5	121	399	265	232	200	305	3,510	2,530	955	1,200	471	751
6	130	396	270	230	200	310	3,600	2,180	971	1,350	451	1,520
7	155	394	275	230	210	340	4,500	1,920	971	1,920	434	1,680
8	180	396	275	230	210	350	5,050	1,780	933	2,360	418	1,660
9	195	415	270	225	210	354	4,960	1,700	917	2,390	407	1,590
10	210	459	260	225	210	380	4,200	1,680	895	2,270	396	1,400
11	220	492	250	225	215	435	3,900	1,550	868	2,110	391	1,170
12	215	507	245	222	215	550	3,790	1,450	857	1,940	380	986
13	210	504	250	220	215	650	3,340	1,350	845	1,800	375	864
14	208	501	255	220	230	720	2,880	1,300	812	1,650	370	758
15	208	505	255	220	235	750	2,530	1,230	772	1,540	359	657
16	210	508	250	215	235	800	2,320	1,190	758	1,520	354	576
17	203	510	250	215	235	830	2,140	1,140	787	1,500	329	540
18	196	445	245	210	235	1,000	1,970	1,110	819	1,390	294	519
19	196	440	245	210	240	1,280	1,820	1,070	906	1,280	269	489
20	192	440	245	200	245	1,770	1,740	1,010	993	1,180	262	474
21	187	430	240	195	245	2,640	1,680	933	1,000	1,080	257	468
22	169	410	240	195	245	3,000	1,660	834	971	978	250	445
23	160	380	240	190	245	3,420	1,740	841	978	910	248	412
24	153	375	240	190	250	3,510	1,900	933	993	853	253	391
25	148	380	235	185	255	3,440	2,070	1,050	986	798	229	370
26	153	350	235	185	260	3,280	2,230	1,080	1,000	772	217	357
27	194	330	235	185	270	3,060	2,390	1,050	1,020	754	208	349
28	241	290	235	185	280	3,000	2,570	1,000	1,060	736	190	346
29	265	290	230	185	------	3,100	2,710	963	1,090	733	185	344
30	282	300	235	185	------	3,380	2,770	952	1,150	718	180	359
31	294	------	235	180	------	4,420	------	948	------	700	190	------
TOTAL	5,842	12,282	7,855	6,529	6,330	48,224	92,550	45,924	28,105	41,152	10,709	20,385
MEAN	188	409	253	211	226	1,556	3,085	1,481	937	1,327	345	680
MAX	294	510	305	235	280	4,420	5,400	2,800	1,150	2,390	664	1,680
MIN	121	290	230	180	180	280	1,660	834	758	700	180	194
AC-FT	11,590	24,360	15,580	12,950	12,560	95,650	183,600	91,090	55,750	81,620	21,240	40,430

CAL YR 1970 TOTAL 544,847 MEAN 1,493 MAX 11,400 MIN 115 AC-FT 1,081,000
WTR YR 1971 TOTAL 325,887 MEAN 893 MAX 5,400 MIN 121 AC-FT 646,400

05064900 Beaver Creek near Finley, N. Dak.

(Hydrologic bench-mark station)

LOCATION.--Lat 47°35'40", long 97°42'18", in NE¼ sec.31, T.148 N., R.55 W., Steele County, on right bank 500 ft upstream from bridge on county highway 7 miles northeast of Finley.

DRAINAGE AREA.--160 sq mi, approximately.

PERIOD OF RECORD.--October 1964 to current year.

GAGE.--Water-stage recorder and concrete broad-crested weir. Datum of gage is 1,170.08 ft above mean sea level.

AVERAGE DISCHARGE.--7 years, 10.3 cfs (7,460 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 392 cfs Apr. 5 (gage height, 4.77 ft); no flow for several months. Period of record: Maximum discharge, 1,320 cfs Apr. 9, 1969 (gage height, 6.55 ft); maximum gage height, 9.70 ft Mar. 14, 1966 (backwater from ice); no flow for several months each year.

REMARKS.--Records good. Records of chemical analyses for the 1971 water year are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0	.70	.15			0	50	4.0	1.4	23	.78	0
2	0	.78	.10			0	189	4.5	1.3	36	.78	0
3	0	.78	.01			0	218	4.0	1.1	26	.63	0
4	0	.78	0			0	248	4.0	1.8	16	.45	0
5	0	.78	0			0	186	3.5	2.5	11	.30	0
6	0	.78	0			0	129	3.0	2.1	7.3	.19	0
7	0	.70	0			0	162	3.0	1.6	5.4	.15	1.3
8	0	.63	0			0	194	2.6	1.3	4.2	.12	.63
9	0	.56	0			0	155	2.5	1.2	3.1	.08	.40
10	0	.56	0			0	96	2.2	1.2	2.6	.05	.26
11	0	.45	0			0	80	2.0	1.2	2.3	.02	.26
12	0	.40	0			.05	65	1.9	1.2	3.6	0	.30
13	0	.40	0			.10	48	1.6	1.0	2.9	0	.30
14	0	.35	0			.20	37	1.3	.85	1.6	.01	.19
15	0	.35	0			5.5	26	1.0	.70	1.3	0	.22
16	0	.35	0			40	19	1.0	1.4	1.2	0	.19
17	0	.35	0			45	13	.90	2.1	.85	0	.02
18	0	.35	0			80	17	.78	1.8	1.5	0	.08
19	0	.35	0			66	23	.78	1.4	1.9	0	.51
20	0	.26	0			44	16	.63	1.0	1.9	0	.51
21	0	.35	0			40	12	.56	1.3	2.9	0	.35
22	0	.10	0			60	9.8	.70	1.4	3.3	0	.26
23	0	0	0			55	8.4	2.3	4.6	3.3	0	.19
24	0	0	0			50	7.6	4.7	6.5	2.9	0	.19
25	0	.19	0			40	7.0	4.7	6.8	4.3	0	.19
26	0	.08	0			60	6.5	3.8	8.1	3.8	0	.28
27	0	.10	0			70	6.0	2.6	14	3.4	0	.51
28	0	0	0			80	5.5	2.1	22	2.9	0	1.4
29	0	.10	0		------	100	5.0	1.5	13	2.3	0	3.6
30	.22	.15	0		------	170	4.0	1.5	18	1.5	0	9.5
31	.35	------	0		------	94	------	1.5	------	.94	0	------
TOTAL	.57	11.73	.26	0	0	1,099.85	2,042.8	71.15	123.85	185.19	3.56	21.64
MEAN	.018	.39	.008	0	0	35.5	68.1	2.30	4.13	5.97	.11	.72
MAX	.35	.78	.15	0	0	170	248	4.7	22	36	.78	9.5
MIN	0	0	0	0	0	0	4.0	.56	.70	.85	0	0
AC-FT	1.1	23	.5	0	0	2,180	4,050	141	246	367	7.1	43

CAL YR 1970 TOTAL 4,718.46 MEAN 12.9 MAX 575 MIN 0 AC-FT 9,360
WTR YR 1971 TOTAL 3,560.60 MEAN 9.76 MAX 248 MIN 0 AC-FT 7,060

PEAK DISCHARGE (BASE, 50 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
3-18	--	--	110	4- 5	1300	4.77	392
3-30	--	--	223				

05065500 Goose River near Portland, N. Dak.

LOCATION.--Lat 47°32'20", long 97°27'20", in SE¼NE¼ sec.19, T.147 N., R.53 W., Traill County, on left bank 75 ft upstream from bridge on State Highway 18, 1.2 miles upstream from unnamed tributary, 4 miles downstream from Beaver Creek, and 5 miles northwest of Portland.

DRAINAGE AREA.--517 sq mi, of which about 110 sq mi is probably noncontributing.

PERIOD OF RECORD.--October 1939 to current year.

GAGE.--Water-stage recorder and wooden control. Datum of gage is 967.48 ft above mean sea level. Prior to Oct. 1, 1956, nonrecording gages at site 2 miles upstream at datum 11.28 ft higher.

AVERAGE DISCHARGE.--32 years, 29.1 cfs (21,080 acre-ft per year); median of yearly mean discharges, 14 cfs (10,100 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 1,150 cfs Apr. 9 (gage height, 12.63 ft, backwater from ice); minimum, 0.05 cfs Sept. 26, 27 (gage height, 3.23 ft).
Period of record: Maximum discharge, 8,530 cfs May 9, 1950 (gage height, 20.12 ft) on basis of contracted-opening measurement, present site and datum; no flow at times most years.

REMARKS.--Records good.

REVISIONS.--WSP 1728: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.31	2.9	1.3	.72	.33	.60	150	37	22	41	7.1	.24
2	.42	4.2	1.3	.64	.36	.60	200	36	20	49	6.4	.33
3	.57	4.3	1.3	.72	.39	.59	180	35	18	42	5.9	.18
4	.48	4.2	1.3	.72	.44	.52	150	34	19	35	5.3	.89
5	.51	3.8	1.2	.63	.41	.50	214	31	23	31	5.0	2.1
6	.37	2.5	1.2	.55	.33	.40	255	26	25	30	4.5	4.7
7	.24	2.2	1.1	.48	.33	.43	331	27	26	26	2.6	2.4
8	.21	2.2	1.1	.44	.33	.40	733	26	26	23	2.6	1.5
9	.18	1.7	.95	.44	.33	.42	1,040	25	24	19	2.6	1.5
10	.27	1.5	.91	.37	.33	.44	1,130	23	21	17	2.1	.89
11	.32	1.7	.88	.33	.30	.45	918	21	19	16	1.9	.44
12	.52	1.5	.73	.33	.24	.77	531	19	19	15	1.5	.44
13	.43	1.4	.70	.44	.32	1.3	379	23	18	15	2.6	.44
14	.57	1.5	.64	.44	.33	3.6	256	22	16	14	4.1	.33
15	.39	1.4	.49	.33	.33	2.8	191	20	15	14	4.4	.33
16	.47	3.5	.61	.43	.33	2.6	141	18	15	13	2.4	.18
17	.58	3.2	.57	.44	.37	5.6	108	16	14	12	1.8	.18
18	.75	3.0	.68	.44	.35	21	79	13	13	12	1.3	.10
19	.82	2.8	.68	.47	.24	30	67	12	12	13	1.4	.08
20	.44	2.4	.63	.44	.24	30	84	12	11	12	1.5	.08
21	.37	2.4	.54	.44	.24	25	99	11	11	11	1.3	.10
22	.58	2.5	.74	.44	.31	50	89	12	10	10	1.1	.13
23	.93	1.7	.72	.40	.33	75	75	17	12	9.3	.89	.13
24	1.3	2.1	.72	.33	.40	60	71	24	14	9.2	.89	.13
25	1.1	1.8	.70	.39	.50	50	65	29	14	16	1.1	.07
26	1.0	1.5	.72	.33	.60	45	55	31	15	11	1.1	.05
27	1.4	.90	.67	.38	.43	41	47	41	15	9.4	1.3	.05
28	1.0	.86	.80	.40	.50	39	44	31	16	8.4	1.1	.06
29	1.7	.95	.72	.45	------	39	41	26	24	9.1	.57	.07
30	2.3	1.0	.72	.44	------	70	38	23	28	8.4	.44	.24
31	2.0	------	.70	.36	------	120	------	23	------	7.8	.44	------
TOTAL	22.53	67.61	26.02	14.16	9.94	717.02	7,761	744	535	558.6	77.23	18.36
MEAN	.73	2.25	.84	.46	.36	23.1	259	24.0	17.8	18.0	2.49	.61
MAX	2.3	4.3	1.3	.72	.60	120	1,130	41	28	49	7.1	4.7
MIN	.18	.86	.49	.33	.24	.40	38	11	10	7.8	.44	.05
AC-FT	45	134	52	28	20	1,420	15,390	1,480	1,060	1,110	153	36

CAL YR 1970 TOTAL 22,591.82 MEAN 61.9 MAX 1,530 MIN .18 AC-FT 44,810
WTR YR 1971 TOTAL 10,551.47 MEAN 28.9 MAX 1,130 MIN .05 AC-FT 20,930

PEAK DISCHARGE (BASE, 200 CFS).--APRIL 2 (240 CFS); APRIL 9 (1,150 CFS).

05066500 Goose River at Hillsboro, N. Dak.

LOCATION.--Lat 47°24'20", long 97°03'40", in NW¼ sec.5, T.145 N., R.50 W., Traill County, on right bank 600 ft upstream from Foogman Dam in Hillsboro 22 miles upstream from mouth.

DRAINAGE AREA.--1,203 sq mi, of which 110 sq mi is probably noncontributing.

PERIOD OF RECORD.--March 1931 to current year (no winter records 1932-34). Monthly discharge only for some periods, published in WSP 1308.

GAGE.--Water-stage recorder and masonry dam. Datum of gage is 879.52 ft above mean sea level. Sept. 26, 1941, to Oct. 27, 1965, at site 600 ft downstream at same datum. See WSP 1728 or 1913 for history of changes prior to Sept. 26, 1941.

AVERAGE DISCHARGE.--38 years (1931-32, 1934-71), 61.7 cfs (44,700 acre-ft per year); median of yearly mean discharges, 36 cfs (26,100 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 1,550 cfs Apr. 10 (gage height, 4.41 ft); minimum, 0.18 cfs Oct. 2, (gage height, 1.56 ft).
Period of record: Maximum discharge, 9,420 cfs Apr. 19, 1950; maximum gage height, 14.94 ft Apr. 19, 1950; no flow at times.

REMARKS.--Records good.

REVISIONS (WATER YEARS).--WSP 925: 1935-36, 1939. WSP 1728: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.94	10	9.4	5.0	3.8	5.6	647	94	75	116	23	2.2
2	.62	11	9.4	5.0	3.8	5.6	719	92	73	133	20	.98
3	.38	15	9.4	4.0	3.8	5.1	541	88	69	145	18	1.4
4	.62	15	9.4	4.0	3.8	4.7	536	87	73	153	18	2.0
5	.94	15	9.4	4.0	4.7	4.7	543	87	80	144	16	2.1
6	1.4	16	11	4.0	4.7	5.2	588	82	79	128	13	1.7
7	1.4	18	11	4.0	4.7	5.6	762	76	89	109	10	11
8	.94	18	11	4.0	4.7	5.6	852	72	90	91	9.2	9.4
9	.94	18	11	4.0	5.2	5.6	1,030	63	90	79	5.2	5.2
10	.94	17	11	3.5	5.5	5.6	1,340	59	86	69	4.5	4.8
11	.94	15	8.0	3.5	5.6	4.7	1,370	57	80	64	5.4	4.6
12	.94	14	6.8	3.5	5.6	5.0	1,290	53	74	57	3.6	3.6
13	1.8	12	6.8	3.5	4.7	7.0	899	48	68	50	4.3	3.8
14	2.4	12	6.8	3.4	4.7	8.5	577	45	65	44	4.7	3.6
15	1.1	11	6.8	3.4	4.7	8.6	416	44	63	40	4.1	3.8
16	.94	12	6.6	3.2	4.7	6.7	319	43	60	36	2.4	3.8
17	.94	14	6.8	3.1	4.7	12	266	38	57	34	3.5	3.7
18	1.8	14	6.8	3.1	4.7	21	221	29	54	37	2.6	2.8
19	2.6	14	6.8	3.1	4.7	41	191	26	52	39	2.5	2.4
20	3.8	15	6.8	3.1	5.2	92	170	25	47	41	2.4	2.0
21	3.8	16	6.8	3.1	5.6	155	171	25	43	41	2.4	1.7
22	3.8	15	6.8	3.1	5.6	193	189	24	40	39	8.0	1.4
23	4.3	12	6.0	3.1	5.6	217	183	33	38	34	8.3	1.4
24	5.8	12	6.0	3.1	5.6	214	166	48	39	31	3.5	1.2
25	8.1	12	6.0	3.1	5.6	230	148	67	40	25	1.7	1.4
26	11	10	6.0	3.1	5.6	195	134	105	71	21	.94	1.4
27	9.6	9.4	5.0	3.1	5.6	162	122	120	84	20	.93	1.4
28	9.3	9.4	5.0	3.1	5.6	138	107	112	99	25	1.6	1.6
29	9.4	9.4	5.0	3.8	------	138	101	109	103	27	1.9	1.7
30	9.4	9.4	5.0	3.9	------	196	93	94	102	26	1.5	34
31	9.4	------	5.0	3.9	------	347	------	84	------	24	2.3	------
TOTAL	110.28	400.6	233.6	110.8	138.8	2,444.8	14,691	2,029	2,083	1,922	205.47	122.08
MEAN	3.56	13.4	7.54	3.57	4.96	78.9	490	65.5	69.4	62.0	6.63	4.07
MAX	11	18	11	5.0	5.6	347	1,370	120	103	153	23	34
MIN	.38	9.4	5.0	3.1	3.8	4.7	93	24	38	20	.93	.98
AC-FT	219	795	463	220	275	4,850	29,140	4,020	4,130	3,810	408	242

CAL YR 1970 TOTAL 56,857.57 MEAN 156 MAX 2,880 MIN .38 AC-FT 112,800
WTR YR 1971 TOTAL 24,491.43 MEAN 67.1 MAX 1,370 MIN .38 AC-FT 48,580

PEAK DISCHARGE (BASE, 200 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
3-25	0515	2.46	237	4-10	1430	4.41	1,550
4- 1	2000	3.25	760				

05082500 Red River of the North at Grand Forks, N. Dak.

LOCATION.--Lat 47°56'34", long 97°03'10", in SW¼NE¼ sec.33, T.152 N., R.50 W., Grand Forks County, on left bank on second floor of old sewage plant in Grand Forks, 2.3 miles downstream from Red Lake River, and at mile 296.0.

DRAINAGE AREA.--30,100 sq mi, approximately (includes 3,800 sq mi in closed basins).

PERIOD OF RECORD.--April 1882 to current year. Monthly discharge only prior to May 1901, published in WSP 1308.

GAGE.--Water-stage recorder. Datum of gage is 778.35 ft above mean sea level. Nov. 3, 1933, to Apr. 13, 1965, water-stage recorder 0.3 mile upstream at present datum. See WSP 1728 or 1913 for history of changes prior to Nov. 3, 1933.

AVERAGE DISCHARGE.--89 years, 2,435 cfs (1,764,000 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 15,800 cfs Apr. 11 (gage height, 27.86 ft); minimum, 696 cfs Sept. 27-30 (gage height, 4.69 ft).
Period of record: Maximum discharge about 80,000 cfs Apr. 10, 1897 (gage height, 50.2 ft, site and datum then in use), from rating curve extended above 54,000 cfs; minimum, 2.4 cfs Feb. 3-5, 12, 14, 16-19, 1937 (caused by unusual regulation during repair of dam at Grand Forks).

REMARKS.--Records good. Flow regulated by many lakes and reservoirs on tributaries. Records of chemical analyses and water temperatures for the water year 1971 are published in Part 2 of this report.

REVISIONS (WATER YEARS).--WSP 855: 1936(M). WSP 1115: 1942. WSP 1175: 1897(M). WSP 1388: 1904, 1914-15, 1917-19, 1921-22, 1927, 1950. WSP 1728: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1,110	1,660	1,250	1,100	1,100	1,250	5,500	4,440	2,560	2,190	1,410	756
2	1,100	1,740	1,300	1,100	1,100	1,250	7,000	4,510	2,470	2,190	1,380	746
3	1,100	1,800	1,300	1,100	1,100	1,250	7,750	4,500	2,410	2,200	1,340	812
4	1,070	1,910	1,250	1,100	1,100	1,250	7,600	4,460	2,340	2,160	1,280	882
5	1,060	1,940	1,250	1,100	1,100	1,300	7,300	4,370	2,320	2,120	1,210	1,020
6	1,030	1,940	1,200	1,100	1,100	1,300	7,050	4,140	2,280	2,110	1,140	1,150
7	1,020	1,850	1,150	1,100	1,100	1,300	7,650	3,800	2,240	2,120	1,090	1,860
8	1,020	1,660	1,150	1,100	1,150	1,300	9,600	3,480	2,200	2,370	1,050	2,380
9	1,040	1,560	1,150	1,100	1,150	1,300	12,400	3,230	2,150	2,780	1,020	2,550
10	1,080	1,510	1,150	1,100	1,150	1,350	14,800	3,050	2,130	2,960	1,010	2,530
11	1,140	1,490	1,100	1,100	1,150	1,350	15,800	2,950	2,140	2,940	1,010	2,350
12	1,170	1,490	1,100	1,100	1,100	1,350	14,600	2,900	2,160	2,890	984	2,070
13	1,140	1,490	1,100	1,100	1,100	1,350	12,400	2,630	2,130	2,720	1,010	1,770
14	1,120	1,420	1,050	1,100	1,100	1,450	9,950	2,510	2,110	2,570	1,020	1,620
15	1,100	1,260	1,050	1,100	1,150	1,600	7,900	2,440	2,060	2,420	1,020	1,450
16	1,070	1,170	1,100	1,100	1,150	1,650	6,200	2,420	2,020	2,260	1,000	1,290
17	1,070	1,180	1,100	1,100	1,150	1,700	5,100	2,370	2,020	2,160	1,010	1,150
18	1,100	1,330	1,100	1,100	1,150	1,750	4,500	2,330	1,990	2,240	1,020	1,060
19	1,090	1,420	1,100	1,100	1,200	1,900	4,280	2,290	1,940	2,170	1,050	992
20	1,060	1,500	1,100	1,100	1,200	2,050	4,220	2,280	1,940	2,040	1,060	942
21	1,060	1,390	1,100	1,100	1,200	2,400	4,210	2,220	2,060	1,930	1,050	903
22	1,070	1,400	1,100	1,100	1,200	3,000	4,150	2,160	2,180	1,860	1,010	858
23	1,160	1,050	1,100	1,100	1,200	3,800	4,130	2,180	2,210	1,830	984	830
24	1,190	950	1,100	1,100	1,200	4,700	4,130	2,260	2,260	1,760	952	802
25	1,200	1,000	1,100	1,100	1,200	4,900	4,020	2,330	2,240	1,700	917	756
26	1,190	950	1,100	1,100	1,200	4,950	3,980	2,660	2,160	1,620	896	710
27	1,210	1,000	1,100	1,100	1,250	4,800	4,010	3,140	2,110	1,570	837	696
28	1,220	1,050	1,100	1,100	1,250	4,600	4,070	3,340	2,110	1,610	802	696
29	1,260	1,150	1,100	1,100	------	4,250	4,210	3,140	2,140	1,500	794	696
30	1,340	1,200	1,100	1,100	------	4,200	4,360	2,860	2,170	1,420	766	732
31	1,480	------	1,100	1,100	------	4,500	------	2,680	------	1,420	749	------
TOTAL	35,070	42,460	35,150	34,100	32,300	75,100	212,870	94,070	65,250	65,830	31,871	37,059
MEAN	1,131	1,415	1,134	1,100	1,154	2,423	7,096	3,035	2,175	2,124	1,028	1,235
MAX	1,480	1,940	1,300	1,100	1,250	4,950	15,800	4,510	2,560	2,960	1,410	2,550
MIN	1,020	950	1,050	1,100	1,100	1,250	3,980	2,160	1,940	1,420	749	696
AC-FT	69,560	84,220	69,720	67,640	64,070	149,000	422,200	186,600	129,400	130,600	63,220	73,510

CAL YR 1970 TOTAL 1,383,295 MEAN 3,790 MAX 23,600 MIN 903 AC-FT 2,744,000
WTR YR 1971 TOTAL 761,130 MEAN 2,085 MAX 15,800 MIN 696 AC-FT 1,510,000

05083600 Middle Branch Forest River near Whitman, N. Dak.

LOCATION.--Lat 48°14'50", long 98°07'00", in SE¼NW¼ sec.16, T.155 N., R.58 W., Walsh County, 150 ft downstream from bridge on State Highway 35, and 6 miles north of Whitman.

DRAINAGE AREA.--73 sq mi, approximately.

PERIOD OF RECORD.--October 1960 to current year.

GAGE.--Water-stage recorder.

AVERAGE DISCHARGE.--11 years, 2.62 cfs (1,900 acre-ft per year); median of yearly mean discharges, 2.0 cfs (1,450 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 235 cfs Apr. 8 (gage height, 6.54 ft, backwater from ice); no flow for several months.
Period of record: Maximum discharge, 425 cfs Apr. 11, 1969 (gage height, 6.82 ft, backwater from ice); no flow for several months each year.

REMARKS.--Records good.

DISCHARGE, IN CUBIC FEET PER SECCND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1							.50	5.2	0	0	.54	
2							1.0	3.9	0	0	.38	
3							3.0	2.8	0	0	.26	
4							2.0	2.1	0	0	.18	
5							5.0	1.7	0	0	.12	
6							25	1.2	0	0	.08	
7							50	.94	0	7.4	.08	
8							79	.66	0	3.5	.08	
9							137	.50	0	1.5	.05	
10							105	.30	.50	1.2	.03	
11							89	.38	1.0	1.0	0	
12							74	.15	2.5	11	0	
13							65	.08	1.5	5.2	.04	
14							51	.08	.50	3.1	.04	
15							43	.07	.10	2.4	.03	
16							34	.05	.05	1.8	0	
17							25	.04	.02	1.3	.69	
18							32	.04	0	6.5	.10	
19							68	.03	0	11	.06	
20							50	.02	0	10	.04	
21							31	.01	0	9.1	.02	
22							21	0	0	7.4	0	
23							15	.01	0	5.9	0	
24							12	.01	0	4.6	0	
25							10	0	0	3.4	0	
26							8.8	0	0	2.3	0	
27							7.8	0	0	1.8	0	
28							7.2	0	0	1.5	0	
29					------		6.1	0	0	1.2	0	
30					------		6.1	0	0	1.0	0	
31		------			------		------	0	------	.66	0	------
TOTAL	0	0	0	0	0	0	1,063.50	20.27	6.17	105.76	2.82	0
MEAN	0	0	0	0	0	0	35.5	.65	.21	3.41	.091	0
MAX	0	0	0	0	0	0	137	5.2	2.5	11	.69	0
MIN	0	0	0	0	0	0	.50	0	0	0	0	0
AC-FT	0	0	0	0	0	0	2,110	40	12	210	5.6	0

CAL YR 1970 TOTAL 467.71 MEAN 1.28 MAX 33 MIN 0 AC-FT 928
WTR YR 1971 TOTAL 1,198.52 MEAN 3.28 MAX 137 MIN 0 AC-FT 2,380

PEAK DISCHARGE (BASE, 70 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
4-8	--	--	235	4-18	2345	5.24	107

05084000 Forest River near Fordville, N. Dak.

LOCATION.--Lat 48°11'50", long 97°43'49", on line between secs.32 and 33, T.155 N., R.55 W., Walsh County, on right bank 50 ft upstream from highway bridge, 0.5 mile downstream from South Branch, and 3 miles southeast of Fordville.

DRAINAGE AREA.--456 sq mi, of which about 120 sq mi is probably noncontributing.

PERIOD OF RECORD.--April 1940 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 1,040 ft (by barometer). Prior to July 21, 1951, nonrecording gage at site 50 ft downstream at same datum.

AVERAGE DISCHARGE.--31 years, 36.8 cfs (26,670 acre-ft per year); median of yearly mean discharges, 33 cfs (23,900 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 2,800 cfs April 8 (gage height, 8.39 ft, backwater from ice); minimum daily discharge, 5.4 cfs Feb. 11-12; minimum gage height, 1.40 ft Sept. 16.
Period of record: Maximum discharge, 16,400 cfs Apr. 18, 1950 (gage height, 14.48 ft, from floodmark), from rating curve extended above 5,600 cfs on basis of contracted-opening and slope-area measurements of peak flow; no flow Apr. 1-13, Sept. 3, 1940.

REMARKS.--Records good. Some regulation of high flows by temporary retention in several retarding basins above station. Retarding basins have a combined capacity of about 14,000 acre-feet.

REVISIONS (WATER YEARS).--WSP 1175: 1948. WSP 1728: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.5	15	10	7.5	6.8	18	16	94	21	17	28	9.4
2	9.4	14	11	7.5	6.5	17	15	80	21	16	26	9.4
3	9.0	12	10	7.5	6.2	17	14	71	21	16	24	9.4
4	7.5	11	10	7.5	6.0	19	14	67	22	16	22	10
5	7.5	12	9.8	7.5	5.7	19	30	62	22	16	21	14
6	8.2	12	9.5	7.5	5.7	19	46	57	21	15	18	16
7	9.0	14	9.5	7.5	5.7	18	724	52	19	19	18	20
8	7.5	14	9.5	7.5	5.7	18	2,160	49	17	26	16	18
9	8.2	15	9.3	7.5	5.7	18	1,970	46	16	41	15	15
10	9.4	17	9.0	7.3	5.7	18	1,610	41	19	46	15	14
11	16	16	9.0	7.3	5.4	18	1,000	39	26	36	14	11
12	15	16	9.0	7.3	5.4	17	570	37	67	48	13	9.8
13	15	13	9.0	7.2	5.7	17	439	34	33	76	18	9.4
14	16	12	8.7	7.2	6.0	16	388	33	23	110	16	8.2
15	16	14	8.5	7.2	6.0	16	370	31	21	74	14	8.2
16	15	12	8.5	7.0	7.0	15	368	29	23	53	12	8.2
17	16	13	8.5	7.0	8.5	16	328	29	23	42	14	8.6
18	16	13	8.5	7.0	12	17	294	28	20	141	14	10
19	16	12	8.5	7.0	12	18	1,020	27	20	468	13	9.0
20	20	9.4	8.5	7.0	12	18	362	26	20	194	12	8.6
21	20	7.8	8.0	7.2	12	17	373	25	19	132	11	8.2
22	20	8.6	8.0	7.5	12	16	300	25	18	105	10	8.6
23	20	8.6	9.0	7.5	12	15	264	26	17	89	9.4	8.6
24	19	7.8	8.0	7.4	13	14	232	26	17	86	10	8.6
25	18	8.6	8.0	7.2	14	12	206	25	17	73	9.4	8.6
26	17	7.8	8.0	7.0	15	10	183	23	18	57	9.0	8.2
27	16	7.1	8.0	7.0	17	10	152	22	18	49	8.6	9.8
28	16	7.8	8.0	7.0	18	12	134	21	17	46	8.2	10
29	16	9.0	8.0	7.0	------	14	114	21	18	40	9.0	11
30	17	9.4	7.8	7.0	------	15	105	21	18	36	9.0	12
31	16	------	7.5	7.0	------	16	------	21	------	32	8.6	------
TOTAL	440.2	348.9	271.6	224.8	252.7	500	13,801	1,188	652	2,215	445.2	319.8
MEAN	14.2	11.6	8.76	7.25	9.03	16.1	460	38.3	21.7	71.5	14.4	10.7
MAX	20	17	11	7.5	18	19	2,160	94	67	468	28	20
MIN	7.5	7.1	7.5	7.0	5.4	10	14	21	16	15	8.2	8.2
AC-FT	873	692	539	446	501	992	27,370	2,360	1,290	4,390	883	634

CAL YR 1970 TOTAL 13,652.5 MEAN 37.4 MAX 1,620 MIN 5.4 AC-FT 27,080
WTR YR 1971 TOTAL 20,659.2 MEAN 56.6 MAX 2,160 MIN 5.4 AC-FT 40,980

PEAK DISCHARGE (BASE, 200 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
4- 8	--	--	2,800	7-19	0400	4.37	664
4-19	1830	6.64	1,760				

05085000 Forest River at Minto, N. Dak.

LOCATION.--Lat 48°16'10", long 97°22'10", in SE¼ sec.31, T.156 N., R.52 W., Walsh County, on right bank 30 ft upstream from dam in Minto, 150 ft upstream from Burlington Northern Railway bridge, and 2 blocks east of U.S. Highway 81.

DRAINAGE AREA.--740 sq mi, of which about 120 sq mi is probably noncontributing.

PERIOD OF RECORD.--April 1944 to current year.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 806.95 ft above mean sea level. Prior to July 15, 1954, nonrecording gage at site 400 ft upstream at same datum.

AVERAGE DISCHARGE.--27 years, 48.6 cfs (35,210 acre-ft per year); median of yearly mean discharges, 36 cfs (26,100 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 2,460 cfs Apr. 10 (gage height, 5.84 ft, from high-water mark); minimum daily discharge, 0.43 cfs Feb. 1.
Period of record: Maximum discharge, 16,600 cfs Apr. 18, 1950 (gage height, 11.80 ft, from floodmarks), from rating curve extended above 7,200 cfs on basis of contracted-opening measurement of peak flow; no flow at times each year 1945-47, 1953-55, 1959-64.

REMARKS.--Records good. Occasionally during high stages, particularly when the channel is filled with snow, overflow occurs 0.5 mile below the municipality of Forest River and bypasses the gage 3 miles south of Minto and flows into Lake Ardoch. Bypass flow is not included in computation of discharge record for station at Minto.

REVISIONS (WATER YEARS).--WSP 1438: 1948-50. WSP 1728: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.7	14	7.1	1.7	.43	1.5	41	135	25	19	50	11
2	5.6	15	7.1	1.7	.50	1.5	20	123	26	18	45	11
3	5.4	15	7.1	1.6	.46	1.5	21	113	25	17	40	11
4	4.7	16	7.1	1.6	.46	1.5	50	105	26	17	36	13
5	5.7	14	7.1	1.4	.48	1.7	93	96	26	17	32	14
6	5.1	14	7.1	1.3	.61	1.3	272	89	28	16	29	15
7	5.3	14	7.1	1.3	.66	1.3	521	84	25	16	25	18
8	5.7	13	7.0	1.0	.56	1.3	719	78	24	16	23	16
9	6.6	13	6.8	1.0	.73	1.3	1,720	70	24	17	22	18
10	6.4	13	6.6	.84	.63	1.3	2,230	64	24	19	22	19
11	6.6	13	6.3	.75	.67	1.5	1,630	64	26	35	20	18
12	7.3	13	5.7	.60	.42	1.3	1,130	62	43	47	19	15
13	8.5	11	5.3	.56	.43	1.3	741	60	59	41	19	14
14	10	11	4.8	.68	.85	1.4	533	56	66	47	20	12
15	10	12	4.1	.69	1.0	.90	446	53	47	67	22	11
16	10	12	3.5	.61	.87	.88	405	51	41	81	19	10
17	10	9.9	3.4	.75	.95	.78	389	48	38	68	17	8.9
18	11	12	3.2	.62	1.2	1.3	352	47	34	67	17	9.1
19	9.7	12	3.0	.69	1.3	9.4	325	44	32	89	17	9.6
20	10	8.7	2.9	.89	1.1	15	702	41	32	266	17	9.3
21	10	8.6	2.5	.86	1.5	16	674	39	30	210	18	9.8
22	11	8.0	2.2	.74	1.5	18	440	37	28	143	15	10
23	12	7.1	2.4	.91	1.5	18	356	37	29	118	14	9.6
24	11	7.1	2.2	.77	1.5	17	304	37	25	107	14	11
25	11	7.1	2.1	.75	1.6	15	271	35	21	96	12	9.4
26	12	7.1	2.2	.59	1.6	12	245	34	22	88	12	9.1
27	13	6.0	2.1	.55	1.5	11	221	33	22	79	12	4.2
28	14	6.0	2.1	.51	1.5	11	199	30	21	74	11	5.7
29	13	6.3	2.1	.69	------	12	169	28	22	68	11	7.9
30	13	6.3	2.0	.58	------	14	149	27	21	63	10	7.1
31	13	------	2.1	.54	------	39	------	26	------	55	11	------
TOTAL	283.3	325.2	136.3	27.77	26.51	230.96	15,368	1,846	912	2,081	651	346.7
MEAN	9.14	10.8	4.40	.90	.95	7.45	512	59.5	30.4	67.1	21.0	11.6
MAX	14	16	7.1	1.7	1.6	39	2,230	135	66	266	50	19
MIN	4.7	6.0	2.0	.51	.42	.78	20	26	21	16	10	4.2
AC-FT	562	645	270	55	53	458	30,480	3,660	1,810	4,130	1,290	688

CAL YR 1970 TOTAL 22,750.10 MEAN 62.3 MAX 1,630 MIN .30 AC-FT 45,120
WTR YR 1971 TOTAL 22,234.74 MEAN 60.9 MAX 2,230 MIN .42 AC-FT 44,100

PEAK DISCHARGE (BASE, 200 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
4-10	-	-	2,460	7-20	1330	2.36	327
4-20	1915	3.40	880				

05088500 Homme Lake near Park River, N. Dak.

LOCATION.--Lat 48°24'20", long 97°47'10", in SE¼NW¼ sec.19, T.157 N., R.55 W., Walsh County, at Homme Dam on South Branch Park River, 2 miles west of town of Park River.

DRAINAGE AREA.--226 sq mi.

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

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

EXTREMES.--Current year: Maximum contents during year, 4,310 acre-ft Apr. 10 (elevation, 1,082.92 ft); minimum, 1,135 acre-ft Mar. 31 (elevation, 1,064.55 ft).
Period of record: Maximum contents, 4,498 acre-ft Apr. 11, 1965 (elevation, 1,083.70 ft); minimum since first reaching spillway level, 184 acre-ft Feb. 8, 1952 (elevation, 1,051.22 ft).

REMARKS.--Reservoir is formed by an earth-fill dam, 865 ft long; storage began in September 1949; dam completed in October 1950. Usable capacity between invert of outlet, elevation, 1,048.0 ft, and crest of spillway, elevation, 1,080.0 ft, is 3,550 acre-ft. Dead storage is 100 acre-ft. Low flows are controlled by two sluice gates 3 x 5 ft. The spillway, which is 150 ft long, is uncontrolled. The records herein represent total contents. The reservoir is operated for flood control, water supply, and pollution abatement during low-flow periods.

COOPERATION.--Records furnished by Corps of Engineers.

REVISIONS.--WSP 1728: Drainage area.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	1,078.60	3,394	
Oct. 31	1,078.24	3,326	-68
Nov. 30	1,077.55	3,194	-132
Dec. 31	1,076.40	2,976	-218
CAL YR 1970	--	--	+228
Jan. 31	1,075.00	2,710	-266
Feb. 28	1,072.40	2,240	-470
Mar. 31	1,064.55	1,135	-1,105
Apr. 30	1,080.00	3,660	+2,525
May 31	1,079.80	3.622	-38
June 30	1,079.80	3,622	0
July 31	1,079.75	3,613	-9
Aug. 31	1,079.60	3,584	-29
Sept. 30	1,079.50	3,565	-19
WTR YR 1971	--	--	+171

05089000 South Branch Park River below Homme Dam, N. Dak.

LOCATION.--Lat 48°24'07", long 97°46'55", in SE¼ sec.19, T.157 N., R.55 W., Walsh County, on right bank 0.5 mile downstream from Homme Dam and 2 miles west of town of Park River.

DRAINAGE AREA.--226 sq mi.

PERIOD OF RECORD.--October 1949 to current year. Monthly discharge only for October and November 1949, published in WSP 1308.

GAGE.--Water-stage recorder. Datum of gage is 1,000.00 ft above mean sea level.

AVERAGE DISCHARGE.--22 years, 27.1 cfs (19,630 acre-ft per year); median of yearly mean discharges, 21 cfs (15,200 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 2,850 cfs Apr. 9 (gage height, 28.99 ft); minimum, 0.08 cfs Oct. 1, 19, 20; minimum gage height, 22.27 ft Oct. 1.
Period of record: Maximum discharge, about 13,000 cfs Apr. 24, 1950 (gage height, 37.52 ft), from rating curve extended above 5,500 cfs, result of failure of emergency embankment at site of Homme Dam; no flow Oct. 1 to Dec. 3, 1949, Oct. 1-4, 1969, Sept. 21, 1970.

REMARKS.--Records good. Flow regulated by Homme Lake (see station 05088500).

REVISIONS.--WSP 1728: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.3	1.4	1.3	10	3.8	4.8	5.3	42	2.1	7.4	.17	.59
2	.30	1.1	.90	7.5	3.5	.86	5.6	42	2.1	6.1	.18	.79
3	.16	.94	.51	6.5	3.4	.47	5.6	34	1.9	4.5	.49	.46
4	.10	.49	.59	6.2	3.0	1.4	5.3	26	2.9	4.4	.89	.42
5	.10	2.5	1.2	6.2	10	14	5.6	27	5.5	3.9	.92	.75
6	.09	2.5	2.0	6.2	7.8	16	5.9	27	4.8	3.8	2.7	.53
7	.10	2.5	11	6.0	7.4	16	6.2	27	4.8	8.1	3.8	.52
8	.12	2.0	13	6.0	7.1	17	129	21	5.0	136	3.0	.71
9	.12	2.1	6.4	5.5	7.1	20	1,750	16	5.0	116	2.9	.43
10	.12	3.3	6.0	5.5	6.8	15	2,500	13	5.3	81	2.3	.24
11	.13	5.6	6.2	5.5	6.5	16	1,740	8.3	8.3	53	1.5	.21
12	.13	5.3	5.9	10	6.2	22	752	5.9	19	55	1.4	1.2
13	.13	5.3	5.6	7.5	6.2	26	409	6.1	69	37	1.6	.69
14	.11	5.0	5.8	6.5	5.9	26	273	8.4	74	30	1.6	.81
15	.11	4.7	5.9	6.2	5.9	26	239	13	48	19	1.4	.59
16	.73	4.4	5.6	5.6	5.6	33	253	9.0	42	12	1.5	.31
17	.17	4.2	5.3	5.0	5.6	43	262	9.0	31	12	1.7	2.7
18	.10	5.0	5.7	4.5	5.6	42	204	8.5	25	17	1.5	2.1
19	.08	5.5	5.5	7.4	5.6	41	377	8.5	25	24	1.6	2.2
20	.08	5.3	5.5	6.5	5.6	40	260	8.5	24	18	1.6	1.7
21	.09	5.1	5.0	4.3	5.6	40	175	8.5	14	13	1.5	.68
22	.09	5.2	10	4.3	5.3	40	141	8.6	9.0	13	1.5	.76
23	.09	6.4	7.5	4.5	5.3	39	104	8.7	14	8.4	1.5	.73
24	.11	6.3	6.0	4.5	5.0	21	85	8.6	16	3.9	3.2	.87
25	.12	5.1	5.5	4.3	5.0	8.1	72	7.9	11	8.5	1.3	1.1
26	4.5	4.1	10	4.0	5.6	7.1	59	5.9	7.2	3.1	.52	1.3
27	16	4.1	7.5	4.0	7.1	5.6	60	5.4	6.8	2.4	.30	1.3
28	16	3.7	6.5	4.0	7.1	5.3	59	4.1	6.8	.78	.19	1.0
29	16	2.9	6.5	4.0	------	5.3	58	2.8	7.1	.54	.41	.61
30	12	1.6	6.5	4.0	------	5.0	50	2.4	7.5	.38	.39	1.1
31	1.8	------	6.5	4.0	------	5.3	------	2.3	------	.19	.33	------
TOTAL	73.08	113.63	177.40	176.2	164.6	602.23	10,050.5	425.4	504.1	702.39	43.89	27.40
MEAN	2.36	3.79	5.72	5.68	5.88	19.4	335	13.7	16.8	22.7	1.42	.91
MAX	16	6.4	13	10	10	43	2,500	42	74	136	3.8	2.7
MIN	.08	.49	.51	4.0	3.0	.47	5.3	2.3	1.9	.19	.17	.21
AC-FT	145	225	352	349	326	1,190	19,940	844	1,000	1,390	87	54

CAL YR 1970 TOTAL 7,833.00 MEAN 21.5 MAX 668 MIN .06 AC-FT 15,540
WTR YR 1971 TOTAL 13,060.82 MEAN 35.8 MAX 2,500 MIN .08 AC-FT 25,910

05089100 Middle Branch Park River near Union, N. Dak.

LOCATION.--Lat 48°32'32", long 98°01'10", on north line of sec.5, T.158 N., R.57 W., Walsh County, on left bank 20 ft downstream from bridge on county highway between Walsh and Cavalier Counties, 3.5 miles southwest of Union.

DRAINAGE AREA.--15.3 sq mi.

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

GAGE.--Water-stage recorder.

AVERAGE DISCHARGE.--6 years, 2.58 cfs (1,870 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, about 650 cfs Apr. 9 (gage height, 7.00 ft, backwater from ice); no flow for several months.
Period of record: Maximum discharge, 687 cfs May 6, 1967 (gage height, 7.22 ft, from floodmark); maximum gage height, 7.51 ft May 4, 1966, from floodmark, backwater from snowdrift; no flow for several months each year.

REMARKS.--Records fair below 20 cfs and poor above.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.03	.15	.05			0	.05	.87	.15	2.6	.07	.15
2	.03	.23	.05			0	.05	.87	.07	1.4	.07	.12
3	.03	.19	.05			0	.05	.60	.07	1.0	.07	.10
4	.03	.15	.05			0	.05	.47	.47	.60	.02	.12
5	.03	.12	.05			0	.10	.24	.24	.24	.02	.15
6	.03	.12	.03			0	.15	.24	.15	.02	.02	.13
7	.03	.12	.03			0	2.5	.24	.02	70	.02	.13
8	.03	.12	.03			0	20	.02	.07	32	.02	.10
9	.03	.10	.02			0	300	.01	.02	9.6	.01	.07
10	.06	.08	.01			0	250	.01	.02	4.7	.01	.05
11	.04	.08	.01			0	200	.02	.15	2.6	.01	.04
12	.04	.08	.01			0	50	.15	5.3	1.8	.01	.03
13	.04	.08	.01			0	38	.15	6.1	.73	.01	.03
14	.04	.07	0			0	14	.24	3.7	.47	.01	.03
15	.04	.07	0			0	12	.15	3.0	.15	.01	.04
16	.04	.07	0			0	10	.24	3.3	.07	.01	.04
17	.04	.07	0			0	6.1	.07	1.0	.07	3.7	.04
18	.04	.06	0			0	5.9	.07	.24	.07	1.3	.04
19	.05	.06	0			0	30	.07	1.2	.02	.35	.04
20	.05	.05	0			0	12	.01	4.5	.02	.24	.04
21	.05	.05	0			0	9.2	.02	5.4	.02	.15	.04
22	.06	.05	0			0	4.1	.07	8.6	.02	.07	.04
23	.06	.05	0			0	2.6	.24	7.2	.02	.15	.04
24	.06	.05	0			0	1.4	.07	6.4	.07	.35	.04
25	.06	.05	0			0	1.9	.15	5.1	.07	.24	.04
26	.06	.05	0			0	1.4	.07	16	.02	.24	.04
27	.06	.05	0			0	1.4	.01	21	.02	.07	.04
28	.06	.05	0			0	.73	.02	12	.02	.07	.04
29	.06	.05	0		------	0	.73	.07	6.6	.07	.07	.04
30	.06	.05	0		------	.05	.87	.07	3.9	.07	.07	.04
31	.06	------	0		------	.10	------	.07	------	.07	.07	------
TOTAL	1.40	2.57	.40	0	0	.15	975.28	5.60	121.97	128.63	7.53	1.89
MEAN	.045	.086	.013	0	0	.005	32.5	.18	4.07	4.15	.24	.063
MAX	.06	.23	.05	0	0	.10	300	.87	21	70	3.7	.15
MIN	.03	.05	0	0	0	0	.05	.01	.02	.02	.01	.03
AC-FT	2.8	5.1	.8	0	0	.3	1,930	11	242	255	15	3.8

CAL YR 1970 TOTAL 790.45 MEAN 2.17 MAX 140 MIN 0 AC-FT 1,570
WTR YR 1971 TOTAL 1,245.42 MEAN 3.41 MAX 300 MIN 0 AC-FT 2,470

PEAK DISCHARGE (BASE, 20 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
4- 9	--	--	about 650	6-26	0830	2.63	26
4-19	0430	2.90	54	7- 7	1500	3.66	231
6-21	2200	2.55	20				

05089500 Cart Creek at Mountain, N. Dak.

LOCATION.--Lat 48°40'37", long 97°51'41", in SW¼ sec.15, T.160 N., R.56 W., Pembina County, on right bank 50 ft downstream from bridge on State Highway 32 and 0.7 mile south of Mountain.

DRAINAGE AREA.--16.9 sq mi.

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

GAGE.--Water-stage recorder and wooden control. Datum of gage is 1,027.40 ft above mean sea level.

AVERAGE DISCHARGE.--17 years, 2.87 cfs (2,080 acre-ft per year); median of yearly mean discharges, 3.3 cfs (2,400 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 337 cfs Apr. 9 (gage height, 5.63 ft); maximum gage height, 6.18 ft Apr. 8 (backwater from ice); no flow for many days.
Period of record: Maximum discharge, 1,300 cfs June 18, 1964 (gage height, 9.18 ft; no flow at times in some years.

REMARKS.--Records good.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.04	.71	.10			0	.10	4.8	.64	5.1	.47	.28
2	.02	.71	.07			0	.20	3.8	.58	3.4	.47	.25
3	.04	.47	.05			0	.50	3.6	.58	3.0	.42	.14
4	.12	.38	.04			0	1.0	3.4	.71	2.2	.38	.14
5	.12	.38	.02			0	4.0	3.0	.95	1.6	.38	.58
6	.12	.38	.01			0	5.0	2.6	.78	1.2	.34	.38
7	.12	.38	0			0	20	2.4	.52	41	.31	.31
8	.14	.34	0			0	106	2.2	.42	7.8	.25	.22
9	.16	.38	0			0	164	2.0	.42	4.1	.22	.12
10	.19	.31	0			0	149	2.0	2.9	2.8	.22	.06
11	.19	.31	0			0	79	1.8	15	2.2	.19	.03
12	.22	.25	0			.10	28	1.7	38	2.4	.19	.06
13	.22	.20	0			.30	21	1.6	7.5	1.6	.22	0
14	.22	.20	0			.50	23	1.4	4.6	1.2	.22	0
15	.22	.20	0			.10	22	1.2	4.1	1.0	.16	0
16	.22	.20	0			0	22	1.2	3.8	.95	.10	.07
17	.22	.20	0			0	18	1.2	2.8	.86	.19	.42
18	.25	.20	0			.10	18	1.2	1.7	2.0	.16	.38
19	.25	.20	0			.50	32	1.0	1.4	1.6	.25	.34
20	.25	.20	0			.50	21	1.0	1.2	.95	.19	.31
21	.28	.20	0			.30	16	.95	16	.86	.12	.31
22	.28	.15	0			.20	11	1.2	6.3	.78	.10	.34
23	.28	.15	0			.20	8.6	1.6	15	.86	.06	.34
24	.31	.15	0			.15	7.2	1.2	4.8	1.2	.06	.31
25	.38	.10	0			.10	5.7	1.0	2.8	.86	.04	.31
26	.42	.10	0			.10	4.6	.95	40	.64	.04	.34
27	.31	.10	0			.15	4.1	.86	16	.78	.03	.38
28	.28	.10	0			1.5	4.1	.78	8.6	.78	.01	.38
29	.28	.10	0		------	1.0	3.6	.71	6.3	.78	.04	.38
30	.31	.10	0		------	.15	6.0	.71	6.3	.58	.01	.38
31	.31	------	0		------	.10	------	.71	------	.52	.03	------
TOTAL	6.77	7.85	.29	C	0	6.05	804.70	53.77	210.70	95.60	5.87	7.56
MEAN	.22	.26	.009	0	0	.20	26.8	1.73	7.02	3.08	.19	.25
MAX	.42	.71	.10	C	0	1.5	164	4.8	40	41	.47	.58
MIN	.02	.10	C	C	0	0	.10	.71	.42	.52	.01	0
AC-FT	13	16	.6	0	0	12	1,600	107	418	190	12	15

CAL YR 1970 TOTAL 1,241.80 MEAN 3.40 MAX 162 MIN C AC-FT 2,460
WTR YR 1971 TOTAL 1,199.16 MEAN 3.29 MAX 164 MIN 0 AC-FT 2,380

PEAK DISCHARGE (BASE, 30 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
4- 9	2100	5.63	337	6-26	1230	3.35	134
6-12	0130	3.22	119	7- 7	0600	3.18	115
6-21	1330	2.92	77				

05090000 Park River at Grafton, N. Dak.

LOCATION.--Lat 48°25'24", long 97°24'30", in NE¼ sec.13, T.157 N., R.53 W., Walsh County, on right bank 30 ft upstream from Wakeman Avenue Bridge in Grafton and 3.5 miles downstream from South Branch.

DRAINAGE AREA.--695 sq mi, approximately.

PERIOD OF RECORD.--April 1931 to current year. Monthly discharge only for some periods, published in WSP 1308.

GAGE.--Water-stage recorder. Datum of gage is 807.39 ft above mean sea level. Prior to Sept. 30, 1940, nonrecording gage at site 30 ft downstream at same datum. Oct. 1, 1940, to Sept. 17, 1946, nonrecording gage at site 2 miles downstream above maxonry dam at same datum. Sept. 18, 1946, to July 25, 1952, nonrecording gage at site 30 ft downstream at same datum.

AVERAGE DISCHARGE (UNADJUSTED).--40 years (1931-71), 56.0 cfs (40,570 acre-ft per year); median of yearly mean discharges, 32 cfs (23,200 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 3,600 cfs Apr. 10 (gage height, 16.42 ft); no flow Jan. 10-20; minimum gage height, 5.63 ft Sept. 17.
Period of record: Maximum discharge, 12,600 cfs Apr. 19, 1950 (gage height, 20.13 ft), from rating curve extended above 9,000 cfs; no flow at times in most years.

REMARKS.--Records fair. Flow regulated by Homme Lake (see station 05088500) and several small reservoirs. Diversion by city of Grafton started in 1955.

REVISIONS (WATER YEARS).--WSP 955: 1941. WSP 1438: 1932, 1933(M), 1936-37(M), 1939(M), 1944. WSP 1728: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.02	2.0	3.5	.02	.01	3.4	20	175	8.4	188	17	.08
2	.02	5.0	3.5	.02	.01	3.4	13	154	6.0	101	16	.08
3	.02	.20	3.4	.02	.01	4.1	11	144	5.0	64	16	.06
4	.02	.86	3.4	.02	.01	5.0	13	130	7.2	58	13	.06
5	.02	1.5	3.0	.02	.01	5.0	17	116	8.4	49	11	.08
6	.02	2.9	2.0	.02	.01	3.4	36	116	2.9	43	9.6	.08
7	.02	1.1	1.5	.02	.01	3.4	473	101	.20	45	8.4	.08
8	.02	1.3	1.2	.01	.01	2.4	1,040	92	.20	38	6.0	.06
9	.01	1.3	.90	.01	.01	2.1	1,340	88	.20	94	7.2	.06
10	.01	1.8	.70	0	.01	2.1	2,660	77	16	180	9.6	.06
11	.01	1.8	.60	0	.01	1.8	2,880	68	47	274	8.4	.06
12	.01	1.5	.20	0	.01	3.4	3,050	58	66	219	5.0	.04
13	.01	1.5	.10	0	.01	14	2,760	51	79	150	4.1	.04
14	.01	2.9	.05	0	.01	26	2,340	40	147	118	2.9	.02
15	.01	5.0	.05	0	.01	16	1,710	33	304	94	1.5	.02
16	.01	5.0	.04	0	.01	17	1,050	30	289	72	.20	.01
17	.01	8.4	.04	0	.02	24	777	30	175	54	.46	.01
18	.01	8.4	.04	0	.04	27	667	27	123	54	1.3	.01
19	.01	7.2	.03	0	.06	36	874	24	92	51	.36	.01
20	.01	4.1	.02	0	.02	38	985	21	75	49	.28	.01
21	.01	5.0	.02	.01	.02	33	690	21	66	43	6.0	.01
22	.01	4.1	.02	.02	.50	31	572	21	62	34	3.4	.01
23	.01	3.4	.02	.02	2.0	40	473	24	52	33	1.1	.01
24	.01	2.4	.01	.02	2.5	47	385	24	47	34	3.4	.01
25	.01	2.4	.01	.01	3.0	38	313	23	52	30	.86	.01
26	.01	2.9	.01	.01	3.0	24	271	21	88	26	.20	.01
27	.01	3.0	.02	.01	3.0	16	239	19	85	28	.10	.01
28	.01	3.0	.02	.01	3.4	13	219	16	75	26	.10	.01
29	.01	3.0	.01	.01	------	11	206	14	101	24	.08	.01
30	.01	3.0	.01	.01	------	14	198	13	193	23	.08	.01
31	.01	------	.01	.01	------	21	------	9.6	------	20	.06	------
TOTAL	.39	95.96	24.43	.30	17.72	525.5	26,282	1,780.6	2,272.50	2,316	153.68	1.03
MEAN	.013	3.20	.79	.010	.63	17.0	876	57.4	75.8	74.7	4.96	.034
MAX	.02	8.4	3.5	.02	3.4	47	3,050	175	304	274	17	.08
MIN	.01	.20	.01	0	.01	1.8	11	9.6	.20	20	.06	.01
AC-FT	.8	190	48	.6	35	1,040	52,130	3,530	4,510	4,590	305	2.0
(+)	65	58	60	59	54	63	66	70	69	65	72	61
*ADJ MEAN	1.06	4.18	1.76	.97	1.60	18.03	877	58.5	77.0	75.8	6.13	1.06
*ADJ AC-FT	65	248	108	60	89	1,100	52,200	3,600	4,580	4,660	377	63

			OBSERVED					ADJUSTED		
CAL YR 1970	TOTAL	27,237.61	MEAN 74.6	MAX 1,460	MIN .01	AC-FT	54,030	MEAN 75.5	AC-FT	54,810
WTR YR 1971	TOTAL	33,470.11	MEAN 91.7	MAX 3,050	MIN 0	AC-FT	66,390	MEAN 75.7	AC-FT	67,110

\+ Diversion in acre-feet by city of Grafton.
* Adjusted for diversion in acre-feet by city of Grafton.

05092000 Red River of the North at Drayton, N. Dak.

LOCATION.--Lat 48°34'20", long 97°08'50", in SE¼SE¼SE¼ sec.24, T.159 N., R.51 W., Pembina County, on downstream end of east pier of interstate highway bridge, 1.5 miles northeast of Drayton and at mile 206.7.

DRAINAGE AREA.--34,800 sq mi, approximately (includes 3,800 sq mi in closed basins).

PERIOD OF RECORD.--April 1936 to June 1937, April 1941 to current year (fragmentary prior to April 1949).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 755.00 ft above mean sea level (Minnesota highway benchmark). Prior to Nov. 30, 1954, nonrecording gage at site 1.5 miles upstream at datum 1.59 ft higher.

AVERAGE DISCHARGE.--22 years (1949-71) 3,665 cfs (2,655,000 acre-ft per year); median of yearly mean discharges, 2,630 cfs (1,910,000 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 23,400 cfs Apr. 11; maximum gage height 31.75 ft Apr. 14; minimum discharge, 685 cfs Nov. 22 (gage height, 9.55 ft).
Period of record: Maximum discharge, 86,500 cfs May 12, 1950 (gage height, 41.58 ft, former site and datum); minimum observed, 7.7 cfs Oct. 16, 1936 (gage height, 1.75 ft, former site and datum).
Maximum discharge known since 1860, that of May 12, 1950. Flood of April 1897 reached a stage of about 41 ft, at site and datum in use prior to Nov. 30, 1954.

REMARKS.--Records good. Some regulation by reservoirs on tributaries. Records of water temperatures for the water year 1971 are published in Part 2 of this report.

REVISIONS (WATER YEARS).--WSP 1388: 1949-50. WSP 1728: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1,170	1,370	980	1,120	1,000	1,310	6,450	4,780	3,190	2,350	1,530	990
2	1,150	1,530	1,080	1,120	990	1,310	6,820	4,780	3,000	2,400	1,510	960
3	1,150	1,670	1,160	1,110	1,070	1,320	7,300	4,790	2,850	2,450	1,490	880
4	1,110	1,790	1,200	1,110	1,030	1,330	7,820	4,800	2,750	2,460	1,450	950
5	1,090	1,880	1,200	1,110	1,050	1,340	8,020	4,800	2,650	2,450	1,400	1,100
6	1,070	1,990	1,190	1,110	1,050	1,350	8,400	4,750	2,600	2,410	1,320	1,170
7	1,050	2,060	1,160	1,120	1,050	1,350	8,950	4,610	2,560	2,350	1,250	1,230
8	1,020	2,030	1,140	1,120	1,050	1,350	10,700	4,400	2,520	2,300	1,200	1,500
9	990	1,880	1,110	1,110	1,050	1,350	16,700	4,150	2,500	2,300	1,130	2,280
10	1,030	1,730	1,090	1,100	1,050	1,370	22,400	3,850	2,450	2,500	1,090	2,800
11	1,030	1,620	1,090	1,100	1,050	1,380	23,300	3,700	2,400	3,000	1,080	2,960
12	1,030	1,550	1,080	1,100	1,050	1,390	22,300	3,500	2,400	3,490	1,040	2,830
13	1,070	1,500	1,080	1,100	1,100	1,400	21,100	3,400	2,400	3,460	1,050	2,590
14	1,120	1,490	1,050	1,100	1,100	1,400	20,200	3,250	2,350	3,300	1,050	2,250
15	1,100	1,460	1,050	1,100	1,100	1,410	19,300	3,110	2,310	3,090	1,060	1,970
16	1,080	1,380	1,040	1,080	1,100	1,600	17,700	2,980	2,280	2,920	1,040	1,740
17	1,050	1,260	1,050	1,060	1,150	1,800	15,100	2,890	2,270	2,760	1,070	1,530
18	1,050	1,200	1,050	1,040	1,200	1,930	12,200	2,860	2,250	2,600	1,080	1,380
19	1,050	1,200	1,060	1,040	1,200	2,100	10,000	2,780	2,240	2,620	1,080	1,230
20	1,060	1,280	1,070	1,040	1,200	2,200	8,400	2,710	2,210	2,650	1,090	1,130
21	1,060	1,120	1,080	1,040	1,200	2,400	7,550	2,660	2,200	2,580	1,110	1,070
22	1,050	766	1,080	1,020	1,200	2,600	7,150	2,600	2,170	2,540	1,110	1,030
23	1,060	739	1,080	1,020	1,200	2,950	6,950	2,540	2,170	2,370	1,110	970
24	1,080	840	1,080	1,020	1,250	3,600	6,700	2,500	2,160	2,250	1,080	960
25	1,170	920	1,080	1,020	1,250	4,650	6,300	2,480	2,200	2,130	1,080	920
26	1,200	920	1,090	1,010	1,300	5,400	5,850	2,480	2,300	2,060	1,050	880
27	1,220	900	1,090	1,000	1,310	5,900	5,450	2,480	2,400	1,920	1,010	850
28	1,220	880	1,100	1,000	1,310	6,050	5,050	2,900	2,440	1,820	960	830
29	1,220	870	1,110	1,000	------	6,100	4,870	3,350	2,350	1,750	910	811
30	1,220	890	1,130	1,000	------	6,050	4,790	3,600	2,300	1,730	890	793
31	1,290	------	1,140	1,000	------	6,150	------	3,400	------	1,600	880	------
TOTAL	34,260	40,715	33,990	33,020	31,660	81,840	333,820	107,880	72,870	76,610	35,200	42,384
MEAN	1,105	1,357	1,096	1,065	1,131	2,640	11,130	3,480	2,429	2,471	1,135	1,413
MAX	1,290	2,060	1,200	1,120	1,310	6,150	23,300	4,800	3,190	3,490	1,530	2,960
MIN	990	739	980	1,000	990	1,310	4,790	2,480	2,160	1,600	880	793
AC-FT	67,950	80,760	67,420	65,500	62,800	162,300	662,100	214,000	144,500	152,000	69,820	84,070

CAL YR 1970 TOTAL 1,751,785 MEAN 4,799 MAX 31,600 MIN 739 AC-FT 3,475,000
WTR YR 1971 TOTAL 924,249 MEAN 2,532 MAX 23,300 MIN 739 AC-FT 1,833,000

05098700 Hidden Island Coulee near Hansboro, N. Dak.

(International gaging station)

LOCATION.--Lat 48°57'10", long 99°25'35", in SE¼SW¼ sec.11, T.163 N., R.68 W., Towner County, on right bank 400 ft downstream from bridge on county highway 2.5 miles west of Hansboro.

DRAINAGE AREA.--38 sq mi, approximately.

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

GAGE.--Water-stage recorder. Prior to May 20, 1962, nonrecording gage 400 ft upstream at same datum.

AVERAGE DISCHARGE.--10 years, 3.18 cfs (2,300 acre-ft per year); median of yearly mean discharges, 2.2 cfs (1,600 acre-ft per year).
Period of record: Maximum discharge, 700 cfs Apr. 12, 1969 (gage height, 8.80 ft); no flow for several months each year.

EXTREMES.--Maximum discharge, 637 cfs Apr. 10 (gage height, 8.11 ft); maximum gage height, 8.39 ft (backwater from ice); no flow for several months.
Period of record: Maximum discharge, 700 cfs Apr. 12, 1969 (gage height, 8.80 ft); no flow for several months each year.

REMARKS.--Records good.

COOPERATION.--This station is one of the international gaging stations maintained by the United States under agreement with Canada.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.01	.02					0	5.0	.47	4.8	1.3	
2	0	.02					0	4.5	.32	4.8	1.2	
3	0	.02					0	3.9	.24	4.8	1.3	
4	.01	.02					0	3.5	.26	4.8	1.2	
5	.01	.02					0	3.0	2.1	4.3	1.1	
6	.01	.02					.50	2.7	1.5	6.9	1.1	
7	.01	.02					1.0	2.7	1.0	45	.86	
8	.01	.02					5.0	2.3	.72	20	.77	
9	.01	.02					150	2.0	.53	19	.56	
10	.01	.02					370	1.9	.72	49	.38	
11	.01	.02					327	1.9	1.1	46	.24	
12	.01	.02					140	1.6	4.2	39	.07	
13	.01	.02					93	1.6	7.2	31	0	
14	.01	.02					75	1.4	5.3	25	0	
15	.01	.02					61	1.2	6.4	19	0	
16	.01	.02					51	.97	4.6	13	0	
17	.01	.02					39	.97	3.7	8.1	0	
18	.01	.02					73	1.1	3.1	6.9	0	
19	.01	.02					93	1.1	3.1	5.3	0	
20	.01	.02					67	1.0	4.3	4.5	0	
21	.01	0					52	1.0	6.4	3.6	0	
22	.01	0					37	1.7	6.9	3.0	0	
23	.01	0					26	2.1	5.6	2.7	0	
24	.01	0					19	1.7	5.0	2.4	0	
25	.01	0					12	1.6	4.7	2.0	0	
26	.01	0					9.4	1.6	6.0	1.6	0	
27	.01	0					7.5	1.4	7.5	1.5	0	
28	.01	0					6.2	1.3	6.7	1.4	0	
29	.01	0			------		5.6	1.1	5.8	.92	0	
30	.01	0			------		5.3	.92	5.5	1.3	0	
31	.01	------			------		------	.60	------	1.3	0	------
TOTAL	.29	.40	0	0	0	0	1,725.50	59.36	110.96	382.92	10.08	0
MEAN	.009	.013	0	0	0	0	57.5	1.91	3.70	12.4	.33	0
MAX	.01	.02	0	0	0	0	370	5.0	7.5	49	1.3	0
MIN	0	0	0	0	0	0	0	.60	.24	.92	0	0
AC-FT	.6	.8	0	0	0	0	3,420	118	220	760	20	0

CAL YR 1970 TOTAL 2,725.11 MEAN 7.47 MAX 600 MIN 0 AC-FT 5,410
WTR YR 1971 TOTAL 2,289.51 MEAN 6.27 MAX 370 MIN 0 AC-FT 4,540

PEAK DISCHARGE (BASE, 25 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
4-10	2300	8.11	637	7- 7	0100	6.79	98
4-18	2200	6.82	104	7-10	1315	6.38	54

05098800 Long River near Sarles, N. Dak.

(International gaging station)

LOCATION.--Lat 48°56'35", long 98°57'05", in SW¼SE¼ sec.9, T.163 N., R.64 W., Cavalier County, on right bank 150 ft downstream from twin multiplate culverts on county highway, 2.5 miles east of Sarles.

DRAINAGE AREA.--71 sq mi, approximately.

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

GAGE.--Water-stage recorder.

AVERAGE DISCHARGE.--10 years, 7.19 cfs (5,210 acre-ft per year); median of yearly mean discharges, 5.3 cfs (3,800 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 1,920 cfs Apr. 10 (gage height, 8.56 ft); no flow for several months.
Period of record: Maximum discharge, 1,920 cfs Apr. 10, 1971 (gage height, 8.56 ft); no flow for several months each year.

REMARKS.--Records good.

COOPERATION.--This station is one of the international gaging stations maintained by the United States under agreement with Canada.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1							0	2.7		0	.20	
2							0	2.0		0	.12	
3							0	1.8		0	.08	
4							0	1.6		0	.05	
5							0	1.3		0	0	
6							0	1.0		0	0	
7							0	.80		.07	0	
8							.10	.62		0	0	
9							25	.40		0	0	
10							1,140	.31		.23	0	
11							1,170	.27		.45	0	
12							428	.23		.45	0	
13							170	.16		1.1	0	
14							124	.09		2.1	0	
15							82	.07		2.4	0	
16							57	.05		2.4	0	
17							49	.05		2.4	0	
18							74	.05		2.2	0	
19							64	.02		2.2	0	
20							49	.01		2.0	0	
21							48	0		1.7	0	
22							37	.04		1.4	0	
23							26	.09		1.2	0	
24							17	.09		1.0	0	
25							11	.09		.86	0	
26							7.1	.07		.74	0	
27							5.9	.04		.68	0	
28							4.3	0		.50	0	
29					------		3.6	0		.40	0	
30					------		3.4	0		.31	0	
31		------			------		------	0	------	.27	0	------
TOTAL	0	0	0	0	0	0	3,595.40	13.95	0	27.06	.45	0
MEAN	0	0	0	0	0	0	120	.45	0	.87	.015	0
MAX	0	0	0	0	0	0	1,170	2.7	0	2.4	.20	0
MIN	0	0	0	0	0	0	0	0	0	0	0	0
AC-FT	0	0	0	0	0	0	7,130	28	0	54	.9	0

CAL YR 1970 TOTAL 6,581.37 MEAN 18.0 MAX 1,560 MIN 0 AC-FT 13,050
WTR YR 1971 TOTAL 3,636.86 MEAN 9.96 MAX 1,170 MIN 0 AC-FT 7,210

PEAK DISCHARGE (BASE, 50 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
4-10	2400	8.56	1,920	4-18	1900	3.49	94

05099100 Snowflake Creek near Snowflake, Manitoba

(International gaging station)

LOCATION.--Lat 49°01'17", long 98°36'13", in SW¼ sec.10, T.1, R.9 W., 1st meridian, at traffic bridge, 2.5 miles east and 1.5 miles south of Snowflake.

DRAINAGE AREA.--348 sq mi.

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

GAGE.--Water-stage recorder since March 1968 and nonrecording gage prior thereto. Datum of gage is 1,222.63 ft above mean sea level, Geodetic Survey of Canada datum. Prior to Apr. 2, 1964, nonrecording gage at present site and datum. Apr. 2, 1964, to May 10, 1965, nonrecording gage at site one-half mile downstream at present datum.

AVERAGE DISCHARGE.--10 years, 15.0 cfs (10,870 acre-ft per year); median of yearly mean discharges, 10 cfs (7,200 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 658 cfs Apr. 12 (gage height, not determined); no flow for several months.
Period of record: Maximum daily discharge, 653 cfs Apr. 11, 1969 (gage height, 7.39 ft); no flow for several months each year.

REMARKS.--Records good.

COOPERATION.--This station is one of the international gaging stations maintained by Canada under agreement with the United States.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.0	1.3					0	303	37	19	7.4	5.0
2	4.7	1.5					0	293	34	18	7.1	4.6
3	4.4	1.3					0	285	31	18	6.8	4.3
4	4.1	1.1					0	266	30	17	6.5	4.9
5	3.7	1.1					0	243	35	16	6.3	5.8
6	3.6	.96					.50	225	30	15	6.0	5.8
7	3.6	.90					3.1	202	26	75	5.7	4.8
8	3.3	.91					4.7	187	23	50	5.5	4.4
9	3.0	.86					2.8	183	23	45	5.4	4.0
10	2.5	.95					174	173	24	70	5.3	3.8
11	2.4	1.3					571	155	23	62	5.2	3.5
12	2.3	1.0					419	151	21	54	5.1	3.2
13	2.1	1.1					271	145	19	48	5.0	3.0
14	2.2	2.1					281	139	18	39	5.0	2.7
15	2.1	1.9					434	128	19	33	4.9	2.6
16	1.8	1.7					539	119	20	28	5.1	2.5
17	1.6	1.5					495	116	19	24	5.4	2.8
18	1.5	1.3					513	103	18	20	5.8	2.6
19	1.6	1.0					511	100	18	18	6.2	2.4
20	1.6	.80					485	94	17	16	6.9	2.2
21	1.8	.60					482	89	17	15	7.1	2.0
22	1.9	.40					496	89	18	14	7.0	1.9
23	2.0	.20					480	78	19	12	6.6	1.7
24	1.9	0					445	69	18	11	6.5	1.6
25	1.6	0					412	64	19	11	6.1	1.4
26	1.5	0					393	62	20	10	5.9	1.3
27	1.3	0					377	61	20	10	5.6	1.2
28	1.1	0					370	59	20	8.9	5.3	1.1
29	1.1	0			------		365	54	20	8.0	5.3	1.0
30	1.1	0			------		344	46	20	7.7	4.9	1.0
31	1.1	------			------		------	41	------	7.6	4.7	------
TOTAL	73.5	25.78	0	0	0	0	8,868.10	4,322	676	800.2	181.6	89.1
MEAN	2.37	.86	0	0	0	0	296	139	22.5	25.8	5.86	2.97
MAX	5.0	2.1	0	0	0	0	571	303	37	75	7.4	5.8
MIN	1.1	0	0	0	0	0	0	41	17	7.6	4.7	1.0
AC-FT	146	51	0	0	0	0	17,590	8,570	1,340	1,590	360	177

CAL YR 1970 TOTAL 11,168.78 MEAN 30.6 MAX 279 MIN 0 AC-FT 22,150
WTR YR 1971 TOTAL 15,036.28 MEAN 41.2 MAX 571 MIN 0 AC-FT 29,820

NOTE.--Differences between figures published herein and corresponding figures in reports of the Water Survey of Canada are due to variations in automated program techniques.

05099150 Mowbray Creek near Mowbray, Manitoba

LOCATION.--Lat 49°00'00", long 98°27'15", in SE¼ sec.3, T.1, R.8 W., 1st meridian, on downstream side of bridge on Municipal Road on international boundary, 1.5 miles east of Mowbray.

DRAINAGE AREA.--93.9 sq mi.

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

GAGE.--Nonrecording gage.

EXTREMES.--Current year: Maximum daily discharge, 630 cfs Apr. 12 (gage height, 6.95 ft); maximum gage height, 7.10 ft Apr. 11; no flow for several months.
Period of record: Maximum daily discharge, 630 cfs Apr. 12, 1971 (gage height, 6.95 ft); maximum gage height, 7.88 ft Mar. 29, 1966 (backwater from ice); no flow for several months each year.

REMARKS.--Records good.

COOPERATION.--Records furnished by Inland Waters Branch, Water Survey of Canada.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1							0	36	3.0	3.5		
2							0	36	3.0	3.2		
3							0	32	3.0	2.9		
4							0	31	3.0	3.0		
5							0	28	2.7	3.4		
6							0	24	2.5	1.6		
7							0	23	2.2	3.7		
8							126	19	2.5	1.9		
9							252	15	2.0	1.3		
10							378	14	2.0	1.4		
11							504	12	3.0	1.7		
12							630	12	3.0	1.6		
13							593	9.0	3.0	1.2		
14							556	9.0	3.0	1.0		
15							574	9.0	3.0	.60		
16							211	9.0	3.0	.10		
17							364	9.0	3.0	.04		
18							336	9.0	3.0	1.4		
19							288	6.0	2.5	1.1		
20							256	6.0	2.5	.44		
21							220	6.0	3.0	.28		
22							188	6.0	3.0	.28		
23							161	6.0	3.0	.14		
24							133	6.0	3.0	.16		
25							105	5.0	6.0	.06		
26							96	4.0	6.0	.04		
27							70	4.0	6.0	.02		
28							58	3.5	4.0	.06		
29					------		49	3.5	4.0	.16		
30					------		38	3.0	4.0	.14		
31		------			------		------	3.0	------	0		------
TOTAL						0	6,186	398.0	96.9	36.42	0	0
MEAN						0	206	12.8	3.23	1.17	0	0
MAX						0	630	36	6.0	3.7	0	0
MIN						0	0	3.0	2.0	0	0	0
AC-FT						0	12,270	789	192	72	0	0

NOTE.--Differences between figures published herein and corresponding figures in reports of the Water Survey of Canada are due to variations in automated program techniques.

05099300 Pembina River near Windygates, Manitoba

LOCATION.--Lat 49°01'53", long 98°16'40", in SE¼ sec.13, T.1, R.7 W., 1st meridian, on left bank 0.2 mile downstream from bridge, 3 miles northeast of Windygates.

DRAINAGE AREA.--3,020 sq mi.

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

GAGE.--Water-stage recorder and nonrecording gage. Datum of recording gage is 1,102.02 ft above mean sea level. Datum of nonrecording gage is 1,105.00 ft above mean sea level, both gages referred to Geodetic Survey of Canada datum.

AVERAGE DISCHARGE.--9 years, 220 cfs (159,400 acre-ft per year).

EXTREMES.--Current year: Maximum daily discharge, 5,910 cfs Apr. 10 (gage height, 13.02 ft, backwater from ice); minimum daily discharge, 6.7 cfs Jan. 1.
Period of record: Maximum discharge, 8,170 cfs Apr. 19, 1969 (gage height, 17.29 ft); no flow in some years.

REMARKS.--Records good.

COOPERATION.--This station is one of the international gaging stations maintained by Canada under agreement with the United States.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	98	68	22	6.7	8.3	11	11	2,300	688	314	349	203
2	94	71	20	7.3	8.5	11	11	2,200	653	307	340	189
3	92	70	17	8.7	8.6	11	11	2,140	621	308	340	174
4	92	69	17	11	8.8	12	12	2,050	603	298	338	180
5	94	68	16	11	8.9	12	13	1,950	637	287	332	173
6	93	66	15	11	9.1	12	20	1,860	616	292	325	197
7	88	64	14	11	9.2	12	100	1,770	576	381	318	228
8	85	64	15	10	9.4	12	500	1,670	556	399	315	211
9	85	62	15	10	9.6	12	1,060	1,580	541	423	312	188
10	84	62	13	10	9.6	12	5,910	1,500	530	436	308	172
11	80	58	14	10	9.6	12	5,020	1,430	518	397	306	160
12	80	50	13	10	9.7	12	4,140	1,360	483	368	305	150
13	79	38	14	10	9.7	12	3,250	1,300	467	345	302	144
14	77	27	16	10	9.7	12	2,370	1,250	447	336	298	134
15	74	43	15	9.9	9.8	12	2,230	1,190	436	340	295	131
16	73	43	15	9.8	9.8	12	2,090	1,140	434	341	287	127
17	72	40	14	9.7	9.8	11	2,070	1,120	419	339	292	126
18	72	33	15	9.6	9.9	11	2,050	1,080	416	339	292	124
19	70	22	14	9.5	9.9	11	2,210	1,040	434	333	296	120
20	68	22	13	9.4	9.9	11	2,340	1,010	411	331	294	118
21	67	20	14	9.3	10	11	2,420	971	400	332	290	114
22	65	27	19	9.2	10	11	2,550	941	404	328	285	110
23	63	30	17	9.1	10	11	2,620	927	368	326	275	105
24	63	32	17	9.0	10	11	2,630	906	348	331	262	103
25	65	25	17	8.9	10	11	2,600	883	333	326	261	101
26	66	24	12	8.9	10	11	2,600	857	331	325	257	98
27	63	24	10	8.8	10	11	2,570	827	331	344	248	95
28	62	22	9.9	8.7	11	11	2,520	794	327	359	245	91
29	63	21	8.7	8.6	------	11	2,450	767	321	356	240	88
30	65	20	8.0	8.5	------	11	2,400	736	318	357	229	88
31	65	------	7.2	8.4	------	11	------	710	------	356	215	------
TOTAL	2,357	1,285	446.8	292.0	268.8	354	60,778	40,259	13,967	10,654	9,051	4,242
MEAN	76.0	42.8	14.4	9.42	9.60	11.4	2,026	1,299	466	344	292	141
MAX	98	71	22	11	11	12	5,910	2,300	688	436	349	228
MIN	62	20	7.2	6.7	8.3	11	11	710	318	287	215	88
AC-FT	4,680	2,550	886	579	533	702	120,600	79,850	27,700	21,130	17,950	8,410

CAL YR 1970 TOTAL 159,888.80 MEAN 438 MAX 3,680 MIN 0 AC-FT 317,100
WTR YR 1971 TOTAL 143,954.60 MEAN 394 MAX 5,910 MIN 6.7 AC-FT 285,500

NOTE.--Differences between figures published herein and corresponding figures in reports of the Water Survey of Canada are due to variations in automated program techniques.

05099400 Little Pembina River near Walhalla, N. Dak.

LOCATION.--Lat 48°51'55", long 98°00'20", in SW¼ sec.10, T.162 N., R.57 W., Cavalier County, on right bank 25 ft upstream from county bridge, 3.5 miles above mouth, and 6 miles southwest of Walhalla.

DRAINAGE AREA.--182 sq mi, of which 10 sq mi is noncontributing.

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

GAGE.--Water-stage recorder. Datum of gage is 1,099.48 ft above mean sea level. Prior to Sept. 10, 1956, non-recording gage at bridge 25 ft downstream at same datum.

AVERAGE DISCHARGE.--15 years, 22.5 cfs (16,300 acre-ft per year); median of yearly mean discharges, 19 cfs (13,800 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 4,480 cfs Apr. 9 (gage height, 13.26 ft); minimum daily discharge, 0.15 cfs Jan. 31 to Feb. 8.
Period of record: Maximum discharge, 6,600 cfs Apr. 25, 1970 (gage height, 13.95 ft); no flow at times in some years.

REMARKS.--Records good except those for the winter period, which are fair. Records of chemical analyses for the water year 1971 are published in Part 2 of this report.

REVISIONS.--WSP 1728: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.0	5.6	3.0	.85	.15	.80	2.0	50	8.0	11	1.9	.81
2	6.6	8.0	2.5	.85	.15	1.0	1.5	44	7.6	9.2	1.8	.81
3	6.6	8.0	2.0	.85	.15	1.0	1.0	41	8.0	9.2	1.7	.67
4	6.2	8.0	2.0	.85	.15	1.0	1.0	38	8.0	8.4	1.6	.74
5	6.2	7.3	1.8	.85	.15	1.0	1.5	36	8.8	8.0	1.5	1.2
6	6.2	6.2	1.5	.85	.15	.75	5.0	34	8.4	7.6	1.5	1.2
7	6.2	5.6	1.5	.85	.15	.75	20	32	8.4	11	1.8	1.0
8	7.0	5.1	1.5	.80	.15	.75	650	30	7.6	8.0	1.4	.88
9	6.6	4.5	1.5	.80	.25	.75	1,820	28	7.0	8.0	1.3	.81
10	6.2	3.5	1.5	.80	.25	.75	2,310	26	14	7.0	1.2	.74
11	5.9	3.3	1.4	.80	.25	1.0	1,400	25	29	5.9	1.0	.67
12	6.2	3.0	1.2	.80	.25	1.0	784	25	44	5.6	1.0	.67
13	7.0	3.0	1.2	.80	.25	1.0	580	24	14	4.6	1.0	.67
14	6.2	3.0	1.1	.80	.50	1.5	432	22	11	4.4	1.0	.60
15	5.9	3.5	1.1	.80	.50	1.5	396	19	10	4.6	.96	.67
16	5.9	3.0	1.0	.75	.75	1.0	376	19	9.3	4.2	.88	.74
17	5.6	2.5	1.0	.75	.75	1.0	276	17	19	4.0	.96	.81
18	5.6	2.5	1.0	.75	.50	1.5	253	15	15	5.1	.88	.81
19	5.1	2.5	1.0	.75	.50	1.5	322	15	12	4.2	1.0	.81
20	4.0	2.5	1.0	.75	.50	1.5	283	14	9.2	3.3	.88	.74
21	3.6	2.0	1.0	.75	.50	1.0	222	13	23	2.8	.81	.74
22	3.5	2.0	.95	.50	.75	1.0	161	13	47	2.7	.81	.74
23	3.3	2.0	.95	.25	.75	1.0	127	14	20	2.5	.74	.74
24	3.1	2.5	.95	.25	1.0	1.0	98	14	16	2.5	.67	.67
25	3.3	3.0	.95	.25	1.0	1.0	81	13	12	2.4	.67	.67
26	3.3	3.0	.90	.25	1.0	1.5	68	12	12	2.3	.67	.74
27	3.0	3.0	.90	.25	.80	1.5	57	10	11	2.5	.60	.96
28	2.8	3.0	.90	.25	.80	1.5	51	9.6	14	2.5	.60	.88
29	2.8	3.5	.90	.25	------	1.5	44	9.2	12	2.3	.60	.88
30	2.8	3.5	.85	.25	------	2.0	71	8.8	12	2.1	.67	.96
31	3.1	------	.85	.15	------	2.0	------	8.8	------	2.0	.67	------
TOTAL	156.8	118.1	39.90	19.50	13.05	36.05	10,894.0	679.4	437.3	159.9	32.77	24.03
MEAN	5.06	3.94	1.29	.63	.47	1.16	363	21.9	14.6	5.16	1.06	.80
MAX	7.0	8.0	3.0	.85	1.0	2.0	2,310	50	47	11	1.9	1.2
MIN	2.8	2.0	.85	.15	.15	.75	1.0	8.8	7.0	2.0	.60	.60
AC-FT	311	234	79	39	26	72	21,610	1,350	867	317	65	48

CAL YR 1970 TOTAL 22,806.63 MEAN 62.5 MAX 2,390 MIN .02 AC-FT 45,240
WTR YR 1971 TOTAL 12,610.80 MEAN 34.6 MAX 2,310 MIN .15 AC-FT 25,010

PEAK DISCHARGE (BASE, 75 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
4- 9	2130	13.26	4,480	6-12	0030	6.88	120
4-30	0530	6.83	104				

05099600 Pembina River at Walhalla, N. Dak.

LOCATION.--Lat 48°54'50", long 97°55'00", in NE¼NE¼ sec.29, T.163 N., R.56 W., Pembina County, on left bank at downstream side of bridge on State Highway 32, at south edge of Walhalla, and 7 miles downstream from Little Pembina River.

DRAINAGE AREA.--3,350 sq mi, approximately.

PERIOD OF RECORD.--October 1939 to current year. Prior to October 1963, published as "near Walhalla."

GAGE.--Water-stage recorder. Altitude of gage is 934 ft (from topographic map). Prior to Nov. 10, 1943 non-recording gage and Nov. 10, 1943, to Sept. 30, 1963, water-stage recorder at site 5.5 miles upstream at different datum.

AVERAGE DISCHARGE.--32 years, 226 cfs (163,700 acre-ft per year); median of yearly mean discharges, 170 cfs (123,000 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 10,200 cfs Apr. 11 (gage height, 14.56 ft); minimum daily discharge 8.5 cfs Feb. 26 to Mar. 1; minimum gage height, 1.58 ft Feb. 28.
Period of record: Maximum discharge, 20,400 cfs Apr. 18, 1950 (gage height, 19.2 ft, former site and datum) from rating curve extended above 7,000 cfs on basis of contracted-opening measurement of peak flow; no flow at times in some years.

REMARKS.--Records good except those for the winter period, which are fair. Records of chemical analyses, suspended sediment loads, and water temperatures for the water year 1971 are published in Part 2 of this report.

REVISIONS (WATER YEARS).--WSP 1388: 1943, 1950(P). WSP 1558: 1957. WSP 1728: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	118	91	32	16	12	8.5	15	2,770	816	392	307	189
2	114	99	35	16	12	9.0	17	2,630	772	378	306	181
3	112	96	33	16	12	10	25	2,520	748	382	302	173
4	111	91	33	16	12	12	20	2,450	716	370	315	168
5	110	90	33	16	12	13	20	2,370	700	342	306	168
6	109	88	28	16	12	13	25	2,240	736	342	297	167
7	108	84	28	16	11	13	124	2,130	676	385	295	188
8	105	83	28	15	11	13	627	2,000	639	392	290	198
9	103	81	28	15	10	12	3,380	1,940	622	408	290	186
10	101	82	25	15	10	11	6,100	1,820	650	452	288	168
11	100	80	25	15	10	11	9,320	1,750	755	428	284	160
12	99	79	24	15	10	11	7,160	1,670	739	398	284	156
13	99	76	22	14	10	12	5,140	1,620	575	375	279	141
14	97	72	20	14	10	12	3,620	1,540	545	352	275	138
15	94	71	20	13	10	12	3,010	1,460	542	345	269	133
16	92	71	20	13	10	13	2,890	1,410	653	345	259	136
17	91	69	20	12	10	13	2,680	1,410	569	340	259	135
18	90	68	18	12	9.0	13	2,650	1,380	536	340	253	136
19	88	61	16	12	9.0	13	2,860	1,320	539	335	255	128
20	87	66	15	12	9.0	13	2,940	1,260	522	325	257	120
21	86	72	15	12	9.0	13	2,930	1,240	513	322	253	117
22	84	70	15	11	9.0	13	2,910	1,180	578	313	250	116
23	82	56	15	11	9.0	12	2,980	1,170	499	320	241	112
24	82	38	15	10	9.0	12	2,990	1,140	460	318	235	112
25	82	25	15	10	9.0	12	2,970	1,110	425	311	228	108
26	33	26	14	10	8.5	12	2,940	1,070	420	304	218	106
27	82	28	12	10	8.5	12	2,930	1,020	423	318	215	104
28	80	29	13	11	8.5	12	2,920	975	423	332	213	103
29	79	30	15	12	------	12	2,860	945	420	335	208	98
30	80	30	15	12	------	12	2,870	895	423	328	201	96
31	82	------	16	12	------	13	------	847	------	322	200	------
TOTAL	2,930	2,002	663	410	281.5	372.5	81,923	49,282	17,634	10,949	8,132	4,241
MEAN	94.5	66.7	21.4	13.2	10.1	12.0	2,731	1,590	588	353	262	141
MAX	118	99	35	16	12	13	9,320	2,770	816	452	315	198
MIN	79	25	12	10	8.5	8.5	15	847	420	304	200	96
AC-FT	5,810	3,970	1,320	813	558	739	162,500	97,750	34,980	21,720	16,130	8,410

CAL YR 1970 TOTAL 221,331.5 MEAN 606 MAX 7,810 MIN 4.5 AC-FT 439,000
WTR YR 1971 TOTAL 178,820.0 MEAN 490 MAX 9,320 MIN 8.5 AC-FT 354,700

PEAK DISCHARGE (BASE, 400 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
4-11	1330	14.56	10,200	6-16	0430	4.97	768
6-12	0230	5.58	1,060				

05100000 Pembina River at Neche, N. Dak.

(International gaging station)

LOCATION.--Lat 48°59'20", long 97°33'05", in SE¼NW¼ sec.31, T.164 N., R.53 W., Pembina County, on right bank 4 blocks east of State Highway 18, at north edge of Neche.

DRAINAGE AREA.--3,410 sq mi, approximately.

PERIOD OF RECORD.--May 1903 to September 1908, June 1909 to September 1915, April 1919 to current year. Monthly discharge only for some periods, published in WSP 1308.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 809.69 ft above mean sea level. Prior to May 24, 1932, nonrecording gage at Burlington Northern Railway bridge 1 mile upstream, at same datum, May 25, 1932, to Apr. 17, 1939, nonrecording gage on bridge on State Highway 18, 500 ft downstream from railway bridge, at same datum.

AVERAGE DISCHARGE.--63 years (1903-8, 1909-15, 1919-71) 180 cfs (130,400 acre-ft per year); median of yearly mean discharges, 130 cfs (94,200 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 7,350 cfs Apr. 12 (gage height, 22.22 ft); minimum daily discharge, 12 cfs Feb. 19-21.
Period of record: Maximum discharge, 10,700 cfs Apr. 20, 1950 (gage height, 21.58 ft, backwater from ice), from rating curve extended 5,300 cfs; maximum gage height, 22.22 ft Apr. 12, 1971; no flow at times each year 1932-41, 1953, 1960-62.

REMARKS.--Records good.

COOPERATION.--This station is one of the international gaging stations maintained by the United States under agreement with Canada.

REVISIONS (WATER YEARS).--WSP 1308: 1904-8, 1910-15, 1920, 1921, 1923, 1924. WSP 1388: 1904(M), 1914, 1915(M), 1931(M), 1933, 1938(M). WSP 1728: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	143	95	30	16	15	13	18	2,540	816	412	321	204
2	136	98	30	16	15	14	18	2,480	788	402	321	197
3	133	105	38	16	15	15	25	2,380	753	388	316	186
4	133	108	40	16	14	15	25	2,280	718	379	308	183
5	133	111	42	16	14	15	20	2,070	697	379	304	180
6	130	111	44	16	14	15	17	2,120	676	356	304	180
7	127	108	38	16	14	14	17	2,010	676	347	300	180
8	130	105	32	16	14	15	21	1,930	655	352	292	183
9	130	98	33	15	14	15	196	1,850	627	379	292	210
10	127	98	34	15	14	15	1,890	1,760	613	384	284	210
11	124	95	30	15	14	14	5,030	1,680	620	393	280	190
12	121	89	27	15	13	15	7,080	1,620	711	402	261	176
13	215	71	25	14	14	15	6,270	1,540	746	379	246	173
14	146	63	27	13	15	15	5,530	1,480	600	347	257	163
15	124	68	25	13	15	15	4,240	1,430	536	334	261	156
16	121	66	22	13	15	15	3,680	1,380	521	325	261	153
17	118	80	21	13	15	15	3,090	1,330	566	321	261	146
18	113	85	18	14	14	15	2,720	1,290	547	321	265	146
19	113	84	16	14	12	14	2,530	1,260	500	321	261	143
20	110	77	15	15	12	14	2,610	1,230	485	321	261	140
21	107	51	15	15	12	14	2,730	1,190	485	316	261	136
22	104	38	15	14	13	15	2,750	1,160	480	312	261	130
23	85	50	15	13	14	15	2,710	1,120	516	308	257	127
24	89	60	15	13	13	15	2,710	1,110	510	308	250	124
25	92	70	16	14	13	15	2,740	1,080	465	308	242	121
26	95	68	16	14	13	15	2,720	1,050	440	308	235	118
27	95	60	16	14	13	15	2,690	1,010	426	308	224	118
28	95	46	15	15	13	15	2,660	977	421	304	221	118
29	95	38	14	15	------	15	2,620	928	421	308	218	116
30	95	30	15	15	------	45	2,580	886	416	316	218	113
31	92	------	16	15	------	28	------	844	------	316	210	------
TOTAL	3,671	2,326	755	454	386	500	71,937	47,015	17,431	10,654	8,253	4,720
MEAN	118	77.5	24.4	14.6	13.8	16.1	2,398	1,517	581	344	266	157
MAX	215	111	44	16	15	45	7,080	2,540	816	412	321	210
MIN	85	30	14	13	12	13	17	844	416	304	210	113
AC-FT	7,280	4,610	1,500	901	766	992	142,700	93,250	34,570	21,130	16,370	9,360

CAL YR 1970 TOTAL 212,639.5 MEAN 583 MAX 6,350 MIN 6.0 AC-FT 421,800
WTR YR 1971 TOTAL 168,102.0 MEAN 461 MAX 7,080 MIN 12 AC-FT 333,400

PEAK DISCHARGE (BASE, 400 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
4-12	1230	22.22	7,350	6-13	0500	9.35	795

05100500 Herzog Creek near Concrete, N. Dak.

LOCATION.--Lat 48°45'13", long 97°54'22", in SE¼ sec.20, T.161 N., R.56 W., Pembina County, on left bank 1.7 miles northeast of Concrete and 1.7 miles upstream from mouth.

DRAINAGE AREA.--18.9 sq mi.

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

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,108.95 ft above mean sea level (levels by Soil Conservation Service). Prior to Sept. 15, 1971, recording gage at site 0.5 mile downstream at same datum.

AVERAGE DISCHARGE.--17 years, 3.34 cfs (2,420 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 128 cfs Apr. 9 (gage height, 7.92 ft, backwater from ice); no flow for many days.
Period of record: Maximum discharge, 260 cfs Apr. 2, 1955 (gage height, 9.74 ft, from floodmarks, backwater from ice); no flow at times each year.

REMARKS.--Records fair. Flood flow affected by temporary retention in four retarding basins above station. The farthest downstream retarding basin, located 0.8 mile above station, is used to regulate summer flow.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.02	2.6	.02				0	15	.40	3.5	.04	.03
2	.02	2.8	.02				0	10	.38	3.0	.04	.03
3	.02	1.8	.02				0	9.0	.25	3.0	.03	.03
4	.02	1.6	.02				0	8.5	.22	2.5	.03	.03
5	.02	1.1	.02				.50	8.0	.20	5.0	.03	.05
6	.02	.75	0				5.0	7.0	.15	6.0	.03	.02
7	.02	.65	0				23	6.5	.05	20	.03	.03
8	.05	.57	0				45	8.0	.02	25	.03	.03
9	.05	.49	0				65	8.0	.02	15	.03	.03
10	.05	.49	.02				118	6.5	.05	10	.03	.03
11	.05	.37	.05				117	.30	9.5	5.0	.02	.03
12	.05	.37	.02				115	.25	78	4.5	.02	.03
13	.05	.32	.02				114	.22	42	3.0	.02	.03
14	.05	.27	.02				109	.32	25	2.2	.02	.03
15	.05	.27	.02				81	.57	7.9	1.0	.02	.03
16	.05	.27	.02				75	1.3	4.0	.50	.02	.03
17	.05	.32	.02				65	12	4.5	.05	.02	.03
18	.05	.32	.02				60	8.8	4.2	.05	.02	.03
19	.05	.27	.01				63	6.3	4.5	.05	.03	.03
20	7.5	.27	.01				58	5.5	2.8	.04	.03	.03
21	22	.27	0				53	4.8	18	.04	.03	.03
22	21	.32	0				47	4.3	20	.02	.03	.03
23	20	.32	0				44	4.8	18	.02	.05	.02
24	18	.27	0				41	4.3	10	.10	.05	.02
25	23	.17	0				39	3.7	8.0	.50	.05	.02
26	26	.05	0				35	2.8	5.5	.40	.03	.02
27	21	.02	0				30	3.4	5.0	.25	.03	.02
28	14	.05	0				20	2.6	5.0	.15	.03	.02
29	8.8	.05	0		------		15	2.1	4.0	.10	.02	.02
30	5.2	.05	0		------		20	1.0	4.0	.05	.03	.02
31	2.8	------	0		------		------	.50	------	.05	.03	------
TOTAL	190.04	17.47	.33	0	0	0	1,457.50	156.36	281.64	111.07	.92	.83
MEAN	6.13	.58	.011	0	0	0	48.6	5.04	9.39	3.58	.030	.028
MAX	26	2.8	.05	0	0	0	118	15	78	25	.05	.05
MIN	.02	.02	0	0	0	0	0	.22	.02	.02	.02	.02
AC-FT	377	35	.7	0	0	0	2,890	310	559	220	1.8	1.7

CAL YR 1970 TOTAL 2,369.94 MEAN 6.49 MAX 101 MIN 0 AC-FT 4,700
WTR YR 1971 TOTAL 2,216.16 MEAN 6.07 MAX 118 MIN 0 AC-FT 4,400

05101000 Tongue River at Akra, N. Dak.

LOCATION.--Lat 48°46'40", long 97°42'55", in SE¼ sec.11, T.161 N., R.55 W., Pembina County, on right bank 0.6 mile east of Akra and 4.2 miles west of Cavalier.

DRAINAGE AREA.--162 sq mi.

PERIOD OF RECORD.--April to June 1950 (in WSP 1137-B), October 1951 to current year.

GAGE.--Water-stage recorder. Datum of gage is 920.90 ft above mean sea level (levels by Soil Conservation Service). Prior to July 10, 1954, nonrecording gage 1.5 miles upstream at datum 20.90 ft lower.

AVERAGE DISCHARGE.--20 years (1951-71) 22.4 cfs (16,230 acre-ft per year); median of yearly mean discharges, 21 cfs (15,200 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 568 cfs Apr. 12 (gage height, 7.75 ft); minimum daily discharge, 0.75 cfs Sept. 3.
Period of record: Maximum discharge, 11,800 cfs Apr. 18, 1950 (gage height, 48.7 ft, from floodmarks, site and datum then in use), from rating curve extended above 1,500 cfs on basis of contracted-opening measurement of peak flow; no flow Dec. 1-27, 1952, Aug. 13, 14, 1961.
Flood of Apr. 18, 1950, is the highest known since settlement of the region (about 1860).

REMARKS.--Records good except those for periods of backwater from beaver dams, which are fair. Flow regulated by temporary retention in ten retarding basins beginning 2.5 miles above station, four of which have slow release outlet structures to regulate low flow. Retarding basins were completed during period 1955 to 1961 and have a combined capacity of 19,245 acre-ft.

REVISIONS.--WSP 1728: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.0	21	13	14	2.6	1.7	2.1	64	23	36	3.6	.80
2	3.0	22	15	14	2.6	1.7	2.1	76	24	35	3.4	.80
3	3.0	22	15	15	2.6	1.8	2.0	82	24	32	3.3	.75
4	3.0	21	14	15	2.6	1.8	2.1	82	25	30	3.2	.80
5	3.0	20	14	15	2.6	1.7	2.6	76	28	27	2.9	.85
6	3.0	19	14	15	2.6	1.7	10	70	29	24	2.5	.85
7	3.0	18	14	13	2.5	1.7	75	63	28	34	2.4	.85
8	3.0	17	13	12	2.3	1.7	100	57	27	40	1.9	.80
9	3.0	17	14	11	2.3	1.8	150	51	25	36	2.0	.80
10	4.3	17	14	10	2.3	1.8	389	47	33	30	2.5	.85
11	3.9	17	14	10	2.3	1.8	510	43	46	26	3.0	.85
12	3.9	17	14	10	2.3	2.0	562	38	78	24	1.4	.85
13	4.3	16	14	9.0	2.3	2.0	543	34	139	16	1.4	.80
14	4.8	15	14	7.5	2.3	2.0	516	30	130	5.8	1.8	.80
15	5.6	15	13	6.0	2.3	1.9	492	27	99	5.3	1.9	.85
16	6.2	10	13	5.0	2.3	1.8	465	25	76	5.0	1.7	.85
17	6.8	8.2	13	4.3	2.2	1.8	436	24	62	4.8	1.8	.85
18	7.4	8.6	12	3.7	1.5	1.9	410	25	56	5.0	1.7	.90
19	8.4	9.0	12	3.4	1.4	1.9	403	25	47	5.0	1.5	.90
20	7.8	9.5	11	3.0	1.4	1.9	393	25	40	5.0	1.8	.90
21	7.6	9.5	12	3.0	1.4	1.9	372	24	36	4.8	2.3	.90
22	9.6	10	12	2.8	1.4	1.9	340	25	38	4.8	2.7	.90
23	13	10	11	2.8	1.8	1.9	290	27	40	5.2	3.2	1.1
24	15	11	12	2.7	1.9	1.9	236	27	38	5.0	3.2	1.5
25	15	11	12	2.6	2.0	1.9	196	27	36	4.4	2.3	1.2
26	16	11	12	2.6	1.9	1.9	175	26	34	3.7	2.2	1.5
27	14	12	10	2.6	1.7	2.0	159	24	35	3.7	2.0	1.9
28	9.6	12	12	2.6	1.7	2.0	144	24	35	3.7	1.0	2.2
29	14	12	12	2.6	------	2.0	132	23	34	3.7	.85	2.5
30	17	12	12	2.6	------	2.2	83	22	35	3.7	.80	2.2
31	19	------	13	2.6	------	2.3	------	22	------	3.6	.80	------
TOTAL	240.2	429.8	400	225.4	59.1	58.3	7,591.9	1,235	1,400	472.2	67.05	32.60
MEAN	7.75	14.3	12.9	7.27	2.11	1.88	253	39.8	46.7	15.2	2.16	1.09
MAX	19	22	15	15	2.6	2.3	562	82	139	40	3.6	2.5
MIN	3.0	8.2	10	2.6	1.4	1.7	2.0	22	23	3.6	.80	.75
AC-FT	476	853	793	447	117	116	15,060	2,450	2,780	937	133	65

CAL YR 1970 TOTAL 15,822.70 MEAN 43.3 MAX 562 MIN 1.9 AC-FT 31,380
WTR YR 1971 TOTAL 12,211.55 MEAN 33.5 MAX 562 MIN .75 AC-FT 24,220

NOTE.--Stage-discharge relation affected by backwater from beaver dams Oct. 1 to Nov. 16 and July 28 to Aug. 28.

05102500 Red River of the North at Emerson, Manitoba

(International gaging station)

LOCATION.--Lat 49°00'30", long 97°12'40", in sec.2, T.1, R.2 E., on right bank 1,500 ft downstream from Canadian National Railway bridge in Emerson, 0.8 mile downstream from international boundary, 3.6 miles downstream from Pembina River, and at mile 154.3.

DRAINAGE AREA.--40,200 sq mi, approximately (includes 3,800 sq mi in closed basins).

PERIOD OF RECORD.--March to November 1902 (gage heights only), May 1912 to September 1929 (monthly discharge only, published in WSP 1308), October 1929 to current year.

GAGE.--Water-stage recorder. Datum of gage is 700.00 ft above mean sea level, datum of 1929, by Geodetic Survey of Canada. See WSP 1728 or 1913 for history of changes prior to Apr. 10, 1953.

AVERAGE DISCHARGE.--59 years (1912-71) 3,100 cfs (2,246,000 acre-ft per year); median of yearly mean discharges, 2,630 cfs (1,910,000 acre-ft per year).

EXTREMES.--Current year: Maximum daily discharge, 26,600 cfs Apr. 16; maximum gage height, 78.28 ft Apr. 15; minimum daily discharge, 887 cfs Sept. 30.
Period of record: Maximum discharge, 95,500 cfs May 13, 1950 (gage height, 90.89 ft); minimum observed, 0.9 cfs Feb. 6-8, 1937 (gage height, 44.00 ft).

REMARKS.--Records good. Discharge partially regulated by reservoirs on tributaries.

COOPERATION.--This station is one of the international gaging stations maintained by Canada under agreement with the United States.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1,390	1,430	1,120	1,000	968	1,130	5,150	8,330	4,340	2,890	2,020	1,080
2	1,350	1,480	1,080	1,020	962	1,130	5,380	8,210	4,140	2,900	1,960	1,070
3	1,320	1,570	1,090	1,040	957	1,120	5,750	8,140	3,930	2,930	1,900	1,050
4	1,310	1,710	1,150	1,040	951	1,120	6,330	8,070	3,740	2,950	1,860	1,030
5	1,300	1,860	1,230	1,050	947	1,130	7,050	7,960	3,590	2,930	1,830	1,060
6	1,270	1,990	1,290	1,060	948	1,140	7,820	7,810	3,470	2,890	1,790	1,140
7	1,240	2,100	1,310	1,070	954	1,140	8,710	7,620	3,380	2,850	1,720	1,250
8	1,230	2,210	1,300	1,080	959	1,130	10,300	7,370	3,310	2,820	1,660	1,320
9	1,200	2,290	1,280	1,090	965	1,110	12,600	7,030	3,230	2,780	1,580	1,480
10	1,180	2,200	1,230	1,100	959	1,110	15,500	6,610	3,150	2,830	1,510	1,950
11	1,180	2,050	1,180	1,110	952	1,110	19,200	6,220	3,100	3,070	1,450	2,450
12	1,200	1,920	1,130	1,110	959	1,120	21,600	5,910	3,240	3,430	1,410	2,720
13	1,210	1,800	1,090	1,100	975	1,130	23,500	5,620	3,300	3,680	1,380	2,730
14	1,240	1,700	1,050	1,100	973	1,140	25,000	5,350	3,310	3,750	1,360	2,610
15	1,300	1,660	996	1,090	970	1,190	26,200	5,050	3,260	3,670	1,340	2,390
16	1,330	1,660	966	1,080	976	1,220	26,600	4,760	3,200	3,510	1,330	2,160
17	1,310	1,630	944	1,080	990	1,270	24,600	4,510	3,190	3,340	1,340	1,940
18	1,270	1,550	935	1,070	999	1,340	22,000	4,330	3,180	3,180	1,330	1,750
19	1,260	1,450	936	1,070	1,010	1,440	20,300	4,180	3,140	3,050	1,340	1,600
20	1,250	1,360	953	1,040	1,010	1,550	18,800	4,070	3,050	2,980	1,340	1,460
21	1,240	1,360	984	1,010	1,010	1,670	17,400	3,970	2,950	2,960	1,330	1,340
22	1,240	1,570	1,010	1,000	1,030	1,790	16,100	3,870	2,880	2,920	1,330	1,250
23	1,240	1,620	1,030	995	1,050	1,960	14,700	3,780	2,840	2,850	1,330	1,180
24	1,250	1,610	1,050	982	1,080	2,220	13,400	3,690	2,880	2,740	1,330	1,120
25	1,250	1,540	1,070	958	1,080	2,680	12,100	3,630	2,950	2,610	1,310	1,080
26	1,280	1,470	1,080	945	1,090	3,360	11,000	3,610	2,990	2,510	1,310	1,030
27	1,330	1,420	1,080	940	1,110	4,020	10,100	3,660	3,000	2,420	1,280	989
28	1,370	1,350	1,090	938	1,130	4,520	9,370	3,830	2,980	2,300	1,230	946
29	1,390	1,270	1,080	944	------	4,810	8,870	4,080	2,940	2,200	1,190	909
30	1,400	1,170	1,080	956	------	4,940	8,560	4,360	2,900	2,130	1,140	887
31	1,400	------	1,110	968	------	5,010	------	4,450	------	2,100	1,100	------
TOTAL	39,730	50,000	33,924	32,036	27,964	60,750	433,990	170,080	97,560	90,170	45,330	44,971
MEAN	1,282	1,667	1,094	1,033	999	1,960	14,470	5,486	3,252	2,909	1,462	1,499
MAX	1,400	2,290	1,310	1,110	1,130	5,010	26,600	8,330	4,340	3,750	2,020	2,730
MIN	1,180	1,170	935	938	947	1,110	5,150	3,610	2,840	2,100	1,100	887
AC-FT	78,800	99,180	67,290	63,540	55,470	120,500	860,800	337,400	193,500	178,900	89,910	89,200

CAL YR 1970 TOTAL 2,315,914 MEAN 6,345 MAX 39,600 MIN 935 AC-FT 4,594,000
WTR YR 1971 TOTAL 1,126,505 MEAN 3,086 MAX 26,600 MIN 887 AC-FT 2,234,000

NOTE.--Differences between figures published herein and corresponding figures in reports of the Water Survey of Canada are due to variations in automated program techniques.

05113360 Long Creek at western crossing of international boundary

(International gaging station)

LOCATION.--Lat 49°00'01", long 103°21'08", in SE¼ sec.1, T.1, R.11 W., 2d meridian, on right bank 10 miles south of Outram, Saskatchewan.

DRAINAGE AREA.--1,320 sq mi.

PERIOD OF RECORD.--March 1959 to current year.

GAGE.--Water-stage recorder and artificial control. Datum of gage is 1,894.00 ft above mean sea level, international boundary survey.

AVERAGE DISCHARGE.--12 years, 29.0 cfs (21,010 acre-ft per year); median of yearly mean discharges, 21 cfs (15,200 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 854 cfs Apr. 9 (gage height, 6.31 ft); no flow for several months. Period of record: Maximum discharge, 3,970 cfs Apr. 10, 1969 (gage height, 12.17 ft, backwater from ice); no flow for several months each year.

REMARKS.--Records good. Discharge affected by storage in upstream reservoirs.

COOPERATION.--This station is one of the international gaging stations maintained by Canada under agreement with the United States.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1					0	.50	51	9.5	0	.82	38	
2					0	.50	55	9.0	0	1.2	33	
3					0	.50	59	9.0	0	4.7	29	
4					0	.50	63	9.2	0	3.6	26	
5					0	.50	67	9.5	.29	4.5	24	
6					0	.50	71	10	1.3	40	22	
7					0	.50	59	10	3.4	49	19	
8					0	.50	255	11	8.9	47	18	
9					0	.50	651	10	4.6	60	16	
10					0	.50	300	10	2.7	93	14	
11					0	.50	338	9.5	1.3	314	13	
12					0	1.0	531	9.2	.04	601	12	
13					0	2.5	541	7.9	0	515	12	
14					0	5.0	382	6.7	0	440	10	
15					0	9.5	268	5.8	0	477	9.3	
16					0	12	215	5.6	0	530	8.9	
17					0	15	160	5.0	0	525	8.1	
18					0	18	118	4.4	0	443	7.2	
19					0	21	89	3.7	0	315	6.3	
20					0	23	65	2.9	0	230	5.2	
21					0	23	52	2.9	0	187	4.0	
22					0	28	42	3.7	0	162	2.7	
23					0	30	35	2.9	0	140	2.0	
24					0	26	30	3.1	0	124	1.3	
25					.10	21	25	2.7	0	115	.65	
26					.20	20	20	1.5	0	96	.13	
27					.30	19	15	.89	0	78	0	
28					.40	17	12	.20	0	68	0	
29					------	16	11	0	0	58	0	
30					------	20	10	0	.31	51	0	
31		------			------	30	------	0	------	44	0	------
TOTAL	0	0	0	0	1.00	362.50	4,590	175.79	22.84	5,816.82	341.78	0
MEAN	0	0	0	0	.036	11.7	153	5.67	.76	188	11.0	0
MAX	0	0	0	0	.40	30	651	11	8.9	601	38	0
MIN	0	0	0	0	0	.50	10	0	0	.82	0	0
AC-FT	0	0	0	0	2.0	719	9,100	349	45	11,540	678	0

CAL YR 1970 TOTAL 24,178.56 MEAN 66.2 MAX 1,750 MIN 0 AC-FT 47,960
WTR YR 1971 TOTAL 11,310.73 MEAN 31.0 MAX 651 MIN 0 AC-FT 22,430

NOTE.--Differences between figures published herein and corresponding figures in reports of the Water Survey of Canada are due to variations in automated program techniques.

05113600 Long Creek near Noonan, N. Dak.

(International gaging station)

LOCATION.--Lat 48°58'52", long 103°04'34", near north line of NE¼ sec.1, T.163 N., R.96 W., Divide County, on right bank 150 ft upstream from county highway bridge, 1.5 miles upstream from international boundary, and 7 miles northwest of Noonan.

DRAINAGE AREA.--1,790 sq mi, approximately, of which about 1,160 sq mi is probably noncontributing.

PERIOD OF RECORD.--October 1959 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 1,840 ft (from topographic map). Prior to Aug. 18, 1960, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--12 years, 36.4 cfs (26,370 acre-ft per year); median of yearly mean discharges, 25 cfs (18,100 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 861 cfs Apr. 9 (gage height, 8.77 ft);maximum gage height, 9.12 ft Apr. 9 (backwater from ice); no flow for many days.
Period of record: Maximum discharge, 4,980 cfs Apr. 10, 1969 (gage height, 16.23 ft); no flow for many days each year.

REMARKS.--Records good.

COOPERATION.--This station is one of the international gaging stations maintained by the United States under agreement with Canada.

REVISIONS.--WSP 2113: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.18	.99	.46	.40	0	0	85	30	1.1	11	61	.64
2	.13	.99	.28	.40	0	0	95	27	1.1	4.8	51	.52
3	.04	.85	.23	.35	0	0	95	26	1.2	6.6	45	.46
4	.13	.85	.28	.30	0	0	110	24	1.1	9.1	39	.52
5	.18	.85	.18	.25	0	0	125	22	2.3	6.8	35	1.6
6	.40	.85	.13	.18	0	0	125	18	2.8	8.8	32	1.6
7	.46	.78	.28	.08	0	0	120	17	1.9	40	28	1.9
8	.58	.78	.34	.13	0	0	95	14	1.1	106	25	1.3
9	.78	.85	.23	.13	0	0	400	12	1.4	99	22	.99
10	.58	.85	.23	.13	0	0	557	11	3.8	211	20	.78
11	.58	.85	.18	.08	0	.10	350	9.8	12	402	17	.71
12	.64	.92	.28	.08	0	.40	452	8.8	12	591	15	.58
13	.64	1.1	.18	.04	0	.60	537	7.7	6.8	776	14	.52
14	.58	1.1	.23	.04	0	.50	473	7.1	4.8	628	12	.46
15	.58	1.2	.18	0	0	.50	344	6.6	4.2	555	10	.46
16	.52	.99	.18	0	1.0	.40	266	4.2	4.0	578	8.8	.52
17	.52	.92	.28	0	2.0	.60	198	4.4	4.0	594	7.4	.46
18	.52	.99	.34	0	1.6	10	167	3.2	3.6	555	6.3	.46
19	.46	.92	.34	0	1.0	25	141	3.2	3.5	461	5.3	.46
20	.52	.85	.28	0	.80	25	121	3.0	3.6	362	4.2	.46
21	.52	.85	.23	0	.40	70	100	2.8	2.9	293	3.0	.46
22	.58	.85	.28	.05	.20	80	80	4.6	2.2	249	2.4	.46
23	.58	.71	.28	.10	0	60	72	5.0	1.8	214	1.9	.40
24	.58	.71	.34	.05	0	50	62	4.0	1.7	191	1.4	.40
25	.71	.71	.34	.05	.20	40	56	3.4	1.4	164	1.3	.40
26	.71	.58	.34	0	.40	40	47	4.0	2.8	149	1.2	.46
27	.85	.52	.34	0	.20	35	44	2.4	3.5	131	.99	.58
28	1.4	.52	.34	0	.10	35	41	2.4	2.3	109	.85	.78
29	1.9	.52	.28	0	------	35	38	2.2	2.2	94	.71	.64
30	2.0	.46	.34	0	------	40	33	1.6	8.1	82	.64	.58
31	1.1	------	.28	0	------	50	------	1.2	------	71	.64	------
TOTAL	19.95	24.91	8.50	2.84	7.90	598.10	5,429	292.6	105.2	7,752.1	473.03	20.56
MEAN	.64	.83	.27	.092	.28	19.3	181	9.44	3.51	250	15.3	.69
MAX	2.0	1.2	.46	.40	2.0	80	557	30	12	776	61	1.9
MIN	.04	.46	.13	0	0	0	33	1.2	1.1	4.8	.64	.40
AC-FT	40	49	17	5.6	16	1,190	10,770	580	209	15,380	938	41

CAL YR 1970 TOTAL 30,375.13 MEAN 83.2 MAX 1,870 MIN 0 AC-FT 60,250
WTR YR 1971 TOTAL 14,734.69 MEAN 40.4 MAX 776 MIN 0 AC-FT 29,230

PEAK DISCHARGE (BASE, 200 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
4- 9	2110	8.77	861	7-13	0300	8.93	791
7-10	2300	7.90	547				

05113750 East Branch Short Creek Reservoir near Columbus, N. Dak.

LOCATION.--Lat 48°59'26", long 102°47'07", in SW¼NW¼ sec.32, T.164 N., R.93 W., Burke County, on left bank of reservoir, 0.5 mile south of international boundary, and 6.0 miles north of Columbus.

DRAINAGE AREA.--280 sq mi of which 175 sq mi is noncontributing.

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

GAGE.--Water-stage recorder. Datum of gage is 1,860.00 ft above mean sea level.

EXTREMES.--Current year: Maximum contents, 1,344 acre-ft Apr. 7 (elevation, 28.20 ft); minimum, 1,122 acre-ft Sept. 27 (elevation, 26.29 ft).
Period of record: Maximum contents, 1,705 acre-ft Apr. 6, 1969 (elevation, 31.11 ft); minimum, 1,002 acre-ft Dec. 10-13, 1967.

REMARKS.--Reservoir is formed by earth-fill dam; storage began April 1963. Outlet of lake is a fixed-crest concrete dam; average crest elevation, 1,886.90 ft above mean sea level. Reservoir capacity at crest elevation, 1,200 acre-ft. The reservoir is operated for water supply and recreation.

MONTHEND GAGE HEIGHT AND CONTENTS AT 2400, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

Date	Gage height (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	26.96	1,196	
Oct. 31	26.86	1,185	-11
Nov. 30	26.82	1,180	-5
Dec. 31	26.77	1,175	-5
CAL YR 1970	--	--	+80
Jan. 31	26.75	1,172	-3
Feb. 28	26.95	1,194	+22
Mar. 31	28.08	1,330	+136
Apr. 30	27.80	1,296	-34
May 31	27.43	1,252	-44
June 30	27.39	1,247	-5
July 31	27.08	1,210	-37
Aug. 31	26.49	1,144	-66
Sept. 30	26.30	1,123	-21
WTR YR 1971	--	--	-73

05113800 Short Creek below international boundary near Roche Percee, Saskatchewan

(International gaging station)

LOCATION.--Lat 49°01'42", long 102°51'00", in SW¼ sec.14, T.1, R.7 W., 2d meridian, 4 miles southwest of Roche Percee and 5 miles upstream from mouth.

DRAINAGE AREA.--480 sq mi.

PERIOD OF RECORD.--March 1960 to current year.

GAGE.--Water-stage recorder.

AVERAGE DISCHARGE.--11 years, 6.73 cfs (4,880 acre-ft per year); median of yearly mean discharges, 3.8 cfs (2,800 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 71.2 cfs July 14 (gage height, not determined); no flow for many days.
Period of record: Maximum discharge, 1,700 cfs Apr. 7, 1969 (gage height, 14.33 ft); maximum gage height, 14.39 ft Mar. 28, 1960; no flow many days each year.

REMARKS.--Records good.

COOPERATION.--This station is one of the international gaging stations maintained by Canada under agreement with the United States.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.01	1.4	.21	.02	.02	.90	46	6.0	.26	.33	.77	0
2	0	1.4	.13	.02	.02	.90	51	5.3	.54	.43	.51	0
3	0	2.5	.05	.02	.02	.90	47	4.5	.44	.38	.19	0
4	0	2.4	.05	.02	.02	.90	43	3.8	.30	.22	.19	.16
5	0	2.3	.05	.02	.02	.90	40	3.3	.46	2.4	.12	.48
6	.14	2.3	.05	.02	.02	1.0	36	2.7	.41	3.0	.17	.02
7	.12	2.2	.05	.02	.02	1.0	50	2.2	.40	3.6	.10	0
8	.09	2.1	.05	.02	.02	1.0	50	1.9	.52	3.5	.05	0
9	.13	2.0	.05	.02	.02	1.0	51	1.7	1.1	3.1	.04	0
10	.14	1.9	.04	.02	.02	1.0	38	1.5	1.6	4.4	.01	0
11	.15	1.9	.04	.02	.02	1.0	26	1.2	2.5	4.5	.11	0
12	.18	1.8	.04	.02	.02	2.0	22	1.0	1.2	4.1	.06	0
13	.22	1.7	.04	.02	.05	4.0	18	1.0	.73	60	.09	0
14	.26	1.6	.04	.02	.05	6.0	14	.83	.35	67	.08	0
15	.23	1.5	.04	.02	.05	8.0	11	.52	.20	50	.01	0
16	.21	1.4	.04	.02	.10	11	9.9	.51	.17	34	.04	0
17	.05	1.4	.04	.02	.10	18	10	.37	.12	23	.01	0
18	.01	1.3	.04	.02	.10	12	11	.20	.75	19	.01	0
19	.06	1.2	.04	.02	.10	5.2	11	.39	2.0	16	.01	0
20	.24	1.1	.04	.02	.10	5.3	12	.05	1.5	14	.01	0
21	.87	1.0	.03	.02	.20	5.5	15	.05	1.2	11	.01	0
22	1.1	.95	.03	.02	.20	5.7	15	.67	.86	8.8	0	0
23	1.4	.87	.03	.02	.20	5.8	14	.83	.50	7.0	0	0
24	1.3	.79	.03	.02	.20	6.2	13	.75	.61	5.3	0	0
25	1.3	.71	.03	.02	.50	6.5	12	.47	.32	3.6	0	0
26	1.1	.62	.03	.02	.50	6.9	11	.26	1.1	2.4	0	0
27	.98	.54	.03	.02	.70	7.2	8.9	.10	.50	1.9	0	.03
28	1.0	.46	.03	.02	.70	7.6	7.9	.01	.20	1.6	0	.12
29	1.5	.38	.03	.02	------	7.9	7.3	.02	.39	1.3	0	.01
30	1.2	.30	.03	.02	------	12	6.8	.01	.44	1.2	0	0
31	1.3	------	.03	.02	------	20	------	.01	------	.93	0	------
TOTAL	15.29	42.02	1.46	.62	4.09	173.30	707.8	42.15	21.67	357.99	2.59	.82
MEAN	.49	1.40	.047	.020	.15	5.59	23.6	1.36	.72	11.5	.084	.027
MAX	1.5	2.5	.21	.02	.70	20	51	6.0	2.5	67	.77	.48
MIN	0	.30	.03	.02	.02	.90	6.8	.01	.12	.22	0	0
AC-FT	30	83	2.9	1.2	8.1	344	1,400	84	43	710	5.1	1.6

CAL YR 1970 TOTAL 7,153.17 MEAN 19.6 MAX 411 MIN 0 AC-FT 14,190
WTR YR 1971 TOTAL 1,369.80 MEAN 3.75 MAX 67 MIN 0 AC-FT 2,720

NOTE.--Differences between figures published herein and corresponding figures in reports of the Water Survey of Canada are due to variations in automated program techniques.

05114000 Souris (Mouse) River near Sherwood, N. Dak.

(International gaging station)

LOCATION.--Lat 48°59'24", long 101°57'28", in NW¼SE¼NE¼ sec.33, T.164 N., R.87 W., Renville County, on right bank 0.8 mile downstream from international boundary and 16 miles northwest of Sherwood and at mile 511.4.

DRAINAGE AREA.--8,940 sq mi, approximately, of which about 5,900 sq mi is probably noncontributing.

PERIOD OF RECORD.--March 1930 to current year. Monthly discharge only for some periods, published in WSP 1308.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,603.73 ft (revised) above mean sea level. Prior to Apr. 8, 1935, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--41 years, 106 cfs (76,800 acre-ft per year); median of yearly mean discharges, 76 cfs (55,100 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 1,480 cfs Apr. 18 (gage height, 13.69 ft); minimum, 5.1 cfs Jan. 8 (gage height, 1.69 ft).
Period of record: Maximum discharge, 12,400 cfs Apr. 11, 1969 (gage height, 24.72 ft, backwater from ice); no flow at times in some years.
Flood in 1927 reached a stage of about 22 ft, from information by local residents.

REMARKS.--Records good. Some regulation at low flows by reservoirs in Canada. Some small diversions for irrigation and municipal supply.

COOPERATION.--This station is one of the international gaging stations maintained by the United States under agreement with Canada.

REVISIONS (WATER YEARS).--WSP 1308: 1934, 1945. WSP 2113: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	32	15	6.9	6.9	11	140	708	86	50	69	35
2	11	33	11	6.9	6.9	8.0	220	690	85	52	58	36
3	9.2	30	8.1	6.6	6.6	7.0	200	667	85	63	49	40
4	8.0	29	12	6.9	7.1	8.0	180	649	85	57	43	42
5	9.9	28	14	6.9	6.6	9.5	170	613	82	67	37	47
6	13	28	13	6.2	6.6	11	170	562	74	65	35	45
7	20	28	12	5.4	6.8	9.0	200	549	65	62	31	54
8	28	28	12	5.4	7.1	8.5	240	563	61	61	28	57
9	49	29	11	5.8	7.4	9.0	510	441	56	61	27	56
10	46	31	10	6.0	7.3	10	950	414	55	56	25	53
11	37	31	9.9	6.0	6.6	16	1,120	396	76	54	20	49
12	32	30	9.2	6.0	6.8	23	756	364	87	51	18	42
13	36	28	9.2	6.0	8.1	36	522	310	75	47	17	40
14	46	28	8.3	6.0	7.1	42	925	281	64	41	17	36
15	44	27	8.0	6.0	6.8	36	1,380	257	55	36	16	33
16	38	26	7.8	6.0	6.3	42	1,450	234	49	312	15	34
17	34	27	7.5	6.3	6.3	38	1,460	219	46	582	13	38
18	31	28	7.5	6.2	6.0	40	1,480	206	45	690	17	37
19	27	27	7.5	6.3	6.0	65	1,460	197	44	716	31	36
20	25	22	7.5	6.6	5.8	130	1,330	186	45	713	54	38
21	25	23	7.0	6.8	5.6	120	1,140	170	44	691	50	42
22	24	20	7.0	7.1	6.8	96	1,050	171	43	653	39	41
23	24	18	7.0	8.1	7.4	80	1,040	170	40	517	30	40
24	24	16	6.5	8.3	7.6	77	1,010	153	35	354	28	40
25	31	16	6.5	9.7	10	75	895	126	31	275	34	40
26	27	16	6.5	13	14	59	815	127	38	250	37	42
27	26	15	7.0	15	14	46	779	123	51	221	31	45
28	28	15	7.0	14	16	36	762	110	55	164	26	59
29	29	16	7.0	9.7	------	40	745	98	52	116	22	250
30	29	16	7.0	7.8	------	108	723	87	52	89	31	401
31	29	------	7.0	7.1	------	138	------	85	------	79	37	------
TOTAL	853.1	741	276.0	231.0	216.5	1,434.0	23,822	9,926	1,761	7,245	985	1,848
MEAN	27.5	24.7	8.90	7.45	7.73	46.3	794	320	58.7	234	31.8	61.6
MAX	49	33	15	15	16	138	1,480	708	87	716	69	401
MIN	8.0	15	6.5	5.4	5.6	7.0	140	85	31	36	13	33
AC-FT	1,690	1,470	547	458	429	2,840	47,250	19,690	3,490	14,370	1,950	3,670

CAL YR 1970 TOTAL 94,943.4 MEAN 260 MAX 2,740 MIN 3.3 AC-FT 188,300
WTR YR 1971 TOTAL 49,338.6 MEAN 135 MAX 1,480 MIN 5.4 AC-FT 97,860

05115500 Lake Darling near Foxholm, N. Dak.

LOCATION.--Lat 48°27'27", long 101°35'14", in NE¼NE¼ sec.1, T.157 N., R.85 W., Ward County, on control structure of Lake Darling Dam, reservoir of Fish and Wildlife Service, on Souris River about 6 miles north of Foxholm, and at mile 430.0.

DRAINAGE AREA.--9,450 sq mi, approximately, of which about 6,200 sq mi is probably noncontributing.

PERIOD OF RECORD.--April 1936 to current year (no winter records 1936-39).

GAGE.--Water-stage recorder. Datum of gage is 1,577.00 ft above mean sea level. April 1936 to Aug. 8, 1963, nonrecording gages at same site and datum.

EXTREMES.--Current year: Maximum contents, 105,600 acre-ft Apr. 24, 25 (gage height, 20.36 ft); minimum, 79,800 acre-ft Sept. 2 (gage height, 17.51 ft).
Period of record: Maximum contents observed, 130,000 acre-ft Apr. 23, 24, 1943 (gage height, 22.83 ft); minimum observed since April 1943 when reservoir was first filled to spillway level, 31,200 acre-ft Feb. 18, 25, 1963 (gage height, 10.04 ft).

REMARKS.--Reservoir is formed by earth dam; storage began in April 1936; dam completed in July 1936. Usable capacity, 108,500 acre-ft between gage heights 0.0 ft (sill of control gates) and 21.0 ft (crest of spillway). Dead storage, 3,500 acre-ft. Water is used during periods of low flow at wildlife refuge downstream.

COOPERATION.--Supplementary gage readings furnished by Fish and Wildlife Service.

REVISIONS (WATER YEAR).--WSP 1338: 1942. WSP 2113: Drainage area.

MONTHEND GAGE HEIGHT AND CONTENTS AT 2400, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

Date	Gage height (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	18.82	91,400	
Oct. 31	18.86	91,700	+300
Nov. 30	18.65	89,800	-1,900
Dec. 31	18.48	88,300	-1,500
CAL YR 1970	--	--	+10,400
Jan. 31	18.22	86,000	-2,300
Feb. 28	18.03	84,300	-1,700
Mar. 31	18.21	85,900	+1,600
Apr. 30	20.09	102,900	+17,000
May 31	19.83	100,500	-2,400
June 30	19.58	98,200	-2,300
July 31	18.58	89,200	-9,000
Aug. 31	17.55	80,200	-9,000
Sept. 30	17.94	83,500	+3,300
WTR YR 1971	--	--	-7,900

05116000 Souris (Mouse) River near Foxholm, N. Dak.

LOCATION.--Lat 48°22'20", long 101°30'18", in SW¼SE¼ sec.34, T.157 N., R.84 W., Ward County, on left bank 30 ft upstream from county highway bridge, 3 miles east of Foxholm, 19 miles upstream from Des Lacs River, and at mile 414.5.

DRAINAGE AREA.--9,470 sq mi, approximately, of which about 6,200 sq mi is probably noncontributing.

PERIOD OF RECORD.--June 1904 to November 1905, March to July 1906 (gage heights only), October 1936 to current year. Monthly discharge only for some periods, published in WSP 1308. Published as Mouse River near Foxholm, 1904-6.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,560.73 ft above mean sea level. June 23, 1904, to July 31, 1906, nonrecording gage at site 3.2 miles upstream at different datum. Apr. 1, 1937, to Mar. 25, 1938, nonrecording gage at site 600 ft downstream at datum about half a foot higher.

AVERAGE DISCHARGE (UNADJUSTED).--36 years, 106 cfs (76,800 acre-ft per year); median of yearly mean discharges, 60 cfs (43,500 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 1,070 cfs Apr. 22 (gage height, 11.10 ft); minimum, 0.29 cfs Apr. 5-10, 12 (gage height, 5.18 ft).
Period of record: Maximum discharge, 5,380 cfs Apr. 17, 18, 1969 (gage height, 15.84 ft); maximum reverse flow, 25 cfs Apr. 4, 1949 caused by backwater from Des Lacs River; no flow at times in many years.

REMARKS.--Records fair. Flow completely regulated since 1936 by Lake Darling (see station 05115500) 15 miles upstream and several smaller reservoirs (combined capacity, about 184,000 acre-ft). Some small diversions for irrigation and municipal supply.

REVISIONS.--WSP 1308: 1905. WSP 2113: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18	51	47	44	44	44	32	1,060	51	157	350	58
2	18	51	47	44	44	44	.6	1,060	51	157	300	58
3	5.9	56	47	44	44	46	.4	1,050	51	157	144	58
4	6.6	62	47	44	44	46	.4	880	51	157	144	62
5	8.1	62	47	44	44	46	.3	655	51	160	144	62
6	16	62	47	44	44	46	.3	544	47	173	147	60
7	11	60	47	44	44	46	.3	526	45	227	130	49
8	8.1	60	47	44	44	46	.3	522	45	199	130	39
9	8.9	52	47	44	44	46	.3	524	44	180	130	39
10	9.8	47	47	44	44	44	.3	529	44	176	130	39
11	8.9	47	47	44	42	44	.4	533	114	173	130	40
12	12	47	46	44	42	44	.3	536	157	170	130	51
13	12	47	46	44	42	46	.8	419	153	160	130	56
14	13	47	46	44	42	46	57	239	153	250	130	40
15	13	47	46	44	42	46	379	230	153	400	130	40
16	14	47	46	44	42	46	655	230	153	480	130	40
17	15	47	46	44	42	46	680	230	157	500	127	40
18	14	47	46	44	42	46	712	230	157	520	127	39
19	14	47	46	44	42	46	918	230	157	522	127	39
20	14	47	46	44	42	46	1,040	235	157	529	127	39
21	14	47	44	44	42	46	1,060	168	157	529	124	39
22	13	47	44	44	42	46	1,070	40	157	522	121	39
23	13	47	44	44	42	47	1,070	42	157	517	121	39
24	13	47	44	44	42	47	1,060	46	157	515	85	39
25	15	47	44	44	42	47	1,060	47	157	509	56	39
26	30	47	44	44	44	47	1,060	49	157	501	56	39
27	56	47	44	44	44	47	1,060	51	157	467	58	39
28	52	47	44	44	44	47	1,060	52	157	452	58	39
29	52	47	44	44	------	49	1,060	52	157	430	58	39
30	51	47	44	44	------	49	1,060	51	157	400	58	39
31	51	------	44	44	------	49	------	51	------	370	58	------
TOTAL	600.3	1,503	1,415	1,364	1,202	1,431	15,097.7	11,111	3,561	10,659	3,890	1,338
MEAN	19.4	50.1	45.6	44.0	42.9	46.2	503	358	119	344	125	44.6
MAX	56	62	47	44	44	49	1,070	1,060	157	529	350	62
MIN	5.9	47	44	44	42	44	.30	40	44	157	56	39
AC-FT	1,190	2,980	2,810	2,710	2,380	2,840	29,950	22,040	7,060	21,140	7,720	2,650

CAL YR 1970 TOTAL 105,605.52 MEAN 289 MAX 2,790 MIN .70 AC-FT 209,500
WTR YR 1971 TOTAL 53,172.00 MEAN 146 MAX 1,070 MIN .30 AC-FT 105,500

05116500 Des Lacs River at Foxholm, N. Dak.

LOCATION.--Lat 48°22'14", long 101°34'11", in NW¼NE¼NW¼ sec.2, T.156 N., R.85 W., Ward County, on left bank 200 ft upstream from county highway bridge in Foxholm and at mile 23.0.

DRAINAGE AREA.--939 sq mi, of which about 400 sq mi is probably noncontributing.

PERIOD OF RECORD.--June 1904 to July 1906, October 1945 to current year. Monthly discharge only for some periods, published in WSP 1308.

GAGE.--Water-stage recorder. Datum of gage is 1,632.98 ft above mean sea level. June 14 to Oct. 23, 1955, non-recording gage at site 200 ft downstream from present gage at same datum. See WSP 1728 to 1913 for history of changes prior to June 14, 1955.

AVERAGE DISCHARGE.--28 years, 22.7 cfs (16,450 acre-ft per year); median of yearly mean discharges, 15 cfs (10,900 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 193 cfs July 7 (gage height, 6.42 ft); maximum gage height, 8.58 ft Mar. 30 (backwater from ice); minimum discharge, 0.70 cfs Aug. 23 (gage height, 1.99 ft).
Period of record: Maximum discharge, 3,660 cfs Apr. 30, 1970 (gage height, 20.71 ft from floodmark); no flow at times in some years.

REMARKS.--Records fair. Some regulation at low flow by a series of wildfowl refuge ponds, beginning about 53 miles upstream, combined capacity about 64,000 acre-feet. Some small diversions for irrigation above station.

REVISIONS.--WSP 1728: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.1	12	8.5	3.5	2.0	14	115	10	5.0	6.4	2.6	1.7
2	4.0	12	8.5	3.5	2.0	14	90	9.4	4.9	6.4	2.0	1.5
3	3.9	12	8.5	3.5	2.0	12	75	9.0	4.5	10	2.0	1.4
4	4.1	12	8.5	3.5	2.0	12	70	8.2	5.0	7.5	1.8	4.7
5	4.2	12	8.0	3.5	2.0	14	55	7.7	10	6.3	1.8	15
6	4.1	12	8.0	3.0	2.0	12	48	7.5	132	20	1.7	19
7	4.3	12	8.0	3.0	2.0	9.0	50	7.4	52	93	1.8	26
8	4.3	12	8.0	3.0	2.0	7.0	52	7.1	19	15	1.8	15
9	4.4	12	8.0	3.0	2.0	6.0	46	7.1	13	13	1.9	8.8
10	4.5	12	7.5	3.0	2.0	5.5	42	7.5	12	13	1.6	6.9
11	4.4	12	7.5	2.5	2.0	6.0	40	7.2	11	10	1.1	6.4
12	8.2	12	6.5	2.5	2.0	9.0	38	6.8	9.8	10	1.1	6.0
13	5.7	10	6.5	2.5	2.5	10	33	6.6	9.2	12	1.2	5.5
14	5.4	8.8	6.0	2.5	3.0	11	32	6.2	8.0	12	1.2	5.1
15	6.8	10	6.0	2.5	3.5	12	29	6.0	7.5	11	1.4	5.1
16	8.0	12	5.5	2.5	5.0	11	26	5.9	7.4	10	1.4	5.4
17	8.6	12	5.0	2.5	9.0	12	23	5.8	7.2	9.0	1.8	5.5
18	8.2	12	5.0	2.5	6.0	22	26	5.6	6.9	8.6	1.6	5.9
19	8.6	11	5.0	2.5	3.0	8.0	29	5.6	6.9	7.8	1.7	5.9
20	9.0	11	5.0	2.5	3.5	7.0	28	5.6	6.9	7.4	2.0	5.9
21	8.8	9.8	5.0	2.5	9.5	6.0	44	5.6	6.6	7.5	1.9	5.1
22	9.2	10	4.5	2.5	15	5.0	33	6.3	6.0	7.2	1.0	5.4
23	11	10	4.5	2.5	8.0	7.0	25	7.1	5.6	6.8	.75	5.6
24	10	9.5	4.5	2.5	5.0	6.0	21	6.9	7.4	6.2	1.1	5.6
25	10	9.5	4.5	2.5	25	4.0	19	6.9	7.5	5.6	1.4	5.2
26	10	9.5	4.5	2.5	30	3.0	15	6.2	7.5	5.2	1.4	5.1
27	10	9.5	4.0	2.5	35	35	12	5.6	7.4	5.0	1.2	5.6
28	11	9.0	4.0	2.5	20	120	11	5.0	6.2	4.9	1.2	5.4
29	12	9.0	4.0	2.5	------	125	11	5.0	6.2	4.6	1.2	6.2
30	13	9.0	4.0	2.5	------	110	11	5.0	6.3	3.8	1.5	6.0
31	13	------	4.0	2.5	------	150	------	4.9	------	3.2	1.8	------
TOTAL	232.8	325.6	187.0	85.0	207.0	784.5	1,149	206.7	404.9	348.4	47.95	211.9
MEAN	7.51	10.9	6.03	2.74	7.39	25.3	38.3	6.67	13.5	11.2	1.55	7.06
MAX	13	12	8.5	3.5	35	150	115	10	132	93	2.6	26
MIN	3.9	8.8	4.0	2.5	2.0	3.0	11	4.9	4.5	3.2	.75	1.4
AC-FT	462	646	371	169	411	1,560	2,280	410	803	691	95	420

CAL YR 1970 TOTAL 29,866.40 MEAN 81.8 MAX 3,200 MIN .90 AC-FT 59,240
WTR YR 1971 TOTAL 4,190.75 MEAN 11.5 MAX 150 MIN .75 AC-FT 8,310

05117500 Souris (Mouse) River above Minot, N. Dak.

LOCATION.--Lat 48°14'45", long 101°22'15", in NW¼NW¼SE¼ sec.17, T.155 N., R.83 W., Ward County, on right bank 180 ft downstream from county highway bridge 3.5 miles west of Minot, 7 miles downstream from Des Lacs River, and at mile 388.5.

DRAINAGE AREA.--10,600 sq mi, approximately, of which about 6,700 sq mi is probably noncontributing.

PERIOD OF RECORD.--May 1903 to current year. Monthly discharge only for some periods, published in WSP 1308. Published as Mouse River at Minot 1903-24, Souris River at Minot, 1927-28, 1929-34, and Souris River near Minot 1928-29.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,545.75 ft above mean sea level. May 5, 1903, to Sept. 30, 1928, Oct. 1, 1929, to Sept. 30, 1934, nonrecording gages at mile 377.6 in Minot, at datum 12.5 ft lower, Oct. 1, 1928, to Sept. 30, 1929, nonrecording gages at Saugstad bridge at mile 366.8, 5 miles southeast of Minot and at datum 19.2 ft lower than present datum. Records equivalent except those for periods of extreme low flow, as some industrial and sanitary waste enters river between the sites.

AVERAGE DISCHARGE (UNADJUSTED).--68 years, 142 cfs (102,900 acre-ft per year); median of yearly mean discharges, 89 cfs (64,500 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 1,180 cfs July 7 (gage height, 10.45 ft); minimum, 13 cfs Oct. 1 (gage height, 4.32 ft).
Period of record: Maximum discharge, 12,000 cfs Apr. 20, 1904 (gage height, 21.9 ft at site in Minot), from rating curve extended above 8,100 cfs; no flow at times in some years.
Maximum stage at present site, about 23 ft in April 1904. Maximum stage in Minot at least 3 ft higher than 1904 peak, in 1881, according to Apr. 20, 1904 issue of Minot Daily Optic. This peak probably occurred in 1882.

REMARKS.--Records fair. Flow almost completely regulated by Lake Darling (see station 05115500), 41 miles upstream and several smaller reservoirs (combined capacity, about 248,000 acre-ft). Some small diversions for irrigation and municipal supply.

REVISIONS (WATER YEARS).--WSP 1308: 1905, 1909-14, 1918, 1924-25, 1927. WSP 1338: 1903-4, 1906, 1917, 1928, 1929(M). WSP 2113: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	69	58	50	46	72	380	1,060	58	170	418	58
2	14	69	58	48	46	68	250	1,050	57	167	402	58
3	16	69	58	48	46	68	110	1,050	57	161	313	58
4	22	73	58	46	46	64	105	1,030	57	164	178	67
5	22	77	58	50	46	62	92	863	60	164	146	100
6	19	73	58	48	46	58	79	772	64	186	136	112
7	15	71	58	48	46	58	81	582	150	938	136	105
8	16	71	58	48	46	58	89	580	119	658	136	89
9	20	71	56	48	46	58	96	548	75	367	133	58
10	21	71	56	48	46	56	83	560	67	277	133	47
11	19	64	56	48	44	54	75	568	60	254	133	42
12	18	62	56	48	44	54	64	562	94	232	131	42
13	19	62	56	48	44	56	55	556	154	216	128	45
14	21	60	56	48	44	74	44	461	159	213	126	55
15	21	57	56	48	44	80	71	358	167	254	126	45
16	21	60	56	48	46	78	410	317	167	376	126	44
17	21	60	56	48	54	76	636	317	167	426	128	44
18	22	60	56	48	62	78	689	307	161	448	128	44
19	25	58	54	48	56	90	747	323	161	475	126	44
20	25	57	54	48	54	90	926	317	161	505	126	44
21	29	53	54	48	52	75	1,040	317	161	516	124	44
22	31	53	54	48	50	70	1,080	238	161	507	124	42
23	32	55	52	48	52	70	1,090	96	170	525	124	40
24	31	60	52	48	54	70	1,080	64	167	533	121	40
25	29	60	52	48	54	75	1,070	60	167	531	100	40
26	32	60	52	48	68	70	1,060	58	164	527	66	40
27	39	60	50	48	74	100	1,060	57	167	525	60	42
28	67	60	50	48	74	120	1,060	57	167	514	60	42
29	75	60	50	48	------	450	1,060	57	170	494	60	42
30	73	60	50	48	------	600	1,060	58	170	468	58	40
31	69	------	50	48	------	550	------	58	------	441	58	------
TOTAL	897	1,895	1,698	1,490	1,430	3,602	15,742	13,301	3,879	12,232	4,364	1,613
MEAN	28.9	63.2	54.8	48.1	51.1	116	525	429	129	395	141	53.8
MAX	75	77	58	50	74	600	1,090	1,060	170	938	418	112
MIN	13	53	50	46	44	54	44	57	57	161	58	40
AC-FT	1,780	3,760	3,370	2,960	2,840	7,140	31,220	26,380	7,690	24,260	8,660	3,200

CAL YR 1970 TOTAL 141,016.0 MEAN 386 MAX 3,280 MIN 6.0 AC-FT 279,700
WTR YR 1971 TOTAL 62,143.0 MEAN 170 MAX 1,090 MIN 13 AC-FT 123,300

05120000 Souris (Mouse) River near Verendrye, N. Dak.

LOCATION.--Lat 48°09'35", long 100°43'45", in NW¼SW¼ sec.17, T.154 N., R.78 W., McHenry County, on left bank 2.7 miles north of Verendrye, 7.5 miles southwest of (19 miles upstream from) mouth of Wintering River, and at mile 302.0.

DRAINAGE AREA.--11,300 sq mi, approximately, of which about 6,900 sq mi is probably noncontributing.

PERIOD OF RECORD.--February to June 1933 (gage heights only), April 1937 to current year. Monthly discharge only for some periods, published in WSP 1308.

GAGE.--Water-stage recorder. Datum of gage is 1,464.87 ft above mean sea level. February to June 1933, at site 4 miles upstream at datum 1.65 ft higher. Apr. 1, 1937, to Mar. 3, 1938, nonrecording gage at present site, at datum 1.97 ft higher.

AVERAGE DISCHARGE.--34 years, 163 cfs (118,100 acre-ft per year); median of yearly mean discharges, 100 cfs (72,400 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 1,600 cfs Apr. 2 (gage height, 14.52 ft, backwater from ice); minimum, 16 cfs Oct. 6, 7 (gage height, 3.55 ft).
Period of record: Maximum discharge, 5,960 cfs Apr. 30, 1969 (gage height, 17.05 ft); minimum recorded, 0.3 cfs Aug. 11-19, 1937, Oct. 10-21, 1939.

REMARKS.--Records good. Flow regulated by reservoirs on Souris and Des Lacs Rivers, the largest of which is Lake Darling, 128 miles upstream (see station 05115500), (combined capacity about 248,000 acre-ft). Some small diversions for irrigation and municipal supply. Records of chemical analyses for the water year 1971 are published in Part 2 of this report.

REVISIONS.--WSP 2113: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	34	67	58	56	56	130	1,450	1,130	101	208	478	67
2	24	87	58	56	56	130	1,550	1,120	99	203	470	67
3	21	87	58	56	56	120	1,300	1,110	97	198	449	67
4	18	87	58	56	56	110	1,000	1,090	97	198	418	71
5	17	83	60	56	56	110	750	1,090	103	196	375	101
6	16	81	60	56	56	100	480	1,090	103	191	310	153
7	16	79	60	56	56	90	480	1,060	81	184	219	304
8	18	79	60	56	56	90	500	954	99	205	178	304
9	25	83	60	56	56	85	520	773	113	531	161	209
10	46	85	58	56	56	80	450	663	122	786	158	158
11	51	87	58	56	56	75	400	617	196	708	147	156
12	53	81	58	56	56	75	284	599	172	452	133	133
13	41	81	58	56	54	75	234	583	130	371	98	110
14	30	79	58	56	54	90	196	576	113	315	131	93
15	25	79	58	56	54	100	161	569	128	267	141	69
16	38	77	58	56	54	130	143	536	174	255	141	56
17	48	75	58	56	54	140	130	461	186	274	150	56
18	41	75	58	54	56	140	191	380	188	297	158	58
19	37	71	58	54	58	160	474	323	198	353	158	60
20	33	64	58	54	60	160	643	322	193	403	150	60
21	28	49	58	54	80	150	718	296	191	431	147	80
22	27	48	58	54	90	140	821	313	188	449	144	69
23	28	55	56	54	100	140	960	311	186	474	144	60
24	30	60	56	54	110	120	1,050	304	191	497	141	56
25	27	60	56	56	100	100	1,100	256	196	482	138	53
26	25	60	56	56	100	85	1,120	165	208	487	138	43
27	28	60	56	56	100	85	1,130	126	208	503	138	45
28	33	60	56	56	110	90	1,130	112	198	509	136	49
29	43	60	56	56	------	150	1,130	111	191	503	103	49
30	45	60	56	56	------	500	1,140	107	198	498	62	48
31	48	------	56	56	------	1,100	------	103	------	490	60	------
TOTAL	994	2,159	1,790	1,722	1,906	4,850	21,635	17,250	4,648	11,918	5,974	2,904
MEAN	32.1	72.0	57.7	55.5	68.1	156	721	556	155	384	193	96.8
MAX	53	87	60	56	110	1,100	1,550	1,130	208	786	478	304
MIN	16	48	56	54	54	75	130	103	81	184	60	43
AC-FT	1,970	4,280	3,550	3,420	3,780	9,620	42,910	34,220	9,220	23,640	11,850	5,760

CAL YR 1970 TOTAL 172,165 MEAN 472 MAX 3,680 MIN 16 AC-FT 341,500
WTR YR 1971 TOTAL 77,750 MEAN 213 MAX 1,550 MIN 16 AC-FT 154,200

05120200 Wintering River near Bergen, N. Dak.

LOCATION.--Lat 47°55'50", long 100°40'15", on west line of sec.4, T.151 N., R.78 W., McHenry County, on left downstream wingwall of bridge, 6 miles southeast of Bergen.

DRAINAGE AREA.--176 sq mi, of which about 50 sq mi is probably noncontributing.

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

GAGE.--Water-stage recorder. Datum of gage is 1,587.91 ft.

AVERAGE DISCHARGE.--15 years, 5.27 cfs (3,820 acre-ft per year); median of yearly mean discharges, 4.0 cfs (2,900 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 219 cfs Apr. 5 (gage height, 4.65 ft); no flow for several months.
Period of record: Maximum discharge, 900 cfs Apr. 10, 1969 (gage height, 5.90 ft); no flow during several months each year.

REMARKS.--Records good. Some regulation by Fish and Wildlife Service dams on Cottonwood and Wintering Lakes (controlled capacity, about 850 acre-ft).

REVISIONS.--WSP 1728: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						0	5.0	8.3	.10	.08		
2						0	10	7.9	.08	.07		
3						0	20	6.7	.07	.05		
4						0	40	5.4	.11	.03		
5						0	175	4.3	.16	.01		
6						0	176	3.5	.16	0		
7						0	158	2.8	.12	0		
8						0	135	2.4	.12	0		
9						0	122	2.1	.14	0		
10						0	96	2.3	.16	.28		
11						0	72	2.4	.16	.46		
12						0	66	2.6	.14	.24		
13						0	53	2.6	.11	.12		
14						0	43	2.6	.09	.09		
15						0	31	2.3	.08	.24		
16						0	20	2.0	.07	.42		
17						0	15	1.9	.12	.39		
18						0	16	1.7	.11	.36		
19						0	15	1.6	.10	.32		
20						0	16	1.4	.09	.24		
21						0	17	1.2	.07	.18		
22						0	15	.95	.06	.14		
23						0	12	.82	.05	.11		
24						0	9.3	.71	.07	.08		
25						0	6.7	.56	.07	.04		
26						0	5.1	.39	.07	.02		
27						0	5.1	.28	.08	0		
28						0	7.6	.18	.08	0		
29					------	0	9.0	.14	.09	0		
30					------	0	8.5	.11	.08	0		
31		------			------	1.0	------	.11	------	0		------
TOTAL	0	0	0	0	0	1.0	1,379.3	72.25	3.01	3.97	0	0
MEAN	0	0	0	0	0	.032	46.0	2.33	.10	.13	0	0
MAX	0	0	0	0	0	1.0	176	8.3	.16	.46	0	0
MIN	0	0	0	0	0	0	5.0	.11	.05	0	0	0
AC-FT	0	0	0	0	0	2.0	2,740	143	6.0	7.9	0	0

CAL YR 1970 TOTAL 5,631.79 MEAN 15.4 MAX 688 MIN 0 AC-FT 11,170
WTR YR 1971 TOTAL 1,459.53 MEAN 4.00 MAX 176 MIN 0 AC-FT 2,890

05120500 Wintering River near Karlsruhe, N. Dak.

LOCATION.--Lat 48°10'14", long 100°32'20", on line between secs.10 and 11, T.154 N., R.77 W., McHenry County, on left bank 30 ft upstream from county highway bridge, 4 miles upstream from mouth, and 7 miles northeast of Karlsruhe.

DRAINAGE AREA.--705 sq mi, of which about 420 sq mi is noncontributing.

PERIOD OF RECORD.--March 1937 to current year. Monthly discharge only for some periods, published in WSP 1308.

GAGE.--Water-stage recorder. Altitude of gage is 1,480 ft, from river-profile map.

AVERAGE DISCHARGE.--34 years, 12.1 cfs (8,770 acre-ft per year); median of yearly mean discharges, 10 cfs (7,200 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 750 cfs Apr. 7 (gage height, 9.13 ft, backwater from ice); no flow Feb. 7-11.
Period of record: Maximum discharge, 3,000 cfs Apr. 7, 1949, by velocity-area studies; maximum gage height, 12.0 ft Apr. 7, 1949 (channel choked by packed snow); no flow at times in many years.

REMARKS.--Records good except those for the winter period, which are poor. Some regulation by Fish and Wildlife Service dams on Cottonwood and Wintering Lakes (controlled capacity, about 850 acre-feet).

REVISIONS.--WSP 1728: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.8	7.0	4.6	2.0	1.0	3.0	9.0	43	12	10	2.4	1.6
2	4.6	7.0	4.5	2.0	.80	3.0	5.5	38	12	9.6	2.2	1.6
3	4.3	7.4	4.5	2.0	.60	3.0	7.5	35	11	9.6	2.2	1.8
4	4.3	7.0	4.0	2.0	.40	3.5	9.0	32	11	9.2	2.2	2.1
5	4.6	7.0	4.0	2.0	.20	4.0	25	29	16	8.1	1.3	7.4
6	4.6	6.7	3.8	2.0	.10	4.0	55	27	17	7.0	1.6	8.8
7	4.8	6.7	3.3	2.0	0	3.5	200	26	14	6.5	1.3	7.0
8	4.8	6.3	3.3	2.0	0	3.4	400	25	12	6.0	1.3	5.7
9	4.8	6.3	3.0	2.0	0	3.5	482	24	12	5.5	1.0	4.8
10	4.8	6.3	2.6	2.0	0	3.5	373	26	11	5.1	1.0	4.0
11	5.1	6.3	2.4	2.0	0	3.5	333	27	10	5.1	1.2	3.8
12	5.1	6.0	2.4	1.8	.10	4.0	252	24	9.6	5.1	1.2	3.3
13	5.1	5.7	2.2	1.8	.20	5.0	208	23	8.8	4.8	1.2	3.0
14	5.4	5.7	2.1	1.8	.40	6.0	171	21	8.4	4.3	1.2	2.8
15	5.4	5.7	2.1	1.8	.60	5.5	163	20	8.4	3.8	1.2	2.8
16	5.4	6.0	1.9	1.8	.80	5.5	146	19	8.4	3.6	.75	3.0
17	5.4	6.0	2.1	1.8	.80	5.5	130	19	8.8	3.3	2.1	3.6
18	5.4	5.7	2.0	1.8	.80	5.2	126	18	8.1	3.3	5.1	3.6
19	5.4	5.4	1.8	1.8	.80	5.0	123	18	7.7	3.0	5.7	3.3
20	5.4	5.1	1.8	1.8	.80	4.5	107	17	7.4	2.8	2.1	3.3
21	5.4	4.3	1.8	1.8	1.0	4.5	100	17	7.0	2.6	3.6	3.3
22	6.0	5.4	2.0	1.8	2.0	4.5	93	17	6.7	2.6	2.6	3.3
23	5.4	5.4	2.0	1.8	3.0	4.5	83	17	6.3	2.6	2.4	3.3
24	5.7	3.8	2.0	1.6	3.5	4.5	72	16	9.6	2.4	1.9	3.3
25	6.0	3.8	2.0	1.6	3.5	4.5	64	16	10	1.9	1.8	3.3
26	6.3	3.8	2.0	1.4	3.5	4.0	57	15	9.2	1.8	1.8	3.3
27	6.0	4.0	1.8	1.2	3.5	4.0	53	14	8.4	2.1	1.8	3.3
28	6.0	4.0	1.8	1.0	3.5	4.0	55	14	8.4	2.4	1.6	3.0
29	6.7	4.0	2.0	1.0	------	4.0	52	14	9.2	2.8	1.3	3.3
30	7.0	4.3	2.0	1.0	------	6.5	48	13	10	3.0	1.2	3.6
31	7.0	------	2.0	1.0	------	10	------	12	------	2.6	1.3	------
TOTAL	167.0	168.1	79.8	53.4	31.90	139.1	4,002.0	676	298.4	142.5	59.55	110.3
MEAN	5.39	5.60	2.57	1.72	1.14	4.49	133	21.8	9.95	4.60	1.92	3.68
MAX	7.0	7.4	4.6	2.0	3.5	10	482	43	17	10	5.7	8.8
MIN	4.3	3.8	1.8	1.0	0	3.0	5.5	12	6.3	1.8	.75	1.6
AC-FT	331	333	158	106	63	276	7,940	1,340	592	283	118	219

CAL YR 1970 TOTAL 9,751.60 MEAN 26.7 MAX 647 MIN .25 AC-FT 19,340
WTR YR 1971 TOTAL 5,928.05 MEAN 16.2 MAX 482 MIN 0 AC-FT 11,760

05122000 Souris (Mouse) River near Bantry, N. Dak.

LOCATION.--Lat 48°30'20", long 100°26'04", in SE¼NW¼SE¼ sec.14, T.158 N., R.76 W., McHenry County, on left bank 200 ft upstream from Nelson bridge, 8 miles east of Bantry, 18 miles upstream from Willow Creek, and at mile 228.0.

DRAINAGE AREA.--12,300 sq mi, approximately, of which about 7,600 sq mi is probably noncontributing.

PERIOD OF RECORD.--March 1937 to current year. Monthly discharge only for some periods, published in WSP 1308.

GAGE.--Water-stage recorder. Datum of gage is 1,427.56 ft above mean sea level. Prior to Mar. 16, 1938, non-recording gage at same site at datum 0.17 ft lower.

AVERAGE DISCHARGE.--34 years, 180 cfs (130,400 acre-ft per year); median of yearly mean discharges, 120 cfs (86,900 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 1,190 cfs May 10 (gage height, 10.73 ft); minimum, 33 cfs Oct. 12, 13 (gage height, 1.90 ft).
Period of record: Maximum discharge, 5,660 cfs May 4, 1969 (gage height, 13.80 ft); no flow at times each year 1937-40, 1963.

REMARKS.--Records poor. Flow regulated by reservoirs on Souris, Des Lacs and Wintering Rivers (total capacity, about 249,000 acre-ft). Diversions for irrigation of about 7,600 acres at Eaton Dam about 42 miles above station and other small diversions for irrigation and municipal supply.

REVISIONS.--WSP 2113: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	68	54	65	58	50	90	140	1,050	328	249	455	108
2	66	59	65	60	50	100	160	1,070	288	243	455	96
3	64	66	65	60	50	110	250	1,110	258	241	454	83
4	62	68	65	62	48	115	400	1,140	235	242	448	78
5	59	78	60	62	48	120	550	1,140	232	240	441	90
6	54	87	60	62	48	130	500	1,130	234	236	431	99
7	48	94	58	62	46	135	600	1,120	223	242	415	96
8	44	96	58	60	46	135	750	1,110	220	233	391	96
9	42	98	58	60	46	125	800	1,140	217	225	349	111
10	38	99	60	60	46	120	780	1,180	216	217	296	160
11	35	98	60	60	48	115	730	1,180	208	227	246	201
12	33	98	60	60	50	100	714	1,150	200	303	205	206
13	34	98	60	60	52	100	710	1,120	198	425	176	188
14	40	98	60	60	54	100	714	1,080	206	490	156	168
15	48	99	60	60	56	100	699	1,050	219	502	140	148
16	53	96	60	60	56	100	680	1,010	219	491	125	129
17	53	97	60	60	58	100	602	980	209	446	133	113
18	52	94	60	60	58	100	558	965	200	386	135	100
19	50	90	60	60	58	100	523	923	201	335	131	90
20	49	80	60	60	58	105	501	880	207	306	129	80
21	50	70	60	58	60	115	496	835	215	301	130	80
22	52	70	60	58	60	125	511	804	223	318	133	80
23	52	70	58	58	62	135	559	763	227	344	133	80
24	50	70	58	58	64	140	626	716	227	369	131	80
25	50	70	58	58	66	145	671	675	232	390	129	80
26	49	70	58	58	68	150	710	638	235	407	128	90
27	48	70	58	58	75	150	757	599	240	423	126	80
28	48	70	58	56	85	155	805	552	242	433	123	70
29	50	65	58	56	------	150	888	495	247	440	121	65
30	50	65	58	56	------	145	1,010	428	250	446	117	60
31	51	------	58	56	------	140	------	371	------	452	115	------
TOTAL	1,542	2,437	1,856	1,836	1,566	3,750	18,394	28,404	6,856	10,602	7,097	3,205
MEAN	49.7	81.2	59.9	59.2	55.9	121	613	916	229	342	229	107
MAX	68	99	65	62	85	155	1,010	1,180	328	502	455	206
MIN	33	54	58	56	46	90	140	371	198	217	115	60
AC-FT	3,060	4,830	3,680	3,640	3,110	7,440	36,480	56,340	13,600	21,030	14,080	6,360

CAL YR 1970 TOTAL 186,652 MEAN 511 MAX 3,600 MIN 28 AC-FT 370,200
WTR YR 1971 TOTAL 87,545 MEAN 240 MAX 1,180 MIN 33 AC-FT 173,600

05123000 Lake Metigoshe near Bottineau, N. Dak.

LOCATION.--Lat 48°59'05", long 100°20'52", in SE¼SW¼ sec.35, T.164 N., R.75 W., Bottineau County, on east end of north abutment of "Maid of Moonshine" bridge over Lake Metigoshe, 11.7 miles northeast of Bottineau.

DRAINAGE AREA.--59 sq mi.

PERIOD OF RECORD.--June 1931 to September 1932, September 1953 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,130.00 ft above mean sea level. 1931-32, nonrecording gage on north abutment of bridge at datum 6.32 ft lower (reduced to elevations above mean sea level). Sept. 4, 1953, nonrecording gage at present datum of east end of south abutment of bridge.

EXTREMES.--Current year: Maximum gage height, 8.96 ft July 8; minimum gage height recorded, 7.70 ft on many days.
Period of record: Maximum gage height, 9.24 ft Apr. 21-24, 1969; minimum, 4.28 ft Sept. 17, 1932, present datum.

REMARKS.--Outlet of lake is a concrete dam with removable stoplogs; average crest elevation without stoplogs about 2,138.0 ft above mean sea level. Lake level regulated since 1959 by dam and control works in the outlet of Sharpe Lake located on the principal tributary in Manitoba.

GAGE HEIGHT, IN FEET, AT 2400 OCTOBER 1970 to SEPTEMBER 1971

Oct. 31--------7.70	Jan. 31--------*7.77	Apr. 30--------8.47	July 31---------*8.59
Nov. 30--------*7.70	Feb. 28-------- 7.78	May 31--------8.55	Aug. 31--------- 8.25
Dec. 31--------7.74	Mar. 31-------- 7.90	June 30--------8.86	Sept. 30---------*8.26

* Estimated

05123100 Oak Creek at Lake Metigoshe Outlet near Bottineau, N. Dak.

LOCATION.--Lat 48°57'56", long 100°21'47", in SE¼SE¼ sec.3, T.163 N., R.75 W., Bottineau County, at outlet of Lake Metigoshe, 10 miles northeast of Bottineau.

DRAINAGE AREA.--59 sq mi.

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

GAGE.--Water-stage recorder and concrete control with stoplogs. Datum of gage is 2,130.00 ft above mean sea level. Prior to Jan. 20, 1955, nonrecording gage at same site and datum. Gage is located 1.5 miles northeast of outlet of lake, and is same as that used for station on Lake Metigoshe.

AVERAGE DISCHARGE.--18 years, 3.24 cfs (2,350 acre-ft per year); median of yearly mean discharges, 1.9 cfs (1,400 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 25 cfs July 8 (gage height, 8.96 ft); no flow at times; minimum gage height recorded, 7.70 ft on many days.
Period of record: Maximum discharge, 95 cfs June 10, 1963 (gage height, 8.69 ft); maximum gage height, 9.25 ft Apr. 20-24, 1969 (due to stoplogs); no flow at times each year.

REMARKS.--Records poor. Flow regulated since 1959 by dam and control works on the outlet of Sharpe Lake located on the principal tributary in Manitoba.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1				0	0	0	0	.08	.02	14	.15	.10
2				0	0	0	0	.09	.02	13	.05	.10
3				0	0	0	0	.09	.02	13	.05	.10
4				0	0	0	0	.09	.22	14	.05	.10
5				0	0	0	0	.09	4.6	16	.05	.10
6				0	0	0	0	.09	8.8	15	.05	.10
7				0	0	0	0	.09	9.6	15	.05	.10
8				0	0	0	0	.09	9.6	20	.05	.06
9				0	0	0	0	.09	9.6	23	.05	.02
10				0	0	0	0	.10	12	19	.05	.02
11				0	0	0	.05	.10	13	18	.05	.02
12				0	0	0	.10	.10	14	17	.05	.02
13				0	0	0	.12	.10	15	14	.05	.02
14				0	0	0	.12	.10	15	12	.05	.02
15				0	0	0	.12	.10	22	10	.05	.02
16				0	0	0	.10	.10	20	8.0	.05	.02
17				0	0	0	.08	.10	19	6.8	.10	.02
18				0	0	0	.06	.10	17	7.4	.10	.02
19				0	0	0	.04	.10	16	6.8	.10	.02
20				0	0	0	.03	.10	17	6.2	.10	.02
21				0	0	0	.04	.10	16	5.1	.10	.02
22				0	0	0	.04	.80	16	4.1	.10	.02
23				0	0	0	.04	.55	16	3.6	.10	.02
24				0	0	0	.04	.55	15	2.8	.10	.02
25				0	0	0	.05	.55	15	1.2	.10	.02
26				0	0	0	.05	.55	15	.75	.10	.02
27				0	0	0	.05	.38	15	1.0	.10	.02
28				0	0	0	.06	.22	15	.50	.10	.02
29				0	------	0	.06	.22	15	.40	.10	.02
30				0	------	0	.07	.12	15	.40	.10	.02
31		------		0	------	0	------	.02	------	.25	.10	------
TOTAL	0	0	0	0	0	0	1.32	5.96	375.48	288.30	2.40	1.20
MEAN	0	0	0	0	0	0	.044	.19	12.5	9.30	.077	.040
MAX	0	0	0	0	0	0	.12	.80	22	23	.15	.10
MIN	0	0	0	0	0	0	0	.02	.02	.25	.05	.02
AC-FT	0	0	0	0	0	0	2.6	12	745	572	4.8	2.4

CAL YR 1970 TOTAL 796.98 MEAN 2.18 MAX 39 MIN 0 AC-FT 1,580
WTR YR 1971 TOTAL 674.66 MEAN 1.85 MAX 23 MIN 0 AC-FT 1,340

05123400 Willow Creek near Willow City, N. Dak.

LOCATION.--Lat 48°35'20", long 100°26'30", in NE¼NW¼ sec.23, T.159 N., R.76 W., McHenry County, on left bank 50 feet downstream from bridge on county road, 1.5 miles upstream from Snake Creek, and 7 miles west of Willow City.

DRAINAGE AREA.--1,160 sq mi, approximately, of which about 430 sq mi is probably noncontributing.

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

GAGE.--Water-stage recorder. Altitude of gage is 1,430 ft (from topographic map). Prior to Oct. 5, 1956, non-recording gage at site 50 ft upstream at same datum.

AVERAGE DISCHARGE.--15 years, 32.1 cfs (23,260 acre-ft per year); median of yearly mean discharges, 13 cfs (9,400 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 690 cfs Apr. 16 (gage height, 12.8 ft); no flow for several months. Period of record: Maximum discharge, 5,900 cfs Apr. 12, 1969 (gage height, 16.76 ft); no flow at times each year.

REMARKS.--Records fair.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1							0	226	48	65	103	19
2							0	218	44	76	99	17
3							0	211	39	82	94	16
4							0	203	37	86	91	16
5							0	195	43	84	88	21
6							50	187	50	84	85	25
7							100	178	50	94	82	28
8							150	168	54	95	80	32
9							305	157	62	97	77	33
10							370	154	69	110	74	32
11							415	146	65	123	71	31
12							430	138	58	132	69	29
13							470	130	52	135	65	25
14							580	121	50	135	65	22
15							660	114	47	133	63	24
16							680	105	46	133	61	33
17							680	99	44	132	60	32
18							670	94	42	131	56	29
19							650	93	42	130	52	25
20							612	89	38	130	48	22
21							560	86	37	129	44	20
22							502	84	34	129	42	19
23							460	82	32	128	39	17
24							421	78	30	128	37	17
25							385	76	32	127	34	17
26							347	78	32	125	31	14
27							308	77	32	121	28	11
28							275	70	31	118	26	10
29					------		252	62	34	114	24	10
30					------		238	56	48	110	22	11
31		------			------		------	52	------	106	20	------
TOTAL	0	0	0	0	0	0	10,570	3,827	1,322	3,522	1,830	657
MEAN	0	0	0	0	0	0	352	123	44.1	114	59.0	21.9
MAX	0	0	0	0	0	0	680	226	69	135	103	33
MIN	0	0	0	0	0	0	0	52	30	65	20	10
AC-FT	0	0	0	0	0	0	20,970	7,590	2,620	6,990	3,630	1,300

CAL YR 1970 TOTAL 18,426.36 MEAN 50.5 MAX 372 MIN 0 AC-FT 36,550
WTR YR 1971 TOTAL 21,728.00 MEAN 59.5 MAX 680 MIN 0 AC-FT 43,100

PEAK DISCHARGE (BASE, 50 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
4-16	--	12.8	690	7-14	1300	8.89	136
6-10	1430	6.55	70				

05123510 Deep River near Upham, N. Dak.

LOCATION.--Lat 48°35'03", long 100°51'44", in SW¼NW¼ sec.22, T.159 N., R.79 W., McHenry County, 60 ft downstream from county highway bridge and 0.8 mile downstream from Little Deep River and 6.3 miles west of Upham.

DRAINAGE AREA.--975 sq mi, of which 605 sq mi is probably noncontributing.

PERIOD OF RECORD.--September 1957 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 1,430 ft (from topographic map).

AVERAGE DISCHARGE.--14 years, 9.79 cfs (7,090 acre-ft per year); median of yearly mean discharges, 0.7 cfs (510 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 40 cfs April 7 (gage height, 7.45 ft, backwater from ice); maximum gage height, 7.60 ft March 30 (backwater from ice); no flow for several months.
Period of record: Maximum discharge, 6,760 cfs Apr. 12, 1969 (gage height, 18.18 ft); no flow for part or all of each year.
Flood in April 1951 reached a stage of about 16 ft, from information by a local resident (discharge, 2,700 cfs).

REMARKS.--Records fair.

REVISIONS.--WSP 1728: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						0	1.0	2.9	.20	.03		0
2						0	.80	2.5	.14	.01		0
3						0	.80	2.4	.14	.05		0
4						0	.60	2.3	.17	.05		0
5						0	.40	2.4	.42	.01		.01
6						0	.50	2.3	.50	.01		0
7						0	30	2.1	.50	.14		0
8						0	28	2.0	.46	.03		0
9						0	26	2.1	.42	.01		0
10						0	23	2.3	.50	.01		0
11						0	21	1.8	.50	.01		0
12						0	17	1.6	.38	.01		0
13						0	14	1.6	.34	0		0
14						0	12	1.4	.23	0		0
15						0	11	1.1	.20	0		0
16						0	9.0	.86	.14	0		0
17						0	8.0	.86	.11	0		0
18						0	8.2	.80	.08	0		0
19						0	7.2	.70	.14	0		0
20						0	7.0	.60	.14	0		0
21						0	6.4	.50	.08	0		0
22						0	5.9	.70	.05	0		0
23						0	5.6	.70	.14	0		0
24						0	5.3	.55	.11	0		0
25						0	5.0	.46	.08	0		0
26						0	4.7	.38	.03	0		0
27						0	4.6	.27	.03	0		0
28						0	4.1	.23	.01	0		0
29					------	0	3.9	.34	.03	0		0
30					------	5.0	3.6	.27	.03	0		0
31		------			------	3.5	------	.27	------	0		------
TOTAL	0	0	0	0	0	8.5	274.60	39.29	6.30	.37	0	.01
MEAN	0	0	0	0	0	.27	9.15	1.27	.21	.012	0	.0003
MAX	0	0	0	0	0	5.0	30	2.9	.50	.14	0	.01
MIN	0	0	0	0	0	0	.40	.23	.01	0	0	0
AC-FT	0	0	0	0	0	17	545	78	13	.7	0	.02

CAL YR 1970 TOTAL 9,873.50 MEAN 27.1 MAX 1,220 MIN 0 AC-FT 19,580
WTR YR 1971 TOTAL 329.07 MEAN .90 MAX 30 MIN 0 AC-FT 653

PEAK DISCHARGE (BASE, 50 CFS).--NO PEAK ABOVE BASE.

051236000 Egg Creek near Granville, N. Dak.

LOCATION.--Lat 48°21'18", long 100°49'19", on west line of sec.10, T.156 N., R.79 W., McHenry County, on right downstream wingwall of bridge, 2 miles downstream from Hay Coulee, 3.5 miles upstream from North Lake, and 6 miles northeast of Granville.

DRAINAGE AREA.--289 sq mi, of which 150 sq mi is probably noncontributing.

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

GAGE.--Water-stage recorder. Datum of gage is 1,478.14 ft above mean sea level (levels by Bureau of Reclamation).

AVERAGE DISCHARGE.--15 years, 3.84 cfs (2,780 acre-ft per year); median of yearly mean discharges, 2.4 cfs (1,700 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 1,000 cfs Mar. 31 (gage height, 6.60 ft, from floodmark); no flow for several months.
Period of record: Maximum discharge, 1,710 cfs Apr. 10, 1969 (gage height, 7.28 ft); maximum gage height, 8.10 ft Apr. 9 (from floodmark, backwater from snow); no flow most of the time each year.

REMARKS.--Records good.

REVISIONS.--WSP 1728: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						0	300	7.4	.67	.42	4.9	0
2						0	250	7.4	.64	.36	4.9	0
3						0	200	7.0	.62	.52	4.6	0
4						0	150	6.6	.64	.49	4.2	0
5						0	102	6.2	.74	.75	3.8	.29
6						0	85	5.9	.70	1.0	2.8	.36
7						0	71	5.5	.64	1.5	1.7	.39
8						0	54	5.2	.64	1.4	1.3	.42
9						0	40	4.9	.64	1.3	.93	.42
10						0	33	5.0	.90	1.2	.74	.38
11						0	25	4.8	.85	1.6	.61	.31
12						0	20	4.4	.90	1.6	.53	.27
13						0	17	4.1	.85	1.3	.48	.31
14						0	14	3.5	.77	1.3	.42	5.3
15						0	13	2.6	.77	1.8	.35	12
16						0	11	1.8	.77	5.3	.29	16
17						0	9.9	1.6	.80	7.2	.56	17
18						0	11	1.3	.70	9.4	.42	16
19						0	10	1.2	.70	11	.41	15
20						0	10	1.1	.64	11	.36	14
21						0	10	1.0	.59	10	.29	12
22						0	9.7	1.0	.52	9.8	.24	11
23						0	8.9	1.0	.49	8.8	.21	9.6
24						0	8.2	1.0	.56	7.7	.13	8.6
25						0	7.7	.93	.53	6.6	.02	8.1
26						0	7.2	.90	.48	6.0	0	7.8
27						0	7.1	.85	.46	5.7	0	7.6
28						0	7.3	.77	.42	5.3	0	7.0
29					------	0	7.4	.74	.43	5.1	0	6.5
30					------	10	7.4	.74	.43	5.0	0	6.2
31		------			------	100	------	.70	------	4.9	0	------
TOTAL	0	0	0	0	0	110	1,506.8	97.13	19.49	135.34	35.19	182.85
MEAN	0	0	0	0	0	3.55	50.2	3.13	.65	4.37	1.14	6.10
MAX	0	0	0	0	0	100	300	7.4	.90	11	4.9	17
MIN	0	0	0	0	0	0	7.1	.70	.42	.36	0	0
AC-FT	0	0	0	0	0	218	2,990	193	39	268	70	363

CAL YR 1970 TOTAL 4,075.84 MEAN 11.2 MAX 348 MIN 0 AC-FT 8,080
WTR YR 1971 TOTAL 2,086.80 MEAN 5.72 MAX 300 MIN 0 AC-FT 4,140

PEAK DISCHARGE (BASE, 20 CFS).--March 31 (2400) 1,000 cfs (6.60 ft).

05123700 Cut Bank Creek at North Lake Outlet near Granville, N. Dak.

LOCATION.--Lat 48°23'10", long 100°46'00", on south line of sec.29, T.157 N., R.78 W., McHenry County, on right downstream wingwall of bridge, 9 miles northeast of Granville and 13.5 miles east of Deering.

DRAINAGE AREA.--534 sq mi, of which about 290 sq mi is probably noncontributing.

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

GAGE.--Water-stage recorder. Datum of gage is 1,477.25 ft above mean sea level.

AVERAGE DISCHARGE.--15 years, 1.73 cfs (1,250 acre-ft per year); median of yearly mean discharges, no flow.

EXTREMES.--Current year: Maximum discharge, 61 cfs Apr. 8 (gage height, 3.10 ft); no flow for many days.
Period of record: Maximum discharge, 339 cfs Apr. 14, 1969 (gage height, 3.78 ft); no flow for most of the time.

REMARKS.--Records fair except those for October and November, which are poor.

REVISIONS.--WSP 1728: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.66	.17					0	28	8.2	3.6	.38	0
2	.64	.15					0	28	8.2	4.0	.36	0
3	.62	.13					0	27	8.0	3.9	.34	0
4	.60	.11					0	26	8.1	3.8	.30	0
5	.58	.09					0	25	9.1	4.0	.24	.03
6	.56	.07					20	24	8.9	4.0	.18	.04
7	.54	.05					51	22	8.2	4.0	.15	.02
8	.52	.04					57	22	8.2	4.0	.12	0
9	.50	.03					42	21	8.7	4.0	.08	0
10	.48	.02					39	20	8.7	3.5	.06	0
11	.46	.01					37	20	8.3	3.6	.07	0
12	.44	0					34	19	8.0	3.3	.05	0
13	.42	0					32	19	7.6	2.7	.03	0
14	.42	0					33	18	7.4	2.4	.01	0
15	.40	0					33	16	7.2	2.1	0	0
16	.38	0					32	16	7.1	1.9	.01	0
17	.36	0					32	14	6.8	1.7	.08	0
18	.34	0					32	14	6.3	1.4	.08	0
19	.34	0					32	13	6.1	1.3	.06	0
20	.32	0					32	13	5.9	1.3	.05	0
21	.31	0					31	12	5.5	1.2	.02	0
22	.30	0					31	12	5.1	1.2	0	0
23	.28	0					31	11	4.8	1.2	0	0
24	.27	0					30	11	4.9	1.1	0	0
25	.26	0					30	11	4.6	.67	0	0
26	.24	0					29	11	4.3	.70	0	0
27	.23	0					29	11	4.1	.60	0	.10
28	.22	0					29	11	4.0	.57	0	.28
29	.21	0			------		29	9.1	4.0	.54	0	.51
30	.20	0			------		28	8.5	3.7	.57	0	.57
31	.19	------			------		------	8.3	------	.42	0	------
TOTAL	12.29	.87	0	0	0	0	835	520.9	200.0	69.27	2.67	1.55
MEAN	.40	.029	0	0	0	0	27.8	16.8	6.67	2.23	.086	.052
MAX	.66	.17	0	0	0	0	57	28	9.1	4.0	.38	.57
MIN	.19	0	0	0	0	0	0	8.3	3.7	.42	0	0
AC-FT	24	1.7	0	0	0	0	1,660	1,030	397	137	5.3	3.1

CAL YR 1970 TOTAL 3,706.98 MEAN 10.2 MAX 119 MIN 0 AC-FT 7,350
WTR YR 1971 TOTAL 1,642.55 MEAN 4.50 MAX 57 MIN 0 AC-FT 3,260

05123900 Boundary Creek near Landa, N. Dak.

LOCATION.--Lat 48°48'46", long 100°51'46", at west line sec.26, T.162 N., R.79 W., Bottineau County, on right bank 80 ft downstream from bridge on county road, 5 miles upstream from mouth and 6 miles southeast of Landa.

DRAINAGE AREA.--230 sq mi, of which about 60 sq mi is probably noncontributing.

PERIOD OF RECORD.--September 1957 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,420.03 ft above mean sea level.

AVERAGE DISCHARGE.--14 years, 8.20 cfs (5,940 acre-ft per year); median of yearly mean discharges, 5.1 cfs (3,700 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 325 cfs July 8 (gage height, 9.07 ft); no flow for several months. Period of record: Maximum discharge, 3,580 cfs Apr. 9, 1969 (gage height, 11.70 ft); no flow for several months each year.

REMARKS.--Records fair.

REVISIONS.--WSP 1728: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						0	1.0	4.0	0	16	6.8	0
2						0	.50	3.6	0	18	6.0	0
3						0	33	2.9	0	21	5.3	0
4						0	50	2.4	0	22	4.0	0
5						0	30	2.2	0	21	2.9	.58
6						0	26	1.9	.09	23	2.0	.76
7						0	26	1.6	.09	51	1.6	1.2
8						0	34	1.5	.04	114	1.2	4.0
9						0	33	1.2	.09	217	1.1	4.0
10						0	28	1.2	1.0	102	.84	5.3
11						0	41	1.0	.70	60	.58	5.3
12						0	40	1.0	.76	40	.52	2.9
13						0	35	.84	.58	29	.42	2.0
14						.01	28	.70	.33	24	.28	1.3
15						.10	23	.64	.38	23	.16	1.1
16						.20	20	.47	.33	21	.09	.92
17						.10	18	.42	.16	19	.04	.76
18						.10	18	.38	.02	18	.02	.70
19						.10	16	.28	.02	17	0	.58
20						.08	14	.20	.06	16	0	.52
21						.06	14	.09	.02	15	0	.42
22						.04	12	.28	0	14	0	.38
23						.04	12	.52	.76	14	0	.24
24						.02	10	.38	.84	14	0	.20
25						.02	9.2	.38	.76	12	0	.16
26						.02	7.6	.28	5.0	12	0	.09
27						.15	6.8	.16	1.2	11	0	.16
28						.60	6.4	.04	1.1	10	0	.09
29					------	.50	5.7	0	9.2	9.6	0	.04
30					------	1.5	4.6	0	14	9.2	0	0
31		------			------	1.8	------	0	------	8.0	0	------
TOTAL	0	0	0	0	0	5.44	602.80	30.56	37.53	1,000.8	33.85	33.70
MEAN	0	0	0	0	0	.18	20.1	.99	1.25	32.3	1.09	1.12
MAX	0	0	0	0	0	1.8	50	4.0	14	217	6.8	5.3
MIN	0	0	0	0	0	0	.50	0	0	8.0	0	0
AC-FT	0	0	0	0	0	11	1,200	61	74	1,990	67	67

CAL YR 1970 TOTAL 1,395.11 MEAN 3.82 MAX 64 MIN 0 AC-FT 2,770
WTR YR 1971 TOTAL 1,744.68 MEAN 4.78 MAX 217 MIN 0 AC-FT 3,460

PEAK DISCHARGE (BASE, 50 CFS).--APRIL 3 (2150) 125 CFS (7.33 FT); JULY 8 (2330) 325 CFS (9.07 FT).

05124000 Souris (Mouse) River near Westhope, N. Dak.

(International gaging station)

LOCATION.--Lat 48°59'47", long 100°57'29", in SW¼SE¼ sec.30, T.164 N., R.79 W., Bottineau County, on left bank 1,200 ft upstream from second crossing of international boundary, 1 mile downstream from Fish and Wildlife Service Dam 357, 7 miles northeast of Westhope, 11 miles downstream from Boundary Creek, and at mile 154.5.

DRAINAGE AREA.--16,900 sq mi, approximately, of which about 10,300 sq mi is probably noncontributing.

PERIOD OF RECORD.--July to October 1929, April 1930 to current year. Monthly discharge only for some periods, published in WSP 1308.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,402.52 ft above mean sea level. Prior to Mar. 28, 1938, nonrecording gage at site 6.3 miles upstream at datum 2.52 ft higher.

AVERAGE DISCHARGE (UNADJUSTED).--41 years (1930-71), 191 cfs (138,400 acre-ft per year); median of yearly mean discharges, 83 cfs (60,100 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 1,350 cfs Apr. 30 (gage height, 9.20 ft; maximum gage height, 9.31 ft May 6 (affected by wind); minimum discharge, 1.5 cfs Dec. 1 (gage height, 4.83 ft).
Period of record: Maximum discharge, 6,400 cfs Apr. 18, 1949; maximum gage height, 17.56 ft Apr. 19, 1969; maximum daily reverse flow, 35 cfs Apr. 8, 1943, caused by backwater from downstream tributary inflow; no flow at times in some years.

REMARKS.--Records good except those for July and August, which are fair. Flow regulated by dams on Souris River and tributaries (combined capacity, about 321,000 acre-ft). Diversion at Eaton Dam for irrigation of about 7,600 acres; and other small diversions for irrigation and municipal supply above station. Records of chemical analyses for the water year 1971 are published in Part 2 of this report.

COOPERATION.--This station is one of the international gaging stations maintained by the United States under agreement with Canada.

REVISIONS (WATER YEARS).--WSP 1338: 1932. WSP 2113: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	20	1.6	1.7	56	58	75	1,340	732	205	450	54
2	20	20	2.2	1.7	56	58	72	1,320	692	205	450	49
3	20	20	2.5	1.8	56	58	70	1,320	670	199	450	31
4	20	20	2.8	1.8	56	58	70	1,330	660	199	450	35
5	20	20	3.1	1.8	56	58	100	1,320	655	199	450	37
6	20	20	3.2	1.9	56	58	210	1,330	532	199	450	34
7	20	20	2.9	2.5	56	58	270	1,320	298	202	450	30
8	20	20	3.1	3.2	56	58	340	1,290	298	202	450	29
9	20	20	3.9	3.1	56	58	360	1,290	304	220	450	29
10	20	20	4.0	3.0	56	58	400	1,320	304	315	450	28
11	20	20	4.2	2.9	56	58	430	1,230	310	315	411	28
12	20	19	4.5	11	56	58	450	1,160	310	315	350	28
13	20	19	4.6	24	56	58	462	1,150	304	315	329	28
14	20	16	5.0	25	58	60	480	1,140	304	315	329	28
15	20	12	4.5	25	58	60	521	1,140	304	315	322	28
16	20	8.8	4.3	25	58	60	645	1,120	299	329	322	28
17	20	6.6	4.3	24	58	58	818	1,130	299	450	322	28
18	20	6.1	4.3	40	58	58	905	1,120	260	450	322	29
19	20	6.1	4.2	58	58	58	944	1,100	205	450	322	29
20	20	5.5	3.3	58	58	58	1,000	1,100	205	450	299	28
21	20	5.2	2.8	58	58	58	1,090	1,090	208	450	240	29
22	20	4.6	2.3	58	58	58	1,110	1,100	205	450	220	29
23	20	4.3	2.5	58	58	58	1,150	1,100	205	450	193	29
24	20	4.0	3.0	58	58	58	1,250	1,090	205	450	184	30
25	20	3.8	3.3	56	58	58	1,280	1,060	205	450	157	30
26	20	3.3	3.6	56	58	58	1,300	978	208	430	109	30
27	20	3.1	3.5	56	58	58	1,330	947	205	450	91	31
28	20	2.8	2.5	56	58	58	1,320	936	205	450	61	30
29	20	2.3	2.2	56	------	60	1,320	916	205	450	52	58
30	19	1.9	2.0	56	------	65	1,340	908	205	444	54	71
31	20	------	1.8	56	------	80	------	866	------	450	54	------
TOTAL	619	354.4	102.0	939.4	1,598	1,835	21,112	35,561	10,001	10,773	9,243	1,005
MEAN	20.0	11.8	3.29	30.3	57.1	59.2	704	1,147	333	348	298	33.5
MAX	20	20	5.0	58	58	80	1,340	1,340	732	450	450	71
MIN	19	1.9	1.6	1.7	56	58	70	866	205	199	52	28
AC-FT	1,230	703	202	1,860	3,170	3,640	41,880	70,540	19,840	21,370	18,330	1,990

CAL YR 1970 TOTAL 223,494.4 MEAN 612 MAX 3,110 MIN 1.6 AC-FT 443,300
WTR YR 1971 TOTAL 93,142.8 MEAN 255 MAX 1,340 MIN 1.6 AC-FT 184,700

06329597 Charbonneau Creek near Charbonneau, N. Dak.

LOCATION.--Lat 47°51'10", long 103°47'40", in SW¼ sec.31, T.151 N., R.102 W., McKenzie County, Custer National Forest, on right bank 45 ft downstream from county highway bridge, 1.5 miles west of Charbonneau.

DRAINAGE AREA.--149 sq mi.

PERIOD OF RECORD.--October 1966 to current year.

GAGE.--Water-stage recorder.

AVERAGE DISCHARGE.--5 years, 11.2 cfs (8,110 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 3,500 cfs Mar. 27 (gage height, 7.48 ft); maximum gage height, 8.08 ft Mar. 27 (backwater from ice); no flow Aug. 7 to Sept. 4.
Period of record: Maximum discharge, 3,500 cfs Mar. 27, 1971 (gage height, 7.48 ft); maximum gage height, 8.08 ft Mar. 27, 1971 (backwater from ice); no flow at times most years.

REMARKS.--Records fair.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.29	.92	.87	.39	.32	5.0	80	2.8	.72	.92	.07	0
2	.29	.92	.82	.39	.32	3.0	48	2.8	.72	.82	.07	0
3	.29	.92	.82	.39	.32	2.5	34	2.5	.72	.53	.07	0
4	.25	.92	.82	.39	.32	3.0	26	2.1	.92	.53	.07	.02
5	.25	.92	.72	.39	.32	20	21	2.0	6.7	.45	.05	20
6	.39	.92	.62	.39	.32	7.0	21	1.7	4.6	.39	.01	12
7	.72	.92	.62	.37	.32	5.0	31	1.7	3.0	.92	.01	7.3
8	.72	1.3	.62	.37	.32	5.0	30	1.7	2.8	.39	0	3.0
9	.62	1.3	.62	.34	.32	5.0	29	1.7	2.8	.39	0	1.3
10	.62	1.0	.62	.34	.32	7.8	23	1.4	2.1	.39	0	.92
11	.62	.92	.53	.34	.45	11	19	1.2	1.6	.62	0	.62
12	.62	.62	.53	.34	.45	75	14	1.2	1.4	.72	0	.39
13	.62	.62	.53	.34	.45	530	12	1.0	2.5	.72	0	.25
14	.62	.62	.53	.34	.53	640	10	1.0	4.3	.45	0	.16
15	.62	.62	.53	.34	.53	130	7.4	1.0	3.7	.39	0	.09
16	.62	.62	.53	.34	5.7	90	7.4	.82	3.0	.22	0	.09
17	.62	.62	.53	.34	20	205	6.9	.72	2.8	.22	0	.11
18	.62	.62	.53	.34	22	188	4.0	.72	2.5	.22	0	.13
19	.62	.62	.53	.34	16	96	4.0	.72	4.3	.16	0	.16
20	.62	.62	.45	.34	11	80	4.0	.72	3.7	.13	0	.25
21	.62	.62	.45	.34	5.7	136	4.0	.72	2.3	.16	0	.39
22	.62	.62	.39	.34	2.4	47	4.0	1.0	1.7	.22	0	.39
23	.62	.62	.39	.34	3.0	22	4.3	1.2	1.8	.22	0	.39
24	.62	.62	.39	.34	11	38	4.3	1.3	2.1	.25	0	.25
25	.62	.62	.39	.34	34	21	4.3	1.2	4.1	.25	0	.19
26	.62	.72	.39	.34	50	16	4.0	1.0	2.7	.25	0	.19
27	.53	.72	.39	.34	30	860	3.0	1.0	1.8	.16	0	.19
28	.62	.72	.39	.34	10	1,580	3.0	.92	.92	.07	0	.19
29	.82	.82	.39	.34	------	412	2.8	.53	.92	.07	0	.19
30	.92	.82	.39	.34	------	390	2.8	.53	.92	.07	0	.19
31	.92	------	.39	.32	------	194	------	.62	------	.07	0	------
TOTAL	18.17	23.44	16.72	10.88	226.41	5,824.3	468.2	39.52	74.14	11.37	.35	49.35
MEAN	.59	.78	.54	.35	8.09	188	15.6	1.27	2.47	.37	.011	1.65
MAX	.92	1.3	.87	.39	50	1,580	80	2.8	6.7	.92	.07	20
MIN	.25	.62	.39	.32	.32	2.5	2.8	.53	.72	.07	0	0
AC-FT	36	46	33	22	449	11,550	929	78	147	23	.7	98

CAL YR 1970 TOTAL 1,993.75 MEAN 5.46 MAX 248 MIN .01 AC-FT 3,950
WTR YR 1971 TOTAL 6,762.85 MEAN 18.5 MAX 1,580 MIN 0 AC-FT 13,410

PEAK DISCHARGE (BASE, 100 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
3-14	0600	7.02	860	3-27	2100	7.48	3,500
3-18	0200	5.90	250	3-29	2200	5.12	592
3-21	0400	5.53	179				

06331000 Little Muddy Creek below Cow Creek near Williston, N. Dak.

LOCATION.--Lat 48°17'04", long 103°34'21", in NE¼NW¼ sec.5, T.155 N., R.100 W., Williams County, on left bank 37 ft downstream from centerline 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.

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

GAGE.--Water-stage recorder. Datum of gage is 1,863.18 ft above mean sea level.

AVERAGE DISCHARGE.--17 years, 29.9 cfs (21,660 acre-ft per year); median of yearly mean discharges, 27 cfs (19,600 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 740 cfs Mar. 13 (gage height, 9.18 ft); maximum gage height, 9.31 ft Mar. 30 (backwater from ice); minimum discharge, 5 cfs Feb. 2-10; minimum gage height, 5.86 ft Aug. 22.
Period of record: Maximum discharge, 6,910 cfs Mar. 27, 1960 (gage height, 13.57 ft); minimum, 0.2 cfs Nov. 27, 1960, Feb. 5, 1963, and June 4, 1968; minimum gage height, 2.26 ft July 26, 1954.

REMARKS.--Records good. Some small diversions for irrigation. Some regulation by Lake Zahl, Fish and Wildlife reservoir 22 miles upstream.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.2	19	12	8.9	5.4	31	200	25	18	8.9	8.6	6.4
2	9.0	18	11	8.9	5.4	31	173	23	21	9.4	8.0	6.4
3	8.3	17	10	8.6	5.3	26	155	22	20	10	8.0	6.6
4	8.3	16	10	8.3	5.5	22	121	20	20	9.5	7.6	7.8
5	8.9	16	9.2	7.8	5.5	28	105	20	37	8.5	7.1	13
6	11	15	8.0	7.0	5.3	33	99	20	43	8.0	7.0	11
7	12	15	9.2	6.2	5.3	38	96	19	66	8.2	6.7	12
8	12	15	10	6.1	5.2	41	113	19	49	7.8	6.9	11
9	12	15	10	6.8	5.2	37	93	18	37	8.0	6.6	10
10	12	15	9.6	6.8	5.3	30	79	17	30	134	6.9	9.6
11	12	15	9.2	6.8	5.6	27	63	17	45	181	6.9	8.8
12	12	15	9.2	7.0	5.7	61	52	17	55	121	6.3	8.2
13	12	16	9.4	6.8	5.8	480	44	16	39	72	6.6	8.2
14	12	15	9.5	6.8	6.2	580	39	16	30	48	6.6	8.6
15	12	15	9.3	6.7	6.8	350	37	14	22	34	6.4	8.4
16	12	15	8.9	6.5	8.0	200	37	15	18	25	6.9	8.4
17	12	16	9.1	6.5	11	157	36	14	16	20	7.1	8.6
18	12	16	9.3	6.5	24	186	39	17	14	16	6.9	8.6
19	12	15	9.4	6.3	30	224	40	16	14	14	6.9	8.6
20	12	15	9.4	6.4	24	303	44	16	13	13	6.8	8.8
21	12	14	9.4	6.7	22	270	48	16	12	12	6.1	8.6
22	12	12	9.4	7.0	28	213	51	39	11	12	5.9	8.6
23	12	10	9.3	6.9	21	153	45	41	11	11	6.5	8.6
24	12	11	9.0	6.9	20	165	39	43	12	10	6.4	8.4
25	12	13	8.7	7.1	22	192	35	33	11	8.9	7.0	8.2
26	12	12	8.7	6.8	34	223	32	26	10	9.0	7.5	8.5
27	13	12	8.7	6.4	37	247	30	21	9.2	9.0	7.0	8.2
28	15	11	8.6	6.1	34	285	30	19	8.9	9.0	6.6	8.5
29	18	11	8.0	6.1	------	330	29	17	9.6	8.9	6.6	8.6
30	17	11	8.1	6.0	------	460	27	16	9.3	8.8	6.6	9.1
31	18	------	8.3	5.6	------	335	------	18	------	8.9	6.4	------
TOTAL	375.7	431	287.9	213.3	398.5	5,758	2,031	650	711.0	863.8	213.4	264.3
MEAN	12.1	14.4	9.29	6.88	14.2	186	67.7	21.0	23.7	27.9	6.88	8.81
MAX	18	19	12	8.9	37	580	200	43	66	181	8.6	13
MIN	8.3	10	8.0	5.6	5.2	22	27	14	8.9	7.8	5.9	6.4
AC-FT	745	855	571	423	790	11,420	4,030	1,290	1,410	1,710	423	524

CAL YR 1970 TOTAL 10,188.3 MEAN 27.9 MAX 488 MIN 4.3 AC-FT 20,210
WTR YR 1971 TOTAL 12,197.9 MEAN 33.4 MAX 580 MIN 5.2 AC-FT 24,190

PEAK DISCHARGE (BASE, 250 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
3-13	1800	9.18	740	3-30	--	--	500
3-20	1800	8.18	347	7-10	1045	7.93	302

06332000 White Earth River at White Earth, N. Dak.

LOCATION.--Lat 48°22'35", long 102°46'00", in SE¼SW¼ sec.36, T.157 N., R.94 W., Mountrail County, 35 ft upstream from bridge on county highway, 0.2 mile east of White Earth.

DRAINAGE AREA.--780 sq mi, appproximately, of which about 290 sq mi is probably noncontributing.

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

GAGE.--Water-stage recorder. Datum of gage is 2,070.00 ft above mean sea level. Prior to Oct. 25, 1959, non-recording gages at site 0.2 mile upstream at datum 1.64 ft higher.

AVERAGE DISCHARGE.--17 years, 19.0 cfs (13,770 acre-ft per year); median of yearly mean discharges, 14 cfs (10,000 acre-feet per year).

EXTREMES.--Current year: Maximum discharge, 250 cfs Mar. 29 (gage height, 7.42 ft, backwater from ice); minimum, 0.50 cfs Feb. 8-11.
Period of record: Maximum discharge, 2,300 cfs Mar. 28, 1960 (gage height, 18.02 ft, backwater from ice); no flow at times in some years.
Flood of 1929 reached a stage of 21.8 ft (former site and datum) from information by local residents.

REMARKS.--Records poor. Flow regulated by White Earth Reservoir 12 miles upstream beginning August 1970 (capacity, 1,600 acre-feet).

REVISIONS.--WSP 2117: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.0	3.5	2.7	1.3	.80	1.8	40	22	11	5.8	8.8	3.5
2	1.9	3.1	2.7	1.3	.80	1.7	34	20	12	5.2	7.9	2.2
3	1.8	2.9	2.7	1.2	.80	1.5	25	19	12	8.0	7.5	1.7
4	2.0	2.9	2.7	1.2	.80	2.0	52	19	13	8.5	7.3	1.7
5	2.0	2.8	2.7	1.2	.70	4.0	78	18	15	7.4	7.0	4.5
6	2.1	2.8	2.7	1.2	.70	5.0	100	18	14	8.1	6.8	6.8
7	2.8	2.9	2.7	1.2	.70	7.0	121	17	13	43	6.6	3.8
8	2.8	3.0	2.7	1.2	.50	6.0	101	16	12	22	6.0	2.6
9	2.7	3.0	2.6	1.2	.50	5.0	86	15	11	25	5.6	2.1
10	2.7	2.9	2.5	1.2	.50	4.0	76	16	10	17	5.8	2.0
11	2.8	2.9	2.4	1.2	.50	4.0	69	15	15	14	5.1	1.9
12	2.8	3.0	2.3	1.2	.60	15	58	14	15	29	4.7	1.9
13	2.8	3.1	2.2	1.2	1.0	65	52	13	14	29	4.2	1.9
14	2.9	3.0	2.2	1.2	1.5	115	48	12	13	26	4.1	1.6
15	3.0	3.3	2.1	1.1	2.0	54	53	11	12	25	4.1	2.0
16	3.0	3.1	2.0	1.0	2.0	75	43	11	11	26	4.1	2.0
17	2.8	3.3	1.9	1.0	2.0	70	35	9.8	10	26	4.2	2.1
18	2.5	3.5	1.8	1.0	4.0	73	53	9.7	9.2	24	4.0	1.9
19	2.5	3.0	1.7	1.0	2.2	48	46	9.3	8.4	20	2.8	1.8
20	2.6	2.8	1.6	1.0	2.0	45	41	9.0	7.9	18	2.8	1.7
21	2.7	2.6	1.6	1.0	1.7	34	40	8.4	7.1	17	2.8	1.9
22	2.7	2.6	1.6	1.0	1.5	24	37	18	6.7	13	2.8	1.6
23	2.7	2.6	1.6	1.0	1.4	15	34	22	6.7	12	2.7	1.5
24	2.7	2.7	1.6	1.0	1.6	11	32	16	7.2	12	3.1	1.2
25	2.8	2.7	1.6	1.0	1.8	8.5	29	13	6.6	12	2.2	1.0
26	2.9	2.7	1.6	1.0	2.0	6.0	27	13	6.0	11	1.9	.97
27	2.8	2.7	1.6	1.0	1.9	25	26	12	5.6	11	2.3	1.0
28	3.2	2.7	1.6	1.0	1.9	73	25	12	5.4	11	2.8	1.0
29	4.7	2.7	1.6	1.0	------	176	24	12	6.0	10	2.8	.83
30	5.4	2.7	1.6	1.0	------	215	23	11	6.9	9.0	3.1	.90
31	4.2	------	1.5	1.0	------	120	------	11	------	9.1	3.1	------
TOTAL	87.3	87.5	64.4	34.1	38.40	1,309.5	1,508	442.2	302.7	514.1	139.0	61.60
MEAN	2.82	2.92	2.08	1.10	1.37	42.2	50.3	14.3	10.1	16.6	4.48	2.05
MAX	5.4	3.5	2.7	1.3	4.0	215	121	22	15	43	8.8	6.8
MIN	1.8	2.6	1.5	1.0	.50	1.5	23	8.4	5.4	5.2	1.9	.83
AC-FT	173	174	128	68	76	2,600	2,990	877	600	1,020	276	122

CAL YR 1970 TOTAL 6,780.35 MEAN 18.6 MAX 270 MIN .89 AC-FT 13,450
WTR YR 1971 TOTAL 4,588.80 MEAN 12.6 MAX 215 MIN .50 AC-FT 9,100

PEAK DISCHARGE (BASE, 1,500 CFS).--MAR. 29, 250 CFS.

06332515 Bear Den Creek near Mandaree, N. Dak.

(Hydrologic benchmark station)

LOCATION.--Lat 47°47'14", long 102°46'05", in NW¼ sec.30, T.150 N., R.94 W., McKenzie County, on right bank half a mile upstream from county highway culvert and 5.5 miles northwest of Mandaree.

DRAINAGE AREA.--74 sq mi.

PERIOD OF RECORD.--June 1966 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,947.58 ft above mean sea level.

AVERAGE DISCHARGE.--5 years, 6.83 cfs (4,950 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 560 cfs Mar. 13 (gage height, 6.20 ft, backwater from ice); no flow Dec. 23 to Feb. 16.
Period of record: Maximum discharge, 1,140 cfs May 9, 1970 (gage height, 6.46 ft); maximum gage height, 10.03 ft Apr. 6, 1969; no flow for several months each year.

REMARKS.--Records good except those for the winter period, which are poor. Records of chemical analyses for the water year 1971 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECCND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.17	.34	.20		0	5.3	61	.98	.25	1.2	.17	.13
2	.17	.28	.19		0	4.0	46	.80	.21	.75	.17	.11
3	.17	.25	.18		0	3.0	25	.61	.21	.49	.17	.09
4	.17	.31	.17		0	2.0	14	.53	1.9	.37	.15	1.5
5	.17	.34	.16		0	1.0	14	.49	8.2	.31	.15	40
6	.17	.43	.15		0	1.0	43	.46	6.7	.23	.15	38
7	.17	.23	.14		0	1.0	63	.37	38	.19	.15	5.8
8	.15	.23	.12		0	1.0	35	.34	18	.15	.15	1.5
9	.15	.25	.11		0	1.0	17	.37	5.7	.19	.15	.57
10	.15	.28	.11		0	1.0	10	.43	3.0	.41	.15	.37
11	.15	.28	.10		0	1.1	7.5	.46	1.4	4.3	.15	.23
12	.15	.28	.10		0	19	5.2	.53	.80	1.5	.15	.21
13	.17	.28	.10		0	350	3.2	.37	.57	.40	.15	.19
14	.19	.31	.10		0	216	2.1	.34	.49	.25	.15	.21
15	.19	.28	.10		0	100	2.5	.28	.59	.21	.09	.21
16	.19	.28	.10		2.0	45	6.4	.23	1.0	.19	.07	.25
17	.19	.69	.10		90	60	7.6	.23	44	.19	.09	.31
18	.21	.37	.08		20	80	21	.31	11	.19	.13	.25
19	.28	.40	.06		9.1	45	15	.25	6.7	.21	.15	.23
20	.31	.34	.04		6.0	80	16	.23	6.7	.21	.13	.38
21	.31	.31	.02		4.0	100	65	.23	4.3	.17	.09	.31
22	.31	.23	.01		2.0	100	15	.37	1.8	.17	.07	.34
23	.31	.15	0		.80	60	8.1	.25	1.0	.17	.09	.25
24	.31	.21	0		.60	60	5.4	.25	8.4	.15	.11	.23
25	.31	.40	0		.50	20	2.1	.25	8.7	.11	.09	.23
26	.31	.25	0		10	20	1.8	.34	5.4	.15	.11	.23
27	.31	.24	0		8.0	165	1.7	.23	4.5	.15	.09	.23
28	.31	.23	0		6.0	290	1.7	.23	2.1	.19	.09	.21
29	.31	.22	0		------	225	1.7	.21	1.6	.19	.07	.21
30	.28	.21	0		------	243	1.3	.23	1.2	.19	.09	.21
31	.31	------	0		------	114	------	.34	------	.15	.13	------
TOTAL	7.05	8.90	2.44	0	159.00	2,413.4	518.3	11.54	194.42	13.73	3.85	92.99
MEAN	.23	.30	.079	0	5.68	77.9	17.3	.37	6.48	.44	.12	3.10
MAX	.31	.69	.20	0	90	350	65	.98	44	4.3	.17	40
MIN	.15	.15	0	0	0	1.0	1.3	.21	.21	.11	.07	.09
AC-FT	14	18	4.8	0	315	4,790	1,030	23	386	27	7.6	184

CAL YR 1970 TOTAL 2,964.49 MEAN 8.12 MAX 628 MIN 0 AC-FT 5,880
WTR YR 1971 TOTAL 3,425.62 MEAN 9.39 MAX 350 MIN 0 AC-FT 6,790

PEAK DISCHARGE (BASE, 100 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
2-17	--	--	220	3-22	--	--	189
3-13	--	--	560	3-27	--	--	496
3-17	--	--	100	4- 7	0830	3.59	112

SHELL CREEK BASIN

06332520 Shell Creek near Parshall, N. Dak.

LOCATION.--Lat 48°03'11", long 102°08'10", in SE¼NE¼ sec.29, T.153 N., R.89 W., Mountrail County, on left bank 800 ft downstream from bridge on county highway 6 miles northwest of Parshall.

DRAINAGE AREA.--465 sq mi.

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

GAGE.--Water-stage recorder.

AVERAGE DISCHARGE.--6 years, 9.92 cfs (7,190 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 680 cfs Mar. 28 (gage height, 6.28 ft, backwater from ice); no flow Dec. 27 to Mar. 11.
Period of record: Maximum discharge, 2,270 cfs Apr. 6, 1969 (gage height, 7.60 ft); no flow at times each year.

REMARKS.--Records fair.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.7	3.3	.80		0	0	110	11	4.8	12	1.1	.15
2	2.7	3.0	.75		0	0	100	10	4.4	8.8	1.1	.15
3	2.3	3.0	.74		0	0	45	9.8	4.1	7.8	1.0	.15
4	2.3	3.0	.73		0	0	37	9.2	5.7	7.3	.89	.15
5	2.2	2.8	.73		0	0	30	8.4	37	6.5	.83	1.0
6	2.6	2.7	.73		0	0	27	7.6	87	6.2	.78	20
7	2.8	2.7	.72		0	0	31	6.9	95	6.0	.63	31
8	2.8	2.7	.70		0	0	29	6.4	110	5.6	.58	14
9	2.9	2.7	.70		0	0	23	5.9	79	5.2	.53	8.3
10	2.9	2.8	.70		0	0	21	6.9	97	5.2	.48	6.0
11	3.0	2.8	.70		0	0	18	7.2	79	5.8	.43	4.9
12	2.9	2.8	.70		0	2.0	16	6.2	48	5.3	.39	4.2
13	2.7	2.7	.70		0	16	14	5.7	31	4.8	.39	3.9
14	2.7	2.7	.65		0	45	12	5.2	23	4.4	.39	3.8
15	2.6	2.6	.60		0	45	11	4.9	19	4.1	.30	3.7
16	2.5	2.7	.50		0	26	10	4.4	16	3.8	.26	3.8
17	2.5	2.7	.50		0	18	10	4.4	16	3.5	.30	4.3
18	2.5	2.7	.40		0	18	13	5.9	13	3.2	.34	4.1
19	2.4	2.7	.30		0	17	22	6.2	11	3.0	.43	3.9
20	2.4	2.6	.30		0	16	35	6.3	10	2.9	.39	4.0
21	2.3	2.5	.20		0	12	32	5.8	10	2.7	.30	4.0
22	2.3	2.2	.20		0	9.1	29	5.7	8.8	2.5	.26	3.9
23	2.3	1.7	.10		0	5.2	27	6.0	7.4	2.3	.26	3.8
24	2.3	1.5	.10		0	5.0	24	6.0	10	2.2	.26	3.7
25	2.3	1.4	.05		0	3.8	22	5.6	13	2.0	.22	3.6
26	2.4	1.1	.02		5.0	3.0	20	5.3	13	1.8	.26	3.6
27	2.4	.95	0		1.0	50	18	5.1	11	1.7	.18	3.6
28	2.4	.90	0		.40	200	16	4.9	9.0	1.6	.15	3.7
29	2.9	.90	0		------	140	14	4.4	8.3	1.5	.15	3.7
30	3.4	.86	0		------	127	12	4.1	12	1.4	.11	3.6
31	3.4	------	0		------	110	------	5.0	------	1.2	.15	------
TOTAL	80.8	69.71	13.32	0	6.40	868.1	828	196.4	892.5	132.3	13.84	158.70
MEAN	2.61	2.32	.43	0	.23	28.0	27.6	6.34	29.8	4.27	.45	5.29
MAX	3.4	3.3	.80	0	5.0	200	110	11	110	12	1.1	31
MIN	2.2	.86	0	0	0	0	10	4.1	4.1	1.2	.11	.15
AC-FT	160	138	26	0	13	1,720	1,640	390	1,770	262	27	315

CAL YR 1970 TOTAL 4,018.49 MEAN 11.0 MAX 430 MIN 0 AC-FT 7,970
WTR YR 1971 TOTAL 3,260.07 MEAN 8.93 MAX 200 MIN 0 AC-FT 6,470

PEAK DISCHARGE (BASE, 150 CFS).--MAR. 28, 680 CFS.

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

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

DRAINAGE AREA.--1,970 sq mi, approximately.

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

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

AVERAGE DISCHARGE.--18 years, 133 cfs (96,360 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 4,440 cfs June 5 (gage height, 10.52 ft); minimum daily, 0.30 cfs Jan. 12-15.
Period of record: Maximum discharge, 7,600 cfs May 28, 1962 (gage height, 13.07 ft); no flow at times. Flood of 1952 reached a stage of about 16 ft, from information by local residents.

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

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

Rating tables (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 1-5, May 26 to June 7; stage discharge relation affected by ice Nov. 21 to Mar. 10, Mar. 16-19)

Oct. 1 to Mar. 16				Mar. 17 to Sept. 30			
0.3	0	1.1	28	0.2	3.4	1.7	163
.4	.80	1.3	50	.3	6.6	3.0	512
.5	1.9	2.0	203	.5	16	7.0	1,950
.6	3.8	5.0	1,330	.7	30	9.0	2,900
.8	10	7.0	2,230	1.2	84	10.2	3,780
1.0	22						

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.48	3.3	4.5	2.5	1.3	60	3,040	648	958	70	17	46
2	.46	3.1	4.5	2.0	1.3	60	2,870	486	1,370	65	12	79
3	.54	3.5	4.0	1.5	1.3	90	2,770	379	2,050	60	11	44
4	.56	3.2	4.0	1.0	1.0	150	2,680	293	1,470	55	10	37
5	.53	3.3	4.0	.90	1.5	300	2,520	234	2,880	55	11	150
6	.72	3.4	4.0	.80	1.0	350	1,950	189	2,970	50	11	176
7	.92	3.5	4.0	.70	1.0	400	1,200	161	1,930	48	9.1	1,060
8	1.2	5.2	4.0	1.0	1.5	450	905	142	1,270	46	12	335
9	1.7	4.9	3.0	.80	3.0	500	773	132	1,010	46	11	109
10	1.9	4.9	2.5	.70	5.0	600	782	134	842	46	7.8	70
11	2.0	4.3	2.0	.50	6.0	786	965	121	782	52	7.4	53
12	2.0	4.9	2.0	.30	7.0	1,010	1,120	112	1,080	46	6.6	40
13	2.0	4.8	2.0	.30	8.0	1,410	1,060	103	1,890	36	9.1	32
14	3.6	5.3	1.5	.30	9.0	1,690	825	100	1,770	28	11	25
15	2.0	5.1	1.5	.30	10	1,880	638	100	855	24	11	21
16	2.0	4.0	1.3	1.0	20	2,000	447	91	616	24	12	20
17	2.3	4.0	1.0	1.5	30	1,500	312	85	551	24	12	19
18	2.5	4.0	.70	1.0	40	1,500	250	78	438	21	12	17
19	2.5	3.7	.50	1.0	40	1,500	269	74	350	18	11	14
20	2.6	3.7	.50	1.5	40	1,540	518	69	300	20	9.9	14
21	2.7	3.5	.50	1.5	30	1,330	835	68	250	22	9.9	13
22	2.6	3.0	.50	1.0	40	1,140	1,350	272	200	21	14	12
23	2.6	3.0	.50	1.5	50	1,000	1,620	365	150	21	10	11
24	2.9	3.5	.70	2.0	60	958	1,460	626	100	15	10	9.1
25	3.0	4.0	1.0	2.5	70	743	1,190	911	100	15	10	8.6
26	3.1	4.0	1.5	2.0	70	713	905	1,050	90	17	8.6	7.8
27	3.0	4.0	1.0	1.5	70	1,000	687	1,060	85	16	7.4	8.2
28	2.9	4.0	1.5	2.0	70	2,860	551	1,070	80	17	6.6	9.5
29	3.6	4.3	2.0	2.5	------	3,720	667	875	80	16	4.3	7.8
30	4.0	4.5	2.5	2.0	------	3,600	769	512	75	17	13	6.6
31	3.4	------	3.0	1.5	------	3,340	------	475	------	15	17	------
TOTAL	66.31	119.9	66.20	39.60	687.9	38,180	35,928	11,015	26,592	1,026	324.7	2,454.6
MEAN	2.14	4.00	2.14	1.28	24.6	1,232	1,198	355	886	33.1	10.5	81.8
MAX	4.0	5.3	4.5	2.5	70	3,720	3,040	1,070	2,970	70	17	1,060
MIN	.46	3.0	.50	.30	1.0	60	250	68	75	15	4.3	6.6
AC-FT	132	238	131	79	1,360	75,730	71,260	21,850	52,750	2,040	644	4,870

CAL YR 1970 TOTAL 35,639.02 MEAN 97.6 MAX 340 MIN .46 AC-FT 70,690
WTR YR 1971 TOTAL 116,500.21 MEAN 319 MAX 3,720 MIN .30 AC-FT 231,100

PEAK DISCHARGE (BASE, 1,000 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
3-16	--	--	2,450	5-26	2000	4.57	1,070
3-29	1215	10.36	3,960	6- 5	2000	10.52	4,440
4-12	1645	4.92	1,150	6-14	0330	7.33	2,100
4-23	0530	6.24	1,650	9- 7	1330	5.22	1,250

06335000 Little Beaver Creek near Marmarth, N. Dak.

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

DRAINAGE AREA.--587 sq mi, approximately.

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

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

AVERAGE DISCHARGE.--33 years, 42.0 cfs (30,430 acre-ft per year); median of yearly mean discharges, 28 cfs (20,300 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 6,480 cfs June 5 (gage height, 22.55 ft); minimum, 0.30 cfs Jan. 7, 8. Period of record: Maximum discharge, 12,700 cfs Apr. 6, 1952 (gage height, 13.9 ft, from floodmark, site and datum then in use), from rating curve extended above 4,500 cfs on basis of slope-area measurement of peak flow; no flow at times in most years.

REMARKS.--Records good except those for the winter period which are fair.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.8	4.2	3.3	1.1	2.1	57	862	44	57	36	6.7	2.3
2	1.8	4.0	3.3	1.1	2.1	31	277	40	39	33	6.4	2.0
3	1.8	3.8	3.3	1.0	2.0	21	216	35	31	31	5.8	2.1
4	1.9	5.4	3.3	.84	1.8	15	215	35	2,520	30	5.8	59
5	2.0	3.0	3.3	.71	2.0	11	242	30	3,540	29	5.2	635
6	2.0	3.2	3.3	.40	2.4	6.5	232	30	931	27	4.9	708
7	2.0	3.5	3.3	.30	2.4	4.5	204	28	244	23	5.2	466
8	2.0	3.7	3.1	.30	2.3	4.5	179	25	159	21	4.9	404
9	2.0	4.0	3.2	.60	2.3	4.5	134	25	137	20	4.9	424
10	2.0	3.5	3.2	.55	3.1	4.5	116	25	131	19	4.4	274
11	2.0	3.5	3.1	.60	3.4	6.0	94	23	340	20	4.4	212
12	2.0	3.5	3.1	.60	3.1	210	75	22	200	17	4.4	46
13	2.0	3.5	3.1	.70	4.0	1,850	64	20	132	15	4.4	19
14	2.0	3.5	3.1	.80	3.8	1,940	59	21	116	14	4.2	6.7
15	2.1	3.5	3.0	.80	4.0	819	58	19	104	13	3.8	4.6
16	2.3	3.5	3.0	.90	30	470	57	18	94	12	3.8	4.0
17	2.3	3.4	2.8	1.0	480	484	55	18	356	11	3.8	3.8
18	2.3	3.4	2.7	1.1	632	402	99	17	652	10	3.8	3.4
19	2.3	3.4	2.5	1.3	424	239	415	17	262	8.8	4.0	3.2
20	2.3	3.4	2.3	1.4	150	293	433	17	137	9.3	4.0	2.9
21	2.1	3.3	2.1	1.7	140	699	691	16	165	9.8	3.8	2.9
22	2.3	3.2	1.9	1.8	90	492	235	49	124	10	3.8	2.9
23	2.3	3.0	1.8	1.9	85	258	133	44	88	9.3	3.8	2.9
24	2.4	2.9	1.6	1.9	105	167	94	23	119	8.3	3.8	2.9
25	2.3	3.0	1.6	1.9	100	181	91	17	82	7.3	3.8	6.1
26	2.5	3.2	1.5	1.9	70	282	79	16	67	7.0	2.8	13
27	2.5	3.3	1.4	1.9	50	970	74	14	59	6.7	2.7	14
28	3.1	3.4	1.4	1.9	60	2,730	62	14	52	6.7	2.7	16
29	3.4	3.4	1.4	2.0	------	2,560	55	13	49	6.7	2.7	17
30	3.8	3.4	1.4	2.1	------	2,060	50	17	42	6.7	2.5	17
31	4.0	------	1.4	2.1	------	1,580	------	30	------	6.7	2.5	------
TOTAL	71.6	105.0	78.8	37.20	2,456.8	18,851.5	5,650	762	11,029	484.3	129.7	3,376.7
MEAN	2.31	3.50	2.54	1.20	87.7	608	188	24.6	368	15.6	4.18	113
MAX	4.0	5.4	3.3	2.1	632	2,730	862	49	3,540	36	6.7	708
MIN	1.8	2.9	1.4	.30	1.8	4.5	50	13	31	6.7	2.5	2.0
AC-FT	142	208	156	74	4,870	37,390	11,210	1,510	21,880	961	257	6,700

CAL YR 1970 TOTAL 9,054.51 MEAN 24.8 MAX 1,760 MIN 0 AC-FT 17,960
WTR YR 1971 TOTAL 43,032.60 MEAN 118 MAX 3,540 MIN .30 AC-FT 85,360

PEAK DISCHARGE (BASE, 2,000 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
3-13			3,130	6- 4	0700	20.45	4,370
3-28	1900	19.77	3,770	6- 5	0215	22.55	6,480
3-29	2330	18.81	3,050				

06335500 Little Missouri River at Marmarth, N. Dak.

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

DRAINAGE AREA.--4,640 sq mi, approximately.

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

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

AVERAGE DISCHARGE.--33 years, 331 cfs (239,800 acre-ft per year); median of yearly mean discharges, 280 cfs (203,000 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 21,300 cfs June 5 (gage height, 16.31 ft); no flow Dec. 24 to Feb. 3.
Period of record: 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 prior to 1953 occurred in June 1907 (stage unknown). Other major floods occurred in March 1913, May 1929, and March 1920 and reached stages of about 21.5, 20.2, and 19.7 ft respectively. These stages are not comparable to stages during period of record, owing to construction of levees.

REMARKS.--Records good except those for the winter period, which are fair. Small diversions for irrigation above station.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.7	20	24		0	140	8,270	698	734	212	44	15
2	6.7	21	23		0	360	7,530	752	530	184	44	15
3	6.7	21	20		0	360	6,400	674	814	168	40	15
4	5.8	21	18		.1	310	5,220	584	4,530	156	38	38
5	5.4	27	16		.2	325	4,730	488	14,800	164	38	1,310
6	5.0	26	14		.3	235	4,170	426	6,500	164	35	921
7	5.4	28	11		.4	210	3,430	376	4,750	144	35	382
8	5.4	73	9.7		.6	230	2,270	340	3,520	128	31	256
9	5.4	128	9.0		.8	160	1,590	301	2,650	120	30	668
10	6.7	109	8.3		1.0	140	1,300	283	3,150	109	30	442
11	7.2	109	7.9		1.0	180	1,120	265	3,350	109	31	278
12	11	101	7.2		1.0	1,250	1,040	238	1,740	105	31	180
13	14	94	6.5		1.0	3,700	1,110	204	1,170	92	31	124
14	17	86	5.9		1.0	3,610	1,150	188	1,480	98	31	92
15	18	80	5.3		1.0	2,980	1,030	176	1,700	89	27	76
16	18	80	4.6		1,150	1,930	866	160	1,400	76	25	68
17	17	80	4.0		2,370	2,430	740	156	3,150	70	24	62
18	14	70	3.3		2,200	2,960	668	156	1,930	62	24	58
19	14	57	2.8		1,670	2,770	1,030	140	1,650	60	23	53
20	12	35	2.1		1,100	2,810	1,090	140	948	62	21	60
21	11	35	1.4		800	4,030	2,470	132	1,100	60	20	70
22	11	35	.90		950	3,380	1,240	553	908	65	19	86
23	10	35	.20		790	2,230	1,300	1,130	632	58	16	58
24	10	35	0		780	1,670	1,820	415	824	58	15	48
25	10	35	0		530	1,790	1,780	432	566	53	14	46
26	12	35	0		470	2,150	1,400	788	530	51	13	40
27	10	34	0		270	3,200	1,120	962	345	51	11	43
28	10	31	0		100	6,590	916	988	283	48	11	40
29	10	29	0		------	7,770	770	936	256	44	14	38
30	14	27	0		------	9,700	674	896	234	44	14	40
31	14	------	0		------	9,150	------	948	------	46	14	------
TOTAL	324.4	1,597	205.10	0	13,188.4	78,750	68,244	14,925	66,174	2,950	794	5,622
MEAN	10.5	53.2	6.62	0	471	2,540	2,275	481	2,206	95.2	25.6	187
MAX	19	128	24	0	2,370	9,700	8,270	1,130	14,800	212	44	1,310
MIN	5.0	20	0	0	0	140	668	132	234	44	11	15
AC-FT	643	3,170	407	0	26,160	156,200	135,400	29,600	131,300	5,850	1,570	11,150

CAL YR 1970 TOTAL 91,283.40 MEAN 250 MAX 3,970 MIN 0 AC-FT 181,100
WTR YR 1971 TOTAL 252,773.90 MEAN 693 MAX 14,800 MIN 0 AC-FT 501,400

PEAK DISCHARGE (BASE, 3,000 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
3-12	-	-	4,850	6- 4	1600	10.06	7,750
3-21	0700	7.50	4,400	6- 5	0530	16.31	21,300
3-28	0530	9.60	7,130	6-11	0300	7.89	4,380
3-29	0230	10.34	8,160	6-17	1000	7.58	4,380
3-30	0330	12.09	11,300				

06336000 Little Missouri River at Medora, N. Dak.

LOCATION.--Lat 46°55'10", long 103°31'40", in NE¼ sec.27, T.140 N., R.102 W., Billings County, on left bank 600 ft downstream from bridge on county highway and 1 mile upstream from Andrews Creek and bridge on I-94.

DRAINAGE AREA.--6,190 sq mi, approximately.

PERIOD OF RECORD.--May 1903 to October 1908, October to November 1921, March to June and November to December 1922, May 1923 to September 1924, September 1928 to September 1934, October 1945 to current year. Monthly discharge only for some periods, published in WSP 1309.

GAGE.--Water-stage recorder, and supplemental nonrecording gage on downstream side of highway bridge. Datum of gage is 2,246.75 ft above mean sea level. Prior to Oct. 9, 1945, nonrecording gages at several sites within 0.2 mile upstream from present site at various datums. Oct. 9, 1945, to Aug. 22, 1951, nonrecording gage at site 600 ft upstream at same datum.

AVERAGE DISCHARGE.--38 years, 463 cfs (335,400 acre-ft per year); median of yearly mean discharges, 420 cfs (304,000 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 21,200 cfs June 6 (gage height, 12.82 ft); no flow Jan. 10-27.
Period of record: Maximum discharge, 65,000 cfs Mar. 23, 1947 (gage height, 20.5 ft); no flow at times.

REMARKS.--Records good, except those for the winter period which are poor. 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 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	48	32	13	1.0	.5	260	12,000	950	1,010	352	69	15
2	41	32	13	1.0	.6	230	9,040	811	1,060	302	67	13
3	29	35	13	1.0	.6	220	7,960	721	838	274	65	12
4	28	35	13	1.0	.7	200	6,800	820	1,510	247	60	73
5	21	35	12	1.0	1.0	180	5,720	811	7,710	216	58	1,190
6	20	35	12	1.0	1.0	220	5,180	747	16,700	201	54	1,780
7	18	35	12	1.0	1.0	490	4,960	600	8,920	180	50	1,770
8	18	39	12	.50	1.0	500	4,390	518	6,730	180	48	1,260
9	18	54	12	.50	1.0	525	3,540	458	5,260	187	43	561
10	18	55	12	0	1.0	560	2,730	426	4,040	163	41	385
11	18	55	12	0	1.0	730	2,230	409	3,820	8,310	39	534
12	16	55	12	0	1.0	2,500	1,880	358	3,620	1,990	37	565
13	18	53	12	0	1.0	7,300	1,600	321	3,450	564	35	372
14	19	52	12	0	2.0	9,930	1,450	301	2,420	397	32	265
15	17	50	11	0	50	8,360	1,480	278	1,970	274	28	201
16	18	125	9.0	0	340	5,640	1,500	252	2,500	216	26	156
17	18	200	7.0	0	700	3,780	1,460	227	2,180	187	26	135
18	20	176	4.0	0	3,300	3,300	1,240	212	2,930	163	26	116
19	21	138	3.0	0	3,300	3,900	1,230	194	4,850	144	26	103
20	24	75	2.0	0	2,700	3,620	1,240	194	3,580	132	25	108
21	25	49	2.0	0	1,500	4,240	2,250	190	2,470	121	22	121
22	25	33	1.0	0	600	5,070	2,310	216	1,530	108	21	103
23	26	14	1.0	0	300	4,540	2,140	278	1,590	100	20	91
24	26	14	1.0	0	1,200	3,670	1,600	444	1,510	93	19	95
25	25	14	1.0	0	1,070	2,860	1,690	1,090	1,780	87	18	97
26	22	14	1.0	0	870	2,410	2,050	560	1,250	87	18	97
27	22	13	1.0	0	340	2,550	1,970	470	856	82	17	82
28	22	13	1.0	.10	330	7,260	1,660	572	730	78	16	73
29	28	13	1.0	.20	------	11,900	1,380	829	539	76	15	69
30	37	13	1.0	.30	------	14,100	1,160	960	403	73	15	60
31	31	------	1.0	.40	------	13,400	------	960	------	71	16	------
TOTAL	737	1,556	220.0	9.00	16,613.4	124,445	95,840	16,177	97,756	15,655	1,052	10,502
MEAN	23.8	51.9	7.10	.29	593	4,014	3,195	522	3,259	505	33.9	350
MAX	48	200	13	1.0	3,300	14,100	12,000	1,090	16,700	8,310	69	1,780
MIN	16	13	1.0	0	.50	180	1,160	190	403	71	15	12
AC-FT	1,460	3,090	436	18	32,950	246,800	190,100	32,090	193,900	31,050	2,090	20,830

CAL YR 1970 TOTAL 125,074.69 MEAN 343 MAX 4,540 MIN .40 AC-FT 248,100
WTR YR 1971 TOTAL 380,562.40 MEAN 1,043 MAX 16,700 MIN 0 AC-FT 754,800

PEAK DISCHARGE (BASE, 4,000 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
2-18	-	-	4,100	6- 6	1330	12.82	21,200
3-13	-	-	13,300	6-12	1530	6.49	4,890
3-22	-	-	5,300	6-19	0430	7.22	6,130
3-30	0300	11.28	15,800	7-11	1100	11.36	16,500

06337000 Little Missouri River near Watford City, N. Dak.

LOCATION.--Lat 47°35'25", long 103°15'05", in NW¼SE¼SE¼ sec.35, T.148 N., R.99 W., McKenzie County, at bridge on U.S. Highway 85, 17 miles upstream from Cherry Creek, and 17.5 miles south of Watford City.

DRAINAGE AREA.--8,310 sq mi, approximately.

PERIOD OF RECORD.--October 1934 to current year.

GAGE.--Water-stage recorder and supplemental nonrecording gage. Datum of gage is 1,929.03 ft above mean sea level. Oct. 2, 1959, to June 17, 1963, water-stage recorder at present site and datum June 18, 1963, to Nov. 28, 1964, at site 700 ft upstream; at present datum. See WSP 1729 or 1917 for history of changes prior to Oct. 2, 1959.

AVERAGE DISCHARGE.--37 years, 583 cfs (422,400 acre-ft per year); median of yearly mean discharges, 470 cfs (341,000 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 31,000 cfs Mar. 28 (gage height, 15.27 ft, backwater from ice); no flow Jan. 11 to Feb. 14.
Period of record: Maximum discharge, 110,000 cfs Mar. 25, 1947 (gage height, 24.0 ft from floodmark, site then in use); no flow at times in most years.

REMARKS.--Records fair.

REVISIONS (WATER YEARS).--WSP 926: 1935. WSP 1270: 1943.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	90	50	39	9.0	0	900	14,100	1,480	1,100	823	153	25
2	60	58	36	7.0	0	900	13,400	1,250	1,150	678	147	23
3	51	68	31	6.0	0	900	12,300	1,090	1,180	570	128	20
4	45	64	27	5.0	0	900	10,900	1,180	2,100	505	121	57
5	40	60	22	4.0	0	900	9,590	964	3,970	440	116	2,870
6	48	58	20	3.0	0	850	7,640	972	8,220	435	104	2,900
7	42	50	20	2.0	0	750	6,620	908	14,800	400	92	1,580
8	37	54	20	1.8	0	500	6,510	886	10,400	360	92	1,710
9	35	70	19	1.0	0	450	6,470	858	7,560	340	88	1,380
10	34	78	18	.50	0	400	6,160	788	8,610	355	85	1,050
11	30	72	16	0	0	500	4,620	704	6,430	410	90	739
12	28	66	15	0	0	800	3,880	654	6,470	6,190	74	558
13	31	63	14	0	0	2,000	2,730	594	8,300	2,750	70	640
14	28	60	14	0	0	9,100	1,840	564	7,520	1,390	70	712
15	27	58	13	0	5.0	12,900	1,620	534	5,220	932	64	460
16	24	58	13	0	40	10,800	1,520	500	4,090	788	62	355
17	22	58	12	0	55	10,000	1,520	475	4,910	636	60	315
18	20	57	10	0	200	6,220	1,960	455	4,350	500	60	238
19	18	57	10	0	1,900	5,660	4,200	430	6,160	420	56	188
20	18	52	10	0	3,400	5,260	3,110	425	8,460	380	53	150
21	17	47	10	0	2,000	5,500	4,060	400	6,420	345	48	131
22	16	45	10	0	1,250	5,500	3,060	380	9,700	310	45	123
23	16	44	10	0	500	6,000	1,820	460	5,290	270	42	121
24	17	43	10	0	300	16,000	3,110	435	2,390	243	36	109
25	19	42	10	0	500	15,000	1,610	435	1,710	265	35	109
26	18	41	10	0	3,500	14,000	1,560	440	1,850	206	34	109
27	20	40	10	0	2,000	15,000	1,660	1,020	2,630	192	31	106
28	35	40	10	0	1,000	25,000	1,870	837	1,560	166	29	101
29	48	40	10	0	------	13,900	1,700	666	1,190	166	28	97
30	48	39	10	0	------	15,100	1,670	684	1,020	175	28	97
31	50	------	10	0	------	14,900	------	1,020	------	162	28	------
TOTAL	1,032	1,632	489	39.30	16,650.0	216,590	142,810	22,488	154,760	21,802	2,169	17,073
MEAN	33.3	54.4	15.8	1.27	595	6,987	4,760	725	5,159	703	70.0	569
MAX	90	78	39	9.0	3,500	25,000	14,100	1,480	14,800	6,190	153	2,900
MIN	16	39	10	0	0	400	1,520	380	1,020	162	28	20
AC-FT	2,050	3,240	970	78	33,030	429,600	283,300	44,600	307,000	43,240	4,300	33,860

CAL YR 1970 TOTAL 163,646.66 MEAN 448 MAX 10,600 MIN .06 AC-FT 324,600
WTR YR 1971 TOTAL 597,534.30 MEAN 1,637 MAX 25,000 MIN 0 AC-FT 1,185,000

PEAK DISCHARGE (BASE, 8,000 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
3-15	-	-	14,000	6-20	0300	6.12	9,660
3-28	-	-	31,000	6-22	0600	6.48	10,800
6- 7	1030	8.48	10,800	7-12	1200	6.72	11,300

06338000 Lake Sakakawea near Riverdale, N. Dak.

LOCATION.--Lat 47°30'10", long 101°25'50", in S½ sec.31, T.147 N., R.84 W., Mercer County, in control structure of Garrison Dam, 2.5 miles west of Riverdale and 14 miles upstream from Knife River.

DRAINAGE AREA.--181,400 sq mi, approximately.

PERIOD OF RECORD.--October 1953 to current year. Prior to October 1966, published as Garrison Reservoir near Riverdale.

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

EXTREMES.--Current year: Maximum contents, 22,271,000 acre-ft July 14 (elevation, 1,849.0 ft); minimum, 19,074,000 acre-ft Feb. 16 (elevation, 1,839.2 ft).
Period of record: Maximum contents, 23,092,000 acre-ft July 23, 1969 (elevation, 1,850.7 ft).

REMARKS.--Reservoir is formed by earth-fill dam; storage began in November 1953. Maximum capacity, 24,790,000 acre-ft below elevation 1,854.0 ft (top of 29-ft gates). Normal maximum, 22,640,000 acre-ft below elevation 1,850.0 ft, of which about 4,250,000 acre-ft is designated for flood control. Elevation of crest of spillway, 1,825.0 ft, surmounted by radial gates. Inactive storage, 4,881,000 acre-ft below elevation 1,775.0 ft. Dead storage, zero at elevation 1,672.0 ft. Snake Creek arm of the reservoir has connecting gate to main reservoir, with sill at elevation, 1,810 ft. Figures herein represent total contents.

COOPERATION.--Elevation and contents furnished by Corps of Engineers from capacity tables dated July 1965 and July 1971. Elevations are those observed; contents are adjusted for wind effect.

REVISIONS (WATER YEARS).--WSP 1559: 1957(M).

MONTHEND ELEVATION AND CONTENTS, AT 2400, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	1,846.8	21,667,000	
Oct. 31	1,845.6	21,243,000	-424,000
Nov. 30	1,844.0	20,636,000	-607,000
Dec. 31	1,842.0	20,061,000	-575,000
CAL YR 1970	--	--	+487,000
Jan. 31	1,839.9	19,351,000	-710,000
Feb. 28	1,804.4	19,513,000	+162,000
Mar. 31	1,843.3	20,404,000	+891,000
Apr. 30	1,843.6	20,582,000	+178,000
May 31	1,843.0	20,343,000	-239,000
June 30	1.848.3	22,213,000	+1,870,000
June 30	1,848.3	21,993,000*	+193,000
July 31	1,848.8	22,186,000	+193,000
Aug. 31	1,847.1	21,630,000	-556,000
Sept. 30	1,846.5	21,390,000	-240,000
WTR YR 1971	--	--	-117,000*

* Based on revised capacity table effective July 1, 1971.

06338490 Missouri River at Garrison Dam, N. Dak.

LOCATION.--Lat 47°30'08", long 101°25'50", in S½ sec.31, T.147 N., R.84 W., Mercer County, in control structure of Garrison Dam, 2.5 miles west of Riverdale and 14 miles upstream from Knife River at mile 1,389.9.

DRAINAGE AREA.--181,400 sq mi, approximately.

PERIOD OF RECORD.--October 1969 to current year.

GAGE.--Flow meter and gate readings.

EXTREMES.--Maximum daily discharge, 39,300 cfs May 24; minimum daily discharge, 17,800 cfs Dec. 20.

REMARKS.--Records good. Many diversions above station. Flow regulated by Lake Sakakawea (see station 06338000). Prior to October 1969 records were obtained at a site 9.1 miles downstream. Discharges at the downstream site were generally about 7 percent greater than those furnished by the Corps of Engineers for the present site.

COOPERATION.--Records furnished by the Corps of Engineers. Records of chemical analyses for the water year 1971 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24,000	25,200	27,400	24,600	32,500	27,500	27,800	38,700	36,400	36,000	28,200	23,900
2	23,800	28,100	30,200	26,300	32,500	27,700	27,700	38,700	32,900	37,300	27,500	23,600
3	24,000	27,900	29,800	26,100	30,400	27,100	27,900	38,600	34,500	37,200	28,200	23,200
4	21,800	31,600	30,100	27,200	30,700	27,900	27,800	36,400	35,900	36,800	28,200	24,000
5	25,600	30,900	30,500	27,900	31,000	27,500	27,200	37,500	36,100	37,200	28,100	19,900
6	25,300	29,400	30,300	28,400	31,200	27,600	28,200	38,400	35,400	36,000	26,100	22,100
7	25,500	31,400	23,600	28,900	28,500	25,800	29,700	38,500	33,500	37,000	26,300	24,100
8	25,900	23,100	26,700	29,200	29,200	25,800	35,400	38,700	34,700	37,200	26,200	23,000
9	27,900	26,500	26,400	30,100	31,200	30,300	37,700	38,700	33,900	37,100	25,600	23,600
10	28,000	25,300	24,900	29,900	31,200	30,500	35,100	38,900	32,400	36,600	26,000	23,000
11	18,500	25,400	25,100	29,500	31,200	30,400	36,700	39,000	32,900	37,000	26,600	24,000
12	26,900	25,000	25,000	30,500	27,400	29,800	32,700	39,000	32,800	36,800	26,900	23,900
13	27,500	24,400	25,100	31,300	27,300	29,400	32,700	38,800	29,600	36,900	26,300	23,400
14	28,600	26,400	25,200	30,600	25,400	29,400	37,000	39,000	29,700	36,800	26,400	23,500
15	29,000	25,700	25,100	30,900	27,200	28,100	36,500	39,200	29,400	36,800	26,000	23,800
16	25,600	25,700	20,000	29,200	27,300	27,900	36,900	39,200	31,800	36,800	25,400	23,700
17	26,500	26,500	20,000	29,400	27,300	27,900	37,300	39,200	34,900	36,900	25,900	23,800
18	22,100	25,800	19,900	29,300	27,700	27,500	37,100	39,200	35,600	37,100	24,300	24,000
19	25,800	25,400	20,000	29,100	27,600	27,600	36,300	39,200	36,300	36,500	26,900	19,900
20	21,900	26,600	17,800	30,400	27,500	28,000	38,300	39,000	36,500	37,000	26,500	23,800
21	25,100	30,100	20,100	32,100	24,700	28,000	36,400	39,200	35,100	34,100	26,900	24,200
22	25,100	30,600	19,900	31,300	27,600	28,100	37,900	39,200	37,400	34,500	24,100	24,000
23	31,700	30,500	20,000	33,500	27,300	28,100	37,900	39,200	37,200	31,900	26,000	23,900
24	28,300	29,900	20,500	33,000	27,700	27,100	36,900	39,300	37,200	31,600	26,200	23,900
25	26,700	30,400	20,600	32,800	27,800	28,300	37,900	35,300	37,400	32,000	25,900	24,000
26	27,200	28,600	21,800	33,800	27,500	28,100	38,400	36,800	36,600	31,700	26,700	20,400
27	29,700	30,100	22,000	33,600	27,600	28,000	35,800	36,500	36,900	29,400	26,400	24,100
28	30,900	30,000	22,500	34,200	27,700	26,600	38,600	34,700	37,600	29,500	26,400	23,900
29	29,800	29,600	23,100	32,800	------	28,400	38,200	36,500	37,900	27,900	24,000	23,200
30	29,800	28,100	24,200	33,000	------	28,100	37,600	33,600	35,700	28,200	24,200	23,100
31	31,100	------	25,100	30,400	------	27,600	------	34,200	------	27,900	23,900	------
TOTAL	819,600	834,200	742,900	939,300	802,200	870,100	1,041.6M	1,178.4M	1,044.2M	1,075.7M	812,300	698,900
MEAN	26,440	27,810	23,960	30,300	28,650	28,070	34,720	38,010	34,810	34,700	26,200	23,300
MAX	31,700	31,600	30,500	34,200	32,500	30,500	38,600	39,300	37,900	37,300	28,200	24,200
MIN	18,500	23,100	17,800	24,600	24,700	25,800	27,200	33,600	29,400	27,900	23,900	19,900
AC-FT	1,626M	1,655M	1,474M	1,863M	1,591M	1,726M	2,066M	2,337M	2,071M	2,134M	1,611M	1,386M

CAL YR 1970 TOTAL 9,347,899 MEAN 25,610 MAX 36,900 MIN 12,000 AC-FT 18,540,000
WTR YR 1971 TOTAL 10,859,400 MEAN 29,750 MAX 39,300 MIN 17,800 AC-FT 21,540,000

06339100 Knife River at Manning, N. Dak.

LOCATION.--Lat 47°14'10", long 102°46'10", in SE¼NW¼ sec.6, T.143 N., R.95 W., Dunn County, on left bank 50 ft downstream from bridge on State Highway 22, 0.4 mile north of Manning.

DRAINAGE AREA.--205 sq mi, approximately.

PERIOD OF RECORD.--July 1967 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,156.55 ft above mean sea level.

EXTREMES.--Current year: Maximum discharge, 956 cfs Mar. 30 (gage height, 13.33 ft); maximum gage height, 13.51 ft Mar. 14 (backwater from ice); minimum, 0.37 cfs Aug. 24, 25 (gage height, 2.71 ft).
Period of record: Maximum discharge, 1,400 cfs June 15, 1970 (gage height, 16.20 ft); minimum, 0.01 cfs Aug. 2, 1968 (gage height, 2.60 ft).

REMARKS.--Records good.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.8	3.2	2.8	2.6	1.7	15	246	14	4.5	11	1.1	.65
2	1.8	3.2	2.8	2.6	1.6	12	79	12	3.9	9.0	1.1	.81
3	1.8	3.2	2.6	2.5	1.5	9.0	60	10	3.7	6.1	1.1	.86
4	1.8	3.2	2.6	2.5	1.4	12	43	9.0	5.5	5.0	.91	.94
5	1.5	3.2	2.6	2.5	1.4	17	33	7.8	27	4.1	1.0	12
6	1.6	3.1	2.6	2.5	1.3	12	31	7.0	44	3.5	.96	111
7	1.7	3.1	2.8	2.5	1.3	12	58	6.4	33	2.8	.86	168
8	1.8	3.1	2.9	2.4	1.3	12	121	5.5	25	3.1	.77	46
9	1.9	2.8	2.7	2.4	1.3	10	108	5.3	19	2.8	.77	22
10	1.8	2.9	2.5	2.3	1.3	13	74	5.5	17	2.6	.69	13
11	1.8	3.1	2.5	2.3	1.3	17	57	5.5	12	3.1	.61	7.4
12	1.8	3.1	2.6	2.3	1.3	70	46	6.7	8.6	2.7	.55	4.3
13	1.9	3.2	2.6	2.2	1.5	340	32	6.1	9.7	2.7	.52	2.8
14	2.0	3.3	2.6	2.2	2.0	680	22	5.0	6.1	2.7	.55	2.1
15	2.2	3.3	2.6	2.2	5.5	480	17	4.1	4.5	2.3	.61	1.9
16	2.4	3.3	2.6	2.2	30	240	15	3.9	3.5	2.1	.58	1.8
17	2.4	3.3	2.6	2.1	47	270	14	3.3	4.1	2.0	.52	1.8
18	2.3	3.3	2.5	2.1	54	350	20	3.2	66	2.0	.52	1.8
19	2.3	3.5	2.5	2.1	40	250	35	2.7	776	2.0	.52	1.8
20	2.3	3.2	2.4	2.0	30	150	71	2.8	326	1.8	.58	1.8
21	2.2	3.2	2.5	2.0	23	280	87	2.8	62	1.8	.52	2.4
22	2.1	3.1	2.6	2.0	23	340	156	2.9	32	1.8	.61	2.5
23	2.1	2.7	2.6	1.9	13	150	58	3.2	21	1.7	.55	2.6
24	2.1	2.7	2.6	1.9	5.0	80	32	3.3	16	1.6	.40	2.8
25	2.2	3.1	2.5	1.9	20	50	22	3.2	15	1.5	.37	2.8
26	2.3	2.9	2.6	1.8	60	32	17	3.2	11	1.4	.43	3.1
27	2.3	2.8	2.6	1.8	27	40	15	3.3	10	1.3	.49	3.1
28	2.3	2.9	2.6	1.8	25	230	14	3.1	9.0	1.2	.58	3.5
29	2.6	2.8	2.6	1.9	------	560	14	2.8	9.7	1.2	.73	3.5
30	3.3	2.8	2.6	1.7	------	800	14	2.9	14	1.1	.73	3.5
31	3.1	------	2.6	1.7	------	767	------	4.1	------	.91	.69	------
TOTAL	65.5	92.6	80.8	66.8	422.7	6,300.0	1,611	160.6	1,598.8	88.91	20.92	432.56
MEAN	2.11	3.09	2.61	2.15	15.1	203	53.7	5.18	53.3	2.87	.67	14.4
MAX	3.3	3.5	2.9	2.6	60	800	246	14	776	11	1.1	168
MIN	1.5	2.7	2.4	1.7	1.3	9.0	14	2.7	3.5	.91	.37	.65
AC-FT	130	184	160	133	838	12,500	3,200	319	3,170	176	41	858

CAL YR 1970 TOTAL 10,137.30 MEAN 27.8 MAX 1,130 MIN 1.2 AC-FT 20,110
WTR YR 1971 TOTAL 10,941.19 MEAN 30.0 MAX 800 MIN .37 AC-FT 21,700

PEAK DISCHARGE (BASE, 100 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
3-14	-	-	750	4-22	0700	6.68	209
3-30	2200	13.33	956	6-19	2200	12.50	874
4- 9	0400	5.81	134	9- 7	0200	7.30	271

06339300 Knife River at Marshall, N. Dak.

LOCATION.--Lat 47°08'17", long 102°20'00", NW¼ sec.10, T.142 N., R.92 W., Dunn County, on right bank 250 ft downstream from bridge on State Highway 8 in Marshall.

DRAINAGE AREA.--722 sq mi.

PERIOD OF RECORD.--October 1970 to current year.

GAGE.--Water-stage recorder.

EXTREMES.--Current year: Maximum discharge, 2,250 cfs Mar. 16 (gage height, 14.72 ft); minimum, 7.0 cfs July 31, Aug. 1.

Flood of March 1943 reached a stage of at least 18.5 ft prior to dike construction and is believed to be highest stage experienced since 1915.

REMARKS.--Records poor.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.7	10	7.7	4.0	5.0	215	1,050	47	13	33	2.0	12
2	8.6	10	7.7	4.0	5.0	150	700	43	16	33	2.4	12
3	8.4	12	7.7	4.0	5.0	100	250	42	14	28	3.0	10
4	7.3	12	7.7	4.0	5.0	60	160	39	400	22	3.7	12
5	7.3	11	7.5	4.0	5.0	51	160	35	1,000	18	4.2	23
6	6.8	11	7.5	4.0	6.0	50	99	31	600	15	4.3	37
7	6.6	11	7.5	4.0	6.0	50	100	28	700	15	4.7	106
8	6.8	11	7.3	4.0	6.0	50	96	24	678	14	5.2	119
9	7.1	11	7.3	4.0	6.0	50	129	23	205	12	5.4	200
10	7.7	11	7.3	3.5	6.9	50	182	23	150	11	5.4	114
11	7.9	10	7.1	3.5	7.0	50	152	23	600	10	5.6	61
12	7.9	10	7.1	3.5	7.0	57	118	24	1,050	9.6	5.8	36
13	8.2	11	7.1	3.5	7.0	240	103	26	600	9.0	6.0	27
14	9.3	11	6.8	3.5	7.0	1,080	86	29	100	8.5	6.4	19
15	8.8	12	6.8	3.5	7.0	1,800	70	27	50	8.1	7.1	15
16	8.6	12	6.1	3.5	7.5	2,100	56	26	70	7.7	7.5	14
17	9.0	12	6.0	3.5	16	1,550	49	23	98	7.2	7.9	14
18	9.0	11	6.0	3.5	150	1,000	52	21	150	6.9	8.6	14
19	9.0	11	6.0	3.5	275	800	63	19	250	6.4	9.3	14
20	9.0	11	5.0	3.5	275	600	95	17	200	6.2	9.3	16
21	9.0	9.5	5.0	3.5	200	400	230	16	250	5.8	9.5	17
22	9.0	9.5	5.0	4.0	150	300	484	15	350	5.2	9.0	18
23	8.6	9.5	5.0	4.0	145	300	346	14	250	4.7	9.0	18
24	8.8	9.5	5.0	4.0	130	200	235	14	150	4.2	9.3	19
25	8.8	9.5	5.0	4.0	105	200	127	14	100	3.7	9.0	22
26	8.8	7.9	5.0	4.0	100	250	88	13	80	3.4	9.5	21
27	9.0	7.9	4.0	4.0	240	280	69	12	60	3.0	9.7	20
28	9.5	7.7	4.0	4.0	250	315	58	12	50	2.7	10	21
29	10	7.7	4.0	4.0	------	310	52	11	40	2.4	9.7	21
30	9.5	7.7	4.0	5.0	------	900	50	10	30	2.2	9.7	21
31	10	------	4.0	5.0	------	1,200	------	10	------	2.0	11	------
TOTAL	264.0	307.4	189.2	120.0	2,134.4	14,758	5,509	711	8,304	319.9	219.2	1,073
MEAN	8.52	10.2	6.10	3.87	76.2	476	184	22.9	277	10.3	7.07	35.8
MAX	10	12	7.7	5.0	275	2,100	1,050	47	1,050	33	11	200
MIN	6.6	7.7	4.0	3.5	5.0	50	49	10	13	2.0	2.0	10
AC-FT	524	610	375	238	4,230	29,270	10,930	1,410	16,470	635	435	2,130

WTR YR 1971 TOTAL 33,909.1 MEAN 92.9 MAX 2,100 MIN 2.0 AC-FT 67,260

PEAK DISCHARGE (BASE, 750 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
3-16	0830	14.72	2,250	6- 7	-	8.9	1,170
3-31	0200	9.94	1,280	6-12	-	-	2,100

06339490 Elm Creek near Golden Valley, N. Dak.

LOCATION.--Lat 47°06'25", long 102°03'05", in SE¼NW¼ sec.23, T.142 N., R.90 W., Mercer County, on right bank 60 ft upstream from highway bridge 13.5 miles south of Golden Valley.

DRAINAGE AREA.--82 sq mi, approximately.

PERIOD OF RECORD.--August 1967 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,915.17 ft above mean sea level.

EXTREMES.--Current year: Maximum discharge, 243 cfs Mar. 14 (gage height, 10.03 ft, backwater from ice); no flow for several months.
Period of record: Maximum discharge, 10,000 May 9, 1970 (gage height, 23.55 ft); no flow for several months each year.

REMARKS.--Records good.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.05	.07	.02		0	.50	75	9.1	.10	.18		0
2	.05	.06	.02		0	.50	52	11	.11	.16		0
3	.04	.07	.02		0	.50	28	6.8	.14	.22		0
4	.04	.07	.02		0	2.0	19	4.1	.35	.12		0
5	.05	.07	.02		0	4.0	14	2.8	65	.16		.03
6	.05	.07	.02		0	3.0	12	2.0	48	.10		.04
7	.05	.07	.02		0	2.0	12	1.3	23	.08		.02
8	.05	.07	.02		0	1.5	17	1.0	12	.07		.01
9	.05	.07	.02		0	1.5	21	.80	6.9	.07		0
10	.06	.07	.02		0	1.5	18	.74	17	.06		0
11	.06	.06	.02		0	3.2	10	.57	8.9	.07		0
12	.06	.04	.02		0	24	6.0	.42	4.4	.08		0
13	.07	.03	.02		0	148	3.5	.30	3.3	.07		0
14	.07	.03	.02		0	211	2.6	.30	1.8	.06		0
15	.07	.03	.02		.26	127	2.0	.22	1.9	.05		0
16	.07	.03	.02		.98	85	1.2	.20	1.0	.05		0
17	.07	.03	.01		.42	91	.86	.22	10	.04		0
18	.07	.03	.01		1.3	82	1.0	.18	3.3	.03		0
19	.07	.03	.01		.20	47	.92	.18	1.2	.02		0
20	.07	.03	.01		.09	31	3.6	.16	.74	.01		0
21	.34	.03	0		.08	94	55	.18	.52	0		0
22	.47	.03	0		.06	83	61	.14	.74	0		0
23	.47	.02	0		.05	57	22	.12	.86	0		0
24	.37	.02	0		.05	17	11	.11	4.9	0		0
25	.28	.02	0		.08	10	6.6	.10	2.2	0		0
26	.22	.02	0		.74	16	4.4	.11	.86	0		0
27	.18	.02	0		.50	51	3.3	.10	.62	0		0
28	.12	.02	0		.50	127	2.9	.08	.32	0		0
29	.10	.02	0		------	138	2.9	.09	.30	0		0
30	.09	.02	0		------	137	3.3	.10	.22	0		0
31	.08	------	0		------	113	------	.18	------	0		------
TOTAL	3.89	1.25	.36	0	5.31	1,709.20	472.08	43.70	220.68	1.70	0	.10
MEAN	.13	.042	.012	0	.19	55.1	15.7	1.41	7.36	.055	0	.003
MAX	.47	.07	.02	0	1.3	211	75	11	65	.22	0	.04
MIN	.04	.02	0	0	0	.50	.86	.08	.10	0	0	0
AC-FT	7.7	2.5	.7	0	11	3,390	936	87	438	3.4	0	.2

CAL YR 1970 TOTAL 5,046.25 MEAN 13.8 MAX 1,630 MIN 0 AC-FT 10,010
WTR YR 1971 TOTAL 2,458.27 MEAN 6.74 MAX 211 MIN 0 AC-FT 4,880

PEAK DISCHARGE (BASE, 100 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
3-14	0930	10.03	243	4-21	2200	5.03	100
3-29	0400	8.09	178	6- 5	0530	6.00	148

06339500 Knife River near Golden Valley, N. Dak.

LOCATION.--Lat 47°09'40", long 102°03'39", in SE¼ sec.34, T.143 N., R.90 W., Mercer County, on left bank 6 ft downstream from highway bridge, 4.5 miles downstream from Elm Creek, and 9 miles south of Golden Valley.

DRAINAGE AREA.--1,230 sq mi, approximately.

PERIOD OF RECORD.--May 1903 to November 1906, April 1907 to November 1915, April 1916 to October 1919, and October 1921 to September 1924 (published as "at Broncho" or "near Broncho"), and April 1943 to current year. Monthly discharge only for some periods published in WSP 1309.

GAGE.--Water-stage recorder. Datum of gage is 1,847.13 ft above mean sea level. See WSP 1729 or 1917 for history of changes prior to May 1, 1946.

AVERAGE DISCHARGE.--45 years, 94.5 cfs (68,470 acre-ft per year); median of yearly mean discharges, 86 cfs (62,300 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 2,610 cfs Mar. 15 (gage height, 18.55 ft, backwater from ice); minimum discharge, 5.8 cfs Jan. 14-19; minimum gage height, 2.10 ft Aug. 10.
Period of record: Maximum discharge, 11,200 cfs May 9, 1970 (gage height, 25.84 ft); maximum gage height, 26.7 ft Mar. 26, 27, 1943 (from floodmark); no flow at times in some years.
The flood in 1943 was the only major flood in period 1930-49, according to local residents.

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

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 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	15	15	11	9.0	390	1,160	84	23	55	9.5	16
2	12	16	15	11	9.0	330	900	83	23	50	9.2	16
3	12	16	14	12	9.0	285	625	76	24	43	8.9	16
4	13	16	13	12	9.0	210	290	68	399	41	8.0	19
5	12	17	13	12	9.0	109	210	62	1,150	36	8.0	32
6	12	16	12	12	9.0	73	190	55	1,510	32	7.7	30
7	11	16	12	11	9.0	59	170	50	673	28	7.4	36
8	11	16	12	10	9.0	54	167	45	541	24	7.2	95
9	11	16	13	8.9	9.0	70	157	42	534	21	7.2	122
10	11	16	13	7.4	9.3	60	216	47	307	20	6.9	199
11	12	16	13	6.3	10	79	247	68	710	19	6.9	114
12	12	16	13	6.1	10	106	202	130	724	19	6.9	71
13	12	16	13	6.0	10	550	156	122	272	17	8.3	49
14	12	16	13	5.8	10	1,670	140	79	155	16	9.5	38
15	13	15	12	5.8	10	2,460	120	59	101	16	9.5	34
16	13	16	12	5.8	10	2,520	102	49	96	15	9.5	28
17	13	16	12	5.8	10	2,150	88	44	220	15	10	27
18	13	16	12	5.8	10	1,760	90	38	266	15	13	26
19	13	16	12	5.8	49	1,270	91	34	406	14	13	24
20	13	15	12	6.0	330	1,000	120	32	306	14	14	23
21	13	15	13	7.0	460	940	338	30	394	13	13	23
22	13	15	13	7.0	330	800	654	28	601	13	14	23
23	13	14	13	8.0	230	600	637	27	309	12	14	23
24	13	14	12	8.0	190	500	445	26	210	11	14	24
25	13	14	12	8.0	180	400	281	24	138	10	14	26
26	13	15	11	8.0	220	350	181	24	103	9.9	14	26
27	13	15	11	8.0	260	300	134	22	85	9.9	14	26
28	14	15	11	9.0	330	400	105	21	71	9.9	15	26
29	14	15	11	9.0	------	600	93	20	64	9.9	15	27
30	15	15	11	9.0	------	810	90	21	60	9.5	15	26
31	15	------	11	9.0	------	1,250	------	22	------	9.5	16	------
TOTAL	392	465	385	256.5	2,749.3	22,155	8,399	1,532	10,475	627.6	338.6	1,265
MEAN	12.6	15.5	12.4	8.27	98.2	715	280	49.4	349	20.2	10.9	42.2
MAX	15	17	15	12	460	2,520	1,160	130	1,510	55	16	199
MIN	11	14	11	5.8	9.0	54	88	20	23	9.5	6.9	16
AC-FT	778	922	764	509	5,450	43,940	16,660	3,040	20,780	1,240	672	2,510

CAL YR 1970 TOTAL 55,841.0 MEAN 153 MAX 8,820 MIN 4.5 AC-FT 110,800
WTR YR 1971 TOTAL 49,040.0 MEAN 134 MAX 2,520 MIN 5.8 AC-FT 97,270

PEAK DISCHARGE (BASE 1,500 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
3-15	--	--	2,610	6-6	1000	13.44	1,700

06340000 Spring Creek at Zap, N. Dak.

LOCATION.--Lat 47°17'10", long 101°55'31", in SW¼ sec.14, T.144 N., R.89 W., Mercer County, on right bank 250 ft downstream from Burlington Northern Railway bridge in Zap and 9 miles upstream from mouth.

DRAINAGE AREA.--549 sq mi.

PERIOD OF RECORD.--March to September 1924, October 1945 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,819.39 ft above mean sea level. Mar. 4 to Sept. 30, 1924, nonrecording gage at site 250 ft upstream at different datum. Oct. 1, 1945, to Sept. 30, 1947, nonrecording gage 250 ft upstream at datum 1.12 ft higher.

AVERAGE DISCHARGE.--26 years, 42.0 cfs (30,430 acre-ft per year); median of yearly mean discharges, 39 cfs (28,300 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 3,060 cfs June 5 (gage height, 16.60 ft); minimum, 4.0 cfs Jan. 13 to Feb. 9; minimum gage height, 2.45 ft Jan. 19, 24.
Period of record: Maximum discharge, 6,130 cfs Apr. 7, 1952 (gage height, 20.03 ft); maximum gage height, 20.27 ft Apr. 6, 1969; no flow at times.
Maximum stage known occurred in about 1902, from ice jam. Floods of February 1913 and March 1943 reached a stage of about 20 ft and 19.5 ft, respectively, from information by local residents.

REMARKS.--Records good except those for the winter period, which are poor. Flow slightly regulated by Lake Ilo 56 miles upstream (capacity, 7,130 acre-ft).

REVISIONS.--WSP 1917: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10	16	15	6.0	4.0	170	334	47	15	88	12	8.0
2	9.3	16	15	6.0	4.0	129	262	42	15	73	12	8.0
3	9.3	16	15	6.0	4.0	70	199	40	16	51	11	7.7
4	9.3	16	15	5.0	4.0	58	148	35	46	45	12	8.3
5	9.7	15	15	5.0	4.0	50	122	32	1,400	36	10	17
6	9.3	15	10	5.0	4.0	55	164	29	1,340	32	10	21
7	9.3	15	10	4.5	4.0	60	113	27	860	29	9.7	22
8	9.7	15	10	4.5	4.0	85	89	26	2,040	28	9.3	30
9	10	14	10	4.5	4.0	65	78	25	427	24	8.9	22
10	10	14	10	4.1	5.0	38	69	32	218	20	8.9	17
11	11	14	10	4.1	5.5	40	67	41	145	25	9.3	14
12	11	14	10	4.1	5.9	125	62	39	123	25	8.9	12
13	11	14	10	4.0	5.9	457	60	31	121	22	8.9	11
14	13	14	10	4.0	5.9	772	56	25	104	20	8.6	9.7
15	12	16	10	4.0	6.2	800	57	22	85	21	8.3	10
16	12	18	10	4.0	6.5	750	53	20	68	21	8.0	10
17	12	15	10	4.0	18	790	49	18	318	21	7.7	11
18	12	15	10	4.0	37	774	56	18	240	20	7.7	11
19	11	15	10	4.0	111	649	71	19	120	18	8.3	10
20	11	15	9.0	4.0	123	458	77	18	98	16	8.3	11
21	11	15	9.0	4.0	73	472	131	18	85	15	8.0	12
22	11	15	8.0	4.0	41	443	152	18	79	14	8.0	12
23	12	15	8.0	4.0	30	308	149	17	67	14	7.7	12
24	12	15	8.0	4.0	24	260	133	15	172	13	7.7	11
25	12	15	7.0	4.0	39	203	108	15	162	12	7.7	12
26	12	15	7.0	4.0	210	200	88	14	96	12	7.7	11
27	14	15	7.0	4.0	250	197	74	14	68	12	7.7	10
28	14	15	7.0	4.0	180	470	64	13	58	12	7.7	11
29	15	15	7.0	4.0	------	750	56	12	56	12	7.7	10
30	16	15	6.0	4.0	------	705	52	13	61	12	7.7	10
31	16	------	6.0	4.0	------	554	------	15	------	12	7.7	------
TOTAL	356.9	452	304.0	134.8	1,212.9	10,957	3,193	750	8,703	775	273.1	381.7
MEAN	11.5	15.1	9.81	4.35	43.3	353	106	24.2	290	25.0	8.81	12.7
MAX	16	18	15	6.0	250	800	334	47	2,040	88	12	30
MIN	9.3	14	6.0	4.0	4.0	38	49	12	15	12	7.7	7.7
AC-FT	708	897	603	267	2,410	21,730	6,330	1,490	17,260	1,540	542	757

CAL YR 1970 TOTAL 18,954.1 MEAN 51.9 MAX 2,360 MIN 6.0 AC-FT 37,600
WTR YR 1971 TOTAL 27,493.4 MEAN 75.3 MAX 2,040 MIN 4.0 AC-FT 54,530

PEAK DISCHARGE (BASE, 1,000 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
6-5	2300	16.60	3,060	6-8	1200	15.55	2,570

06340200 West Branch Otter Creek near Beulah, N. Dak.

LOCATION.--Lat 47°08'05", long 101°39'35", on east line sec.11, T.142 N., R.87 W., Oliver County, on right bank 10 miles southeast of Beulah.

DRAINAGE AREA.--26.5 sq mi.

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

GAGE.--Water-stage recorder.

AVERAGE DISCHARGE.--6 years, 4.65 cfs (3,370 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 252 cfs April 1 (gage height, 5.63 ft); maximum gage height, 5.81 ft Mar. 28 (backwater from ice); no flow on many days.
Period of record: Maximum discharge, 23,700 cfs June 24, 1966 (gage height, 17.2 ft, from floodmark, from rating curve extended above 77 cfs on basis of slope-area measurement of peak flow); no flow at times in some years.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.01	.03	.06	.06	0	2.1	15	2.1	.07	.34	0	0
2	.01	.03	.06	.06	0	1.6	5.3	2.2	.07	.25	0	0
3	.01	.03	.06	.06	0	1.1	4.8	1.7	.06	.16	0	0
4	.01	.03	.06	.06	0	1.1	4.6	.95	.11	.13	0	0
5	.01	.02	.06	.06	0	2.6	4.4	37	.38	.11	0	.02
6	.01	.02	.04	.05	0	1.1	6.1	.42	17	.09	0	.01
7	.01	.02	.04	.04	0	1.6	11	.38	9.6	.08	0	.01
8	.01	.02	.05	.03	0	1.1	9.6	.86	5.3	.06	0	.01
9	.01	.02	.05	.03	0	.52	7.1	.25	3.3	.05	0	.01
10	.01	.02	.05	.02	.02	.52	5.8	.31	63	.05	.01	0
11	.02	.02	.05	.02	.05	.78	5.3	.47	22	.06	0	0
12	.02	.02	.05	.01	.10	10	3.7	.34	11	2.6	0	0
13	.02	.02	.05	.01	.10	100	2.2	.64	6.1	7.5	0	0
14	.02	.02	.05	.01	.10	50	1.4	.28	3.5	5.8	0	0
15	.02	.02	.05	.01	.10	20	.95	.13	1.7	3.9	0	0
16	.02	.02	.04	.01	.10	20	.86	.15	.78	.86	0	0
17	.02	.02	.05	.01	4.1	20	.78	.13	2.2	.28	.01	0
18	.02	.02	.05	.01	5.1	20	.52	.11	1.1	.16	0	0
19	.02	.02	.05	.01	2.1	20	1.6	.08	.64	.09	0	0
20	.02	.02	.05	.01	1.1	20	2.2	.09	.47	.07	0	0
21	.03	.03	.05	.01	.52	30	4.1	.09	.16	.05	0	0
22	.04	.03	.05	.01	.34	20	5.6	.09	.52	.04	0	0
23	.03	.02	.05	.01	.10	8.0	3.7	.10	.47	.03	0	0
24	.02	.03	.05	.01	.10	4.4	2.2	.04	.47	.03	0	0
25	.03	.05	.05	.01	5.1	4.1	1.7	.08	4.1	.03	0	0
26	.03	.05	.05	0	10	10	1.1	.04	5.3	.02	0	0
27	.02	.05	.05	0	5.1	25	1.1	.07	3.3	.01	0	0
28	.02	.05	.05	0	3.0	100	1.7	.04	1.9	.01	0	0
29	.03	.05	.06	0	------	65	2.1	.01	1.1	0	0	0
30	.03	.05	.07	0	------	79	2.4	.04	.58	0	0	0
31	.03	------	.06	0	------	23	------	.04	------	0	0	------
TOTAL	.61	.85	1.61	.63	37.23	662.62	118.91	49.23	166.28	22.86	.02	.06
MEAN	.020	.028	.052	.020	1.33	21.4	3.96	1.59	5.54	.74	.0006	.002
MAX	.04	.05	.07	.06	10	100	15	37	63	7.5	.01	.02
MIN	.01	.02	.04	0	0	.52	.52	.01	.06	0	0	0
AC-FT	1.2	1.7	3.2	1.3	74	1,310	236	98	330	45	.04	.1

CAL YR 1970 TOTAL 1,005.19 MEAN 2.75 MAX 190 MIN .01 AC-FT 1,990
WTR YR 1971 TOTAL 1,060.91 MEAN 2.91 MAX 100 MIN 0 AC-FT 2,100

PEAK DISCHARGE (BASE, 100 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
3-12	-	-	100	4- 1	0530	5.63	252
3-28	-	-	210	6-10	0900	5.54	233

06340500 Knife River at Hazen, N. Dak.

LOCATION.--Lat 47°17'06", long 101°37'26", in SE¼ sec.18, T.144 N., R.86 W., Mercer County, on right bank at upstream side of highway bridge, 0.5 mile south of Hazen and 2 miles upstream from Antelope Creek.

DRAINAGE AREA.--2,240 sq mi, approximately.

PERIOD OF RECORD.--October to November 1928, March 1929 to September 1933, August 1937 to current year. Monthly discharge only for some periods, published in WSP 1309.

GAGE.--Water-stage recorder. Datum of gage is 1,712.35 ft above mean sea level. Prior to Sept. 25, 1947, non-recording gages at same site and datum.

AVERAGE DISCHARGE.--38 years (1923-33, 1937-71) 177 cfs (128,200 acre-ft per year); median of yearly mean discharges, 150 cfs (109,000 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 4,320 cfs Mar. 17 (gage height, 18.79 ft, backwater from ice); minimum, 12 cfs Aug. 30 (gage height, 2.83 ft).
Period of record: Maximum discharge, 35,300 cfs June 24, 1966 (gage height, 27.01 ft); no flow at times in 1933, 1959, 1962.
Floods in 1943, 1950, 1952 and 1966 are the only major floods known since 1884.

REMARKS.--Records good except those for the winter period, which are poor. Small diversions above station. Slight regulation by Lake Ilo 81 miles upstream (capacity, 7,130 acre-ft).

REVISIONS (WATER YEARS).--WSP 1146: 1943. WSP 1279: 1930-31, 1932-33(M). WSP 1917: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	48	60	35	25	15	500	2,210	206	70	168	40	14
2	47	60	35	25	15	500	1,780	187	70	182	39	14
3	44	62	35	25	15	500	1,460	170	70	155	37	14
4	45	62	35	25	15	510	960	156	83	135	37	14
5	45	60	35	25	15	590	561	145	845	123	35	27
6	45	60	35	21	15	520	492	134	3,350	113	33	47
7	45	58	35	21	15	330	527	123	2,310	106	31	59
8	45	57	35	21	13	200	496	116	2,260	84	30	59
9	45	55	35	21	13	200	439	110	1,930	85	28	100
10	46	54	35	21	13	171,	394	112	955	80	24	119
11	47	54	35	21	13	174	413	121	714	77	16	182
12	47	54	35	21	13	249	415	136	909	81	16	130
13	48	54	35	20	13	955	355	172	865	107	16	87
14	51	52	35	20	13	2,220	294	171	454	108	16	67
15	55	50	35	20	13	2,370	260	133	317	89	16	68
16	54	51	35	15	13	2,750	230	112	252	80	15	63
17	52	53	35	15	13	3,720	206	103	386	75	15	44
18	52	53	35	15	32	3,640	212	95	748	69	15	60
19	53	51	35	15	139	2,940	226	92	540	65	15	39
20	52	46	30	15	151	2,100	246	88	572	60	15	31
21	50	50	30	15	450	1,860	346	86	461	55	16	31
22	50	45	30	15	400	1,660	589	83	487	52	16	32
23	50	40	30	15	360	1,220	807	79	656	51	15	30
24	51	40	30	15	268	840	759	76	492	48	14	29
25	51	40	25	15	472	800	572	73	483	44	14	28
26	52	40	25	15	530	835	420	70	334	41	14	26
27	54	40	25	15	520	740	326	68	250	40	14	26
28	55	35	25	15	520	1,450	271	63	205	40	14	26
29	58	35	25	15	------	1,980	235	61	181	40	14	25
30	60	35	25	15	------	2,600	214	63	169	42	13	25
31	61	------	25	15	------	2,580	------	63	------	39	14	------
TOTAL	1,558	1,506	990	572	4,077	41,704	16,715	3,467	21,418	2,534	647	1,516
MEAN	50.3	50.2	31.9	18.5	146	1,345	557	112	714	81.7	20.9	50.5
MAX	61	62	35	25	530	3,720	2,210	206	3,350	182	40	182
MIN	44	35	25	15	13	171	206	61	70	39	13	14
AC-FT	3,090	2,990	1,960	1,130	8,090	82,720	33,150	6,880	42,480	5,030	1,280	3,010

CAL YR 1970 TOTAL 92,855.6 MEAN 254 MAX 8,090 MIN 9.6 AC-FT 184,200
WTR YR 1971 TOTAL 96,704.0 MEAN 265 MAX 3,720 MIN 13 AC-FT 191,800

PEAK DISCHARGE (BASE, 1,500 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
3-17	--	--	4,320	6- 6	1600	16.57	3,760
3-31	0400	15.09	2,790	6- 9	0300	13.97	2,610

06341400 Turtle Creek near Turtle Lake, N. Dak.

LOCATION.--47°27'30", long 100°55'15", on north line of sec.19, T.146 N., R.80 W., McLean County, on downstream end of twin culverts on State Highway 7, 2.5 miles downstream from Lake Ordway and 4 miles southwest of Turtle Lake.

DRAINAGE AREA.--310 sq mi, approximately, of which about 195 sq mi is probably noncontributing.

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

GAGE.--Water-stage recorder. Altitude of gage is 1,805 ft (from topographic map).

AVERAGE DISCHARGE.--15 years, 0.41 cfs (297 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, about 15 cfs March 27 (gage height, 4.60 ft from floodmark, backwater from ice); no flow for several months.
Period of record: Maximum discharge, 326 cfs Apr. 8, 1969 (gage height, 5.06 ft); maximum gage height, 6.2 ft Mar. 2, 1967 (backwater from snow), from floodmark; no flow most of time each year.

REMARKS.--Records poor.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1					0	1.0	3.5	3.5	.09	.38		
2					0	.70	2.5	3.0	.08	.24		
3					0	.50	2.0	3.0	.07	.18		
4					0	.40	2.0	2.5	.66	.17		
5					0	.30	2.0	2.4	1.0	.13		
6					0	.30	2.0	2.4	.46	.10		
7					0	.30	2.0	2.5	.34	.06		
8					0	.20	2.0	2.4	.27	.04		
9					0	.10	2.0	2.3	.19	.02		
10					0	.10	2.0	2.3	.19	.01		
11					0	.15	1.5	2.1	2.5	0		
12					0	9.5	1.5	1.9	.74	.13		
13					0	9.0	1.5	1.6	.38	.21		
14					0	8.0	1.5	1.5	.24	.13		
15					0	6.0	1.5	1.2	.21	.10		
16					.50	5.0	1.5	1.0	.24	.07		
17					1.0	4.0	2.0	.87	2.5	.05		
18					3.0	3.5	4.0	.82	.80	.03		
19					2.0	3.0	5.0	.78	.40	.02		
20					1.0	3.0	4.0	.70	.20	.01		
21					.40	3.0	3.5	.54	.40	0		
22					.20	2.0	4.0	.50	.30	0		
23					.10	1.5	3.5	.46	.20	0		
24					0	1.0	3.0	.34	.80	0		
25					2.0	1.0	2.5	.27	.60	0		
26					5.0	5.0	2.5	.19	.40	0		
27					4.0	10	3.0	.15	.30	0		
28					2.0	5.5	3.5	.11	.27	0		
29					------	10	4.0	.07	.27	0		
30					------	11	3.5	.06	.54	0		------
31		------			------	5.0	------	.07	------	0		
TOTAL	0	0	0	0	21.20	110.05	79.0	41.53	15.64	2.08	0	0
MEAN	0	0	0	0	.76	3.55	2.63	1.34	.52	.067	0	0
MAX	0	0	0	0	5.0	11	5.0	3.5	2.5	.38	0	0
MIN	0	0	0	0	0	.10	1.5	.06	.07	0	0	0
AC-FT	0	0	0	0	42	218	157	82	31	4.1	0	0

CAL YR 1970 TOTAL 262.43 MEAN .72 MAX 30 MIN 0 AC-FT 521
WTR YR 1971 TOTAL 269.50 MEAN .74 MAX 11 MIN 0 AC-FT 535

PEAK DISCHARGE (BASE, 10 CFS).--MARCH 27 (15 CFS); MARCH 30 (12 CFS).

06341800 Painted Woods Creek near Wilton, N. Dak.

LOCATION.--Lat 47°16'30", long 100°47'30", in SW¼SW¼ sec.23, T.144 N., R.80 W., McLean County, on right bank 600 ft upstream from county highway bridge, 7 miles upstream from Yanktonai Creek, and 8 miles north of Wilton.

DRAINAGE AREA.--427 sq mi, approximately, of which about 310 sq mi probably is noncontributing.

PERIOD OF RECORD.--October 1957 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 1,760 ft (from topographic map).

AVERAGE DISCHARGE.--14 years, 6.45 cfs (4,670 acre-ft per year); median of yearly mean discharges, 4.6 cfs (3,300 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 303 cfs Mar. 29 (gage height, 6.29 ft); no flow Jan. 5 to Feb. 13. Period of record: Maximum discharge, 1,800 cfs Apr. 9, 1969 (gage height, 8.12 ft, backwater from ice); maximum gage height, 8.67 ft Mar. 15, 1966 (backwater from ice); no flow for many days each year.

REMARKS.--Records good. Flows during summer increased due to aquifer dewatering for the McClusky Canal. Records of chemical analyses for the 1971 water year are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.11	.50	.44	.02	0	9.0	135	5.7	20	31	34	.76
2	.09	.85	.44	.02	0	11	88	5.3	31	18	16	.85
3	.10	.84	.45	.01	0	11	85	4.8	39	12	7.8	.82
4	.12	.66	.42	.01	0	4.8	84	4.4	54	8.7	4.4	1.1
5	.12	.69	.36	0	0	3.2	84	4.1	154	9.6	2.6	4.9
6	.14	.56	.32	0	0	1.9	54	3.5	52	7.3	15	2.9
7	.14	.53	.32	0	0	.87	45	3.1	38	5.4	37	2.0
8	.15	.53	.32	0	0	.49	36	2.8	34	9.9	31	12
9	.16	.56	.31	0	0	.45	26	2.5	58	40	14	19
10	.16	.50	.29	0	0	.93	21	2.6	64	41	6.5	9.3
11	.16	.56	.27	0	0	3.5	16	3.1	64	41	8.2	5.5
12	.16	.58	.25	0	0	11	13	3.5	54	28	35	3.2
13	.16	.59	.24	0	0	54	11	3.4	47	14	39	2.2
14	.16	.53	.24	0	.02	58	9.1	3.1	50	8.4	34	1.4
15	.18	.50	.23	0	.18	45	7.5	2.8	50	5.5	15	1.1
16	.21	.50	.22	0	.24	31	6.4	9.1	53	4.2	7.0	.96
17	.24	.50	.21	0	.56	39	6.4	39	55	3.2	4.2	.88
18	.23	.54	.19	0	2.9	35	6.7	39	57	2.4	10	.80
19	.24	.57	.18	0	.39	29	5.8	26	53	1.9	36	.80
20	.24	.56	.17	0	.12	27	6.3	14	51	1.4	39	.71
21	.27	.66	.16	0	.10	37	6.0	14	52	1.3	30	.61
22	.30	.55	.15	0	.01	28	5.4	12	50	34	13	3.6
23	.30	.43	.14	0	.02	20	5.0	8.6	48	49	6.9	39
24	.34	.46	.12	0	2.3	17	4.6	6.8	50	39	3.6	42
25	.39	.55	.06	0	2.6	13	4.1	5.5	54	37	2.2	33
26	.39	.52	.04	0	6.8	21	3.6	4.4	49	21	1.6	34
27	.37	.52	.04	0	12	27	4.4	4.2	49	9.7	1.2	20
28	.35	.42	.03	0	13	59	5.2	4.3	48	14	.94	9.6
29	.52	.40	.03	0	------	145	5.7	34	48	39	.71	26
30	.57	.39	.02	0	------	202	5.9	44	47	41	.75	35
31	.52	------	.03	0	------	216	------	38	------	40	.79	------
TOTAL	7.59	16.55	6.69	.06	41.24	1,161.14	796.1	357.6	1,573	617.9	457.39	313.99
MEAN	.24	.55	.22	.002	1.47	37.5	26.5	11.5	52.4	19.9	14.8	10.5
MAX	.57	.85	.45	.02	13	216	135	44	154	49	39	42
MIN	.09	.39	.02	0	0	.45	3.6	2.5	20	1.3	.71	.61
AC-FT	15	33	13	.1	82	2,300	1,580	709	3,120	1,230	907	623

CAL YR 1970 TOTAL 2,704.95 MEAN 7.41 MAX 348 MIN .02 AC-FT 5,370
WTR YR 1971 TOTAL 5,349.25 MEAN 14.7 MAX 216 MIN 0 AC-FT 10,610

PEAK DISCHARGE (BASE, 30 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
3-14	0045	5.75	88	6- 5	0300	6.00	261
3-29	2045	6.29	303				

06342100 Square Butte Creek tributary No. 2 near Center, N. Dak.

LOCATION.--Lat 47°06'40", long 101°15'05", in NE¼NE¼ sec.24, T.142 N., R.84 W., Oliver County, on right bank 60 ft upstream from county highway bridge, 2.1 miles southeast of Center.

DRAINAGE AREA.--13.0 sq mi.

PERIOD OF RECORD.--December 1954 to April 1965 (annual maximum only). May 1965 to current year.

GAGE.--Water-stage recorder. Prior to May 1965, crest-stage only at site 1,000 ft upstream at datum 1.48 ft higher.

AVERAGE DISCHARGE.--6 years, 1.13 cfs (819 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, about 200 cfs Mar. 29 (gage height, 8.30 ft, backwater from ice); no flow on many days.
Period of record: Maximum discharge, 2,500 cfs July 16, 1957 (gage height, 7.98 ft, site and datum then in use); no flow for several months each year.

REMARKS.--Records fair.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.25	.40	.45		0	C	28	.65	.45	.40	.10	.02
2	.25	.45	.45		0	0	18	.58	.35	.35	.10	.02
3	.25	.45	.40		0	C	10	.58	.30	.35	.10	.02
4	.25	.45	.40		0	0	11	.51	.40	.30	.10	.03
5	.25	.45	.40		0	0	16	.45	.79	.30	.10	.58
6	.30	.40	.35		0	0	29	.45	.45	.30	.10	.20
7	.30	.40	.35		0	0	20	.58	.35	.40	.07	.10
8	.30	.45	.35		0	C	13	.58	.30	.35	.07	.07
9	.30	.45	.35		0	0	9.0	.58	.25	.30	.07	.07
10	.30	.40	.30		0	0	8.8	.72	.45	.30	.05	.07
11	.25	.35	.30		0	0	6.0	.72	.40	.45	.05	.05
12	.25	.35	.25		0	4.0	2.5	.72	.72	34	.07	.05
13	.25	.35	.25		0	5.0	1.9	.58	.45	7.1	.07	.03
14	.25	.30	.20		0	5.0	2.1	.58	.35	.79	.07	.03
15	.25	.30	.20		0	4.0	1.8	.58	.35	.40	.05	.05
16	.20	.30	.15		0	3.0	1.8	.58	.35	.35	.03	.13
17	.20	.30	.10		0	2.0	.95	.65	1.2	.30	.03	.30
18	.20	.25	.05		0	1.2	3.6	.65	.58	.30	.03	.20
19	.20	.25	0		0	1.2	1.7	.65	.45	.25	.05	.13
20	.20	.20	C		0	2.0	1.4	.51	.35	.16	.05	.13
21	.20	.20	0		0	1.6	1.2	.45	2.9	.16	.03	.13
22	.20	.15	0		0	1.2	.95	.45	.58	.13	.03	.13
23	.20	.10	0		C	1.0	.79	.51	.40	.13	.03	.13
24	.20	.10	C		.20	1.0	.72	.51	2.4	.13	.03	.13
25	.20	.15	C		1.0	2.0	.72	.30	.58	.13	.03	.13
26	.25	.20	C		.90	4.0	.65	.30	.45	.13	.03	.13
27	.25	.40	0		.40	20	1.0	.30	.45	.16	.02	.13
28	.25	.50	0		0	50	1.1	.25	.45	.20	.01	.13
29	.30	.50	0		------	60	.79	.25	.45	.16	.01	.13
30	.35	.50	0		------	33	.79	.30	.45	.13	.02	.13
31	.45	------	0		------	28	------	.51	------	.13	.02	------
TOTAL	7.85	10.05	5.30	C	2.50	229.2	195.26	16.03	18.40	49.04	1.62	3.58
MEAN	.25	.34	.17	C	.089	7.39	6.51	.52	.61	1.58	.052	.12
MAX	.45	.50	.45	C	1.0	60	29	.72	2.9	34	.10	.58
MIN	.20	.10	0	C	0	0	.65	.25	.25	.13	.01	.02
AC-FT	16	20	11	C	5.0	455	387	32	37	97	3.2	7.1

CAL YR 1970 TOTAL 550.97 MEAN 1.51 MAX 104 MIN 0 AC-FT 1,090
WTR YR 1971 TOTAL 538.83 MEAN 1.48 MAX 60 MIN 0 AC-FT 1,070

PEAK DISCHARGE (BASE, 50 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
3-29	--	--	about 200	7-12	0100	3.53	76
4- 6	--	--	67				

06342260 Square Butte Creek below Center, N. Dak.

LOCATION.--Lat 47°03'25", long 101°11'35", in SE¼ sec.4, T.141 N., R.83 W., Oliver County, on right bank at southeast corner of farmyard, 6 miles southeast of Center.

DRAINAGE AREA.--146 sq mi.

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

GAGE.--Water-stage recorder.

AVERAGE DISCHARGE.--6 years, 15.1 cfs (10,940 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 1,520 cfs Mar. 29 (gage height, 8.78 ft); minimum, 0.50 cfs on many days.
Period of record: Maximum discharge, 9,700 cfs June 24, 1966 (gage height, 14.35 ft); no flow Feb. 14-26, 1966.

REMARKS.--Records poor. Flow regulated by Nelson Lake 1.5 miles upstream beginning Aug. 24, 1967 (capacity, 5,000 acre-ft).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.90	2.6	1.4	1.6	1.6	1.5	71	7.0	1.2	1.6	1.7	1.6
2	.90	3.0	1.2	1.6	1.6	1.5	13	5.5	1.2	1.4	1.7	1.4
3	.90	2.1	1.0	1.6	1.6	1.5	63	2.0	1.2	1.4	1.7	1.4
4	1.2	1.7	.90	1.6	1.6	1.6	31	.60	1.6	1.4	1.7	2.5
5	1.4	1.9	1.4	1.6	1.6	1.6	24	.60	1.4	1.4	1.7	3.2
6	1.4	1.9	1.2	1.6	1.5	1.5	66	.60	1.2	1.2	1.6	2.1
7	1.4	1.7	1.4	1.6	1.5	1.5	131	.60	1.2	1.6	1.6	2.1
8	1.4	1.7	1.2	1.6	1.5	1.5	138	.60	1.2	1.2	1.6	2.3
9	1.4	1.7	.90	1.6	1.5	1.5	59	.60	1.2	1.4	1.6	2.3
10	1.4	1.6	.90	1.6	1.5	3.0	59	.60	1.6	1.4	1.7	2.1
11	1.4	1.4	1.4	1.6	1.5	5.5	56	.55	16	24	1.7	2.1
12	1.4	1.4	1.6	1.6	1.5	6.0	5.9	.55	44	83	1.7	2.5
13	1.4	1.7	1.6	1.4	1.6	100	28	.55	1.7	.70	1.6	2.5
14	1.4	2.3	1.4	1.4	1.8	357	10	.55	1.4	1.7	1.6	2.3
15	1.4	2.1	1.4	1.4	2.0	65	39	.55	7.7	1.7	1.4	2.5
16	1.4	1.9	.90	1.4	2.5	62	18	.50	31	1.6	1.4	2.5
17	1.4	1.6	1.0	1.4	3.0	61	7.9	.50	2.1	1.6	1.4	3.2
18	1.6	2.1	1.4	1.4	2.5	62	8.1	.50	1.4	1.6	1.6	3.2
19	1.6	1.7	1.2	1.6	2.5	61	8.1	.50	1.4	1.6	1.6	3.0
20	1.2	1.4	.90	1.6	2.0	63	8.4	.50	1.4	1.6	1.4	3.2
21	2.1	1.2	.90	1.6	2.0	61	8.4	.50	41	1.6	1.4	3.2
22	1.7	1.2	.90	1.6	2.0	57	8.1	.60	2.5	1.6	1.4	3.0
23	1.7	1.2	1.0	1.6	2.0	56	25	1.0	1.6	1.6	1.4	3.0
24	1.6	.90	.90	1.6	2.2	38	42	1.0	40	1.6	1.4	3.0
25	1.2	.90	1.2	1.6	2.5	6.6	7.7	1.0	55	1.6	1.4	3.0
26	1.4	1.0	1.0	1.7	2.5	6.8	6.8	1.0	2.1	1.6	1.4	3.2
27	1.7	.70	1.6	1.7	2.0	12	7.0	.90	1.7	1.7	1.4	3.0
28	1.7	.80	3.5	1.7	2.0	135	7.4	.90	40	1.7	1.4	3.2
29	2.3	1.0	1.2	1.7	------	891	5.5	1.0	23	1.7	1.4	2.8
30	1.9	1.2	1.4	1.7	------	1,250	5.5	1.6	1.7	1.7	1.6	2.8
31	1.9	------	1.4	1.7	------	912	------	1.7	------	1.7	1.7	------
TOTAL	45.70	47.60	39.30	49.0	53.6	4,284.6	967.8	35.15	329.7	151.20	47.9	78.2
MEAN	1.47	1.59	1.27	1.58	1.91	138	32.3	1.13	11.0	4.88	1.55	2.61
MAX	2.3	3.0	3.5	1.7	3.0	1,250	138	7.0	55	83	1.7	3.2
MIN	.90	.70	.90	1.4	1.5	1.5	5.5	.50	1.2	.70	1.4	1.4
AC-FT	91	94	78	97	106	8,500	1,920	70	654	300	95	155

CAL YR 1970 TOTAL 4,901.18 MEAN 13.4 MAX 742 MIN .70 AC-FT 9,720
WTR YR 1971 TOTAL 6,129.75 MEAN 16.8 MAX 1,250 MIN .50 AC-FT 12,160

06342450 Burnt Creek near Bismarck, N. Dak.

LOCATION.--Lat 46°54'54", long 100°48'48", in SW¼NW¼SW¼ sec.29, T.140 N., R.80 W., Burleigh County, on left bank on upstream side of county highway bridge, 7 miles northwest of Bismarck.

DRAINAGE AREA.--108 sq mi.

PERIOD OF RECORD.--October 1967 to current year.

GAGE.--Water-stage recorder.

EXTREMES.--Current year: Maximum discharge, 350 cfs Mar. 30 (gage height, 10.67 ft); no flow for many days.
Period of record: Maximum discharge, 3,000 cfs Apr. 8, 1969 (gage height, 14.80 ft); no flow for several days each year.

REMARKS.--Records fair.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1		0	.22	.01	0	10	40	5.9	.74	2.6	.01	
2		0	.22	.01	0	5.0	40	5.9	.74	2.3	.01	
3		0	.22	.01	0	1.5	45	4.4	.78	1.8	.01	
4		0	.22	.01	0	1.0	40	3.7	1.0	1.0	.01	
5		.18	.22	.01	0	.50	35	3.0	2.0	.86	.01	
6		.47	.20	0	0	.50	35	2.7	1.5	.66	.01	
7		.54	.20	0	0	1.0	30	2.2	1.2	.58	.01	
8		.62	.18	0	0	2.0	25	2.1	1.0	.50	.01	
9		.66	.18	0	0	1.5	14	1.8	1.0	.50	.01	
10		.65	.18	0	0	2.0	12	1.7	.80	.41	0	
11		.65	.16	0	0	2.0	9.2	1.8	.80	.35	0	
12		.60	.16	0	0	5.0	7.3	1.8	.60	.74	0	
13		.60	.16	0	0	100	6.1	1.7	.60	.78	0	
14		.55	.16	0	0	200	5.0	1.7	.40	.44	0	
15		.55	.14	0	0	90	4.2	1.6	5.0	.44	0	
16		.50	.14	0	0	70	4.3	1.4	10	.26	0	
17		.50	.14	0	0	70	4.1	1.4	30	.22	0	
18		.45	.12	0	0	75	4.6	1.3	50	.16	0	
19		.45	.12	0	0	90	4.9	1.2	40	.15	0	
20		.40	.10	0	0	90	5.1	1.2	35	.11	0	
21		.35	.10	0	0	230	5.3	1.1	50	.10	0	
22		.30	.10	0	0	225	4.8	1.0	45	.07	0	
23		.25	.08	0	0	100	4.4	1.0	40	.05	0	
24		.25	.06	0	0	60	3.9	.96	36	.04	0	
25		.25	.04	0	0	50	3.7	.96	17	.01	0	
26		.25	.04	0	10	70	3.3	.90	11	.01	0	
27		.25	.04	0	20	90	3.5	.82	8.6	.01	0	
28		.25	.03	0	15	130	3.9	.74	7.4	.01	0	
29		.22	.03	0	------	250	4.9	.62	6.4	.01	0	
30		.22	.03	0	------	260	5.8	.58	4.0	.01	0	
31		------	.02	0	------	100	------	.70	------	.01	0	------
TOTAL	0	10.96	4.01	.05	45	2,382.00	414.3	57.88	408.56	15.19	.09	0
MEAN	0	.37	.13	.002	1.61	76.8	13.8	1.87	13.6	.49	.003	0
MAX	0	.66	.22	.01	20	260	45	5.9	50	2.6	.01	0
MIN	0	0	.02	0	0	.50	3.3	.58	.40	.01	0	0
AC-FT	0	22	8.0	.1	89	4,720	822	115	810	30	.2	0

CAL YR 1970 TOTAL 1,729.65 MEAN 4.74 MAX 180 MIN 0 AC-FT 3,430
WTR YR 1971 TOTAL 3,338.04 MEAN 9.15 MAX 260 MIN 0 AC-FT 6,620

PEAK DISCHARGE (BASE, 20 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
3-14	--	--	230	3-30	--	--	350
3-22	--	--	200	6-18	unknown	5.90	86

MISSOURI RIVER MAIN STEM

06342500 Missouri River at Bismarck, N. Dak.

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

DRAINAGE AREA.--186,400 sq mi, approximately.

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

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

AVERAGE DISCHARGE.--43 years (1928-71), 21,470 cfs (15,560,000 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 42,700 cfs May 27 (gage height, 10.63 ft); maximum gage height, 12.89 ft Jan. 29 (backwater from ice); minimum discharge, 21,300 cfs Oct. 13; minimum gage height, 6.37 ft Sept. 7.
Period of record: 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 Mar. 31, 1881 (ice jam), present site and datum.

REMARKS.--Records good. Many diversions from tributaries. Flow regulated by Lake Sakakawea 75.4 miles upstream (see station 06338000). Records of chemical analyses for the water year 1971 are published in Part 2 of this report.

REVISIONS (WATER YEARS).--WSP 716: 1929-30. WSP 1279: 1929(M). See also PERIOD OF RECORD.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	27,000	33,100	32,100	24,400	27,700	31,100	36,300	40,900	36,000	37,900	30,200	27,700
2	27,000	29,700	31,700	24,600	30,100	30,800	34,200	41,600	37,900	37,700	29,500	27,100
3	25,900	30,000	32,300	24,800	31,900	30,900	32,900	41,800	36,600	37,900	29,900	26,900
4	26,400	31,300	33,400	24,800	31,800	29,600	32,600	41,400	37,000	38,700	30,500	26,600
5	25,500	34,000	32,000	26,000	30,600	31,100	32,200	39,700	38,900	38,200	30,600	27,200
6	26,200	34,900	32,700	26,900	30,900	31,000	31,300	40,100	39,200	38,200	30,800	24,000
7	27,600	34,200	34,800	28,000	30,200	29,400	31,100	40,800	39,500	37,600	28,600	23,600
8	27,900	34,500	29,100	28,500	28,700	27,500	32,600	40,900	39,100	37,900	27,800	26,200
9	28,300	28,600	25,900	28,600	28,300	27,500	37,200	41,300	39,300	38,200	27,800	26,300
10	30,100	28,200	29,900	28,800	30,200	30,200	40,500	41,800	39,200	38,300	28,000	25,800
11	30,200	29,000	26,500	28,700	31,100	33,800	39,000	41,700	37,600	38,400	26,800	25,700
12	24,700	27,800	28,600	28,200	31,500	35,000	39,500	41,700	36,300	38,900	28,300	26,400
13	24,700	27,600	28,400	27,900	31,100	35,300	37,100	41,600	36,400	38,500	28,100	27,400
14	29,400	27,400	27,500	29,000	29,100	36,000	35,700	41,800	33,800	38,200	28,300	26,700
15	31,000	28,900	27,700	29,800	28,800	36,300	39,000	41,800	32,300	38,100	27,900	26,000
16	31,600	28,600	27,800	29,600	28,800	36,300	40,200	41,800	32,700	38,200	28,100	27,000
17	30,600	28,400	27,500	29,100	29,600	35,900	39,600	42,400	33,700	38,200	27,700	26,500
18	28,200	29,100	26,200	29,200	29,700	36,000	41,200	42,000	33,000	38,400	28,100	26,900
19	26,200	28,600	25,000	29,100	29,600	34,800	40,900	42,200	36,800	38,400	26,600	26,400
20	26,600	28,600	24,000	28,200	29,100	33,100	40,200	42,200	37,600	38,300	27,800	23,800
21	26,000	28,300	23,800	28,800	28,100	32,600	40,500	42,000	37,400	38,900	30,600	25,200
22	27,100	31,800	23,600	29,100	27,200	32,200	40,600	42,300	37,000	37,400	30,200	27,100
23	27,300	33,500	23,800	29,500	27,500	32,600	41,200	42,300	38,500	37,100	29,000	26,800
24	30,200	34,200	23,800	29,700	29,500	32,300	41,900	42,000	39,500	36,100	28,800	26,900
25	31,500	34,000	24,000	29,900	31,300	31,800	41,500	41,400	39,500	34,900	28,900	26,700
26	30,200	33,300	24,000	29,500	32,000	32,000	41,800	38,900	39,700	34,800	29,400	27,300
27	31,100	33,500	24,000	29,600	31,100	32,400	42,400	38,400	38,800	34,900	30,400	24,900
28	31,700	33,700	24,000	29,000	30,400	32,600	40,900	38,400	38,700	32,600	29,900	25,300
29	33,900	34,000	24,000	29,600	------	32,300	41,100	37,900	39,400	32,000	30,400	27,200
30	33,100	33,100	24,000	29,500	------	35,800	41,400	38,900	39,400	30,600	29,800	26,300
31	33,300	------	24,400	28,900	------	37,500	------	37,300	------	30,800	27,400	------
TOTAL	890,500	931,900	846,500	877,300	835,900	1,015.7M	1,146.6M	1,269.3M	1,120.8M	1,144.3M	896,200	787,900
MEAN	28,730	31,060	27,310	28,300	29,850	32,760	38,220	40,950	37,360	36,910	28,910	26,260
MAX	33,900	34,900	34,800	29,900	32,000	37,500	42,400	42,400	39,700	38,900	30,800	27,700
MIN	24,700	27,400	23,600	24,400	27,200	27,500	31,100	37,300	32,300	30,600	26,600	23,600
AC-FT	1,766M	1,848M	1,679M	1,740M	1,658M	2,015M	2,274M	2,518M	2,223M	2,270M	1,778M	1,563M

CAL YR 1970 TOTAL 10,344,500 MEAN 28,340 MAX 41,100 MIN 13,800 AC-FT 20,520,000
WTR YR 1971 TOTAL 11,762,900 MEAN 32,230 MAX 42,400 MIN 23,600 AC-FT 23,330,000

06343500 Edward Arthur Patterson Lake near Dickinson, N. Dak.

LOCATION.--Lat 46°52'11", long 102°49'37", in NE¼NW¼SW¼ sec.8, T.139 N., R.96 W., Stark County, at left edge of spillway, 2 miles southwest of Dickinson.

DRAINAGE AREA.--400 sq mi, approximately.

PERIOD OF RECORD.--May 1950 to current year. Prior to October 1958, published as Dickinson Reservoir near Dickinson.

GAGE.--Water-stage recorder. Datum of gage is 2,400.00 ft above mean sea level (levels by Bureau of Reclamation); gage readings have been reduced to elevations above mean sea level. Prior to Jan. 4, 1961, nonrecording gage at same site and datum.

EXTREMES.--Current year: Maximum contents, 8,090 acre-ft Mar. 30 (elevation, 2,418.08 ft); minimum, 5,170 acre-ft Sept. 4 (elevation, 2,414.43 ft).
Period of record: Maximum contents, 11,180 acre-ft May 9, 1970 (elevation, 2,420.81 ft); minimum since initial filling of reservoir, 2,950 acre-ft Mar. 16, 1962 (elevation, 2,410.41 ft).

REMARKS.--Reservoir is formed by earth-fill dam; storage began May 23, 1950; dam completed Aug. 9, 1950. Total capacity is 24,600 acre-ft at maximum pool (elevation, 2,428.9 ft). Dead storage is 1,000 acre-ft below lowest point of outlet (elevation, 2,404.0 ft). Conservation storage is 5,600 acre-ft between elevation, 2,404.0 and 2,416.5 ft (crest of spillway). The reservoir is for flood control, irrigation, and municipal supply. Figures given herein represent total contents.

MAXIMUM ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	2,414.89	5,470	
Oct. 31	2,414.60	5,280	-190
Nov. 30	2,414.79	5,400	+120
Dec. 31	2,414.77	5,390	-10
CAL YR 1970	--	--	+340
Jan. 31	2,414.78	5,400	+10
Feb. 28	2,415.8	6,120	+720
Mar. 31	2,417.79	7,810	+1,690
Apr. 30	2,416.61	6,770	-1,040
May 31	2,416.21	6,440	-330
June 30	2,416.54	6,710	+270
July 31	2,415.64	6,000	-710
Aug. 31	2,414.55	5,250	-759
Sept. 30	2,414.70	5,350	+100
WTR YR 1971	--	--	-120

06344000 Heart River below Dickinson Dam, near Dickinson, N. Dak.

LOCATION.--Lat 46°51'43", long 102°48'58", in SE¼SW¼SE¼ sec.8, T.139 N., R.96 W., Stark County, on left bank 1 mile downstream from Dickinson Dam and 1.8 miles southwest of Dickinson.

DRAINAGE AREA.--404 sq mi, approximately.

PERIOD OF RECORD.--October 1951 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,377.92 ft above mean sea level.

AVERAGE DISCHARGES.--20 years, 25.6 cfs (18,550 acre-ft per year); median of yearly mean discharges, 17 cfs (12,300 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 1,200 cfs Mar. 30 (gage height, 8.15 ft); minimum, 0.16 cfs Oct. 1, Sept. 29; minimum gage height, 1.34 ft July 11, 12.
Period of record: Maximum discharge, 6,970 cfs May 9, 1970 (gage height, 15.85 ft); no flow at times in some years.
Flood in April 1950 reached a stage of 14.5 ft from floodmarks.

REMARKS.--Records fair. Flow regulated by Edward Arthur Patterson Lake 1 mile upstream (see station 06343500). Some diversions above station by city of Dickinson and for irrigation.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.19	.81	.53	.45	.34	.4	506	21	.82	11	3.0	1.0
2	.22	.76	.58	.44	.31	.4	257	18	1.0	7.0	3.0	1.0
3	.31	.76	.62	.45	.31	.4	140	15	.82	9.0	2.9	1.0
4	.37	.67	.61	.40	.31	.4	85	13	.34	5.4	2.8	1.0
5	.46	.69	.60	.40	.30	.4	54	11	61	2.5	2.6	1.0
6	.64	.74	.58	.40	.31	.4	42	9.0	148	1.6	2.4	.82
7	.76	.70	.61	.40	.28	.4	41	7.1	171	2.8	2.4	.76
8	.88	.64	.63	.37	.28	.4	42	9.6	119	2.0	2.7	.76
9	.94	.66	.60	.38	.31	.4	42	6.2	72	1.8	2.6	.76
10	1.1	.64	.61	.37	.31	.4	42	4.7	44	1.6	2.3	.70
11	1.1	.53	.58	.37	.32	.4	39	4.7	30	1.4	2.0	.64
12	1.2	.53	.65	.37	.34	3.0	30	8.0	21	1.5	1.6	.58
13	1.2	.52	.63	.34	.34	435	25	14	72	1.7	1.4	.52
14	1.2	.44	.54	.34	.34	882	22	9.2	73	3.5	1.2	.46
15	1.3	.49	.57	.34	.37	900	18	7.2	55	4.7	1.2	.44
16	1.1	.41	.56	.34	.37	688	27	4.9	39	4.5	1.2	.42
17	.94	.37	.56	.31	.37	645	9.5	9.8	108	4.5	1.1	.46
18	1.1	.39	.53	.31	.40	701	21	2.4	257	4.5	1.1	.44
19	1.2	.39	.54	.29	.40	589	34	1.4	393	4.5	1.1	.40
20	1.2	.42	.55	.31	.40	414	108	1.3	347	4.5	1.1	.57
21	1.2	.46	.51	.33	.40	502	442	1.2	403	4.5	1.1	.60
22	1.3	.51	.52	.34	.43	613	652	1.2	289	7.3	1.1	.50
23	.90	.43	.49	.34	.41	496	470	1.2	179	7.3	1.1	.36
24	.99	.39	.46	.37	.40	339	222	.94	115	7.0	1.1	.30
25	.99	.46	.45	.37	.41	235	112	.94	86	6.5	1.0	.25
26	.99	.46	.44	.37	.40	167	67	.88	73	6.5	1.0	.25
27	.97	.54	.43	.37	.38	156	54	.94	45	6.3	1.1	.25
28	1.0	.52	.45	.37	.38	352	42	.94	26	4.9	1.0	.22
29	.92	.52	.45	.37	------	767	38	.88	17	3.3	1.1	.18
30	.82	.52	.41	.38	------	1,160	28	1.0	22	3.0	1.0	.21
31	.82	------	.43	.37	------	952	------	.94	------	3.0	1.1	------
TOTAL	28.31	16.37	16.72	11.36	9.92	11,000.4	3,711.5	188.56	3,267.98	139.6	51.4	16.85
MEAN	.91	.55	.54	.37	.35	355	124	6.08	109	4.50	1.66	.56
MAX	1.3	.81	.65	.45	.43	1,160	652	21	403	11	3.0	1.0
MIN	.19	.37	.41	.29	.28	.40	9.5	.88	.34	1.4	1.0	.18
AC-FT	56	32	33	23	20	21,820	7,360	374	6,480	277	102	33

CAL YR 1970 TOTAL 22,659.83 MEAN 62.1 MAX 5,820 MIN .10 AC-FT 44,950
WTR YR 1971 TOTAL 18,458.97 MEAN 50.6 MAX 1,160 MIN .18 AC-FT 36,610

06344600 Green River near New Hradec, N. Dak.

LOCATION.--Lat 47°01'40", long 103°03'10", Billings County, on left bank below county highway bridge on line between secs.13 and 14, T.141 N., R.98 W., 8 miles west of New Hradec.

DRAINAGE AREA.--152 sq mi, approximately.

PERIOD OF RECORD.--February 1964 to current year.

GAGE.--Water-stage recorder.

AVERAGE DISCHARGE.--7 years, 17.3 cfs (12,530 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 1,680 cfs June 11 (gage height, 14.4 ft); no flow Aug. 10-13. Period of record: Maximum discharge, 4,120 cfs May 9, 1970 (gage height, 16.88 ft); maximum gage height, 16.93 ft July 5, 1964; no flow at times.

REMARKS.--Records fair.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.1	1.7	1.8	.84	.71	3.9	107	6.6	2.8	3.9	.30	.22
2	1.1	2.3	1.8	.84	1.1	2.4	66	6.0	3.1	3.1	.22	.30
3	1.1	2.3	1.8	.84	1.4	1.9	32	5.5	2.6	2.7	.22	.30
4	1.0	2.1	1.7	.84	1.4	2.0	17	5.2	3.1	2.3	.12	.77
5	.84	2.0	1.4	.84	1.4	2.5	15	4.7	6.8	2.0	.18	3.1
6	.93	2.0	1.4	.93	1.4	2.4	14	4.1	10	1.5	.16	16
7	.92	2.0	1.4	.86	1.1	2.7	24	5.0	13	1.0	.14	22
8	.84	2.2	1.4	.84	1.1	2.4	33	5.2	11	.84	.34	12
9	.84	2.2	1.4	.84	1.1	2.1	21	4.1	9.2	.70	.06	7.7
10	.84	2.4	1.2	.84	1.1	2.3	17	4.7	35	.63	0	5.2
11	.84	2.6	1.2	.84	1.1	4.8	13	5.1	406	.93	0	3.0
12	.84	2.7	1.1	.84	1.1	38	12	5.0	45	.39	0	1.9
13	.96	2.7	1.1	.84	1.1	207	9.9	4.7	28	.51	0	.82
14	1.0	2.7	1.1	.93	1.1	431	8.5	3.8	20	.39	.01	.68
15	1.1	2.9	1.1	.93	1.1	217	7.6	3.6	14	.45	.01	.43
16	1.1	2.9	1.0	.93	1.1	196	7.1	3.2	10	.51	.01	.47
17	1.1	2.9	.93	.93	1.2	270	6.5	2.8	9.0	.26	.01	.37
18	1.1	2.9	.93	.93	1.4	266	7.4	2.8	7.0	.22	.01	.34
19	1.3	2.9	.93	.93	1.8	128	11	2.5	5.0	.26	.01	.41
20	1.3	2.9	.93	1.0	2.9	114	53	2.3	4.0	.30	.04	.59
21	1.3	2.9	1.0	1.0	3.1	288	457	2.3	3.8	.30	.06	.63
22	1.3	2.4	1.0	1.0	3.6	180	171	2.3	44	.34	.06	.68
23	1.2	1.9	1.0	1.0	3.1	104	36	3.6	18	.30	.06	.77
24	1.1	1.7	.93	1.1	2.4	66	17	4.3	12	.26	.06	1.5
25	1.1	1.8	.91	1.1	3.4	40	13	3.9	9.1	.22	.01	1.2
26	1.3	1.8	.84	1.1	4.4	26	10	3.6	7.0	.18	.02	.40
27	1.3	2.0	.84	1.3	3.5	80	8.8	3.0	5.0	.51	.06	1.1
28	1.3	2.0	.84	1.3	5.3	346	8.2	2.7	4.4	.70	.09	.89
29	1.3	2.0	.86	1.3	------	543	8.0	2.0	3.7	.45	.06	.89
30	1.3	2.0	.84	1.4	------	790	6.9	2.0	4.1	.45	.02	.76
31	1.3	------	.84	1.3	------	541	------	2.2	------	.26	.06	------
TOTAL	33.95	69.8	35.52	30.51	54.51	4,900.4	1,217.9	118.8	755.7	26.86	2.40	85.42
MEAN	1.10	2.33	1.15	.98	1.95	158	40.6	3.83	25.2	.87	.077	2.85
MAX	1.3	2.9	1.8	1.4	5.3	790	457	6.6	406	3.9	.34	22
MIN	.84	1.7	.84	.84	.71	1.9	6.5	2.0	2.6	.18	0	.22
AC-FT	67	138	70	61	108	9,720	2,420	236	1,500	53	4.8	169

CAL YR 1970 TOTAL 10,807.23 MEAN 29.6 MAX 2,530 MIN .57 AC-FT 21,440
WTR YR 1971 TOTAL 7,331.77 MEAN 20.1 MAX 790 MIN 0 AC-FT 14,540

PEAK DISCHARGE (BASE, 100 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
3-14	--	--	460	4-21	1500	10.65	700
3-17	--	--	325	6-11	2330	14.4	1,680
3-21	--	--	325	6-22	0200	5.82	102
3-30	--	--	930				

06345000 Green River near Gladstone, N. Dak.

LOCATION.--Lat 46°53'40", long 102°37'25", in SW¼ sec.36, T.140 N., R.95 W., Stark County, on right bank 0.5 mile upstream from county highway bridge, 3.5 miles northwest of Gladstone, 3.5 miles upstream from mouth, and 8 miles downstream from Russian Spring Creek.

DRAINAGE AREA.--356 sq mi.

PERIOD OF RECORD.--October 1945 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,311.55 ft above mean sea level. See WSP 1729 or 1917 for history of changes prior to June 27, 1953.

AVERAGE DISCHARGE.--26 years, 34.4 cfs (24,920 acre-ft per year); median of yearly mean discharges, 35 cfs (25,400 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 1,200 cfs June 10 (gage height, 8.06 ft); maximum gage height, 8.78 ft Mar. 14 (backwater from ice); minimum discharge, 1.3 cfs Sept. 1 (gage height, 0.88 ft); minimum gage height, 0.87 ft Aug. 19, 20.
Period of record: Maximum discharge, 5,260 cfs Apr. 15, 1950 (gage height, 18.3 ft, from floodmark, site and datum then in use); no flow at times in some years.

REMARKS.--Records good except those for the winter period, which are fair. A few diversions above station for irrigation of hay meadows and washing of sand and gravel.

REVISIONS (WATER YEARS).--WSP 1917: 1954(M).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.9	7.6	8.0	5.2	6.5	10	700	30	12	13	3.1	1.4
2	8.1	8.0	8.0	5.2	6.5	10	300	28	35	11	3.2	1.6
3	5.6	8.8	7.6	5.2	6.6	10	150	28	74	10	3.0	1.8
4	4.3	8.8	7.6	5.2	6.6	21	130	24	76	10	2.4	1.9
5	3.7	8.4	7.5	5.2	6.6	44	97	23	132	9.3	2.7	17
6	3.1	8.4	7.5	5.2	6.6	21	87	20	43	8.5	2.8	18
7	4.5	8.0	7.5	5.2	6.6	10	83	20	80	7.2	2.5	20
8	5.6	8.0	7.5	5.2	6.6	10	80	18	28	5.6	2.4	14
9	5.9	8.4	7.0	5.2	6.6	15	81	19	28	5.3	2.5	21
10	5.6	8.8	7.0	5.2	10	15	88	24	515	5.6	2.3	28
11	5.9	8.8	7.0	5.2	20	20	73	22	78	6.0	2.0	18
12	6.7	8.4	7.0	5.2	22	107	55	19	45	7.1	2.1	12
13	6.3	9.2	7.0	5.2	24	700	42	16	173	4.9	2.1	9.0
14	8.0	9.2	7.0	5.2	26	720	36	15	129	4.0	2.0	6.5
15	7.6	9.7	7.0	5.2	28	700	32	15	74	4.0	1.9	5.4
16	5.9	9.2	7.0	5.5	34	604	29	14	49	3.8	1.9	4.6
17	6.3	9.7	7.0	5.5	40	540	27	13	93	3.9	1.9	3.9
18	7.6	9.7	7.0	5.5	31	610	30	12	115	4.0	1.8	3.2
19	6.7	9.7	6.0	5.5	30	590	36	11	99	3.9	1.6	3.6
20	5.9	9.7	6.0	5.5	30	460	52	11	63	3.5	1.5	4.2
21	6.7	9.7	6.0	6.0	30	460	197	10	43	3.1	1.7	4.4
22	6.3	9.7	5.5	6.0	20	500	512	9.9	39	3.4	1.8	4.2
23	5.9	8.8	5.5	6.0	10	460	390	11	30	2.8	1.8	4.0
24	5.6	12	5.5	6.0	9.0	300	152	9.8	57	3.2	1.8	3.6
25	5.9	10	5.2	6.0	30	190	98	9.3	52	3.2	1.8	3.5
26	5.9	10	5.2	6.0	44	130	71	9.9	34	3.1	1.8	3.5
27	4.5	9.2	5.2	6.0	30	115	55	9.6	26	3.0	1.8	3.8
28	7.1	8.0	5.2	6.0	20	210	44	9.3	21	2.7	2.0	3.1
29	7.6	8.0	5.2	6.0	------	492	38	9.0	18	2.8	2.1	3.4
30	7.6	8.0	5.2	6.0	------	800	33	9.9	15	3.1	1.6	3.8
31	7.6	------	5.2	6.0	------	800	------	12	------	2.5	1.5	------
TOTAL	188.9	269.9	202.1	171.5	547.2	9,674	3,798	491.7	2,276	163.5	65.4	232.4
MEAN	6.09	9.00	6.52	5.53	19.5	312	127	15.9	75.9	5.27	2.11	7.75
MAX	8.1	12	8.0	6.0	44	800	700	30	515	13	3.2	28
MIN	3.1	7.6	5.2	5.2	6.5	10	27	9.0	12	2.5	1.5	1.4
AC-FT	375	535	401	340	1,090	19,190	7,530	975	4,510	324	130	461

CAL YR 1970 TOTAL 26,182.0 MEAN 71.7 MAX 3,040 MIN 3.1 AC-FT 51,930
WTR YR 1971 TOTAL 18,080.6 MEAN 49.5 MAX 800 MIN 1.4 AC-FT 35,860

PEAK DISCHARGE (BASE, 500 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
3-14	--	--	830	4-22	2300	5.64	650
3-30	--	--	930	6-10	0400	8.06	1,200

06345500 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., Stark County, on right bank 5 ft upstream from bridge on State Highway 8, 0.5 mile downstream from Blacktail Creek, and 9.5 miles south of Richardton.

DRAINAGE AREA.--1,240 sq mi, approximately.

PERIOD OF RECORD.--May 1903, to September 1922, April 1943 to current year. Monthly discharge only for some periods, published in WSP 1309.

Gage.--Water-stage recorder. Datum of gage is 2,153.67 ft above mean sea level. May 18, 1903, to Sept. 30, 1922, nonrecording gage at 3 sites in 1-mile reach below present site at different datums. Apr. 14, 1943, to July 7, 1947, nonrecording gage at present site and datum.

AVERAGE DISCHARGE.--47 years, 101 cfs (73,170 acre-ft per year); median of yearly mean discharges, 94 cfs (68,100 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 3,230 cfs Mar. 29 (gage height, 15.59 ft, backwater from ice); minimum daily, 2.5 cfs Aug. 16, 17; minimum gage height, 4.38 ft Aug. 9.
Period of record: Maximum discharge, 23,400 cfs Apr. 16, 1950 (gage height, 28.05 ft, from high-water mark in gage well; no flow at times in some years.
Flood of July 5, 1938, reached a stage of about 26 ft, from information by 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. Flow regulated by Edward Arthur Patterson Lake 59 miles upstream (see station 06343500).

REVISIONS (WATER YEARS).--WSP 1209: Drainage area. WSP 1239: 1906, 1918(M), 1947(M).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	20	20	11	15	180	1,910	128	34	80	12	4.4
2	17	21	22	11	15	158	1,120	110	35	75	12	5.4
3	18	21	23	11	15	110	570	95	35	67	11	5.4
4	19	21	21	11	15	90	385	86	122	57	8.3	6.4
5	21	21	20	10	15	73	303	79	387	53	5.9	13
6	20	21	18	10	15	81	250	71	221	51	4.9	29
7	18	22	19	9.0	15	90	238	65	222	44	3.5	42
8	17	23	20	8.0	15	133	224	61	279	40	5.6	29
9	17	23	22	7.0	15	103	217	59	217	37	4.4	23
10	16	23	22	6.0	15	84	205	107	408	34	3.2	18
11	18	24	24	6.0	20	83	200	109	422	33	3.0	20
12	19	24	25	6.0	20	160	181	86	170	34	3.5	22
13	19	23	24	6.0	20	1,500	159	69	119	32	3.0	17
14	20	22	23	6.0	20	2,700	139	59	186	32	3.5	13
15	20	22	22	6.0	20	2,800	125	55	345	31	3.0	11
16	20	22	21	6.0	20	2,200	117	56	208	29	2.5	9.2
17	21	22	20	7.0	300	1,900	109	51	198	27	2.5	7.8
18	20	22	20	7.0	500	1,800	121	48	252	26	3.5	4.9
19	18	22	20	8.0	400	1,700	121	43	553	25	3.5	5.9
20	19	21	19	8.0	160	1,300	155	44	560	25	3.0	6.4
21	19	19	18	9.0	150	1,200	577	42	540	25	3.5	7.3
22	18	19	17	9.0	100	1,200	1,110	39	638	25	6.8	8.8
23	18	22	16	10	80	1,100	1,360	37	435	24	6.8	11
24	18	22	13	10	70	900	784	36	365	22	5.4	12
25	18	22	12	11	60	560	411	34	305	21	6.4	12
26	18	22	12	11	300	370	275	32	225	22	4.4	9.2
27	18	22	12	12	210	300	217	31	180	19	4.0	11
28	18	22	12	12	200	460	183	30	158	16	3.5	7.8
29	20	22	12	13	------	1,400	159	29	121	13	4.0	9.2
30	20	22	11	14	------	2,430	143	30	98	12	4.4	9.2
31	20	------	11	15	------	2,720	------	32	------	13	4.9	------
TOTAL	578	654	571	286.0	2,800	29,885	12,068	1,853	8,038	1,044	155.9	390.3
MEAN	18.6	21.8	18.4	9.23	100	964	402	59.8	268	33.7	5.03	13.0
MAX	21	24	25	15	500	2,800	1,910	128	638	80	12	42
MIN	16	19	11	6.0	15	73	109	29	34	12	2.5	4.4
AC-FT	1,150	1,300	1,130	567	5,550	59,280	23,940	3,680	15,940	2,070	309	774

CAL YR 1970 TOTAL 69,860.6 MEAN 191 MAX 9,470 MIN 2.5 AC-FT 138,600
WTR YR 1971 TOTAL 58,323.2 MEAN 160 MAX 2,800 MIN 2.5 AC-FT 115,700

PEAK DISCHARGE (BASE, 1,500 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
3-14	--	--	3,190	3-31	0400	13.79	3,020
3-29	--	--	3,230				

06346000 Lake Tschida near Glen Ullin, N. Dak.

LOCATION.--Lat 46°35'48", long 101°48'34", in SW¼NE¼ sec.13, T.136 N., R.89 W., Grant County, 10 miles upstream from Heart Butte Creek, 14 miles north of Elgin.

DRAINAGE AREA.--1,710 sq mi, approximately.

PERIOD OF RECORD.--August 1949 to current year. Prior to October 1957, published as Heart Butte Reservoir near Glen Ullin.

GAGE.--Nonrecording gage. Datum of gage is at mean sea level (levels by Bureau of Reclamation).

EXTREMES.--Current year: Maximum contents, 90,818 acre-ft Apr. 1 (elevation, 2,068.72 ft); mimimum, 56,247 acre-ft Oct. 21 (elevation, 2,058.34 ft).
Period of record: Maximum contents, 174,000 acre-ft Apr. 9, 1952 (elevation, 2,086.23 ft); minimum since first reaching spillway level, 40,840 acre-ft Mar. 6, 1962 (elevation, 2,052.5 ft).

REMARKS.--Reservoir is formed by earth-fill dam; storage began Sept. 29, 1949; dam completed Dec. 9, 1949. Total capacity is 430,000 acre-ft at maximum pool (elevation, 2,1118.2 ft). Dead storage is 6,750 acre-ft below lowest point of outlet (elevation, 2,030.0 ft). Active conservation storage is 69,030 acre-ft between elevation 2,030.0 and 2,064.5 ft (crest of spillway). Figures given herein represent total contents. Controlled releases are through 4 by 5 ft 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 elevations and contents furnished by Bureau of Reclamation.

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	2,058.61	57,044	
Oct. 31	2,058.50	56,719	-325
Nov. 30	2,059.11	58,528	+1,809
Dec. 31	2,059.18	58,741	+213
CAL YR 1970	--	--	-5,187
Jan. 31	2,059.18	58,741	0
Feb. 28	2,062.43	68,909	+10,168
Mar. 31	2,068.20	88,884	+19,975
Apr. 30	2,066.16	81,524	-7,360
May 31	2,065.00	77,483	-4,041
June 30	2,066.03	81,063	+3,580
July 31	2,063.73	73,189	-7,874
Aug. 31	2,061.08	64,586	-8,603
Sept. 30	2,059.56	59,892	-4,694
WTR YR 1971	--	--	+2,848

06346500 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., Grant County, 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.

PERIOD OF RECORD.--April 1943 to current year. Published as "near Glen Ullin" prior to October 1948.

GAGE.--Water-stage recorder. Datum of gage is 1,998.87 ft above mean sea level (levels by Corps of Engineers). Prior to Aug. 24, 1943, nonrecording gage and Aug. 24, 1943, to May 31, 1947, water-stage recorder at site 4 miles upstream at different datum.

AVERAGE DISCHARGE.--28 years, 135 cfs (97,810 acre-ft per year); median of yearly mean discharges, 130 cfs (94,200 acre-ft per year).

Extremes.--Current year: Maximum discharge, 2,220 cfs Apr. 1 (gage height, 5.58 ft); minimum, 0.13 cfs Nov. 1 (gage height, 1.19 ft).

Period of record: Maximum discharge, 25,000 cfs Mar. 24, 1947 (gage height, 21.5 ft, site and datum then in use, from floodmark, backwater from ice); maximum discharge since September 1949 when dam was completed, 4,100 cfs Apr. 9, 1952 (gage height, 6.99 ft); maximum gage height, 7.55 ft Apr. 17, 1950, 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 measurement).

REMARKS.--Records good. Flow completely regulated by Lake Tschida 0.5 mile upstream (see station 06346000).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.55	.20	18	18	13	6.4	2,200	372	52	324	117	132
2	.36	.20	18	18	12	8.2	2,090	324	50	280	114	132
3	.36	.20	18	18	12	8.2	1,750	292	48	260	114	132
4	.45	.20	18	18	12	8.2	1,360	256	56	228	114	132
5	60	.20	18	18	12	8.2	1,080	220	111	192	114	132
6	87	.20	18	18	12	8.2	878	192	160	164	114	132
7	72	.20	18	18	12	8.2	725	172	192	160	114	132
8	36	.28	18	16	12	8.2	625	148	200	120	114	132
9	36	.28	18	16	12	8.2	540	140	216	105	114	132
10	36	.28	18	16	12	8.2	480	136	228	93	114	132
11	36	.28	18	15	10	8.8	435	136	248	114	114	102
12	36	.28	18	13	8.8	9.2	372	140	292	120	114	74
13	36	.28	18	13	8.8	9.2	328	132	268	96	114	71
14	38	.28	18	13	8.8	136	284	132	236	90	114	76
15	38	.28	18	13	8.8	779	248	120	244	102	114	76
16	38	.28	18	13	8.8	1,350	232	108	284	124	114	76
17	38	.28	18	13	8.8	1,740	164	111	356	120	114	76
18	38	.28	18	13	8.8	1,970	176	99	364	108	108	68
19	25	.28	18	13	8.8	2,030	180	90	425	99	114	48
20	20	.28	18	13	8.8	1,970	180	85	575	111	114	48
21	20	.36	18	13	8.8	1,940	340	74	700	120	124	48
22	20	7.7	18	13	8.8	1,850	535	82	818	117	132	48
23	9.0	18	18	13	8.8	1,690	690	79	818	114	132	48
24	.36	18	18	13	8.8	1,580	848	71	818	114	132	48
25	.36	18	18	13	8.8	1,450	842	66	770	117	132	48
26	.36	18	18	13	8.8	1,280	734	61	710	114	132	48
27	.36	18	18	13	8.2	1,110	645	50	650	117	132	45
28	.36	18	18	13	8.2	1,010	560	52	545	117	132	45
29	.36	18	18	13	------	1,020	485	50	465	117	132	45
30	.28	18	18	13	------	1,360	430	45	392	117	132	45
31	.20	------	18	13	------	1,900	------	52	------	117	132	------
TOTAL	723.36	157.10	558	449	279.4	26,272.4	20,436	4,087	11,291	4,291	3,721	2,503
MEAN	23.3	5.24	18.0	14.5	9.98	847	681	132	376	138	120	83.4
MAX	87	18	18	18	13	2,030	2,200	372	818	324	132	132
MIN	.20	.20	18	13	8.2	6.4	164	45	48	90	108	45
AC-FT	1,430	312	1,110	891	554	52,110	40,530	8,110	22,400	8,510	7,380	4,960

CAL YR 1970 TOTAL 102,178.44 MEAN 280 MAX 3,910 MIN .20 AC-FT 202,700
WTR YR 1971 TOTAL 74,768.26 MEAN 205 MAX 2,200 MIN .20 AC-FT 148,300

06347000 Antelope Creek near Carson, N. Dak.

LOCATION.--Lat 46°31'50", long 101°38'25", in NW¼NE¼ sec.8, T.135 N., R.87 W., Grant County, on right bank 800 ft upstream from county highway bridge, 4 miles upstream from mouth and 8 miles northwest of Carson.

DRAINAGE AREA.--221 sq mi.

PERIOD OF RECORD.--June 1948 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 1,974 ft (by barometer). Prior to June 23, 1958, wire-weight gage at site 800 ft downstream at same datum.

AVERAGE DISCHARGE.--23 years, 15.4 cfs (11,160 acre-ft per year); median of yearly mean discharges, 9.2 cfs (6,700 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 1,580 cfs June 11 (gage height, 13.18 ft); minimum, 0.01 cfs Aug. 27-30 (gage height, 3.37 ft).
Period of record.--Maximum discharge, 11,100 cfs Apr. 16, 1950 (gage height, 17.95 ft, former site, from floodmark), from rating curve extended above 1,100 cfs on basis of slope-area measurement of peak flow; no flow at times.
Flood of Mar. 25, 1943 at 17.1 ft (7,650 cfs), was the highest between 1943 and 1950.

REMARKS.--Records fair.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.8	3.8	3.0	3.0	1.0	170	30	23	9.7	19	1.6	.15
2	1.8	4.6	3.0	3.0	1.0	121	20	20	8.8	15	1.4	.22
3	1.8	5.2	3.0	3.0	1.0	81	10	17	8.1	12	1.3	.07
4	1.8	4.5	3.0	3.0	1.0	59	8.0	16	11	10	1.2	.23
5	1.9	3.9	3.0	2.0	1.0	52	11	14	21	8.8	1.1	4.1
6	1.9	3.9	3.0	2.0	1.0	47	15	13	81	7.9	1.0	3.2
7	1.9	3.8	3.0	2.0	1.0	40	26	11	70	6.5	.86	2.1
8	1.9	5.5	3.0	2.0	1.0	34	28	10	38	5.1	.80	1.6
9	2.0	5.1	3.0	2.0	1.0	23	26	9.9	26	4.8	.74	1.3
10	2.0	5.2	3.0	2.0	1.0	16	27	9.9	20	4.6	.68	1.1
11	2.0	5.3	3.0	2.0	1.0	20	22	10	859	6.5	.59	.86
12	2.0	4.6	3.0	2.0	1.0	50	19	10	187	30	.50	.70
13	2.0	4.3	3.0	2.0	1.0	200	16	9.9	64	47	.53	.59
14	2.0	3.6	3.0	2.0	1.0	600	15	9.1	51	25	.44	.49
15	2.1	3.1	3.0	2.0	1.0	500	13	8.2	41	18	.38	.47
16	2.1	2.9	3.0	2.0	2.0	400	12	12	33	13	.26	.51
17	2.1	3.0	3.0	2.0	3.0	330	11	15	31	9.2	.15	.64
18	2.1	3.1	3.0	2.0	5.0	200	22	8.6	27	6.1	.10	.74
19	2.1	2.7	3.0	2.0	10	150	20	8.1	33	5.0	.10	.83
20	3.1	2.6	3.0	3.0	50	130	32	7.4	80	4.8	.10	.91
21	1.9	2.5	3.0	3.0	100	120	99	10	346	4.2	.10	1.0
22	1.9	2.0	3.0	3.0	90	110	385	11	299	3.8	.10	1.0
23	2.0	1.8	3.0	3.0	70	100	106	13	187	3.2	.10	1.1
24	2.2	3.7	3.0	3.0	50	80	52	11	100	2.9	.04	1.1
25	2.5	4.2	3.0	2.0	40	70	34	9.6	70	2.5	.02	.98
26	2.5	3.5	3.0	1.0	30	70	26	8.7	57	2.3	.02	.92
27	2.8	3.0	3.0	1.0	63	80	27	7.9	46	2.2	.01	.97
28	2.9	3.0	3.0	1.0	140	100	27	7.1	34	1.9	.01	1.1
29	3.5	3.0	3.0	1.0	------	120	27	6.4	27	1.8	.01	1.1
30	3.9	3.0	3.0	1.0	------	100	26	7.1	23	1.8	.01	1.1
31	3.3	------	3.0	1.0	------	50	------	10	------	1.7	.04	------
TOTAL	69.8	110.4	93.0	65.0	668.0	4,193	1,192.0	343.5	2,888.6	286.6	14.17	31.18
MEAN	2.25	3.68	3.00	2.10	23.9	135	39.7	11.1	96.3	9.25	.46	1.04
MAX	3.9	5.5	3.0	3.0	140	600	385	23	859	47	1.6	4.1
MIN	1.8	1.8	3.0	1.0	1.0	16	8.0	6.0	9.1	1.7	.01	.07
AC-FT	138	219	184	129	1,320	8,320	2,360	681	5,730	568	28	62

CAL YR 1970 TOTAL 10,366.83 MEAN 28.4 MAX 4,000 MIN .04 AC-FT 20,560
WTR YR 1971 TOTAL 9,955.25 MEAN 27.3 MAX 859 MIN .01 AC-FT 19,750

PEAK DISCHARGE (BASE, 200 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
3- 1	--	--	200	6-11	1500	13.18	1,580
3-14	--	--	700	6-21	1800	9.06	619
4-22	0530	8.37	508				

06348000 Heart River near Lark, N. Dak.

LOCATION.--Lat 46°36'37", long 101°22'54", in NW¼NW¼SW¼ sec.9, T.136 N., R.85 W., Grant County, on right bank 20 ft downstream from bridge on State Highway 31, 1 mile downstream from Big Muddy Creek, and 10 miles north of Lark.

DRAINAGE AREA.--2,750 sq mi, approximately.

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

GAGE.--Water-stage recorder. Datum of gage is 1,802.83 ft above mean sea level (levels by Corps of Engineers). Prior to Nov. 16, 1948, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--25 years, 210 cfs (152,100 acre-ft per year); median of yearly mean discharges, 170 cfs (123,000 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 3,300 cfs Mar. 18 (gage height, 16.41 ft, backwater from ice); minimum, 9.0 cfs Nov. 21, but may have been lower during mid-February; minimum gage height, 2.74 ft Nov. 21.
Period of record: 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 measurement of peak flow; no flow Jan. 16 to Mar. 4, 1950, Jan. 17-26, 1962.

REMARKS.--Records good except those for the winter period, which are fair. Flow regulated by Lake Tschida 45 miles upstream (see station 06346000).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22	17	22	22	15	177	2,480	529	90	411	90	110
2	20	18	22	22	14	230	2,450	473	85	348	95	106
3	20	18	22	22	14	163	2,000	423	75	296	86	100
4	18	17	22	22	14	127	1,700	386	78	262	84	114
5	17	17	22	22	14	104	1,420	347	96	229	83	143
6	17	16	22	21	14	90	1,220	310	528	194	84	143
7	42	15	22	21	14	78	1,030	278	740	166	82	134
8	84	16	22	21	14	73	896	253	424	159	84	130
9	64	15	22	21	14	68	798	228	341	133	91	127
10	47	16	22	21	14	68	707	214	315	110	81	129
11	47	18	22	21	12	63	627	203	1,010	107	86	131
12	49	16	22	21	10	180	551	196	1,080	129	86	118
13	54	15	22	21	10	500	484	200	478	176	91	78
14	55	14	22	21	10	2,300	438	192	371	159	89	75
15	53	13	22	21	10	2,350	397	187	349	118	86	71
16	53	12	22	21	10	2,400	366	181	358	93	88	76
17	51	13	22	21	10	2,600	344	177	395	119	88	83
18	52	12	22	21	10	3,100	336	171	490	115	89	86
19	49	11	22	21	10	2,900	347	149	456	111	87	86
20	45	11	22	21	10	2,550	369	140	579	97	91	72
21	39	9.0	22	21	20	2,330	727	133	910	91	89	65
22	33	12	22	21	50	2,270	1,380	126	1,170	105	95	64
23	32	15	22	21	90	1,800	1,230	130	1,150	97	110	64
24	31	17	22	21	77	1,790	1,140	130	1,030	88	106	64
25	30	19	22	21	100	1,780	1,150	117	937	87	101	62
26	25	21	22	21	185	1,760	1,040	105	865	88	101	62
27	21	22	22	21	140	1,740	906	94	818	85	102	60
28	19	22	22	21	158	1,700	792	81	703	88	97	59
29	19	22	22	19	------	1,390	675	71	575	86	102	58
30	19	22	22	16	------	2,350	597	78	480	90	101	58
31	18	------	22	15	------	2,580	------	88	------	90	104	------
TOTAL	1,145	481.0	682	643	1,063	41,611	28,647	6,390	16,976	4,527	2,849	2,728
MEAN	36.9	16.0	22.0	20.7	38.0	1,342	955	206	566	146	91.9	90.9
MAX	84	22	22	22	185	3,100	2,480	529	1,170	411	110	143
MIN	17	9.0	22	15	10	63	336	71	75	85	81	58
AC-FT	2,270	954	1,350	1,280	2,110	82,540	56,820	12,670	33,670	8,980	5,650	5,410

CAL YR 1970 TOTAL 147,289.0 MEAN 404 MAX 14,800 MIN 9.0 AC-FT 292,100
WTR YR 1971 TOTAL 107,742.0 MEAN 295 MAX 3,100 MIN 9.0 AC-FT 213,700

06348490 Sweetbriar Reservoir near Judson, N. Dak.

LOCATION.--Lat 46°51'55", long 101°15'35", in SE¼SE¼ sec.10, T.139 N., R.84 W., Morton County, on south shore of reservoir 700 ft west of spillway and 2.5 miles northeast of Judson.

DRAINAGE AREA.--152 sq mi.

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

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

EXTREMES.--Current year: Maximum contents, 3,680 acre-ft Mar. 30 (elevation, 1,941.20 ft); minimum, 2,788 acre-ft Sept. 30 (elevation, 1,938.03 ft).
Period of record: Maximum contents, 5,215 acre-ft Apr. 7, 1969 (elevation, 1,944.97 ft); minimum since initial filling of reservoir, 2,699 acre-ft Dec. 29, 1966 (elevation, 1,937.69 ft).

REMARKS.--Reservoir is formed by an earth-fill dam on Interstate 94; storage began April 1964. Capacity at spillway elevation, 1,940.00 ft is 3,320 acre-ft. Controlled releases are through a 12-inch pipe. The spillway is an uncontrolled drop-inlet type. Figures herein represent total contents. The reservoir is for recreation.

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	1,938.38	2,879	
Oct. 31	1,938.24	2,842	-37
Nov. 30	1,938.54	2,920	+78
Dec. 31	*1,938.67	2,954	+34
CAL YR 1970	--	--	-190
Jan. 31	*1,938.75	2,975	+21
Feb. 28	*1,939.17	3,088	+113
Mar. 31	*1,940.70	3,530	+442
Apr. 30	1,940.04	3,332	-198
May 31	1,939.68	3,230	-102
June 30	*1,940.01	3,323	+93
July 31	1,938.92	3,019	-304
Aug. 31	1,938.22	2,837	-182
Sept. 30	1,938.03	2,788	-49
WTR YR 1971	--	--	-91

* Partly estimated.

06348500 Sweetbriar Creek near Judson, N. Dak.

LOCATION.--Lat 46°51'06", long 101°15'10", in SW¼ sec.14, T.139 N., R.84 W., Morton County, on right bank 80 ft downstream from bridge on county highway, 2 miles northeast of Judson, and 16 miles upstream from mouth.

DRAINAGE AREA.--157 sq mi.

PERIOD OF RECORD.--July 1951 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,886.42 ft above mean sea level. Prior to July 20, 1955, non-recording gage 80 ft upstream at same datum.

AVERAGE DISCHARGE.--20 years, 10.6 cfs (7,680 acre-ft per year); median of yearly mean discharges, 8.8 cfs (6,400 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 554 cfs Mar. 30 (gage height, 5.83 ft); minimum, 0.01 cfs Jan. 6, 7 (gage height, 1.42 ft).
Period of record: Maximum discharge, 4,200 cfs Apr. 7, 1969 (gage height, 11.28 ft); 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 measurement of peak flow).

REMARKS.--Records good. Flow regulated by Sweetbriar Reservoir 2 miles upstream (see station 06348490).

REVISIONS (WATER YEARS).--WSP 1439: 1955(M).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.45	.37	.41	.33	.10	1.0	127	7.6	4.3	4.7	.15	.30
2	1.8	.45	.37	.27	.09	.80	55	9.4	4.3	4.1	.18	.24
3	2.4	.41	.37	.30	.07	.72	51	10	4.3	4.5	.18	.27
4	2.2	.33	.37	.33	.07	.72	37	9.0	4.7	4.5	.13	.45
5	2.2	.33	.33	.15	.08	.58	26	7.4	4.3	3.9	.13	.65
6	3.0	.33	.33	.05	.08	.51	22	5.7	4.1	3.9	.13	.45
7	2.7	.33	.37	.09	.07	.51	21	6.1	4.3	4.1	.13	.41
8	2.7	.33	.37	.11	.07	.51	25	4.5	4.1	3.9	.13	.37
9	2.7	.33	.33	.18	.09	.51	30	4.1	4.3	3.9	.13	.33
10	2.2	.33	.30	.10	.09	.51	29	5.1	6.0	3.9	.13	.33
11	1.8	.33	.27	.18	.11	.58	22	4.1	4.9	4.3	.13	.33
12	1.5	.33	.30	.24	.13	6.3	19	4.7	4.5	3.9	.13	.33
13	1.3	.33	.30	.18	.13	16	15	4.1	4.5	3.9	.15	.33
14	1.0	.30	.30	.18	.13	184	13	4.9	5.5	3.9	.15	.33
15	.80	.30	.30	.13	.15	176	11	4.5	10	3.9	.13	.37
16	.58	.30	.27	.13	.18	100	12	4.5	9.4	3.9	.11	.41
17	.45	.37	.30	.18	.30	83	7.9	4.9	13	3.9	.11	.65
18	.37	.33	.30	.18	.45	100	12	4.5	8.5	4.1	.13	.65
19	.27	.33	.27	.18	.51	99	12	4.5	7.6	4.1	.21	.58
20	.27	.30	.27	.18	.58	91	13	4.3	5.9	3.9	.18	.58
21	.27	.33	.21	.15	.58	148	13	4.5	5.9	3.9	.13	.65
22	.27	.30	.30	.15	.58	130	11	4.9	5.7	3.9	.13	.65
23	.27	.27	.30	.15	.51	101	13	4.7	5.5	3.4	.13	.58
24	.27	.33	.30	.11	.58	63	12	4.9	8.2	.45	.13	.51
25	.27	.45	.27	.13	1.7	41	10	4.5	6.3	.15	.13	.51
26	.27	.37	.33	.18	2.7	46	7.9	4.3	7.6	.15	.18	.51
27	.30	.41	.30	.18	1.1	74	11	4.1	7.1	.18	.18	.58
28	.37	.41	.27	.13	1.1	220	7.9	4.1	5.1	.21	.18	.65
29	.45	.41	.27	.13	------	439	6.6	4.1	4.9	.24	.18	.80
30	.41	.41	.30	.13	------	466	7.6	4.9	5.9	.18	.18	.90
31	.33	------	.33	.13	------	356	------	4.7	------	.13	.33	------
TOTAL	34.17	10.45	9.61	5.24	12.33	2,946.25	659.9	163.6	180.7	94.09	4.73	14.70
MEAN	1.10	.35	.31	.17	.44	95.0	22.0	5.28	6.02	3.04	.15	.49
MAX	3.0	.45	.41	.33	2.7	466	127	10	13	4.7	.33	.90
MIN	.27	.27	.21	.05	.07	.51	6.6	4.1	4.1	.13	.11	.24
AC-FT	68	21	19	10	24	5,840	1,310	325	358	187	9.4	29

CAL YR 1970 TOTAL 6,415.12 MEAN 17.6 MAX 1,450 MIN .05 AC-FT 12,720
WTR YR 1971 TOTAL 4,135.77 MEAN 11.3 MAX 466 MIN .05 AC-FT 8,200

06349000 Heart River near Mandan, N. Dak.

LOCATION.--Lat 46°50'02", long 100°58'27", in NW¼NE¼ sec.25, T.139 N., R.82 W., Morton County, on left bank near downstream wingwall of bridge on county highway, 3 miles west of Mandan and 4 miles downstream from Sweetbriar Creek.

DRAINAGE AREA.--3,310 sq mi, approximately.

PERIOD OF RECORD.--April to September 1924, March 1928 to June 1933, August 1937 to current year. Published as "at Sunny" 1924, 1928-33.

GAGE.--Water-stage recorder. Datum of gage is 1,638.70 ft above mean sea level, and 1,623.03 ft above Burlington Northern Railway datum. See WSP 1729 or 1917 for history of changes prior to June 30, 1958.

AVERAGE DISCHARGE.--38 years (1928-32, 1937-71), 250 cfs (179,000 acre-ft per year); median of yearly mean discharges, 190 cfs (138,000 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 4,100 cfs Mar. 19 (gage height, 17.50 ft, backwater from ice); minimum, 5.0 cfs Jan. 17-20.
Period of record: 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 in some years.

REMARKS.--Records fair except those for the winter period, which are poor. Flow regulated by Lake Tschida 105 miles upstream (see station 06346000). Some diversions above station.

REVISIONS (WATER YEARS).--WSP 926: 1938. WSP 1209: Drainage area. WSP 1239: 1924, 1928-29, 1948.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	45	43	20	15	10	215	3,400	756	128	604	103	115
2	45	43	22	15	10	210	2,900	676	122	510	101	110
3	45	43	22	14	10	205	2,230	650	115	426	105	110
4	44	43	22	13	11	180	1,900	625	115	359	105	115
5	44	43	24	12	11	160	1,680	580	138	324	94	125
6	44	42	24	11	11	140	1,540	540	150	297	86	138
7	44	42	24	10	12	120	1,480	500	226	264	82	155
8	44	42	28	9.0	12	100	1,340	450	800	235	82	150
9	44	42	28	8.0	12	90	1,200	400	510	215	86	150
10	70	42	26	7.0	12	80	1,090	370	394	202	90	148
11	81	42	26	6.6	12	100	994	340	376	182	101	140
12	67	43	26	6.0	12	200	895	310	1,020	175	92	138
13	66	43	26	5.8	12	500	792	290	1,240	261	94	138
14	66	43	25	5.6	12	800	724	270	588	225	90	119
15	67	43	25	5.4	12	1,500	650	250	471	215	92	82
16	68	43	25	5.2	12	2,500	600	230	412	175	86	79
17	68	42	24	5.0	12	3,000	550	220	436	150	86	79
18	66	42	24	5.0	12	3,400	500	210	443	130	86	86
19	65	42	23	5.0	12	4,000	480	200	516	152	87	97
20	64	42	23	5.0	12	3,700	480	190	510	140	87	97
21	63	39	22	5.2	12	3,500	550	176	592	125	88	94
22	62	35	21	5.2	12	3,300	895	166	931	120	88	82
23	61	25	20	5.3	12	2,900	1,490	160	1,180	110	89	71
24	56	15	20	5.5	12	2,800	1,410	158	1,200	122	90	67
25	53	15	19	5.8	40	2,700	1,260	155	1,110	107	90	64
26	50	16	18	6.1	100	2,640	1,300	152	1,050	105	92	63
27	50	17	18	6.4	150	2,500	1,220	142	954	103	99	63
28	50	17	17	6.7	200	2,400	1,090	125	940	101	99	66
29	45	18	16	7.0	------	2,500	967	112	850	101	99	67
30	44	18	16	8.0	------	3,000	850	112	716	101	99	64
31	44	------	15	9.0	------	3,000	------	125	------	101	110	------
TOTAL	1,725	1,065	689	238.8	769	52,440	36,457	9,640	18,233	6,437	2,878	3,072
MEAN	55.6	35.5	22.2	7.70	27.5	1,692	1,215	311	608	208	92.8	102
MAX	81	43	28	15	200	4,000	3,400	756	1,240	604	110	155
MIN	44	15	15	5.0	10	80	480	112	115	101	82	63
AC-FT	3,420	2,110	1,370	474	1,530	104,000	72,310	19,120	36,170	12,770	5,710	6,090

CAL YR 1970 TOTAL 168,041.9 MEAN 460 MAX 13,700 MIN 8.0 AC-FT 333,300
WTR YR 1971 TOTAL 133,643.8 MEAN 366 MAX 4,000 MIN 5.0 AC-FT 265,100

06349500 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., Burleigh County, on left bank 75 ft downstream from bridge on county highway, 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.

PERIOD OF RECORD.--March to June 1905, October 1945 to current year. Published as "near Bismarck" 1905.

GAGE.--Water-stage recorder. Datum of gage is 1,638.61 ft above mean sea level. See WSP 1729 or 1917 for history of changes prior to Sept. 30, 1953.

AVERAGE DISCHARGE.--26 years, 36.5 cfs (26,440 acre-ft per year); median of yearly mean discharges, 19 cfs (13,800 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 540 cfs Apr. 2 (gage height, 10.69 ft, backwater from ice); minimum, 0.03 cfs Aug. 30, Sept. 13 (gage height, 0.34 ft).
Period of record: Maximum discharge, 6,750 cfs Apr. 18, 1950 (gage height, 17.07 ft); no flow at times in some years.

REMARKS.--Records good.

REVISIONS.--WSP 1209: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.68	1.4	2.6	1.9	1.8	1.7	478	16	6.9	36	3.5	.12
2	.55	1.5	2.6	1.9	1.8	1.7	490	15	6.7	30	2.9	.12
3	.53	1.6	2.6	1.9	1.8	1.7	340	15	6.5	27	2.1	.12
4	.56	1.6	2.6	1.9	1.8	1.7	230	15	6.5	19	1.6	.23
5	.60	1.6	2.6	1.9	1.8	1.7	160	16	7.3	15	1.5	.19
6	.60	1.7	2.5	1.9	1.8	1.6	106	15	7.3	13	1.2	.19
7	.59	1.7	2.5	1.9	1.8	1.7	76	14	9.4	9.9	.98	.19
8	.69	1.8	2.5	1.9	1.8	1.6	60	13	64	8.6	.98	.19
9	.71	1.8	2.5	1.9	1.8	1.5	58	13	53	7.4	.84	.15
10	.67	1.9	2.5	1.9	1.8	1.7	66	13	34	7.0	.59	.15
11	.70	1.9	2.4	1.9	1.8	1.6	67	13	26	7.2	.54	.15
12	.74	1.8	2.4	1.9	1.8	1.9	59	12	20	8.5	.49	.09
13	.87	1.7	2.4	1.9	1.8	25	48	11	16	8.6	.44	.06
14	.94	1.7	2.4	1.9	1.8	48	39	11	13	8.5	.44	.06
15	.93	1.6	2.3	1.9	1.8	53	34	10	15	7.6	.39	.12
16	1.0	1.7	2.3	1.9	1.8	64	29	9.6	16	6.7	.35	.12
17	.87	1.7	2.3	1.9	1.9	63	27	9.3	20	5.8	.31	.15
18	.89	1.7	2.3	1.9	1.9	51	24	11	23	5.4	.27	.12
19	1.1	1.6	2.2	1.8	1.9	58	23	12	40	5.0	.19	.12
20	1.2	1.6	2.2	1.8	1.9	71	23	11	33	4.6	.15	.12
21	1.2	1.8	2.2	1.8	1.9	68	21	9.6	31	3.9	.12	.12
22	1.1	2.9	2.2	1.8	1.9	88	19	19	27	3.2	.09	.09
23	1.1	3.2	2.1	1.8	1.9	94	18	11	21	3.0	.09	.09
24	1.1	2.8	2.1	1.7	1.9	112	17	9.8	19	2.9	.12	.09
25	1.0	2.8	2.1	1.7	1.8	191	16	9.2	18	2.5	.09	.09
26	1.0	2.7	2.1	1.7	1.8	73	16	9.0	19	2.0	.09	.09
27	1.2	2.7	2.0	1.7	1.8	57	18	11	24	1.5	.09	.09
28	1.3	2.7	2.0	1.7	1.8	63	18	11	37	1.2	.09	.09
29	1.3	2.7	2.0	1.7	------	87	17	8.7	50	3.5	.09	.09
30	1.3	2.7	2.0	1.7	------	198	17	7.2	46	3.8	.09	.09
31	1.3	------	2.0	1.7	------	378	------	7.0	------	2.4	.12	------
TOTAL	28.32	60.6	71.5	56.8	51.2	1,772.1	2,608	359.4	715.6	270.7	20.84	3.69
MEAN	.91	2.02	2.31	1.83	1.83	57.2	86.9	11.6	23.9	8.73	.67	.12
MAX	1.3	3.2	2.6	1.9	1.9	378	490	16	64	36	3.5	.23
MIN	.53	1.4	2.0	1.7	1.8	1.5	16	7.0	6.5	1.2	.09	.06
AC-FT	56	120	142	113	102	3,510	5,170	713	1,420	537	41	7.3

CAL YR 1970 TOTAL 7,868.64 MEAN 21.6 MAX 361 MIN .35 AC-FT 15,610
WTR YR 1971 TOTAL 6,018.75 MEAN 16.5 MAX 490 MIN .06 AC-FT 11,940

PEAK DISCHARGE (BASE, 200 CFS).--APRIL 2 (0600) 540 CFS (10.69 FT).

06350000 Cannonball River at Regent, N. Dak.

LOCATION.--Lat 46°25'36", long 102°33'05", in NE¼NE¼ sec.13, T.134 N., R.95 W., Hettinger County, on right bank 400 ft upstream from bridge on county highway 0.3 mile north of Regent.

DRAINAGE AREA.--580 sq mi, approximately.

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

GAGE.--Water-stage recorder. Datum of gage is 2,422.90 ft above mean sea level.

AVERAGE DISCHARGE.--21 years, 40.9 cfs (29.630 acre-ft per year); median of yearly mean discharges, 25 cfs (18,100 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 2,600 cfs Mar. 15 (gage height, 12.24 ft from floodmark, backwater from ice); minimum, 3.5 cfs Jan. 7-20.
Period of record: Maximum discharge, 6,280 cfs May 9, 1970 (gage height, 16.85 ft); maximum gage height, 17.35 ft June 22, 1957; no flow at times.
Maximum stage known since 1914, 26.1 ft Apr. 16, 1950, from floodmarks (discharge, 20,300 cfs, on basis on slope area measurement at site 4 miles downstream.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.4	8.2	10	5.7	5.7	150	814	54	14	79	13	5.1
2	6.0	8.2	10	5.7	5.7	110	660	50	15	58	12	4.9
3	5.7	8.2	10	5.7	5.7	66	255	46	14	47	11	4.7
4	5.7	8.5	10	5.0	5.7	64	210	41	15	40	10	6.8
5	5.7	8.8	10	4.4	5.7	75	180	36	573	34	9.9	17
6	5.7	8.2	10	3.8	5.7	60	160	32	738	30	8.5	18
7	6.0	8.9	10	3.5	5.7	52	140	30	450	26	7.7	16
8	6.0	9.9	10	3.5	5.7	53	123	26	258	23	7.7	14
9	6.0	10	10	3.5	5.7	70	122	26	160	22	7.7	12
10	6.0	10	10	3.5	5.7	70	121	28	117	20	7.4	34
11	6.2	10	10	3.5	5.7	70	115	28	459	20	7.2	31
12	6.6	10	10	3.5	5.7	340	101	26	200	52	6.4	25
13	7.2	10	10	3.5	5.7	1,800	88	24	92	32	6.4	20
14	7.2	10	10	3.5	5.7	2,400	72	23	62	368	6.0	16
15	7.2	10	10	3.5	6.0	2,400	58	21	1,040	303	5.3	14
16	7.4	10	10	3.5	10	2,020	53	22	1,090	164	5.3	12
17	7.4	10	10	3.5	50	1,720	47	20	608	107	4.9	11
18	7.2	10	9.7	3.5	320	1,480	45	19	416	77	5.3	9.9
19	7.2	10	9.0	3.5	240	1,240	48	18	1,080	54	5.5	8.9
20	7.2	10	8.1	3.5	180	930	80	18	1,250	41	5.3	8.5
21	7.2	10	7.2	3.8	150	1,200	879	17	810	33	5.1	8.5
22	7.2	10	6.6	4.5	120	1,110	1,050	18	600	28	5.3	8.2
23	7.2	10	6.0	4.7	110	1,020	614	18	307	24	5.5	7.4
24	7.2	10	5.7	4.7	103	900	291	16	536	21	5.5	7.2
25	7.4	10	5.7	4.7	80	510	188	15	729	18	5.3	7.2
26	7.7	10	5.7	4.7	130	360	131	14	422	16	5.5	7.4
27	7.7	10	5.7	4.7	255	420	107	14	304	16	5.5	7.7
28	7.4	10	5.7	4.8	225	1,050	87	13	207	14	5.3	7.7
29	8.0	10	5.7	5.0	------	1,800	72	13	139	14	4.7	7.4
30	8.2	10	5.7	5.4	------	2,340	62	14	106	13	5.1	8.0
31	8.2	------	5.7	5.7	------	1,620	------	14	------	13	5.1	------
TOTAL	213.4	288.9	262.2	132.0	2,058.8	27,500	6,973	754	12,811	1,807	210.4	365.5
MEAN	6.88	9.63	8.46	4.26	73.5	887	232	24.3	427	58.3	6.79	12.2
MAX	8.2	10	10	5.7	320	2,400	1,050	54	1,250	368	13	34
MIN	5.7	8.2	5.7	3.5	5.7	52	45	13	14	13	4.7	4.7
AC-FT	423	573	520	262	4,080	54,550	13,830	1,500	25,410	3,580	417	725

CAL YR 1970 TOTAL 30,386.1 MEAN 83.2 MAX 5,000 MIN 1.9 AC-FT 60,270
WTR YR 1971 TOTAL 53,376.2 MEAN 146 MAX 2,400 MIN 3.5 AC-FT 105,900

PEAK DISCHARGE (BASE, 400 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
3-15	--	--	2,600	6-15	1430	9.90	1,840
3-21	--	--	1,300	6-17	1830	7.11	843
3-30	0030	11.56	2,620	6-19	1830	9.47	1,670
4-21	1830	9.11	1,520	6-21	1400	7.65	1,020
6- 5	1430	7.74	1,030	6-25	0030	7.40	930
6-11	0930	6.93	789	7-14	1800	5.74	470

06351000 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., Grant County, on left bank a quarter of a mile downstream from Thirty Mile Creek, 2 miles northeast of Bentley.

DRAINAGE AREA.--1,140 sq mi, approximately.

PERIOD OF RECORD.--April 1943 to current year. Published as "near New Leipzig" 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. Datum of gage is 2,252.09 ft above mean sea level. Prior to Nov. 7, 1947, nonrecording gage and Nov. 7, 1947, to June 16, 1952, water-stage recorder, at site 8 miles downstream at different datum.

AVERAGE DISCHARGE.--28 years, 84.3 cfs (61,080 acre-ft per year); median of yearly mean discharges, 69 cfs (50,000 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 3,550 cfs June 21 (gage height, 12.70 ft); maximum gage height, 17.78 ft Mar. 15 (backwater from ice);minimum discharge, 6.1 cfs; minimum gage height, 1.59 ft Aug. 29, 30, Sept. 3,4.
Period of record: 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 measurement at gage height 26.9 ft and slope-area and contracted-opening measurements 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 and 26, 1943, reached a stage of 26.9 ft, site and datum then in use (discharges 15,000 cfs by slope-area measurement).

REMARKS.--Records good except those for the winter period, which are poor. Some diversions and some storage in small lakes above the station.

REVISIONS.--WSP 1729: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	14	17	10	12	200	1,830	137	33	196	26	9.0
2	9.7	16	16	10	12	120	1,030	121	32	160	24	8.7
3	9.4	17	15	9.0	13	121	615	109	32	133	22	8.4
4	10	17	13	8.0	13	120	430	98	169	115	21	9.9
5	9.7	17	12	7.4	13	120	310	92	412	100	20	20
6	9.1	16	11	6.3	13	120	270	82	264	90	18	30
7	9.1	16	13	7.3	13	120	232	75	769	82	17	33
8	9.2	18	14	7.0	13	120	216	68	532	74	16	27
9	12	19	12	7.0	13	120	206	62	356	64	15	24
10	9.5	21	12	7.0	13	125	206	62	236	58	14	23
11	9.8	21	13	7.0	13	130	207	67	1,060	57	13	20
12	11	21	12	7.0	13	220	192	82	1,120	222	14	20
13	12	21	12	7.0	19	650	163	79	492	129	14	37
14	12	21	13	7.0	27	1,470	141	59	225	98	13	30
15	13	20	12	7.0	35	3,200	127	39	237	156	12	24
16	13	20	11	7.0	35	2,600	111	49	751	358	11	21
17	12	19	11	7.0	30	1,400	105	56	1,220	218	11	20
18	13	19	11	7.0	100	1,000	177	47	811	152	10	17
19	13	19	13	7.0	345	800	149	44	781	121	10	16
20	12	19	11	7.0	545	580	148	41	1,610	98	9.9	16
21	12	19	10	8.0	400	400	784	39	2,860	82	9.9	16
22	12	18	11	9.0	250	400	1,030	40	1,910	67	9.9	15
23	12	17	9.8	10	220	400	1,250	44	1,140	58	9.6	14
24	12	16	9.9	10	220	300	865	38	727	48	9.0	14
25	12	16	10	10	190	300	464	36	733	42	9.0	14
26	12	16	10	10	400	300	298	34	946	38	9.3	13
27	13	15	10	10	290	300	232	32	630	34	9.0	13
28	13	16	9.8	10	270	400	192	29	474	31	9.0	13
29	14	16	11	10	------	1,000	167	28	344	28	8.7	13
30	15	16	10	11	------	1,400	148	31	255	27	8.4	13
31	15	------	10	11	------	2,860	------	32	------	26	8.7	------
TOTAL	361.5	536	365.5	258.0	3,530	21,396	12,295	1,852	21,161	3,162	411.4	552.0
MEAN	11.7	17.9	11.8	8.32	126	690	410	59.7	705	102	13.3	18.4
MAX	15	21	17	11	545	3,200	1,830	137	2,860	358	26	37
MIN	9.1	14	9.8	6.3	12	120	105	28	32	26	8.4	8.4
AC-FT	717	1,060	725	512	7,000	42,440	24,390	3,670	41,970	6,270	816	1,090

CAL YR 1970 TOTAL 48,807.6 MEAN 134 MAX 6,130 MIN 5.0 AC-FT 96,810
WTR YR 1971 TOTAL 65,880.4 MEAN 180 MAX 3,200 MIN 6.3 AC-FT 130,700

PEAK DISCHARGE (BASE, 500 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
2-20	--	--	600	6- 7	1000	6.47	811
3-15	--	--	3,300	6-11	1745	8.90	1,700
3-31	0400	12.06	3,160	6-16	2200	8.28	1,450
4-22	2015	8.60	1,530	6-21	1000	12.70	3,550
6- 5	0100	6.69	877	6-26	0400	7.17	1,030

06351680 White Butte Fork Cedar Creek near Scranton, N. Dak.

LOCATION.--Lat 46°19'20", long 102°59'45", in NW¼ sec.21, T.133 N., R.98 W., Slope County, on left bank 1,200 ft downstream from county highway bridge and 13 miles northeast of Scranton.

DRAINAGE AREA.--42.9 sq mi.

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

GAGE.--Water-stage recorder.

AVERAGE DISCHARGE.--6 years, 5.30 cfs (3,840 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 607 cfs Mar. 29 (gage height, 7.09 ft); maximum gage height, 7.19 ft Mar. 14 (backwater from ice); no flow for many days.
Period of record: Maximum discharge, 645 cfs May 8, 1970 (gage height, 7.20 ft); maximum gage height, 7.76 ft May 8, 1967; no flow for many days each year.

REMARKS.--Records poor.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.21	.49	1.1	.37	.29	7.5	49	3.8	1.5	1.7	0	0
2	.21	.47	1.1	.37	.29	7.0	36	3.4	1.6	1.4	0	0
3	.21	.47	1.0	.35	.29	6.5	26	3.1	1.2	1.1	0	0
4	.21	.47	.90	.35	.29	6.0	15	2.9	4.6	.88	0	0
5	.21	.47	.80	.35	.29	5.5	13	2.8	12	.58	0	0
6	.23	.47	.70	.33	.29	5.0	14	2.6	10	.35	0	.20
7	.23	.47	.70	.33	.29	5.0	11	2.4	22	.09	0	.29
8	.23	.51	.75	.31	.29	4.5	16	2.2	12	0	0	.05
9	.23	.64	.80	.31	.29	4.0	19	2.1	4.8	0	0	0
10	.23	.64	.75	.29	.29	3.5	17	2.4	3.3	.04	0	.68
11	.27	1.0	.75	.29	.29	3.5	12	2.5	2.8	1.4	0	2.2
12	.27	1.5	.70	.29	.29	3.5	8.8	2.4	2.4	329	0	1.5
13	.29	1.5	.60	.29	.29	75	6.9	2.3	2.1	92	0	.97
14	.33	1.4	.55	.29	.33	150	5.0	2.2	1.8	32	0	.45
15	.33	1.2	.51	.30	.35	75	4.3	2.3	1.7	6.9	0	.29
16	.35	1.0	.47	.30	.45	50	4.0	2.3	1.6	1.7	0	.23
17	.35	.90	.45	.30	.50	40	3.5	2.3	1.9	1.0	0	.20
18	.35	.80	.43	.30	.45	30	4.2	2.1	1.7	.70	0	.18
19	.37	.70	.41	.30	.40	20	47	1.9	80	.51	0	.15
20	.37	.60	.39	.30	.40	20	3.3	1.9	311	.33	0	.15
21	.37	.50	.39	.30	2.0	15	171	1.6	92	.07	0	.21
22	.37	.35	.39	.30	10	20	75	1.6	40	0	0	.23
23	.37	.35	.39	.30	10	40	28	1.8	15	0	0	.21
24	.37	2.0	.39	.30	9.0	50	14	1.6	28	0	0	.18
25	.37	1.6	.39	.30	9.0	50	7.7	1.2	80	0	0	.15
26	.39	1.0	.39	.30	8.0	60	5.5	.88	88	0	0	.15
27	.39	1.0	.39	.30	8.0	200	5.0	.58	38	0	0	.13
28	.39	1.2	.37	.29	8.0	475	4.8	.49	13	0		.15
29	.39	1.2	.37	.29	------	470	4.4	.35	3.5	0	0	.15
30	.41	1.1	.37	.29	------	194	4.3	.51	2.4	0	0	.15
31	.51	------	.37	.29	------	81	------	1.	------	0	0	------
TOTAL	9.81	26.00	18.07	9.58	70.65	2,171.5	634.7	61.51	879.9	469.75	0	9.25
MEAN	.32	.87	.58	.31	2.52	70.0	21.2	1.98	29.3	15.2	0	.31
MAX	.51	2.0	1.1	.37	10	475	171	3.8	311	329	0	2.2
MIN	.21	.35	.37	.29	.29	3.5	3.3	.35	1.2	0	0	0
AC-FT	19	52	36	19	140	4,310	1,260	122	1,750	932	0	18

CAL YR 1970 TOTAL 2,516.92 MEAN 6.90 MAX 420 MIN 0 AC-FT 4,990
WTR YR 1971 TOTAL 4,360.72 MEAN 11.9 MAX 475 MIN 0 AC-FT 8,650

PEAK DISCHARGE (BASE, 50 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
3-14			200	6-20	0500	6.58	460
3-29	0400	7.09	607	6-26	0400	4.82	125
4-19	2200	4.13	66	7-12	0800	6.79	517
4-21	1400	5.70	260				

06352000 Cedar Creek near Haynes, N. Dak.

LOCATION.--Lat 46°09'15", long 102"28'25", in W½ sec.20, T.131 N., R.94 W., Adams County, on left bank 30 ft downstream from bridge on State Highway 8 and 12.5 miles north of Haynes.

DRAINAGE AREA.--553 sq mi.

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

GAGE.--Water-stage recorder. Datum of gage is 2,472.90 ft above mean sea level (North Dakota Highway Department benchmark). Prior to May 20, 1951, nonrecording gage on former bridge 400 ft upstream at same datum.

AVERAGE DISCHARGE.--21 years, 29.4 cfs (21,300 acre-ft per year); median of yearly mean discharges, 27 cfs (19,600 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 2,760 cfs Mar. 30 (gage height, 17.60 ft); minimum, 1.2 cfs Oct. 5 (gage height, 2.75 ft); minimum gage height, 2.72 ft Aug. 24, 25, 28-30, Sept. 3, 4.
Period of record: Maximum discharge, 7,870 cfs Apr. 7, 1952 (gage height, 21.25 ft); no flow at times in some years.
Flood of Apr. 17, 1950 reached a stage of about 23 ft (discharge, 26,900 cfs, by slope-area measurement at site 9 miles upstream).

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.3	4.6	8.5	5.6	4.0	83	1,390	74	12	89	7.4	1.5
2	1.3	5.1	8.5	5.2	4.0	98	940	65	11	67	6.9	1.5
3	1.4	5.5	9.0	4.6	3.5	74	423	57	11	50	6.4	1.4
4	1.4	5.3	9.0	4.1	3.5	56	270	50	12	35	5.6	1.8
5	1.3	5.1	9.0	4.1	3.0	34	230	42	63	28	5.1	5.7
6	1.3	5.0	9.5	4.1	3.0	28	182	37	274	23	4.4	9.2
7	1.3	5.1	9.5	4.3	3.0	19	158	33	320	20	4.2	12
8	1.3	5.8	9.5	5.3	2.9	14	144	29	147	16	3.8	8.6
9	1.3	6.3	9.5	5.4	3.7	10	157	27	143	13	3.4	7.6
10	1.4	6.5	9.5	5.4	5.0	9.8	200	39	138	12	3.2	7.2
11	1.4	6.9	9.5	5.2	5.2	7.3	179	31	99	17	2.7	6.2
12	1.5	7.1	9.5	5.2	5.5	14	144	27	540	66	2.6	4.6
13	2.0	7.6	9.0	5.1	5.6	228	116	25	285	488	2.7	3.8
14	2.0	7.8	9.0	4.9	5.5	666	92	24	126	1,250	2.6	2.9
15	2.1	7.5	9.0	4.6	5.8	833	78	21	106	682	2.2	2.3
16	2.2	7.3	9.0	4.3	6.7	810	66	19	71	346	2.0	2.0
17	2.8	7.1	9.0	4.3	7.9	856	56	17	129	201	2.0	2.1
18	2.7	7.1	8.9	4.0	8.9	825	52	16	210	128	2.0	2.0
19	3.1	7.4	7.8	3.9	64	735	49	15	165	87	2.0	1.8
20	3.2	7.0	7.2	4.2	217	750	130	14	121	65	2.0	1.8
21	3.1	7.0	7.1	3.9	152	720	455	14	339	46	1.9	2.0
22	3.0	7.0	6.0	3.7	117	600	894	15	454	35	1.7	1.9
23	3.0	7.0	5.7	4.0	89	500	891	15	388	28	1.5	1.7
24	3.3	7.5	5.6	4.0	68	400	568	14	241	22	1.4	3.3
25	3.2	7.5	5.0	4.2	45	500	293	13	237	18	1.4	10
26	3.3	7.5	5.5	4.3	44	600	184	12	196	16	1.4	16
27	3.2	8.0	4.9	4.0	43	700	141	11	153	14	1.4	20
28	3.7	8.0	4.7	3.9	67	800	112	11	170	12	1.4	23
29	4.1	8.0	4.8	4.4	------	1,200	96	10	165	11	1.4	27
30	5.0	8.5	5.4	4.7	------	2,260	86	10	120	9.3	1.4	29
31	4.5	------	5.7	4.2	------	2,020	------	11	------	8.3	1.4	------
TOTAL	75.7	203.1	239.8	139.1	992.7	16,450.1	8,776	798	5,446	3,902.6	89.5	219.9
MEAN	2.44	6.77	7.74	4.49	35.5	531	293	25.7	182	126	2.89	7.33
MAX	5.0	8.5	9.5	5.6	217	2,260	1,390	74	540	1,250	7.4	29
MIN	1.3	4.6	4.7	3.7	2.9	7.3	49	10	11	8.3	1.4	1.4
AC-FT	150	403	476	276	1,970	32,630	17,410	1,580	10,800	7,740	178	436

CAL YR 1970 TOTAL 15,135.9 MEAN 41.5 MAX 1,920 MIN 1.0 AC-FT 30,020
WTR YR 1971 TOTAL 37,332.5 MEAN 102 MAX 2,260 MIN 1.3 AC-FT 74,050

PEAK DISCHARGE (BASE, 400 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
3-15	--	--	900	6-12	0700	10.77	641
3-30	2000	17.60	2,760	6-22	1630	9.75	502
4-22	2145	12.60	952	7-14	0615	15.04	1,400

06352500 Cedar Creek near Pretty Rock, N. Dak.

LOCATION.--Lat 46°01'55", long 101°49'55", in S½ sec.33, T.130 N., R.89 W., Grant County, on left bank on downstream side of county highway bridge, 7 miles north of Keldron, S. Dak., 10.5 miles south of abandoned townsite of Pretty Rock, and 15 miles downstream from Timber Creek.

DRAINAGE AREA.--1,340 sq mi, approximately.

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

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, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--28 years, 70.1 cfs (50,790 acre-ft per year); median of yearly mean discharges, 49 cfs (35,500 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 2,210 cfs Apr. 1 (gage height, 9.65 ft); maximim gage height, 12.12 ft, Mar. 18 (backwater from ice); minimum discharge, 1.4 cfs Oct. 9-11; minimum gage height, 2.80 ft Sept. 2,3.
Period of record: 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 measurement of peak flow; no flow at times.
Flood of Mar. 24, 1943, reached a stage of 21.8 ft, from floodmarks (discharge, 14,300 cfs).

REMARKS.--Records good.

REVISION (WATER YEARS).--WSP 1146: 1944, 1947. WSP 1209: Drainage area. WSP 1389: 1951.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.8	9.3	17	6.5	9.0	73	2,090	231	29	150	19	2.1
2	2.3	9.7	18	6.5	9.0	59	2,090	201	29	135	17	1.7
3	1.9	10	18	6.0	9.0	55	1,510	177	29	104	15	1.6
4	2.3	10	17	6.0	9.0	54	990	156	26	80	13	1.9
5	2.3	9.5	16	6.0	9.0	50	640	138	27	66	12	2.6
6	2.1	9.3	15	6.0	9.0	48	423	123	53	56	10	3.0
7	1.9	10	14	5.5	9.0	50	360	108	108	47	8.9	3.1
8	3.0	11	13	5.3	9.0	60	309	98	157	40	8.0	3.4
9	1.6	12	13	5.3	9.0	63	267	88	296	31	7.9	3.9
10	1.4	12	12	5.3	9.0	55	237	80	242	26	7.5	4.3
11	1.7	12	12	5.3	9.3	45	213	77	151	24	7.2	5.2
12	2.3	12	12	5.5	8.8	43	249	72	143	40	7.4	8.8
13	2.4	12	12	5.5	8.4	117	243	71	128	26	6.0	11
14	2.7	12	12	5.5	8.9	675	216	71	259	21	5.2	8.7
15	2.6	12	12	5.5	9.4	1,450	189	70	343	41	4.4	7.2
16	2.6	12	12	5.5	10	1,230	168	65	197	856	3.9	6.5
17	2.6	12	12	5.5	11	1,810	153	60	129	701	3.7	6.6
18	2.6	12	12	5.5	12	2,110	150	56	106	403	3.3	5.5
19	2.8	12	11	5.5	13	2,020	168	52	85	262	3.2	5.1
20	3.3	12	11	6.0	14	1,940	180	49	102	178	2.5	4.6
21	4.1	12	11	6.5	23	1,920	651	48	181	123	2.3	4.2
22	4.8	12	10	7.3	23	1,900	847	45	131	91	2.3	4.0
23	5.4	12	10	8.1	16	1,900	801	45	142	74	2.5	3.5
24	5.9	12	9.0	8.4	34	1,550	938	44	343	65	2.5	3.2
25	6.6	12	8.5	9.0	47	1,390	959	43	385	55	2.0	4.0
26	7.1	13	7.7	9.0	104	1,340	819	41	284	46	1.9	5.1
27	6.7	13	7.6	9.0	109	1,520	567	41	207	40	1.9	5.6
28	7.1	14	7.2	9.0	95	1,470	399	39	212	34	2.1	6.2
29	8.7	15	6.7	9.0	------	1,500	318	35	167	29	2.6	6.3
30	9.0	16	6.7	9.0	------	1,710	267	31	138	25	2.2	6.2
31	9.0	------	6.7	9.0	------	1,610	------	29	------	22	2.1	------
TOTAL	121.6	353.8	362.1	207.0	645.8	29,817	17,411	2,484	4,829	3,891	189.5	145.1
MEAN	3.92	11.8	11.7	6.68	23.1	962	580	80.1	161	126	6.11	4.84
MAX	9.0	16	18	9.0	109	2,110	2,090	231	385	856	19	11
MIN	1.4	9.3	6.7	5.3	8.4	43	150	29	26	21	1.9	1.6
AC-FT	241	702	718	411	1,280	59,140	34,530	4,930	9,580	7,720	376	288

CAL YR 1970 TOTAL 25,955.4 MEAN 71.1 MAX 2,350 MIN 1.4 AC-FT 51,480
WTR YR 1971 TOTAL 60,456.9 MEAN 166 MAX 2,110 MIN 1.4 AC-FT 119,900

PEAK DISCHARGE (BASE, 500 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
3-18	--	--	2,190	4-21	1930	6.53	1,040
4- 1	2115	9.65	2,210	7-16	1545	6.32	962

06353000 Cedar Creek near Raleigh, N. Dak.

LOCATION.--Lat 46°05'00", long 101°20'05", in SE¼NE¼ sec.17, T.130 N., R.85 W., Sioux County, on right bank 300 ft downstream from unnamed tributary, 1 mile upstream from bridge on N. D. Highway 31, 7 miles upstream from mouth, and 19 miles south of Raleigh.

DRAINAGE AREA.--1,750 sq mi, approximately.

PERIOD OF RECORD.--April to September 1939, March 1962 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,890.81 ft above mean sea level. Prior to June 6, 1962, nonrecording gage at site 1 mile downstream at datum 9.58 ft lower.

AVERAGE DISCHARGE.--9 years (1962-71), 91.5 cfs (66,290 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 3,460 cfs Mar. 20 (gage height, 8.90 ft); maximum gage height, 9.23 ft Mar. 16 (backwater from ice); minimum, 1.1 cfs Sept. 18, 19 (gage height, 0.37 ft).
Period of record: Maximum discharge, 6,000 cfs Mar. 15, 1966 (gage height, 12.32 ft, backwater from ice); no flow at times in most years.
Maximum stage known since 1950, about 18 ft Apr. 18, 1950 (discharge 45,000 cfs, on basis of slope-area measurement 5 miles upstream).

REMARKS.--Records good.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.2	6.7	11	13	11	120	1,810	277	46	154	32	2.2
2	2.2	7.9	12	12	11	150	2,150	240	42	147	29	2.4
3	1.8	8.7	13	12	11	130	2,110	215	40	153	25	2.4
4	1.7	8.4	14	12	11	90	1,550	192	39	131	22	4.2
5	1.6	7.9	15	11	11	75	1,040	170	39	110	20	9.3
6	1.7	7.9	16	11	11	70	648	153	38	91	19	3.4
7	1.5	7.9	16	11	11	65	457	135	38	89	17	3.0
8	1.4	13	17	11	11	65	388	128	55	75	15	2.5
9	1.4	13	17	12	11	60	325	113	105	57	14	2.4
10	1.5	11	17	12	11	60	280	122	185	49	13	2.1
11	1.6	11	17	11	11	55	253	135	248	45	12	2.0
12	1.7	11	17	11	11	50	228	108	182	179	11	1.8
13	1.8	11	17	11	12	200	242	96	141	73	11	1.8
14	1.8	10	16	11	13	900	244	89	150	47	10	1.7
15	1.7	9.8	16	11	14	1,800	224	87	138	40	8.4	1.4
16	1.7	9.8	15	11	14	1,850	196	84	340	31	7.2	1.3
17	1.9	13	15	11	16	2,300	170	79	240	471	6.7	1.3
18	1.9	14	15	11	18	2,240	159	71	170	803	7.9	1.2
19	1.8	11	14	11	21	2,400	148	66	133	460	7.9	1.3
20	1.9	9.5	13	11	24	2,500	297	61	117	289	7.4	3.9
21	2.0	13	13	12	23	2,880	1,490	55	112	207	6.2	6.0
22	2.1	6.5	13	13	22	2,320	1,020	57	142	160	5.8	6.5
23	2.5	9.2	12	12	21	1,910	990	92	179	124	5.2	6.2
24	2.8	11	12	12	21	1,580	938	75	153	99	4.0	5.4
25	3.3	10	12	12	22	1,450	1,120	61	244	82	3.4	5.2
26	3.3	11	12	12	35	1,460	1,080	54	364	73	3.1	4.6
27	4.0	11	12	12	70	1,860	866	48	295	63	2.8	4.4
28	5.4	11	12	12	80	2,330	1,100	47	222	54	2.4	5.2
29	6.0	11	12	12	------	1,930	418	45	201	47	2.1	5.2
30	6.0	11	12	12	------	1,900	358	47	189	41	2.0	5.0
31	6.7	------	13	12	------	1,950	------	51	------	35	2.1	------
TOTAL	78.9	307.2	438	360	558	36,750	22,299	3,253	4,587	4,479	334.6	105.3
MEAN	2.55	10.2	14.1	11.6	19.9	1,185	743	105	153	144	10.8	3.51
MAX	6.7	14	17	13	80	2,880	2,150	277	364	803	32	9.3
MIN	1.4	6.5	11	11	11	50	148	45	38	31	2.0	1.2
AC-FT	157	609	869	714	1,110	72,890	44,230	6,450	9,100	8,880	664	209

CAL YR 1970 TOTAL 35,883.96 MEAN 98.3 MAX 2,780 MIN .83 AC-FT 71,180
WTR YR 1971 TOTAL 73,550.00 MEAN 202 MAX 2,880 MIN 1.2 AC-FT 145,900

PEAK DISCHARGE (BASE, 700 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
3-20	2300	8.90	3,460	4-21	0215	7.17	2,120
3-28	0200	8.25	2,880	7-17	2330	5.35	985

06354000 Cannonball River at Breien, N. Dak.

LOCATION.--Lat 46°22'33", long 100°56'03", in sec.36, T.134 N., R.82 W., Sioux County, on right bank 600 ft upstream from bridge on State Highway 6, 950 ft downstream from Louise Creek, and 0.5 mile south of Breien.

DRAINAGE AREA.--4,100 sq mi, approximately.

PERIOD OF RECORD.--August 1934 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,676.54 ft above mean sea level.

AVERAGE DISCHARGE.--37 years, 236 cfs (171,000 acre-ft per year); median of yearly mean discharges, 170 cfs (123,000 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 9,370 cfs Mar. 17 (gage height, 10.67 ft); minimum discharge, 10 cfs Jan. 14, 15.
Period of record: Maximum discharge, 94,800 cfs Apr. 19, 1950 (gage height, 22.30 ft, from floodmarks), from rating curve extended above 16,000 cfs on basis of slope-area and contracted-opening of peak flow; no flow at times in some years.

REMARKS.--Records fair except those for the winter period, which are poor. Some storage in several small lakes above station.

REVISIONS (WATER YEARS).--WSP 786: 1934. WSP 1146: 1943. WSP 1279: 1936-37(M), 1947(M). WSP 1509: 1955(M).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	28	28	18	18	375	4,520	635	100	555	172	11
2	14	32	28	17	18	400	4,650	555	100	458	162	12
3	13	38	28	16	20	450	4,130	490	100	386	155	12
4	14	39	28	15	20	525	3,070	450	100	348	146	11
5	14	38	28	15	20	400	2,020	410	150	308	139	24
6	13	39	28	16	20	450	1,440	366	308	273	130	48
7	13	34	28	17	22	350	1,150	338	182	265	124	32
8	14	44	28	18	22	350	1,020	314	314	235	122	20
9	14	53	28	18	22	350	924	296	327	204	115	17
10	14	76	26	17	22	325	825	290	600	189	108	14
11	14	68	26	15	22	325	747	305	578	177	102	15
12	14	63	26	13	22	300	678	293	532	899	97	14
13	15	59	26	11	22	300	630	262	918	989	93	15
14	15	61	26	10	24	350	630	238	1,230	717	87	14
15	15	56	26	10	24	2,000	605	225	813	442	82	13
16	15	57	24	11	26	3,500	560	220	524	314	78	12
17	15	55	24	12	28	6,890	515	210	564	240	70	11
18	16	63	24	13	26	6,400	482	200	532	507	64	11
19	18	82	24	15	26	5,610	454	180	1,220	807	63	12
20	17	55	22	17	24	4,900	634	160	873	555	59	18
21	17	59	22	18	24	5,600	1,990	150	1,010	418	57	19
22	18	29	22	19	24	4,940	2,110	140	1,440	324	57	19
23	18	25	22	18	23	3,790	2,120	150	2,840	279	39	18
24	18	25	22	16	24	2,980	2,080	243	2,120	232	25	18
25	19	30	22	15	26	2,820	2,220	202	1,290	196	18	18
26	19	30	20	14	350	2,750	1,960	199	976	182	14	15
27	19	3	20	14	350	3,090	1,660	196	930	182	13	15
28	20	30	20	16	375	3,920	1,310	180	1,070	182	13	16
29	23	30	21	16	------	3,950	996	140	867	179	12	17
30	24	30	20	16	------	4,290	783	130	656	179	12	17
31	26	------	20	18	------	4,940	------	120	------	177	11	------
TOTAL	512	1,352	756	474	1,644	77,620	46,913	8,287	23,204	11,398	2,439	508
MEAN	16.5	45.1	24.4	15.3	58.7	2,504	1,564	267	773	368	78.7	16.9
MAX	26	82	28	19	375	6,890	4,650	635	2,840	989	172	48
MIN	13	25	20	10	18	300	454	120	100	177	11	11
AC-FT	1,020	2,680	1,500	940	3,260	154,000	93,050	16,440	46,030	22,610	4,840	1,010

CAL YR 1970 TOTAL 101,429.0 MEAN 278 MAX 8,180 MIN 5.0 AC-FT 201,200
WTR YR 1971 TOTAL 175,107.0 MEAN 480 MAX 6,890 MIN 10 AC-FT 347,300

PEAK DISCHARGE (BASE, 1,000 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
3-17	0015	10.67	9,370	6-19	0800	3.75	1,310
3-31	0300	7.63	5,120	6-23	0600	6.08	3,180
4-21	2400	5.53	2,990	7-12	1900	4.23	1,640
6-13	2200	4.01	1,490				

06354500 Beaver Creek at Linton, N. Dak.

LOCATION.--Lat 46°15'27", long 100°13'58", on line between secs.17 and 18, T.132 N., R.76 W., Emmons County, on left bank 60 ft downstream from 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.

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

GAGE.--Water-stage recorder. Datum of gage is 1,690.55 ft above mean sea level. Prior to June 18, 1958, non-recording gage at site 60 ft upstream at same datum.

AVERAGE DISCHARGE.--22 years, 43.5 cfs (31,520 acre-ft per year); median of yearly mean discharges, 27 cfs (19,600 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 1,200 cfs Mar. 30 (gage height, 12.34 ft, backwater from ice); no flow Sept. 13-16.
Period of record: Maximum discharge, 9,800 cfs Apr. 8, 1952 (gage height, 17.50 ft); no flow at times in some years.

REMARKS.--Records fair.

REVISIONS (WATER YEARS).--WSP 1209: Drainage area. WSP 1239: 1950(M).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.1	2.2	3.6	.76	.80	1.7	610	42	22	25	3.4	.61
2	1.9	2.2	3.7	.80	.72	1.7	356	42	20	28	3.3	.38
3	1.8	2.2	3.7	.82	.68	1.8	243	32	17	24	3.1	.34
4	1.8	2.2	3.4	.86	.64	1.8	204	29	41	21	2.8	.46
5	1.8	2.2	4.2	.90	.62	1.8	190	26	76	19	2.5	.61
6	1.7	2.2	3.2	.92	.60	1.8	193	16	20	18	2.5	.42
7	1.5	2.2	2.7	.98	.60	1.9	175	19	19	18	2.4	.34
8	1.5	2.2	2.3	1.0	.60	1.9	157	19	19	16	2.2	.22
9	1.4	2.2	2.1	1.0	.60	1.9	137	18	17	15	2.2	.16
10	1.2	2.1	2.0	1.1	.66	2.0	120	16	17	16	1.9	.12
11	1.1	2.1	1.9	1.1	.70	2.0	110	15	56	17	1.8	.08
12	.99	2.1	1.8	1.2	.72	2.0	104	14	88	19	1.8	.06
13	.92	2.1	1.7	1.2	.80	2.0	98	13	30	17	1.8	.02
14	.85	2.2	1.6	1.2	.90	100	90	12	43	16	1.6	0
15	.78	2.2	1.5	1.2	.95	500	78	10	62	14	1.6	0
16	.92	2.2	1.4	1.2	1.0	470	68	8.8	62	12	1.5	0
17	1.1	8.8	1.3	1.2	1.1	460	61	9.4	49	12	1.4	.02
18	.92	6.5	1.2	1.2	1.2	355	57	6.5	53	11	1.4	.12
19	.92	3.6	1.2	1.2	1.2	370	53	6.2	30	10	1.4	.04
20	.99	3.4	1.1	1.2	1.3	364	53	5.9	26	9.9	1.4	.10
21	.99	3.7	1.1	1.2	1.4	566	64	4.9	29	8.8	1.2	.19
22	.92	4.0	1.0	1.2	1.4	726	53	5.4	62	8.8	1.2	.16
23	.92	4.5	.90	1.2	1.5	534	45	18	35	69	1.1	1.9
24	.99	4.0	.88	1.2	1.5	363	42	28	29	52	.99	2.2
25	1.3	3.8	.82	1.2	1.5	303	42	52	36	13	.92	1.1
26	1.3	4.5	.79	1.2	1.6	249	42	74	33	14	.72	.85
27	3.6	4.0	.74	1.1	1.6	345	42	59	27	11	.56	.99
28	3.1	3.8	.74	1.0	1.6	658	42	39	24	6.9	.38	.99
29	2.6	3.4	.72	1.0	------	865	42	28	22	5.1	.30	1.1
30	2.3	3.2	.74	.92	------	1,090	42	23	27	4.3	.26	1.1
31	2.2	------	.75	.86	------	1,040	------	21	------	3.8	.46	------
TOTAL	46.41	96.0	54.78	33.12	28.49	9,382.3	3,613	712.1	1,091	534.6	50.09	14.68
MEAN	1.50	3.20	1.77	1.07	1.02	303	120	23.0	36.4	17.2	1.62	.49
MAX	3.6	8.8	4.2	1.2	1.6	1,090	610	74	88	69	3.4	2.2
MIN	.78	2.1	.72	.76	.60	1.7	42	4.9	17	3.8	.26	0
AC-FT	92	190	109	66	57	18,610	7,170	1,410	2,160	1,060	99	29

CAL YR 1970 TOTAL 6,165.63 MEAN 16.9 MAX 198 MIN 0 AC-FT 12,230
WTR YR 1971 TOTAL 15,656.57 MEAN 42.9 MAX 1,090 MIN 0 AC-FT 31,050

PEAK DISCHARGE (BASE, 500 CFS).--MAR. 15, 700 CFS; MAR. 22, 750 CFS; MAR. 30, 1,200 CFS.

06354860 Spring Creek near Herreid, S. Dak.

LOCATION.--Lat 45°48'52", long 100°06'28", in SW¼ sec.13, T.127 N., R.77 W., Campbell County, on left bank 0.5 mile upstream from county highway bridge, 2.4 miles southwest of Herreid and 13.2 miles upstream from high-water line of Lake Oahe.

DRAINAGE AREA.--440 sq mi, approximately, of which about 220 sq mi is probably noncontributing.

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

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

AVERAGE DISCHARGE.--9 years, 10.4 cfs (7,530 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 931 cfs June 18 (gage height, 10.85 ft); no flow for many days. Period of record: Maximum discharge, 1,160 cfs Mar. 17, 1966 (gage height, 11.60 ft); no flow for several months each year.

REMARKS.--Records fair.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Feb. 16-20, Apr. 2-9, Aug. 30 to Sept. 30;
stage-discharge relation affected by ice Mar. 12-24)

3.0	0	3.4	.90	4.4	16	7.0	171
3.1	.03	3.5	1.6	4.8	28	8.0	301
3.2	.10	3.7	3.8	5.2	46	9.0	483
3.3	.40	3.9	6.8	6.0	88	11.0	980

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1		0	.78	.16	.44	.96	75	18	11	35	1.6	.31
2		0	.78	.22	.48	.90	41	16	9.2	29	1.4	.37
3		0	.72	.19	.44	.96	51	13	8.5	23	1.5	.28
4		0	.56	.20	.48	.96	42	12	7.5	20	1.3	.22
5		0	.52	.25	.44	.84	31	11	6.8	17	1.1	.25
6		0	.37	.28	.44	.78	24	9.8	5.7	16	1.2	.37
7		0	.37	.28	.44	.90	23	8.9	6.0	15	1.0	.34
8		0	.48	.28	.40	.90	21	7.5	6.0	12	.96	.31
9		0	.52	.31	.44	.84	18	6.9	5.7	12	.96	.28
10		.17	.48	.34	.48	.90	16	6.8	7.5	11	.84	.25
11		1.3	.48	.34	.40	.96	14	6.3	7.1	10	.84	.25
12		1.2	.48	.34	.48	1.0	12	4.9	8.2	10	.66	.22
13		.90	.48	.37	.48	2.0	11	4.4	12	8.7	.72	.16
14		.72	.48	.40	.44	50	10	3.8	19	7.5	.66	.10
15		.56	.48	.40	.52	300	9.4	3.4	29	6.4	.56	.09
16		.52	.48	.44	.52	430	8.0	3.2	149	5.8	.40	.09
17		.52	.48	.44	.60	410	8.0	3.1	394	5.5	.34	.09
18		.52	.48	.44	.66	300	7.6	2.8	855	5.8	.34	.09
19		.52	.40	.44	.60	150	7.8	2.5	645	5.7	.44	.10
20		.56	.37	.40	.56	100	8.9	2.3	293	4.9	.44	.10
21		.60	.31	.44	.66	95	24	2.5	256	4.4	.44	.16
22		.60	.31	.40	.66	90	37	2.6	226	4.0	.37	.22
23		.60	.31	.40	.66	90	19	19	147	3.8	.25	.25
24		.52	.28	.40	.66	100	18	65	123	3.6	.16	.25
25		.56	.25	.40	.84	135	26	46	105	3.7	.13	.25
26		.56	.25	.40	.78	108	22	26	84	3.5	.07	.22
27		.60	.25	.40	.78	93	23	21	69	3.0	.06	.28
28		.78	.19	.48	.90	97	36	16	59	2.8	.08	.40
29		.78	.13	.72	------	93	26	14	50	2.7	.09	.60
30		.72	.10	.52	------	103	20	12	45	2.1	.13	.56
31		------	.13	.34	------	96	------	12	------	2.0	.19	------
TOTAL	0	13.81	12.70	11.42	15.68	2,852.90	689.7	382.7	3,649.2	295.9	19.23	7.46
MEAN	0	.46	.41	.37	.56	92.0	23.0	12.3	122	9.55	.62	.25
MAX	0	1.3	.78	.72	.90	430	75	65	855	35	1.6	.60
MIN	0	0	.10	.16	.40	.78	7.6	2.3	5.7	2.0	.06	.09
AC-FT	0	27	25	23	31	5,660	1,370	759	7,240	587	38	15

CAL YR 1970 TOTAL 938.43 MEAN 2.57 MAX 55 MIN 0 AC-FT 1,860
WTR YR 1971 TOTAL 7,950.70 MEAN 21.8 MAX 855 MIN 0 AC-FT 15,770

PEAK DISCHARGE (BASE, 40 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
3-16	--	--	450	5-24	1400	6.27	103
4-22	0700	5.23	46	6-18	1400	10.85	931
4-28	1600	5.28	50				

06354988 Bowman Haley Lake near Haley, N. Dak.

LOCATION.--Lat 45°59'06", long 103°14'43", in NE¼ sec.24, T.129 N., R.101 W., Bowman County, 6 miles west of Haley.

DRAINAGE AREA.--446 sq mi, approximately.

PERIOD OF RECORD.--August 1966 to current year.

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

EXTREMES.--Current year: Maximum contents, 26,197 acre-ft Mar. 30 (elevation, 2,758.08 ft); minimum, 17,681 acre-ft Oct. 27, 28 (elevation, 2,753.54 ft).
Period of record: Maximum contents, 26,197 acre-ft Mar. 30, 1971 (elevation, 2,758.08 ft); minimum since first reaching spillway level, 17,363 acre-ft Dec. 3, 1969 (elevation, 2,753.34 ft).

REMARKS.--Reservoir is formed by a rolled earth-fill dam; storage began Aug. 22, 1966; dam completed April 1967. Total capacity is 93,000 acre-ft at maximum pool (elevation, 2,777.0 ft). Dead storage is 4,280 acre-ft below lowest point of outlet (elevation, 2,740.0 ft). Normal operating storage is 20,100 acre-ft at elevation 2,755.0 ft (crest of spillway). Figures given herein represent total contents. Controlled releases are through a 30-inch or 8-inch gate valve. The spillway is uncontrolled "glory hole" type and discharges through a conduit 9 ft in diameter. The reservoir is for flood control, irrigation, and incidental water supply.

COOPERATION.--Records of elevations and contents furnished by Corps of Engineers from capacity table dated August 1966. Elevations affected by wind.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	2,753.88	18,220	
Oct. 31	2,753.64	17,840	-380
Nov. 30	2,753.87	18,210	+370
Dec. 31	2,753.96	18,350	+140
CAL YR 1970	--	--	+890
Jan. 31	2,753.96	18,350	0
Feb. 28	2,755.18	20,450	+2,100
Mar. 31	2,757.82	25,640	+5,190
Apr. 30	2,755.43	20,910	-4,730
May 31	2,754.88	19,920	-990
June 30	2,755.26	20,600	+680
July 31	2,754.47	19,220	-1,380
Aug. 31	2,753.81	18,110	-1,110
Sept. 30	2,753.69	17,920	-190
WTR YR 1971	--	--	-300

06355000 North Fork Grand River at Haley, N. Dak.

LOCATION.--Lat 45°57'39", long 103°07'09", at southwest corner of sec.30, T.129 N., R.99 W., Bowman County, on left bank 10 ft downstream from county highway bridge, 300 ft south of post office at Haley, and 1 mile north of South Dakota state line.

DRAINAGE AREA.--509 sq mi.

PERIOD OF RECORD.--May 1908 to September 1917, October 1945 to current year. Monthly discharge only for some periods, published in WSP 1309.

GAGE.--Water-stage recorder. Datum of gage is 2,658.60 ft above mean sea level. Oct. 23, 1945, to June 18, 1951, nonrecording gage on downstream side of bridge near left abutment at present datum. See WSP 1729 or 1917 for history of changes prior to Oct. 23, 1945.

AVERAGE DISCHARGE.--35 years, 29.0 cfs (21,010 acre-ft per year); median of yearly mean discharges, 22 cfs (15,900 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 1,350 cfs Mar. 15 (gage height, 12.00 ft, backwater from ice); minimum, 0.21 cfs Oct. 4; minimum gage height, 4.34 ft Nov. 21, Aug. 17, 18.
Period of record: 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 measurement of flow over roadway outside of main channel; maximum gage height, 17.10 ft Apr. 15, 1950; no flow at times.

REMARKS.--Records fair. Flow regulated by Bowman-Haley Lake 14 miles upstream (see station 06354988).

REVISIONS (WATER YEARS).--WSP 1239: 1908-10, 1913-15 (M), 1917 (M).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.3	1.5	1.6	.71	1.5	51	930	65	4.9	37	4.0	1.0
2	1.2	1.4	1.6	.63	1.5	52	890	58	4.9	30	3.5	.86
3	2.4	1.4	1.6	.63	1.6	45	700	53	4.7	27	3.2	.28
4	.34	1.3	1.6	.71	1.6	41	600	48	6.6	25	2.8	1.1
5	.88	1.4	1.8	.55	1.6	37	500	44	20	21	2.3	5.1
6	1.4	1.3	1.9	.38	1.7	36	300	40	335	19	2.1	5.3
7	.98	1.3	1.7	.36	1.6	32	238	36	506	18	2.0	3.4
8	.87	1.6	1.7	1.3	1.6	29	204	32	442	17	1.6	1.9
9	.76	1.6	1.6	1.5	1.6	27	179	30	360	11	1.3	.86
10	.72	1.5	1.6	.73	1.6	24	160	30	299	8.6	1.4	.86
11	.64	1.5	1.5	.95	1.7	45	140	28	306	6.9	1.1	.77
12	.58	1.4	1.4	1.2	1.6	148	122	26	257	6.7	.86	.69
13	.59	1.6	1.4	1.0	1.7	288	107	24	216	9.7	1.4	.62
14	.55	1.6	1.4	.87	1.7	748	93	24	175	5.7	1.6	.70
15	.52	1.5	1.4	.89	1.8	1,180	85	22	139	4.0	1.2	.78
16	.49	1.5	1.4	.84	3.4	1,040	82	19	118	4.9	.56	.78
17	.50	1.4	1.1	.95	17	690	69	20	146	4.1	.42	.73
18	.55	1.5	.95	1.0	6.0	600	67	21	140	3.5	.41	.61
19	.49	1.6	.95	1.2	2.8	500	85	14	134	5.2	.86	.65
20	.54	1.5	.95	1.2	4.3	400	81	12	123	5.9	.87	.46
21	.74	1.4	.95	1.4	16	300	97	10	110	4.0	.71	.62
22	.89	1.6	.78	1.6	22	200	120	9.6	97	3.8	.76	.60
23	.88	1.6	.71	1.7	7.5	150	148	9.3	82	4.1	.62	.51
24	1.1	1.6	.63	1.6	2.3	100	148	9.3	74	4.3	.60	.37
25	1.1	1.6	.63	1.5	2.2	100	132	9.2	67	4.7	.77	.42
26	1.1	1.6	.56	1.5	3.2	200	115	7.0	60	6.1	.71	.43
27	1.1	1.6	.56	1.5	13	500	103	5.5	53	5.6	.71	.46
28	1.3	1.6	.63	1.5	47	700	91	5.5	49	5.1	.95	.82
29	1.4	1.5	.63	1.6	------	810	82	5.6	43	6.1	.56	.88
30	1.6	1.6	.71	1.5	------	950	74	5.6	40	5.8	.63	.78
31	1.6	------	.71	1.5	------	960	------	5.3	------	4.7	.95	------
TOTAL	29.11	45.1	36.65	34.50	171.1	10,983	6,742	727.9	4,412.1	324.5	41.45	33.34
MEAN	.94	1.50	1.18	1.11	6.11	354	225	23.5	147	10.5	1.34	1.11
MAX	2.4	1.6	1.9	1.7	47	1,180	930	65	506	37	4.0	5.3
MIN	.34	1.3	.56	.36	1.5	24	67	5.3	4.7	3.5	.41	.28
AC-FT	58	89	73	68	339	21,780	13,370	1,440	8,750	644	82	66

CAL YR 1970 TOTAL 7,943.36 MEAN 21.8 MAX 344 MIN .34 AC-FT 15,760
WTR YR 1971 TOTAL 23,580.75 MEAN 64.6 MAX 1,180 MIN .28 AC-FT 46,770

06355500 North Fork Grand River near White Butte, S. Dak.

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

DRAINAGE AREA.--1,190 sq mi, approximately.

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

GAGE.--Water-stage recorder. Altitude of gage is 2,275 ft (by barometer). Aug. 28, 1947, and Apr. 17, 1950, to June 11, 1951, nonrecording gage, and Aug. 29, 1947, to Apr. 16, 1950, water-stage recorder all at site 100 ft downstream at same datum.

AVERAGE DISCHARGE.--26 years, 56.3 cfs (40,790 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 2,750 cfs Mar. 14 (gage height, 7.81 ft); maximum gage height, 8.62 ft Mar. 13 (backwater from ice); no flow Oct. 2-11, Aug. 20, 21, Sept. 3.
Period of record: Maximum discharge, 30,900 cfs Apr. 16, 1950 (gage height, 20.0 ft, from floodmarks), from rating curve extended above 19,000 cfs on basis of slope-area measurement of peak flow; no flow at times.

REMARKS.--Records good except those for winter periods, which are poor. Flow regulated by Bowman Haley Lake (capacity, 93,000 acre-ft), 71 miles upstream, beginning August 1966.

REVISIONS (WATER YEARS).--WSP 1279: 1947, 1950.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.05	4.6	5.2	1.9	1.5	40	1,210	148	28	84	3.7	.10
2	0	4.6	5.0	1.7	1.6	40	1,030	131	28	74	3.4	.04
3	0	4.8	4.6	1.5	1.5	30	855	119	30	68	2.4	0
4	0	4.8	4.8	1.5	1.4	22	693	108	28	62	.80	.75
5	0	4.4	4.0	1.5	1.5	20	566	96	39	54	.45	1.6
6	0	4.8	3.7	1.5	1.4	20	472	86	75	50	1.0	2.8
7	0	4.8	3.7	1.5	1.3	20	400	81	50	46	1.2	4.0
8	0	5.0	4.0	1.7	1.3	20	340	75	101	41	.50	5.0
9	0	5.0	3.4	1.6	1.4	25	289	68	387	37	.70	4.8
10	0	5.2	3.0	1.4	1.5	45	258	68	370	36	1.7	3.7
11	0	5.6	2.5	1.2	1.7	60	237	66	314	73	1.0	3.1
12	.05	5.4	3.0	1.2	1.7	100	217	68	340	141	.35	2.7
13	.25	5.8	3.0	1.2	2.2	600	196	62	314	121	.48	2.2
14	.72	5.8	2.5	1.0	3.0	1,900	180	57	258	59	.25	1.8
15	.72	5.6	2.7	1.0	5.0	1,460	161	52	227	39	.76	1.7
16	.95	5.4	2.6	1.5	20	1,160	146	48	205	30	.80	1.6
17	1.2	5.6	2.7	1.5	50	1,440	135	46	215	24	.25	1.6
18	1.4	6.4	2.2	1.4	50	1,350	135	44	232	24	.05	1.5
19	1.6	6.1	1.7	1.5	40	1,190	129	42	337	21	.05	1.4
20	1.7	5.6	1.5	2.0	30	965	148	38	227	17	0	1.6
21	1.7	5.0	1.5	1.8	25	1,050	210	40	200	14	0	1.5
22	2.1	4.0	1.5	1.6	30	1,040	344	38	237	13	.02	1.4
23	2.5	3.0	1.6	1.8	35	930	377	39	245	12	.25	1.2
24	2.3	4.0	1.6	1.8	45	868	321	35	200	9.8	.10	1.2
25	2.3	4.8	1.7	1.8	44	745	269	33	170	7.8	.10	1.6
26	2.3	4.5	1.8	1.6	42	693	245	31	150	6.4	.10	2.3
27	2.4	4.6	1.6	1.8	41	682	224	27	135	4.6	.20	3.5
28	3.5	4.6	1.7	1.9	40	864	200	25	119	2.8	.15	5.4
29	4.6	5.0	1.8	2.0	------	1,060	180	23	109	2.8	.10	7.2
30	4.4	5.2	1.9	1.5	------	1,310	164	24	98	3.4	.10	8.0
31	4.8	------	2.0	1.5	------	1,350	------	25	------	3.8	.15	------
TOTAL	41.54	150.0	84.5	48.4	520.0	21,099	10,331	1,843	5,468	1,181.4	21.11	75.29
MEAN	1.34	5.00	2.73	1.56	18.6	681	344	59.5	182	38.1	.68	2.51
MAX	4.8	6.4	5.2	2.0	50	1,900	1,210	148	387	141	3.7	8.0
MIN	0	3.0	1.5	1.0	1.3	20	129	23	28	2.8	0	0
AC-FT	82	298	168	96	1,030	41,850	20,490	3,660	10,850	2,340	42	149

CAL YR 1970 TOTAL 11,583.35 MEAN 31.7 MAX 430 MIN 0 AC-FT 22,980
WTR YR 1971 TOTAL 40,863.24 MEAN 112 MAX 1,900 MIN 0 AC-FT 81,050

PEAK DISCHARGE (BASE, 400 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
3-14	1730	7.81	2,750	6-19	0100	4.15	436
3-30	1300	6.30	1,430				

06439980 Lake Oahe near Pierre, S. Dak.

LOCATION.--Lat 44°27'30", long 100°23'29", in NE¼ sec.1, T.111 N., R.80 W., 5th principal meridian, Hughes County, in Pier A of Control Tower No. 1 of powerhouse intake structure of dam on Missouri River, 6 miles northwest of Pierre, 7.1 miles upstream from Bad River, and at mile 1,072.3.

DRAINAGE AREA.--243,500 sq mi, approximately.

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

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

EXTREMES.--Current year: Maximum contents, 22,397,000 acre-ft May 31 (elevation, 1,616.7 ft, affected by wind); minimum, 18,367,000 acre-ft Dec. 24 (elevation, 1,604.3 ft, affected by wind).
Period of record: Maximum contents, 22,397,000 acre-ft May 31, 1970 (elevation, 1,616.7 ft, affected by wind); minimum since initial filling, 16,984,000 acre-ft Sept. 24, 26, 1967 (elevation, 1,599.2 ft).

REMARKS.--Reservoir is formed by an earthfill dam; storage began in August 1958. Maximum capacity, 23,630,000 acre-ft below elevation 1,620.0 ft (top of spillway gates). Normal maximum, 22,530,000 acre-ft below 1,617.0 ft, of which about 2,390,000 acre-ft is designated for flood control. Inactive storage, 5,538,000 acre-ft below elevation 1,540.0 ft. Dead storage, 2,000 acre-ft below elevation 1,425.0 ft (invert of lowest outlet tunnel). Figures given herein represent elevations at powerhouse intake structure and total contents adjusted for wind effect.
The spillway consists of a gated chute with flat crest at elevation 1,596.5 ft, 8 gates, 50 by 23.5 ft each; design capacity, 300,000 cfs. The outlet works consist of 7 turbines with a generating capacity of 85,000 kilowatts each. Water is used for flood control, navigation, power, and incidental uses.

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

MONTHEND ELEVATION AND CONTENTS AT 2400 HOURS, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	1,605.1	18,619,000	-
Oct. 31	1,604.9	18,551,000	-68,000
Nov. 30	1,605.9	18,758,000	+207,000
Dec. 31	1,604.5	18,411,000	-347,000
CAL YR 1970	--	--	-1,050,000
Jan. 31	1,606.1	18,899,000	+488,000
Feb. 28	1,608.5	19,646,000	+747,000
Mar. 31	1,613.4	21,243,000	+1,597,000
Apr. 30	1,615.5	22,016,000	+773,000
May 31	1,616.7	22,397,000	+381,000
June 30	1,616.2	22,233,000	-164,000
July 31	1,614.7	21,698,000	-535,000
Aug. 31	1,610.5	20,317,000	-1,381,000
Sept. 30	1,607.2	19,236,000	-1,081,000
WTR YR 1971	--	--	+617,000

06467600 James River near Manfred, N. Dak.

LOCATION.--Lat 47°38'40", long 99°49'40", near midpoint of north line sec.15, T.148 N., R.72 W., Wells County, on left upstream wingwall of bridge on county highway, 5 miles southwest of Manfred.

DRAINAGE AREA.--253 sq mi, of which about 197 sq mi is probably noncontributing.

PERIOD OF RECORD.--October 1954 to August 1957 (annual maximum only), September 1957 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,605.73 ft above mean sea level. Prior to Sept. 16, 1957, crest-stage gage only on downstream side of bridge at same datum.

AVERAGE DISCHARGE.--14 years (1957-71), 2.59 cfs (1,880 acre-ft per year); median of yearly mean discharges, 1.5 cfs (1,100 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 300 cfs Apr. 7 (gage height, 5.61 ft, backwater from ice); maximum gage height, 6.8 ft Mar. 31 (backwater from snow); no flow for several months.
Period of record: Maximum discharge, 900 cfs Apr. 10, 1969 (gage height, 7.70 ft); no flow for many days in each year.

REMARKS.--Records good.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0	.01	.01			0	25	4.1	1.2	2.2	.01	
2	0	.01	.01			0	105	3.8	1.1	1.9	.01	
3	0	.01	.01			0	80	3.6	1.0	1.5	0	
4	0	.01	.01			0	70	3.2	1.8	1.0	0	
5	0	.01	.01			0	65	3.2	13	.80	0	
6	0	.01	.01			0	100	2.9	8.2	.63	0	
7	0	.01	.01			0	280	2.8	5.4	.41	0	
8	0	.01	.01			0	145	2.7	4.1	.09	0	
9	0	.01	.01			0	112	2.7	4.4	.04	0	
10	0	.01	.01			0	87	2.8	9.9	.04	0	
11	0	.01	.01			0	62	2.8	9.9	.06	0	
12	0	.01	.01			0	44	2.7	7.7	.48	0	
13	0	.01	.01			0	29	2.6	5.7	.34	0	
14	0	.01	.01			0	20	2.4	4.0	.27	0	
15	0	.01	.01			0	14	2.2	2.8	.14	0	
16	0	.01	0			0	11	2.0	2.8	.06	0	
17	0	.01	0			0	8.6	1.9	2.5	.04	0	
18	0	.01	0			0	7.3	1.7	1.9	.02	0	
19	0	.01	0			0	5.9	1.6	1.6	.01	0	
20	.01	.01	0			0	5.9	1.5	1.8	0	0	
21	0	.01	0			0	5.2	1.4	5.0	0	0	
22	0	.01	0			0	4.5	1.4	4.5	.14	0	
23	0	.01	0			0	4.1	1.8	3.2	.20	0	
24	0	.01	0			0	3.8	1.8	2.5	.04	0	
25	.01	.01	0			0	3.3	1.8	2.0	.01	0	
26	.01	.01	0			0	2.1	1.8	1.2	.03	0	
27	0	.01	0			0	3.7	1.7	.71	.09	0	
28	0	.01	0			0	4.2	1.4	.41	.06	0	
29	.01	.01	0		------	0	3.3	1.3	.88	.06	0	
30	.01	.01	0		------	0	3.2	1.2	2.2	.04	0	
31	.01	------	0		------	10	------	1.2	------	.02	0	------
TOTAL	.06	.30	.15	0	0	10	1,314.1	70.0	113.40	10.72	.02	0
MEAN	.002	.010	.005	0	0	.32	43.8	2.26	3.78	.35	.0006	0
MAX	.01	.01	.01	0	0	10	280	4.1	13	2.2	.01	0
MIN	0	.01	0	0	0	0	2.1	1.2	.41	0	0	0
AC-FT	.1	.6	.3	0	0	20	2,610	139	225	21	.04	0

CAL YR 1970 TOTAL 675.45 MEAN 1.85 MAX 62 MIN 0 AC-FT 1,340
WTR YR 1971 TOTAL 1,518.75 MEAN 4.16 MAX 280 MIN 0 AC-FT 3,010

PEAK DISCHARGE (BASE, 30 CFS).--APR. 2, 120 CFS; APR. 7, 300 CFS.

06467900 Big Slough at Hamberg, N. Dak.

LOCATION.--Lat 47°45'20", long 99°30'42", on line between secs.4 and 5, T.149 N., R.69 W., Wells County, on right bank 30 ft upstream from bridge on State Highway 30 and 0.5 mile south of Hamberg.

DRAINAGE AREA.--60 sq mi, approximately, of which about 18 sq mi is probably noncontributing.

PERIOD OF RECORD.--September 1957 to September 1968, October 1969 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,532.71 ft above mean sea level, datum of 1929.

AVERAGE DISCHARGE.--13 years, 1.32 cfs (960 acre-ft per year); median of yearly mean discharges, 0.2 cfs (140 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 55 cfs Apr. 8 (gage height, 3.87 ft); no flow for several months.
Period of record: Maximum discharge, 170 cfs July 22, 1965; maximum gage height, 5.46 ft July 23, 1965; no flow for long periods each year.
Flood of 1969 reached a stage of about 5.7 ft according to local residents.

REMARKS.--Records fair.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1							0	8.1	.30	11	.16	
2							0	7.5	.30	11	.14	
3							0	6.4	.27	11	.13	
4							0	6.4	.24	12	.11	
5							4.0	5.6	.49	12	.09	
6							12	5.4	.71	10	.08	
7							41	5.2	.49	9.9	.07	
8							55	4.6	.40	9.2	.06	
9							51	3.5	.32	8.3	.05	
10							43	4.6	.34	7.3	.05	
11							35	4.8	.30	6.2	.04	
12							35	4.8	.27	7.0	.02	
13							29	4.6	.23	6.0	.02	
14							26	4.8	.22	5.4	.01	
15							24	4.8	.28	4.8	0	
16							21	4.0	.38	3.8	0	
17							17	3.8	.46	2.9	0	
18							18	3.6	.43	2.4	0	
19							19	3.3	.40	2.0	0	
20							17	2.9	.40	1.4	0	
21							16	2.6	.40	.93	0	
22							15	1.8	.40	.71	0	
23							14	1.8	.49	.66	0	
24							14	1.8	.86	.55	0	
25							13	1.6	1.0	.46	0	
26							13	1.5	2.4	.30	0	
27							12	.93	3.1	.30	0	
28							11	.76	3.5	.23	0	
29					------		10	.62	5.2	.20	0	
30					------		9.0	.49	11	.19	0	
31		------			------		------	.36	------	.17	0	------
TOTAL	0	0	0	0	0	0	574.0	112.96	35.58	148.30	1.03	0
MEAN	0	0	0	0	0	0	19.1	3.64	1.19	4.78	.033	0
MAX	0	0	0	0	0	0	55	8.1	11	12	.16	0
MIN	0	0	0	0	0	0	0	.36	.22	.17	0	0
AC-FT	0	0	0	0	0	0	1,140	224	71	294	2.0	0

CAL YR 1970 TOTAL 26.96 MEAN .07 MAX 4.0 MIN 0 AC-FT 53
WTR YR 1971 TOTAL 871.87 MEAN 2.39 MAX 55 MIN 0 AC-FT 1,730

PEAK DISCHARGE (BASE, 20 CFS).--April 8 (1200) 55 cfs (3.87 ft).

06468170 James River near Grace City, N. Dak.

LOCATION.--Lat 47°33'29", long 98°51'45", in NW¼NW¼NW¼ sec.17, T.147 N., R.64 W., Foster County, on left bank on downstream side of county highway bridge and 2.5 miles northwest of Grace City.

DRAINAGE AREA.--1,060 sq mi, approximately, of which about 650 sq mi is probably noncontributing.

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

GAGE.--Water-stage recorder.

EXTREMES.--Current year: Maximum discharge, 1,150 cfs April 8 (gage height, 11.04 ft, backwater from ice); no flow Dec. 20 to Mar. 29.
Period of record: Maximum discharge, 3,100 cfs Apr. 13, 1969 (gage height, 12.00 ft); no flow at times.

REMARKS.--Records fair.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.06	.60	.50			0	30	65	8.4	33	9.8	.45
2	.05	.65	.50			0	20	61	8.4	35	9.5	.35
3	.04	.65	.40			0	15	57	7.5	35	8.7	.31
4	.04	.65	.40			0	10	53	400	34	7.8	.31
5	.05	.65	.40			0	20	47	250	31	7.3	.30
6	.05	.60	.35			0	80	44	100	30	7.0	1.2
7	.05	.55	.31			0	320	37	50	28	6.5	.92
8	.05	.50	.27			0	800	34	30	25	5.8	.70
9	.05	.50	.27			0	850	32	25	24	5.4	.60
10	.05	.50	.23			0	800	30	70	23	5.2	.45
11	.08	.50	.17			0	750	28	50	22	4.9	.35
12	.12	.50	.10			0	725	26	40	25	4.5	.31
13	.17	.45	.10			0	695	25	35	25	4.3	.27
14	.17	.40	.08			0	645	23	32	25	4.0	.23
15	.27	.35	.03			0	517	22	30	25	3.6	.20
16	.35	.35	.02			0	370	20	30	24	3.1	.20
17	.40	.35	.02			0	300	17	30	23	2.6	.20
18	.45	.40	.01			0	236	17	32	20	2.3	.20
19	.55	.50	.01			0	209	16	35	19	1.8	.25
20	.50	.55	0			0	198	16	35	19	1.8	.25
21	.40	.55	0			0	172	16	35	18	1.6	.25
22	.40	.55	0			0	146	15	32	18	1.4	.30
23	.40	.50	0			0	132	15	32	18	1.1	.30
24	.45	.50	0			0	118	14	32	17	1.0	.30
25	.45	.50	0			0	100	13	32	17	.92	.35
26	.40	.50	0			0	88	12	32	16	.86	.40
27	.40	.50	0			0	80	12	35	14	.80	.40
28	.35	.50	0			0	76	10	35	14	.75	.45
29	.35	.50	0		------	0	73	10	33	13	.65	.45
30	.31	.50	0		------	5.0	68	8.7	32	12	.60	.45
31	.35	------	0		------	20	------	8.7	------	11	.55	------
TOTAL	7.81	15.30	4.17	0	0	25.0	8,643	804.4	1,628.3	693	116.13	12.00
MEAN	.25	.51	.13	0	0	.81	288	25.9	54.3	22.4	3.75	.40
MAX	.55	.65	.50	0	0	20	850	65	400	35	9.8	1.2
MIN	.04	.35	0	0	0	0	10	8.7	7.5	11	.55	.20
AC-FT	15	30	8.3	0	0	50	17,140	1,600	3,230	1,370	230	24

CAL YR 1970 TOTAL 3,153.84 MEAN 8.64 MAX 65 MIN 0 AC-FT 6,260
WTR YR 1971 TOTAL 11,949.11 MEAN 32.7 MAX 850 MIN 0 AC-FT 23,700

PEAK DISCHARGE (BASE, 200 CFS).--APRIL 8 (1,150 CFS); JUNE 4 (ABOUT 500 CFS).

06469000 Jamestown Reservoir near Jamestown, N. Dak.

LOCATION.--Lat 46°55'50", long 98°42'23", in SE¼NW¼ sec.24, T.140 N., R.64 W., on left bank in control house below Jamestown Dam on James River, 1.7 miles north of Jamestown Post Office, and 4 miles upstream from Pipestem Creek.

DRAINAGE AREA.--1,760 sq mi, approximately, of which about 1,010 sq mi is probably noncontributing.

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

GAGE.--Water-stage recorder. Datum of gage is 1,400.00 ft above mean sea level; gage readings have been reduced to elevations above mean sea level. June 22, 1959 to June 3, 1971 at site 0.2 mile upstream at same datum. Prior to June 22, 1959, nonrecording gages at different locations.

EXTREMES.--Current year: Maximum contents, 40,080 acre-ft May 5 (elevation, 1,434.33 ft); minimum observed, 26,510 acre-ft Oct. 11 (elevation, 1,428.60 ft).
Period of record: Maximum contents, 103,100 acre-ft May 1, 1969 (elevation, 1,443.60).

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, 389,000 acre-ft (elevation, 1,464.6 ft). Figures given herein represent total contents based on capacity table dated Oct. 1, 1965. Reservoir is used for flood control and municipal supply. Records of chemical analyses for the water year 1971 are published in Part 2 of this report.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	1,428.78	26,850	--
Oct. 31	1,429.70	28,700	+1,850
Nov. 30	1,430.36	30,110	+1,410
Dec. 31	1,430.33	30,040	-70
CAL YR	--	--	+1,870
Jan. 31	1,430.29	29,950	-90
Feb. 28	1,430.27	29,910	-40
Mar. 31	1,430.89	31,270	+1,360
Apr. 30	1,434.07	39,310	+8,040
May 31	1,432.34	34,710	-4,600
June 30	1,432.01	33,880	-830
July 31	1,431.30	32,210	-1,670
Aug. 31	1,430.54	30,500	-1,710
Sept. 30	1,430.96	31,420	+920
WTR YR 1971	--	--	+4,570

06469500 Pipestem Creek near Buchanan, N. Dak.

LOCATION.--Lat 47°03'59", long 98°55'07", on north line sec.4, T.141 N., R.65 W., Stutsman County, on left bank 30 ft downstream from bridge on county highway and 4.5 miles west of Buchanan.

DRAINAGE AREA.--758 sq mi, of which about 460 sq mi is probably noncontributing.

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

GAGE.--Water-stage recorder. Datum of gage is 1,467.01 ft above mean sea level. Prior to July 11, 1950, non-recording gage at same site and datum.

AVERAGE DISCHARGE.--21 years, 20.3 cfs (14,710 acre-ft per year); median of yearly mean discharges, 14 cfs (10,100 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 1,480 cfs June 4 (gage height, 9.38 ft); no flow Dec. 18 to Mar. 11. Period of record: Maximum discharge, 6,080 cfs Apr. 10, 1969 (gage height, 12.08 ft); no flow at times.

REMARKS.--Records good except those for the winter period, which are fair.

REVISIONS.--WSP 1917: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.22	.77	1.0			0	85	30	7.6	27	3.2	.35
2	.10	1.0	.95			0	95	28	7.0	26	2.8	.35
3	.16	.95	.85			0	105	26	6.6	24	2.6	.42
4	.22	.77	.85			0	115	25	652	22	2.4	.77
5	.22	.77	.85			0	120	24	447	21	1.9	2.8
6	.22	.68	.77			0	320	22	159	19	1.6	2.0
7	.22	.68	2.5			0	370	21	87	17	1.3	1.8
8	.22	.68	.68			0	308	19	54	16	1.2	1.2
9	.22	.68	.42			0	256	18	45	15	1.0	.95
10	.28	.68	.28			0	216	17	114	14	.95	.77
11	.35	.68	.28			0	224	17	82	13	.85	.59
12	.35	.77	.16			.20	201	15	56	17	.77	.42
13	.50	.77	.16			1.0	139	14	41	15	.68	.35
14	.50	.59	.05			5.0	125	12	34	14	.68	.16
15	.42	.59	.01			8.0	110	12	28	13	.59	.16
16	.42	.68	.01			9.5	95	10	28	12	.50	.16
17	.42	.68	.01			8.5	82	8.8	28	12	.42	.16
18	.42	.68	0			8.0	75	8.8	34	8.8	.68	.16
19	.42	.68	0			8.5	68	8.4	35	8.4	.77	.22
20	.35	.68	0			8.0	61	7.6	32	7.3	.68	.22
21	.42	.77	0			9.0	55	7.0	30	8.0	.59	.22
22	.42	.95	0			10	50	7.3	26	8.4	.42	.28
23	.35	.95	0			10	46	15	26	8.4	.35	.28
24	.42	.85	0			12	42	16	30	7.3	.28	.35
25	.50	.95	0			12	38	13	28	6.0	.22	.42
26	.50	.95	0			15	36	11	27	4.8	.22	.42
27	.50	.85	0			20	37	8.8	32	4.8	.16	.50
28	.50	.95	0			25	36	7.6	32	4.6	.16	.59
29	.59	.95	0		------	40	33	6.3	32	3.8	.16	.68
30	.68	.95	0		------	55	32	6.6	29	3.6	.16	.68
31	.59	------	0		------	80	------	8.0	------	3.4	.22	------
TOTAL	11.70	23.58	9.83	0	0	344.70	3,575	450.2	2,269.2	384.6	28.51	18.43
MEAN	.38	.79	.32	0	0	11.1	119	14.5	75.6	12.4	.92	.61
MAX	.68	1.0	2.5	0	0	80	370	30	652	27	3.2	2.8
MIN	.10	.59	0	0	0	0	32	6.3	6.6	3.4	.16	.16
AC-FT	23	47	20	0	0	684	7,090	893	4,500	763	57	37

CAL YR 1970 TOTAL 4,463.01 MEAN 12.2 MAX 121 MIN 0 AC-FT 8,850
WTR YR 1971 TOTAL 7,115.75 MEAN 19.5 MAX 652 MIN 0 AC-FT 14,110

PEAK DISCHARGE (BASE, 200 CFS).--APRIL 6 (410 CFS); JUNE 4 (1500) 1,480 CFS (9.38 FT).

06470000 James River at Jamestown, N. Dak.

LOCATION.--Lat 46°53'22", long 98°40'58", in NW¼NE¼ sec.6, T.139 N., R.63 W., Stutsman County, on left bank 100 ft upstream from Interstate 94 bridge at southeast corner of Jamestown and 3 miles downstream from Pipestem Creek.

DRAINAGE AREA.--2,820 sq mi, approximately, of which about 1,650 sq mi is probably noncontributing.

PERIOD OF RECORD.--June 1928 to September 1934, March to May 1935, August 1937 to September 1939, March 1943 to current year. Monthly discharge only for some periods, published in WSP 1309.

GAGE.--Water-stage recorder. Datum of gage is 1,373.27 ft above mean sea level. Prior to Oct. 1, 1965, non-recording gages at former bridge one half mile upstream, 1928-35 at datum 3.00 ft lower, and 1937-65 at datum 2.00 ft higher. See WSP 1917 for history of changes.

AVERAGE DISCHARGE.--36 years (1928-34, 1937-39, 1943-71) 56.7 cfs (41,080 acre-ft per year); median of yearly mean discharges, 24 cfs (17,400 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 627 cfs June 5 (gage height, 7.17 ft); minimum, 1.3 cfs Oct. 1-4; minimum gage height, 2.27 ft Aug. 16-19.
Period of record: Maximum discharge, 6,390 cfs May 13, 1950 (gage height, 15.82 ft, site and datum then in use; no flow at times in 1933.

REMARKS.--Records fair except those for the winter period, which are poor. Flow regulated by Arrowwood and Jim Lakes and Jamestown Reservoir (combined capacity, 246,000 acre-ft), the largest of which is Jamestown Reservoir, 6 miles upstream (see station 06469000).

REVISIONS (WATER YEARS).--WSP 1239: 1938(M). WSP 1917: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.3	3.8	4.7	2.5	2.5	5.0	134	134	160	171	11	18
2	1.3	4.1	4.3	2.5	2.5	4.0	105	132	122	169	10	19
3	1.3	3.6	4.7	2.5	3.0	4.0	56	131	56	169	10	20
4	1.3	3.5	4.5	2.5	3.0	4.0	127	128	26	164	9.8	31
5	1.4	3.6	4.9	2.5	3.0	4.0	81	140	174	162	9.5	31
6	1.5	3.6	4.3	2.5	3.0	3.5	150	175	429	120	8.7	26
7	1.6	3.6	4.3	2.5	3.0	3.5	363	173	175	30	8.2	24
8	1.5	4.3	4.1	2.5	3.0	3.5	398	173	144	20	7.9	24
9	1.6	4.7	3.8	2.5	3.0	3.5	310	172	119	18	11	26
10	1.6	4.3	3.8	2.5	3.0	4.5	253	170	82	15	8.4	26
11	1.6	4.3	3.6	2.5	3.0	6.0	220	168	65	15	7.4	24
12	1.6	4.3	3.9	2.5	3.0	9.5	175	168	22[illegible]	22	6.7	33
13	2.5	4.1	3.9	2.5	3.0	25	158	168	213	16	6.7	25
14	2.3	4.1	3.5	2.5	3.0	25	149	166	198	15	6.7	20
15	2.2	3.9	3.5	2.5	3.0	30	136	165	194	14	6.5	15
16	2.0	4.5	3.5	2.5	4.0	20	121	164	185	14	6.2	15
17	2.0	4.9	3.5	2.5	6.5	60	108	164	182	13	6.2	14
18	2.1	4.9	3.5	2.5	7.0	75	98	162	175	13	6.2	26
19	2.2	4.7	3.3	2.5	4.5	65	85	161	174	12	6.2	30
20	2.3	4.7	3.2	2.5	3.0	60	76	160	176	12	12	30
21	2.5	4.7	3.2	2.5	3.0	60	70	160	175	12	17	30
22	2.5	4.7	3.1	2.5	3.0	60	74	164	171	14	19	30
23	2.5	4.7	3.0	2.5	3.0	55	121	191	170	12	19	30
24	2.5	4.7	2.9	2.5	5.0	45	153	174	185	14	19	31
25	2.4	4.5	2.8	2.5	10	35	149	170	169	14	19	31
26	2.5	4.1	2.7	2.5	20	35	147	168	168	12	18	32
27	2.6	4.1	2.5	2.5	15	35	148	162	166	12	16	33
28	2.6	4.1	2.5	2.5	10	45	144	159	165	11	17	33
29	2.7	4.3	2.5	2.5	------	60	141	158	183	11	17	34
30	2.8	4.5	2.5	2.5	------	80	138	156	176	11	17	59
31	2.8	------	2.5	2.5	------	90	------	162	------	11	17	------
TOTAL	63.6	127.9	109.0	77.5	138.0	1,015.0	4,588	4,998	4,997	1,318	360.3	820
MEAN	2.05	4.26	3.52	2.50	4.93	32.7	153	161	167	42.5	11.6	27.3
MAX	2.8	4.9	4.9	2.5	20	90	398	191	429	171	19	59
MIN	1.3	3.5	2.5	2.5	2.5	3.5	56	128	26	11	6.2	14
AC-FT	126	254	216	154	274	2,010	9,100	9,910	9,910	2,610	715	1,630

CAL YR 1970 TOTAL 6,366.0 MEAN 17.4 MAX 162 MIN 1.2 AC-FT 12,630
WTR YR 1971 TOTAL 18,612.3 MEAN 51.0 MAX 429 MIN 1.3 AC-FT 36,920

06470500 James River at La Moure, N. Dak.

LOCATION.--Lat 46°21'20", long 98°18'15", at northeast corner of sec.11, T.133 N., R.61 W., La Moure County, on left bank 80 ft downstream from bridge on State Highway 13, 0.5 mile west of La Moure, and 12 miles upstream from Cottonwood Creek.

DRAINAGE AREA.--4,390 sq mi, approximately, of which about 2,600 sq mi is probably noncontributing.

PERIOD OF RECORD.--April to July 1903 (gage-height record only), April 1950 to current year. Gage-height records for 1902-11 are contained in reports of U.S. Weather Bureau.

GAGE.--Water-stage recorder and rubble-masonry control. Datum of gage is 1,290.00 ft above mean sea level. See WSP 1729 or 1917 for history of changes prior to Apr. 19, 1950.

AVERAGE DISCHARGE.--21 years (1950-71), 84.4 cfs (61,150 acre-ft per year); median of yearly mean discharges, 53 cfs (38,400 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 621 cfs Apr. 11 (gage height, 8.53 ft); no flow Oct. 3 (gage height, 6.90 ft, caused by wind).
Period of record: Maximum discharge, 6,800 cfs Apr. 14, 1969 (gage height, 16.17 ft); no flow at times.
Prior to flood of Apr. 14, 1969, a long-time resident said that the flood of May 16, 1950 was the highest since 1881, with stage in either 1942 or 1943 being almost as high owing to large ice jam.

REMARKS.--Records fair. Flow regulated by Arrowwood and Jim Lakes, and Jamestown Reservoir (combined capacity, 246,000 acre-ft), the largest of which is Jamestown Reservoir, 85 miles upstream (see station 06469000). Records of chemical analyses and water temperatures for water year 1971 are published in Part 2 of this report.

REVISIONS.--WSP 1917: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	15	13	7.8	7.9	10	107	156	168	196	13	14
2	12	11	11	8.2	7.4	11	87	147	165	189	10	14
3	.03	13	12	8.0	7.7	11	99	141	166	188	9.4	16
4	.42	10	11	7.5	7.5	11	101	145	164	176	8.9	16
5	2.1	9.1	11	7.2	8.1	12	110	136	134	168	9.1	18
6	6.7	14	9.2	7.2	8.3	12	127	135	89	161	9.5	17
7	3.7	9.6	9.0	6.4	7.7	11	122	134	68	164	8.1	20
8	3.9	12	9.2	6.0	7.4	11	153	142	222	157	7.5	18
9	7.0	11	9.2	6.5	7.4	11	183	162	297	126	11	21
10	1.3	17	9.1	6.5	7.6	13	380	177	218	70	12	22
11	1.9	13	8.8	6.4	7.9	15	491	165	181	40	6.7	13
12	4.3	11	8.3	6.8	7.9	23	359	164	160	46	7.3	19
13	6.2	15	8.6	7.3	7.9	37	276	164	111	30	7.9	16
14	5.0	12	8.9	7.4	7.7	99	214	162	121	30	6.7	13
15	4.4	12	8.4	7.3	7.9	129	191	166	199	27	5.5	11
16	4.5	12	8.2	7.3	8.4	102	179	145	210	25	6.5	9.8
17	9.0	12	8.4	7.3	9.2	113	145	176	216	20	8.4	13
18	7.5	12	8.5	7.4	9.7	139	151	152	197	28	12	11
19	4.6	12	8.2	7.4	9.2	159	145	159	196	17	11	12
20	7.9	13	8.0	6.9	8.9	168	125	153	181	16	6.3	16
21	6.4	13	7.4	7.9	8.7	177	115	146	174	19	7.1	11
22	7.9	14	7.9	8.4	8.9	176	107	161	181	16	8.4	17
23	5.9	12	8.5	7.4	8.9	165	97	201	181	19	7.4	22
24	5.6	10	8.4	7.5	9.3	158	81	205	195	16	10	18
25	11	9.6	7.8	8.1	13	143	91	209	197	27	8.6	21
26	13	9.5	8.3	7.4	16	134	120	204	202	14	12	26
27	9.8	9.5	8.2	7.4	12	125	160	180	204	20	14	26
28	8.8	9.4	7.5	7.3	10	116	161	164	180	18	15	23
29	8.4	9.8	7.5	8.3	------	108	158	182	197	18	19	23
30	15	10	7.6	8.8	------	108	175	163	198	12	20	29
31	13	------	7.3	9.1	------	118	------	181	------	14	19	------
TOTAL	208.25	352.5	274.4	230.4	248.5	2,625	5,010	5,077	5,372	2,067	317.3	525.8
MEAN	6.72	11.8	8.85	7.43	8.88	84.7	167	164	179	66.7	10.2	17.5
MAX	15	17	13	9.1	16	177	491	209	297	196	20	29
MIN	.03	9.1	7.3	6.0	7.4	10	81	134	68	12	5.5	9.8
AC-FT	413	699	544	457	493	5,210	9,940	10,070	10,660	4,100	629	1,040

CAL YR 1970 TOTAL 11,720.95 MEAN 32.1 MAX 173 MIN .03 AC-FT 23,250
WTR YR 1971 TOTAL 22,308.15 MEAN 61.1 MAX 491 MIN .03 AC-FT 44,250

06471000 James River at Columbia, S. Dak.

LOCATION.--Lat 45°37'05", long 98°19'30", in NE¼NW¼ sec.29, T.125 N., R.62 W., Brown County, on left bank 10 ft downstream from highway bridge, 0.8 mile northwest of Columbia, 2.4 miles upstream from Chicago and North Western Railway Co. bridge, 3.6 miles upstream from Elm River, and 9.4 miles downstream from Columbia Road Dam.

DRAINAGE AREA.--7,050 sq mi, approximately.

PERIOD OF RECORD.--October 1945 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,275.01 ft above mean sea level. Prior to Oct. 5, 1957, non-recording gage at same site and datum.

AVERAGE DISCHARGE.--26 years, 106 cfs (76,800 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 145 cfs July 9 (gage height, 8.66 ft); no flow for many days. Period of record: Maximum discharge, 5,420 cfs May 24, 25, 1950 (gage height, 16.89 ft, from graph based on gage readings); maximum gage height, 17.09 ft Apr. 22, 1969; maximum daily reverse flow, 1,860 cfs Apr. 8 1952 (backwater from Elm River).

REMARKS.--Records fair. Flow regulated by Arrowwood and Jim Lakes, and Jamestown Reservoir (combined capacity, 246,000 acre-ft). Regulation by Jamestown Reservoir (capacity, 229,470 acre-ft), 168 miles upstream, since May 1953. Water-quality records for the water year 1971 are published in Part 2 of this report.

REVISIONS.--Corrected figure of discharge for Sept. 16, 1962 is 72 cfs, and minimum discharge for calendar year 1964 is -720 cfs, superseding figures published in WSP 1917.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						0	0	49	73	127	101	89
2						0	0	50	71	125	100	89
3						0	0	52	70	123	99	87
4						0	0	52	70	125	99	85
5						0	0	51	71	130	99	81
6						0	0	52	70	134	99	73
7						0	0	52	71	140	98	65
8						0	.03	53	73	140	97	57
9						0	3.0	53	78	139	95	50
10						0	.86	53	87	142	94	44
11						0	.60	54	96	137	93	39
12						0	.31	54	101	132	91	41
13						0	.14	54	105	129	90	53
14						0	0	55	107	125	88	58
15						0	0	55	109	123	86	55
16						2.0	0	55	111	120	84	49
17						4.3	0	55	112	119	81	43
18						2.5	0	55	113	118	80	37
19						.60	0	55	114	118	78	33
20						.38	0	55	116	117	78	29
21						1.0	0	55	119	117	76	27
22						3.0	0	56	123	116	76	25
23						4.0	0	60	122	115	75	24
24						2.0	0	63	124	113	73	23
25						1.0	0	62	125	111	71	23
26						0	0	61	125	109	71	23
27						0	0	61	125	107	71	23
28						0	19	60	125	106	70	23
29					------	0	35	60	127	104	72	23
30					------	0	45	61	128	103	79	22
31		------			------	0	------	66	------	102	87	------
TOTAL	0	0	0	0	0	20.78	103.94	1,729	3,061	3,766	2,651	1,393
MEAN	0	0	0	0	0	.67	3.46	55.8	102	121	85.5	46.4
MAX	0	0	0	0	0	4.3	45	66	128	142	101	89
MIN	0	0	0	0	0	0	0	49	70	102	70	22
AC-FT	0	0	0	0	0	41	206	3,430	6,070	7,470	5,260	2,760

CAL YR 1970 TOTAL 16,149.08 MEAN 44.2 MAX 280 MIN 0 AC-FT 32,030
WTR YR 1971 TOTAL 12,724.72 MEAN 34.9 MAX 142 MIN 0 AC-FT 25,240

06471200 Maple River at North Dakota-South Dakota State line

LOCATION.--Lat 45°56'20", long 98°27'08", in SW¼SE¼ sec.33, T.129 N., R.62 W., Dickey County, N. Dak., on left bank 0.4 mile upstream from State line, 7.8 miles northeast of Frederick, S. Dak., and 15.7 miles upstream from mouth.

DRAINAGE AREA.--750 sq mi, approximately, of which about 270 sq mi is probably noncontributing.

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

GAGE.--Water-stage recorder. Altitude of gage is 1,365 ft (from topographic map). Prior to June 14, 1962, nonrecording gage at site 0.4 mile downstream at datum 0.94 ft lower.

AVERAGE DISCHARGE.--15 years, 19.4 cfs (14,060 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 125 cfs Mar. 18; maximum gage height, 5.66 ft Mar. 18, backwater from ice; no flow for many days.
Period of record: Maximum discharge, 5,930 cfs Apr. 11, 1969 (gage height, 15.22 ft); maximum gage height, 16.05 ft Apr. 11, 1969 (backwater from ice); no flow for long periods in each year.

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

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Stage-discharge relation affected by ice Mar. 10-23; shifting-control method used Mar. 24 to Apr. 8, June 22 to July 5)

2.92	0	3.4	4.9
3.0	.14	3.7	13
3.1	.70	4.0	26
3.2	1.7	4.5	59
3.3	3.1	5.0	114

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						0	20	2.2	1.1	49	1.3	
2						0	15	1.6	.87	34	1.2	
3						0	14	1.2	.78	45	.87	
4						0	15	1.4	.78	78	.78	
5						0	13	1.2	1.4	63	.70	
6						0	12	.78	1.4	47	.70	
7						0	11	.70	1.4	39	.63	
8						0	11	.43	1.5	33	.49	
9						0	9.6	.22	1.5	27	.56	
10						0	7.0	.43	2.5	23	.56	
11						0	7.5	.43	2.3	20	.37	
12						.20	6.3	.27	2.8	18	.22	
13						1.0	5.4	.22	5.4	16	.18	
14						.80	3.9	.09	3.1	14	.14	
15						1.0	3.4	.03	2.2	12	.02	
16						2.0	3.3	0	1.6	11	0	
17						5.0	2.3	0	2.9	9.1	.03	
18						100	1.9	0	4.1	8.0	.32	
19						120	2.3	0	6.7	6.5	.22	
20						110	2.2	0	8.0	5.4	.14	
21						90	1.8	0	24	4.3	.05	
22						70	1.6	0	57	3.8	.02	
23						60	1.6	.17	49	2.2	.02	
24						46	1.3	.43	36	1.6	0	
25						40	1.2	.27	29	2.3	0	
26						37	1.1	.09	28	2.2	0	
27						34	2.1	.03	27	2.1	0	
28						32	2.1	0	24	1.9	0	
29					------	30	1.6	.01	33	2.1	0	
30					------	25	2.2	.05	55	1.8	0	
31		------			------	22	------	.49	------	1.4	0	------
TOTAL	0	0	0	0	0	826.00	182.7	12.74	414.33	582.7	9.52	
MEAN	0	0	0	0	0	26.6	6.09	.41	13.8	18.8	.31	0
MAX	0	0	0	0	0	120	20	2.2	57	78	1.3	0
MIN	0	0	0	0	0	0	1.1	0	.78	1.4	0	0
AC-FT	0	0	0	0	0	1,640	362	25	822	1,160	19	0

CAL YR 1970 TOTAL 1,561.61 MEAN 4.28 MAX 84 MIN 0 AC-FT 3,100
WTR YR 1971 TOTAL 2,027.99 MEAN 5.56 MAX 120 MIN 0 AC-FT 4,020

PEAK DISCHARGE (BASE, 50 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
3-18	--	--	125	6-30	1700	4.60	59
6-22	1600	4.66	61	7- 4	1200	4.83	81

06471500 Elm River at Westport, S. Dak.

LOCATION.--Lat 45°39'22", long 98°29'48", in SW¼NW¼ sec.12, T.125 N., R.64 W., Brown County, on right bank 12 ft downstream from highway bridge, 0.5 mile north of Westport, 0.7 mile upstream from Chicago, Milwaukee, St. Paul and Pacific Railroad bridge, 9.3 miles downstream from Willow Creek, and 30.4 miles upstream from mouth.

DRAINAGE AREA.--1,680 sq mi, approximately.

PERIOD OF RECORD.--October 1945 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,309.3 ft above mean sea level. Prior to Aug. 6, 1951, and Apr. 8 to Sept. 9, 1952, nonrecording gage 12 ft upstream at same datum. Aug. 6, 1951, to Apr. 7, 1952, water-stage recorder at present site and datum.

AVERAGE DISCHARGE.--26 years, 48.0 cfs (34,780 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 254 cfs July 4 (gage height, 6.35 ft); minimum daily, 1.2 cfs Nov. 22.
Period of record: Maximum discharge, 12,600 cfs Apr. 10, 1969 (gage height, 22.11 ft); no flow for many days in most years prior to 1960.

REMARKS.--Records good. Flow regulated for Aberdeen municipal water supply by Elm Lake and other small reservoirs upstream (combined capacity, about 16,000 acre-ft).

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Dec. 11 to Jan. 25)

4.2	0.78	4.8	24
4.3	2.0	5.1	48
4.4	4.2	5.5	92
4.5	7.6	6.0	176
4.6	12	6.5	287

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.9	3.3	4.0	2.4	3.0	5.2	29	7.2	3.8	43	2.6	13
2	3.0	3.0	3.3	2.2	3.0	5.2	25	6.1	3.5	116	2.6	13
3	2.4	2.8	3.0	2.4	2.6	5.2	19	6.5	3.8	230	2.6	12
4	2.8	2.8	3.6	2.4	2.6	4.9	19	6.1	4.0	233	2.6	9.2
5	3.0	2.8	3.5	2.4	2.6	4.6	17	4.9	3.8	209	2.6	8.4
6	3.3	2.6	5.0	2.6	2.4	4.6	25	4.0	3.5	178	2.6	8.4
7	4.9	2.4	8.0	3.0	2.4	4.3	25	3.5	3.8	142	2.8	8.8
8	6.5	3.3	7.2	3.8	2.4	4.0	22	2.8	3.5	104	2.8	8.8
9	7.6	2.8	4.0	4.3	2.4	4.0	22	2.8	3.8	89	2.8	9.2
10	6.1	2.8	3.0	4.3	2.4	4.3	20	3.0	4.3	77	2.6	9.8
11	7.2	2.8	2.6	4.3	2.6	5.2	16	3.0	3.8	65	2.4	4.3
12	7.6	2.4	2.6	4.3	2.6	9.2	16	2.4	3.5	55	2.8	4.0
13	8.0	2.4	2.6	4.0	2.4	30	17	2.2	2.8	46	8.0	3.8
14	8.0	2.2	2.4	3.8	2.6	145	13	1.9	2.4	38	8.0	3.5
15	6.5	2.2	2.2	3.8	2.6	113	12	2.0	4.0	33	8.4	4.0
16	4.0	5.5	2.0	3.8	3.0	55	11	1.9	6.8	29	8.4	9.6
17	2.8	6.0	2.0	3.5	2.8	74	8.4	2.4	6.5	23	8.0	12
18	2.6	6.1	2.0	3.5	3.0	66	11	2.6	5.2	19	11	12
19	2.6	2.4	2.0	3.8	4.6	128	9.6	3.5	8.8	15	17	12
20	4.0	2.0	2.2	4.3	6.5	209	8.4	3.5	8.8	14	17	13
21	4.0	1.9	2.2	4.0	6.1	189	7.6	3.8	11	11	17	12
22	3.8	1.2	2.2	5.2	5.5	115	7.2	4.3	12	9.6	16	13
23	3.8	1.4	2.2	7.2	4.6	98	6.5	5.2	14	10	16	10
24	3.8	1.6	2.2	12	5.2	92	4.9	4.3	53	8.8	14	4.9
25	4.0	2.4	2.4	14	5.8	69	4.3	3.8	56	8.8	14	4.3
26	3.5	3.0	2.4	9.6	5.8	65	3.5	3.8	47	4.9	14	4.3
27	3.5	3.3	2.2	8.4	5.8	57	9.2	3.8	43	4.6	14	4.0
28	3.8	3.8	2.2	6.8	5.5	48	9.2	3.8	39	4.6	13	3.8
29	4.0	4.0	2.2	3.8	------	41	9.2	3.8	40	3.5	13	3.5
30	3.8	4.3	2.4	3.3	------	37	9.6	3.8	37	3.3	14	3.8
31	3.0	------	2.4	3.3	------	35	------	4.6	------	3.0	14	------
TOTAL	138.8	91.2	92.2	146.5	102.8	1,726.7	416.6	117.3	442.4	1,830.1	276.6	241.4
MEAN	4.48	3.04	2.97	4.73	3.67	55.7	13.9	3.78	14.7	59.0	8.92	8.05
MAX	8.0	8.0	8.0	14	6.5	209	29	7.2	56	233	17	13
MIN	2.4	1.2	2.0	2.2	2.4	4.0	3.5	1.9	2.4	3.0	2.4	3.5
AC-FT	275	181	183	291	204	3,420	826	233	878	3,630	549	479

CAL YR 1970 TOTAL 3,677.7 MEAN 10.1 MAX 89 MIN 1.0 AC-FT 7,290
WTR YR 1971 TOTAL 5,622.6 MEAN 15.4 MAX 233 MIN 1.2 AC-FT 11,150

PEAK DISCHARGE (BASE, 100 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
3-14	1800	6.05	184	7- 4	0030	6.35	254
3-20	0030	6.31	239				

As the number of streams on which streamflow information is likely to be desired far exceeds the number of stream-gaging stations feasible to operate at one time, the Geological Survey collects limited streamflow data at sites other than stream-gaging stations. When limited streamflow data are collected on a systematic basis over a period of years for use in hydrologic analyses, the site at which the data are collected is called a partial-record station. Data collected at these partial-record stations are usable in low-flow or flood-flow analyses, depending on the type of data collected. In addition, discharge measurements are made at other sites not included in the partial-record program. These measurements are usually made in time of drought or flood to give better areal coverage to those events. Those measurements and others collected for some special reason are called measurements at miscellaneous sites.

Records collected at partial-record stations are prepared in two tables. The first is a table of discharge measurements at low-flow partial-record stations, and the second is a table of annual maximum stage and discharge at crest-stage stations. Discharge measurements made at miscellaneous sites for both low flow and high flow are given in a third table.

Crest-stage partial-record stations

The following table contains annual maximum discharges for crest-stage stations. A crest-stage gage is a device which will register the peak stage occurring between inspections of the gage. A stage-discharge relation for each gage is developed from discharge measurements made by indirect measurements of peak flow or by current meter. The date of the maximum discharge is not always certain but is usually determined by comparison with nearby continuous-record stations, weather records, or local inquiry. Only the maximum discharge for each water year is given. Information on some lower floods may have been obtained but is not published herein. The years given in the period of record represent water years for which the annual maximum has been determined.

Annual maximum discharge at crest-stage partial-record stations

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Discharge (cfs)
		Red River of the North basin					
05051800	Grass Lake tributary near Lidgerwood, N. Dak.	Lat 46°04'45", long 97°11'40", at west line sec.15, T.130 N., R.52 W., Richland County, at culvert on county highway just off State Highway 11, 2 miles west of Lidgerwood.	0.61	1958-71	7- -71	2.87	16
05051900	Wild Rice River tributary near Mantador, N. Dak.	Lat 46°10'15", long 97°04'15", at east line sec.9, T.131 N., R.51 W., Richland County, at bridge on county highway 4.5 miles west of Mantador.	15.7	1958-71	7- -71	3.87	48
05052000	Wild Rice River near Mantador, N. Dak.	Lat 46°10'21", long 97°00'37", on south half of east line of sec.12, T.131 N., R.51 W., Richland County, at county highway bridge 1.5 miles west of Mantador.	1,360	‡1944-50 1952-71	3- -71	[a]4.00	40
05052500	Antelope Creek at Dwight, N. Dak.	Lat 46°18'52", long 96°44'13", SE¼ sec. 20, T.133 N., R.48 W., Richland County, at bridge on former U.S. Highway 81 about 0.5 mile north of Dwight.	294	‡1944-49 1950-71	3-17-71	[a]6.36	288
050552000	Big Coulee near Maddock, N. Dak.	Lat 47°57'30", long 99°34'53", on north line sec.11, T.151 N., R.70 W., Benson County, at culvert on county highway, 3.5 miles southwest of Maddock.	140	‡1957-67 1969-71	4- 6-70 4- 8-71	[b]10.35 12.0	[b]200 810
05056020	Mauvais Coulee tributary near Bisbee, N. Dak.	Lat 48°31'00", long 99°23'10", in SE¼SE¼ sec.11, T.158 N., R.68 W., Towner County, at bridge on county highway, 7.5 miles south of Bisbee.	2.83	1955-71	4- 9-71	2.73	92
05056040	Mauvais Coulee tributary No. 2 near Cando, N. Dak.	Lat 48°29'10", long 99°24'20", in SW¼SW¼ sec.23, T.158 N., R.68 W., Towner County, at culvert on State Highway 17, 9 miles west of Cando.	8.48	1955-71	4-10-71	3.90	250
05056060	Mauvais Coulee tributary No. 3 near Cando,	Lat 48°27'20", long 99°12'40", in NW¼NW¼ sec.5, T.157 N., R.66 W., Towner County at bridge on U.S. Highway 281, 2.2 miles south of Cando.	60.2	1955-71	4-11-71	7.56	840
05056080	Mauvais Coulee tributary No. 4 near Bisbee, N. Dak.	Lat 48°29'10", long 99°26'50", in SW¼SW¼ sec.21, T.158 N., R.68 W., Towner County, at culvert on State Highway 17, 10 miles southwest of Bisbee.	24.4	1955-71	4-11-71	4.78	840

‡ Operated as a continuous-record station.
a Backwater from ice or vegetation.
b Not previously published.

Annual maximum discharge at crest-stage partial-record stations--continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Discharge (cfs)
		Red River of the North basin--continued					
05056300	Little Coulee near Leeds, N. Dak.	Lat 48°17'15", long 99°26'55", in center of sec.31, T.156 N., R.68 W., Benson County, at culverts on U.S. Highway 2, 0.2 mile west of Leeds.	280	‡1956-67 1969-71	4- 8-71	7.52	556
05056900	Sheyenne River tributary near Cooperstown, N. Dak.	Lat 47°27'25", long 98°00'25", at sec. corner 23-24-25-26, T.146 N., R.58 W., Griggs County, on county highway, 1.4 miles north of State Highway 7 and 5 miles east of Cooperstown.	15.2	1959-71	3-29-71	a5.72	250
050569500	Sheyenne River tributary No. 2 near Cooperstown, N. Dak.	Lat 47°26'20", long 98°01'35", on east line sec.27, T.146 N., R.58 W., Griggs County, at culvert on county highway 0.1 mile south of State Highway 7, and 4 miles east of Cooperstown.	.08	1959-71	6-21-71	3.96	3.5
05059800	Swan Creek near Absaraka, N. Dak.	Lat 46°58'30", long 97°21'30", on north line sec.3, T.140 N., R.53 W., Cass County, at bridge on county highway 1.8 miles east of Absaraka.	32.9	1955-71	4- -71	3.75	270
05059850	Swan Creek tributary near Ayr, N. Dak.	Lat 46°58'30", long 97°30'00", in NE¼ sec.4, T.140 N., R.54 W., Cass County, at culvert on county highway, 4.5 miles south of Ayr.	4.24	1955-71	5- -71	3.37	24
05059900	Swan Creek near Casselton, N. Dak.	Lat 46°55'00", long 97°15'30", in NW¼ sec.28, T.140 N., R.52 W., Cass County, at bridge on county highway, 2.6 miles northwest of Casselton.	56.6	1955-71	5-30-70 3- -71	-- 4.31	c950 320
05059950	Swan Creek tributary near Casselton, N. Dak.	Lat 46°53'10", long 97°12'40", near center sec.2, T.139 N., R.52 W., Cass County, at culverts on State Highway 18, 1 mile south of Casselton.	14.1	1955-71	4- -71	4.43	20
05062200	Elm River near Kelso, N. Dak.	Lat 47°17'30", long 97°06'50", on west line sec.14, T.144 N., R.51 W., Traill County, on downstream side of county highway bridge, 5 miles southwest of Kelso, and 14 miles upstream from North Branch.	193	‡1955-63 1964-71	3- -71	a7.28	140
05065700	Middle Branch Goose River near Finley, N. Dak.	Lat 47°33'25", long 97°45'00", in SE¼SE¼ sec.11, T.147 N., R.56 W., Steele County, at bridge on county highway, 4.5 miles northeast of Finley.	49.0	1965-71	7-26-66 4-20-67 6- 8-68 4-10-69 6-16-70 6-22-71	7.32 7.09 6.05 7.06 7.62 6.59	c862 c560 c124 c614 c1,250 256
05065800	Middle Branch Goose River tributary near Finley, N. Dak.	Lat 47°28'05", long 97°46'20", NW¼NW¼ sec.14, T.146 N., R.56 W., Steele County, on downstream left wingwall of bridge on county highway, 4.5 miles southeast of Finley	26.3	1965-71	7-26-66 4-20-67 6- 7-68 5-14-69 4-24-70 3-30-71	4.75 4.61 4.70 5.48 c4.75 4.80	c342 c340 c330 c587 c315 150
05082600	English Coulee tributary near Grand Forks, N. Dak.	Lat 47°55'05", long 97°10'40", in SE¼SE¼ sec.4, T.151 N., R.51 W., Grand Forks County, at bridge on county highway at Powell, 7 miles west of Grand Forks.	4.68	1955-71	4- -71	a4.10	25
05082680	Saltwater Coulee tributary near Emerado, N. Dak.	Lat 47°53'00", long 97°21'55", on west line sec.19, T.151 N., R.52 W., Grand Forks County, at bridge on county highway, 2.5 miles south of Emerado.	22.0	1955-71	4- -71	a5.40	150
05082700	Saltwater Coulee near Emerado, N. Dak.	Lat 47°55'55", long 97°15'40", in NW¼NW¼ sec.1, T.151 N., R.52 W., Grand Forks County, at bridge on county highway 0.1 mile south of U.S. Highway 2, and 5.5 miles east of Emerado.	110	1955-71	4- 8-71	a4.75	180

‡ Operated as a continuous-record station
a Backwater from ice or vegetation.
c Revised.

Annual maximum discharge at crest-stage partial-record stations--continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Discharge (cfs)
Red River of the North basin--continued							
05082900	Freshwater Coulee near Emerado, N. Dak.	Lat 47°56'00", long 97°14'00", in SW¼ sec.31, T.152 N., R.51 W., Grand Forks County, at bridge on U.S. Highway 2, 6.5 miles east of Emerado.	31.0	1955-71	4- -71	3.72	302
05089200	North Branch Park River at Gardar, N. Dak.	Lat 48°35'30", long 97°52'50", at west line sec.16, T.159 N., R.56 W., Pembina County, at bridge on county highway at northwest corner of Gardar.	34.7	1955-71	4-10-71	[a]5.3	900
05089700	Cart Creek at Crystal, N. Dak.	Lat 48°35'20", long 97°39'55", on east line sec.13, T.159 N., R.55 W., Pembina County, at bridge on county highway, 0.6 mile south of post office at Crystal.	74.0	1955-71	4- -71	9.24	1,310
05089800	Cart Creek tributary near Crystal, N. Dak.	Lat 48°34'35", long 97°41'15", on east line sec.23, T.159 N., R.55 W., Pembina County, at culvert on county highway, 1.6 miles southwest of Crystal.	3.77	1955-71	4- 7-71	[a]5.84	80
05113450	Long Creek tributary No. 2 near Crosby, N. Dak.	Lat 48°57'29", long 103°18'57", on east line sec.7, T.163 N., R.97 W., Divide County, at culverts on county highway, 3.4 miles north of junction of State Highway 5 and 42 at Crosby.	6.69	1960-71	7- -71	4.61	30
05113520	Long Creek tributary near Crosby, N. Dak.	Lat 48°50'11", long 103°19'19", on north line sec.30, T.162 N., R.97 W., Divide County, 0.5 mile west of State Highway 42, and 5 miles south of Crosby.	.35	1960-71	3- -71	--	+
05116100	Souris River tributary near Burlington, N. Dak.	Lat 48°18'04", long 101°25'13", in SW¼ Sec.25, T.156 N., R.83 W., Ward County, at culvert on county highway, 1.8 miles north of Burlington.	.13	1959-71	7- 6-71	7.08	26
05116200	Des Lacs River tributary near Donnybrook, N. Dak.	Lat 48°29'35", long 101°51'20", in NE¼SW¼ sec.24, T.158 N., R.87 W., Ward County, at culvert on Minneapolis, St. Paul, Sault Ste. Marie Railroad, 1.8 miles southeast of Donnybrook.	3.82	1956-71	7- -71	3.69	33
05116550	Fuller Coulee at Foxholm, N. Dak.	Lat 48°21'45", long 101°34'00", in NE¼SW¼ sec.2, T.156 N., R.85 W., Ward County, at culvert on U.S. Highway 52, 0.4 mile southeast of Foxholm.	12.8	1955-71	7- 6-71	3.41	240
05117200	Souris River tributary No. 2 near Burlington, N. Dak.	Lat 48°15'17", long 101°22'48", in NW¼NW¼ sec.17, T.155 N., R.83 W., Ward County, at culvert on county highway, 2.6 miles southeast of Burlington.	2.04	1960-71	7- 6-71	--	300
05122500	Willow Creek at Dunseith, N. Dak.	Lat 48°49'12", long 100°03'45", in NE¼NW¼ sec.35, T.162 N., R.73 W., Rolette County, at bridge on county highway, 0.4 mile northwest of railway station in Dunseith.	142	‡1953-70 1971	4- -71	12.04	53
05123300	Oak Creek tributary near Bottineau, N. Dak.	Lat 48°49'14", long 100°24'38", 0.4 mile west of sec. corner 28, 29, 32, 33, T.162 N., R.75 W., Bottineau County, on State Highway 5, 1.5 miles east of Bottineau.	3.1	1955, 1959-71	7- 7-71	10.67	180
05123350	Oak Creek tributary No. 5 near Bottineau, N. D.	Lat 48°49'14", long 100°20'42", on south line sec.26, T.162 N., R.75 W., Bottineau County, 1 mile north of State Highway 5, and 4.5 miles east of Bottineau.	.73	1959-71	7- 7-71	3.71	55
05123520	Egg Creek near Glenburn, N. Dak.	Lat 48°29'15", long 101°24'15", in SW¼ SW¼ sec.21, T.158 N., R.83 W., Renville County, at culvert on county highway, 8.5 miles west of Glenburn.	20.9	1955-71	3- -71	[a]3.27	35

\+ Not determined.

‡ Operated as a continuous-record station.

a Backwater from ice or vegetation.

Annual maximum discharge at crest-stage partial-record stations--continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Discharge (cfs)
Red River of the North basin--continued							
05123540	Egg Creek near Ruthville, N. Dak.	Lat 48°26'25", long 101°17'55", in SW¼ NW¼ sec.8, T.157 N., R.82 W., Ward County, at bridge on U.S. Highway 83, 4.7 miles north of Ruthville.	108.4	1955-71	9- -71	5.64	1,400
05123560	Egg Creek tributary near Deering, N. Dak.	Lat 48°22'15", long 101°09'10°, in SE¼ sec.32, T.157 N., R.81 W., Ward County, at culvert on county highway, 5 miles southwest of Deering.	4.25	1955-71	7- -71	3.15	8.2
05123580	Egg Creek near Deering, N. Dak.	Lat 48°20'35", long 101°07'20", in SE¼ SE¼ sec.7, T.156 N., R.81 W., Ward County, at culvert on county highway 5 miles southwest of Deering.	132.0	1955-71	9- -71	4.17	80
Painted Woods Creek basin (upper)							
06329700	Painted Woods Creek tributary near Williston, N. Dak.	Lat 48°12'20", long 103°53'00", in SE¼ NE¼ sec.35, T.155 N., R.103 W., Williams County, at culvert on county highway 13 miles west of Williston.	.35	1955-71	7- 1-71	3.65	31
06329800	Painted Woods Creek near Williston, N. Dak.	Lat 48°11'55", long 103°52'05", in NW¼ NE¼ sec.1, T.154 N., R.103 W., at bridge on county highway 12 miles west of Williston.	17.4	1955-71	6- -71	6.59	160
06329900	Painted Woods Creek tributary No. 2 near Williston, N. D.	Lat 48°13'55", long 103°49'10", in SW¼ SW¼ sec.21, T.155 N., R.102 W., Williams County, at culvert on county highway, 10.5 miles northwest of Williston.	8.30	1955-71	7- 71	[a]3.90	32
Sand Creek basin							
06330100	Sand Creek at Williston, N. Dak.	Lat 48°08'50", long 103°39'10", in NW¼ SE¼ sec.22, T.154 N., R.101 W., Williams County, at bridge on U.S. Highways 2 and 85, 1.5 miles west of post office at Williston.	38.2	1955-71	7- 71	4.67	234
White Earth River basin							
06331900	White Earth River tributary near Tioga, N. Dak.	Lat 48°21'20", long 102°54'20", on north line sec.9, T.156 N., R.95 W., Williams County, at culvert on county highway, 1 mile north of U.S. Highway 2 and 2 miles southeast of Tioga.	9.55	1960-71	3- -71	3.54	57
06332150	White Earth River tributary near White Earth, N. Dak.	Lat 48°19'55", long 102°45'10", in south ½ sec.15, T.156 N., R.94 W., Mountrail County, at culvert on U.S. Highway 2, 3 miles south of White Earth.	--	1960-71	3- -71	[a]6.26	20
Little Missouri River basin							
06335700	Deep Creek near Bowman, N. Dak.	Lat 46°13'55", long 103°22'05", in NW¼ NW¼ sec.30, T.132 N., R.101 W., Bowman County, at culvert on U.S. Highway 85, 3.8 miles north of Bowman.	.20	1955-71	6- -71	5.91	31
06336100	Sheep Creek tributary near Medora, N. Dak.	Lat 46°54'00", long 103°26'53", in SE¼ NW¼SE¼ sec.29, T.140 N., R.101 W., Billings, County, at culvert on Interstate Highway 94, 4.0 miles east of Medora.	.29	1955-71	5- -70 6- 9-71	8.46 8.90	[b]17 24
06336200	Sheep Creek tributary No. 2 near Medora, N. Dak.	Lat 46°55'32", long 103°28'23", near center of sec.19, T.140 N., R.101 W., Billings County, at culvert on Theodore Roosevelt National Park highway, 3 miles east of Medora.	.42	1955-71	6- 9-71	7.87	210

a Backwater from ice or vegetation.
b Not previously published.

Annual maximum discharge at crest-stage partial-record stations--continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Discharge (cfs)
		Little Missouri River basin--continued					
06336300	Little Missouri River tributary near Medora, N. Dak.	Lat 46°57'05", long 103°30'20", in SE¼ sec.11, T.140 N., R.102 W., Billings County, at culvert on Theodore Roosevelt National Park highway, 3 miles north of Medora.	0.32	1955-71	6- 9-71	4.04	12
06336400	Jules Creek near Medora, N. Dak.	Lat 46°59'39", long 103°29'13", in NW¼ sec.33, T.141 N., R.101 W., Billings County, at bridge on Theodore Roosevelt National Park highway, 6 miles north of Medora.	3.80	1955-71	6- 9-71	9.69	629
06336980	Little Missouri River tributary near Watford City, N. Dak.	Lat 47°36'07", long 103°16'41", in NW¼ NE¼ sec.34, T.148 N., R.99 W., McKenzie County, at bridge on Theodore Roosevelt Park highway, 1.8 miles west of U.S. Highway 85 and 14 miles south of Watford City.	2.02	1960-71	7-10-71	6.65	470
06337100	Spring Creek near Watford City, N. Dak.	Lat 47°41'18", long 103°15'53", in NE¼ NE¼ sec.31, T.149 N., R.98 W., McKenzie County, at bridge on county highway, 1 mile east of U.S. Highway 85 and 8 miles south of Watford City.	22.7	1960-71	6-14-70 6- -71	9.56 4.88	[b]740 85
		Douglas Creek basin					
06337600	East Branch Douglas Creek tributary near Garrison, N. Dak.	Lat 47°38'37", long 101°31'09", in SW¼ NE¼NW¼ sec.16, T.148 N., R.85 W., McLean County, at culvert on State Highway 37, 5 miles west of Garrison.	1.39	1957, 1959-71	4- -71	5.98	31
		Snake Creek basin					
06337900	Snake Creek tributary near Garrison, N. Dak.	Lat 47°37'55", long 101°21'00", on south line sec.14, T.148 N., R.84 W., McLean County, at culvert on county highway, 1 mile south of State Highway 37 and 3 miles southeast of Garrison.	1.22	1959-71	4- -71	2.62	9.5
		Knife River basin					
06340300	Otter Creek near Hannover, N. Dak.	Lat 47°06'40", long 101°35'55", in NE¼ NE¼ sec.20, T.142 N., R.86 W., Oliver County, on downstream left wingwall of county highway bridge, 8 miles west of Hannover.	42.9	1965-71	6-10-71	7.40	650
		Square Butte Creek basin					
06342050	Square Butte Creek at Center, N. Dak.	Lat 47°06'40", long 101°17'55", at sec. corner 14, 15, 22, 23, T.142 N., R.84 W., Oliver County, at bridge on State Highway 25, in Center.	56.8	1956-71	3-30-71	1.38	430
06342150	Square Butte Creek tributary near Center, N. Dak.	Lat 47°06'20", long 101°15'30", on south line sec.13, T.142 N., R.84 W., Oliver County, at culvert on State Highway 25, 1.7 miles east of Center.	.19	1955-71	4- 1-71	4.20	15
06342250	Square Butte Creek tributary No. 3 near Center, N. Dak.	Lat 47°06'20", long 101°10'35", in SE¼ sec.15, T.142 N., R.83 W., Oliver County, at culvert on State Highway 25, 6 miles east of Center.	1.68	1955-71	4- -71	2.32	12
		Burnt Creek basin					
06342300	Burnt Creek tributary near Baldwin, N. Dak.	Lat 47°01'25", long 100°47'30", 0.2 mile south of sec. corner 14, 15, 22, 23, T.141 N., R.80 W., Burleigh County, at culvert on U.S. Highway 83, 2 miles west of Baldwin.	2.98	1956-71	6- 4-71	8.48	520

b Backwater from ice or vegetation.

Annual maximum discharge at crest-stage partial-record stations--continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Discharge (cfs)
		Burnt Creek basin--continued					
06342350	Burnt Creek tributary No. 2 near Baldwin, N. Dak.	Lat 46°59'05", long 100°47'25", in SW¼SW¼ sec.35, T.141 N., R.80 W., Burleigh County, at culvert on U.S. Highway 83, 3.5 miles southwest of Baldwin.	2.12	1956-71	6- -71	8.27	260
		Heart River basin					
06343000	Heart River near South Heart, N. Dak.	Lat 46°51'50", long 102°57'15", in SW¼ sec.8, T.139 N., R.97 W., Stark County, 2 miles east of South Heart.	315	‡1947-70 1971	3-30-71	13.50	1,580
06343200	Heart River tributary near South Heart, N. Dak.	Lat 46°52'35", long 102°55'10" in SE¼ sec.4, T.139 N., R.97 W., Stark County, at culvert on U.S. Highway 10, 3.5 miles northwest of South Heart.	.13	1955-71	71	9.83	15
06344200	Heart River tributary near Dickinson, N. Dak.	Lat 46°50'21", long 102°47'22", in NW¼SW¼ sec.22, T.139 N., R.96 W., Stark County, at culverts on State Highway 22, 3 miles south of Dickinson.	1.72	1955-71	3- -71	4.09	20
06345100	Antelope Creek near Dickinson, N.Dak.	Lat 46°43'15", long 102°47'25", in NW¼SW¼ sec.34, T.138 N., R.96 W., Stark County at bridge on State Highway 22, 11 miles south of Dickinson.	69.2	1955-71	3- -71	[a]7.95	150
06345200	Antelope Creek tributary near New England, N. Dak.	Lat 46°40'05", long 102°47'25", in SW¼NW¼ sec.22, T.137 N., R.96 W., Stark County at culvert on State Highway 22, 9.5 miles northwest of New England.	13.0	1955-71	6- -71	4.65	312
06345300	Antelope Creek tributary (site No. 2) near New England, N. Dak.	Lat 46°41'20", long 102°47'25", in SW¼SW¼ sec.10, T.137 N., R.96 W., Stark County at culvert on State Highway 22, 11 miles northwest of New England.	22.4	1955-71	3-13-71	5.5	500
06345700	Government Creek near Richardton, N. Dak.	Lat 46°48'15", long 102°18'35", in NE¼NE¼ sec.5, T.138 N., R.92 W., Stark County, at bridge on county highway, 5.4 miles south of Richardton.	33.4	1950, 1955-71	3-13-71	[a]7.45	230
06347200	Hailstone Creek near Blue Grass, N. Dak.	Lat 46°55'20", long 101°38'15", in SW¼SW¼ sec.23, T.140 N., R.87 W., Morton County, on right wingwall of county highway bridge 3 miles southwest of Blue Grass.	38.7	1965-71	6- 4-71	7.29	532
		Apple Creek basin					
06349100	Dead Buffalo Lake tributary near Steele, N. Dak.	Lat 46°53'03", long 99°49'34", on east line sec.1, T.139 N., R.73 W., Kidder County, at culverts on county highway 1.3 miles north of U.S. Highway 10 and 4.5 miles northeast of Steele.	5.92	1960-71	3-31-71	3.77	51
06349200	West Branch Long Lake Creek near Hazelton, N. Dak.	Lat 46°29'10", long 100°09'20", on south line sec.19, T.135 N., R.75 W., Emmons County, at culverts on State Highway 34, 5.9 miles east of Hazelton.	16.5	1955-71	3-13-71	[a]6.93	200
		Cannonball River basin					
06351650	Middle Fork Cedar Creek near Buffalo Springs, N. Dak.	Lat 46°15'55", long 103°13'30", in SW¼ SW¼ sec.8, T.132 N., R.100 W., Bowman County, on downstream right corner of bridge on county highway, 6.3 miles north of Buffalo Springs.	32.9	1965-71	7-11-71	10.91	2,050
06353600	Louise Creek tributary near Brisbane, N. Dak.	Lat 46°22'25", long 101°29'20", in SW¼ SW¼SW¼ sec.34, T.134 N., R.86 W., Grant County, at culvert on county highway 2 miles north of Brisbane.	.29	1955-71	7- -71	7.31	31

‡ Operated as a continuous-record station.
a Backwater from ice or vegetation.

Annual maximum discharge at crest-stage partial-record stations--continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Discharge (cfs)
		Cannonball River basin--continued					
06353700	Louise Creek tributary near Lark, N. Dak.	Lat 46°26'30", long 101°25'00", at center of NW¼ sec.7, T.134 N., R.85 W., Grant County at culvert on State Highway 21, 1.3 miles southwest of Lark.	.76	1956-71	6- -71	4.14	59
06353800	Louise Creek tributary No. 2 near Lark, N. Dak.	Lat 46°26'35", long 101°19'55", on south line sec.2, T.134 N., R.85 W., Grant County, at culvert on State Highway 21, 3.4 miles east of Lark.	7.70	1956-71	6- -71	1.61	25
06353900	Louise Creek above Flasher, N. Dak.	Lat 46°27'15", long 101°14'55", in SW¼ NE¼ sec.4, T.134 N., R.84 W., Grant County, at bridge on Burlington Northern Railway, 0.7 mile west of Flasher.	110	1955-71	6- -71	8.8	600
		Beaver Creek basin					
06354700	Spring Creek near Linton, N. Dak.	Lat 46°18'40", long 100°13'50", in NE¼ NE¼ sec.28, T.133 N., R.76 W., Emmons County, at bridge on county highway 3 miles north of Linton.	22.9	1955-71	6- -71	6.99	1,120
06354750	Sand Creek tributary near Hazelton, N. Dak.	Lat 46°25'50", long 100°17'50", in SE¼ SE¼ sec.12, T.134 N., R.77 W., Emmons County, at culvert on county highway 1.1 miles west of U. S. Highway 83 and 3.5 miles south of Hazelton.	2.96	1960-71	6- -71	4.83	27
06354800	Sand Creek near Temvik, N. Dak.	Lat 46°22'20", long 100°20'40", on north line sec.3, T.133 N., R.77 W., Emmons County, at bridge on county highway, 4.2 miles west of Temvik.	23.3	1955-71	3-27-71	2.94	275
		Grand River basin					
06354885	North Fork Grand River tributary near Bowman, N. Dak.	Lat 45°59'20", long 103°28'55", on north line sec.19, T.129 N., R.102 W., Bowman County, on downstream wingwall of county highway bridge 14 miles south of Bowman.	36.7	1965-71	6- 5-71	10.86	621
06354900	Spring Creek near Bowman, N. Dak.	Lat 46°07'30", long 103°24'35", in NW¼ SW¼ sec.35, T.131 N., R.102 W., Bowman County, at bridge on U.S. Highway 85, 4 miles south of Bowman.	51.2	1955-71	3-31-71	5.96	600
06354950	Spring Creek tributary near Bowman, N. Dak.	Lat 46°08'55", long 103°24'35", in SW¼ SW¼ sec.23, T.131 N., R.102 W., Bowman County, at bridge on U.S. Highway 85, 2.3 miles south of Bowman.	11.4	1955-71	3-16-71	5.37	155
06354985	Alkali Creek near Bowman, N. Dak.	Lat 46°00'00", long 103°22'05", on west line sec.18, T.129 N., R.101 W., Bowman County, on right bank on downstream side of county highway bridge 12 miles south of Bowman.	58.1	1965-71	6- 5-71	7.56	553
06355200	Buffalo Creek tributary near Buffalo Springs,	Lat 46°10'30", long 103°16'35", in NE¼ NW¼ sec.14, T.131 N., R.101 W., Bowman County, at culverts on U.S. Highway 12, 2 miles west of Buffalo Springs.	3.39	1955-71	6- -71	3.93	164
		James River basin					
06467650	James River tributary near Manfred, N. Dak.	Lat 47°38'50", long 99°54'20", in SW¼ sec.7, T.148 N., R.72 W., Wells County, at bridge on county highway, 8 miles southwest of Manfred.	90.2	1955-71	- -71	4.10	80
06467800	James River tributary No. 3 near Manfred, N. Dak.	Lat 48°38'40", long 99°45'30", in NE¼NE¼ sec.18, T.148 N., R.71 W., Wells County at culvert on U.S. Highway 52, 3.5 miles south of Manfred.	23.5	1955-71	4- 7-71	--	65

Annual maximum discharge at crest-stage partial-record stations--continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Discharge (cfs)
		James River basin--continued					
06468000	James River at New Rockford, N. Dak.	Lat 47°41'05", long 99°07'30", on east line sec.32, T.149 N., R.66 W., Eddy County, at bridge on U.S. Highway 281 at New Rockford, N. Dak.	714	‡1951-69 1970-71	6-10-70 71	9.00 --	65 +
06469600	Minneapolis Flats Creek tributary near Eldridge, N. Dak.	Lat 46°53'25", long 98°55'30", on west line sec.5, T.139 N., R.65 W., Stutsman County, at culverts on county highway, 3.5 miles west of Eldridge.	9.91	1955-71	5- -71	2.03	5
06470200	Beaver Creek tributary near Eldridge, N. Dak.	Lat 46°52'15", long 98°55'30", on east line sec.7, T.139 N., R.65 W., Stutsman County, at culvert on county highway 4 miles southwest of Eldridge.	.19	1955-71	6- -71	3.59	21
06470300	Beaver Creek near Sydney, N. Dak.	Lat 46°45'00", long 98°47'50", in SW¼SW¼ sec.20, T.138 N., R.64 W., Stutsman County, at bridge on county highway 2 miles northwest of Sydney.	224	1955-71	-71	2.51	80
06470400	Buffalo Creek tributary near Sydney, N. Dak.	Lat 46°42'40", long 98°50'20", in SW¼NW¼ sec.1, T.137 N., R.65 W., Stutsman County, at bridge on county highway 3.5 miles southwest of Sydney.	23.7	1955-71	3-15-71	--	1.0

\+ Not determined.
‡ Operated as a continuous-record station.

Measurements at miscellaneous sites

Measurements of streamflow at points other than gaging stations or partial-record stations are given in the following table. Those that are measurements of base flow are designated by an asterisk (*); measurements of peak flow by a dagger (+).

Discharge measurements made at miscellaneous sites during water year 1971

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
Red River of the North basin						
Antelope Creek	Wild Rice River	Lat 46°23'01", long 96°58'11", in SE¼SE¼ sec.28, T.134 N., R.50 W., on county highway 8 miles west of Galchutt.	--	--	3-15-71 3-17-71 7- 4-71	21.8 5.5 [a]5
Pitcairn Creek	Wild Rice River	Lat 46°27'24", long 96°47'03", in SW¼SE¼ sec.36, T.135 N., R.49 W., at bridge on county highway 2 miles northwest of Abercrombie.	--	--	3-15-71 3-17-71 7- 4-71	20.3 16.3 [a]10
Maple River	Sheyenne River	Lat 46°49'05", long 97°07'25", on south line sec.33, T.139 N., R.51 W., at bridge on county highway 1 mile northeast of Durbin.	--	--	3-31-71 4- 6-71	180 153
South Branch Maple River	Maple River	Lat 46°37'05", long 97°35'35", in SW¼SW¼ sec.3, T.136 N., R.55 W., at bridge in Enderlin.	--	--	3-17-71 3-29-71	5.92 .05
Lower Branch Rush River	Sheyenne River	Lat 46°56'31", long 96°59'17", in NE¼SE¼ sec.16, T.140 N., R.50 W., Cass County at bridge on county highway 2 miles southeast of Prosper.	--	1965-67 1970	3-31-71 4- 7-71	34.7 [a]9.0
McCleod Drain	Park River	Lat 48°23'53", long 97°23'00", in SW¼SW¼ SW¼ sec.20, T.157 N., R.52 W., at bridge on county highway, 2 miles southeast of Grafton.	--	--	4- 7-71	135
Pembina River	Red River of the North	Lat 48°54'10", long 98°13'40", in SW¼NW¼ sec.29, T.163 N., R.57 W., at bridge on county highway, 3 miles east of Vang.	--	1962, 1966	11- 4-70 4- 7-71 4-13-71	79.5 2,710 4,840
Des Lacs River	Souris River	Lat 48°40'35", long 102°05'36", in NE¼ NE¼NW¼ sec.19, T.160 N., R.88 W., Ward County, at bridge on county highway at Kenmare.	--	1968-70	3-31-71 4- 8-71	43.4 16.7
Gassman Coulee	Souris River	Lat 48°13'54", long 101°22'20", in NE¼SW¼ sec.20, T.155 N., R.83 W., Ward County, at culvert on U.S. Highways 2 and 52, 2 miles west of Minot.	61	1969-70	3-17-71 3-28-71 4- 1-71 4- 6-71 4-15-71	[a]4.0 28.8 4.9 24.5 1.36
Souris River	Red River of the North	Lat 48°14'23", long 101°17'30", in NE¼ NW¼NW¼ sec.24, T.155 N., R.83 W., Ward County, at bridge on Main Street in Minot.	--	1968-70	4-15-71 4-22-71 5-18-71	47.3 1,040 223
Larson Coulee	Souris River	Lat 48°11'47", long 101°13'51", in NE¼ NE¼NE¼ sec.5, T.154 N., R.82 W., Ward County, at bridge on U.S. Highway 52, 4 miles southeast of Minot.	--	--	3-17-71 3-31-71 4- 7-71 4-15-71	[a]2.5 61.1 11.4 1.43
Souris River	Red River of the North	Lat 48°09'11", long 101°09'00", on north line sec.24, T.154 N., R.82 W., at bridge on county highway at Logan.	--	--	4-15-71 4-22-71 4-29-71 5-18-71 9- 8-71	[a]50 1,110 1,090 327 118

a Estimated.

Discharge measurements made at miscellaneous sites during water year 1971--continued

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
Red River of the North basin--continued						
Bonnes Coulee	Souris River	Lat 48°03'30", long 100°57'00", in NE¼SW¼ sec.21, T.153 N., R.80 W., at culvert on U.S. Highway 52, ½ mile west of Velva.	53	1962, 1965	4- 2-71 4- 6-71 4-15-71	[a]15.0 29.1 7.61
Souris River	Red River of the North	Lat 48°03'50", long 100°55'42", in NE¼NE¼ sec.22, T.153 N., R.80 W., Ward County, at bridge on county highway in Velva.	--	1966-70	4- 2-71 4- 6-71 4-12-71 4-29-71 5-18-71	99.0 226 184 1,090 321
Souris River	Red River of the North	Lat 48°21'05", long 48°25'08", in SW¼NE¼ sec.10, T.156 N., R.76 W., at bridge on State Highway 14, 0.5 mile northwest of Towner.	--		4-16-71 4-30-71 5-18-71 9-14-71	538 1,110 702 152
Ox Creek	Willow Creek	Lat 48°35'58", long 100°08'44", on west line sec.13, T.159 N., R.74 W., Bottineau County, at bridge on county highway, 7 miles east of Willow City.	--	1969-70	4- 8-71 4-13-71 4-14-71 4-21-71	[a]3.0 700 628 197
Willow Creek	Souris River	Lat 48°36'33", long 100°17'44", in NW¼SW¼ sec.12, T.159 N., R.75 W., Bottineau County, at bridge on State Highway 60 at Willow City.	--	1969-70	4-14-71 4-21-71 5-12-71	686 450 105
Oak Creek	Willow Creek	Lat 48°45'53", long 100°28'02", in SW¼SW¼ sec.13, T.161 N., R.76 W., Bottineau County, at bridge on county highway, 4 miles east of Bottineau.	--	1969-70	4- 8-71 4-14-71	26.1 7.60
Square Butte Creek	Missouri River	Lat 47°05'12", long 101°14'05", on east line sec.30, T.142 N., R.83 W., Oliver County, at culvert on county highway, 3 miles southeast of Center.	--	1968-70	6-24-71	3.4
Square Butte Creek tributary No. 4	Square Butte Creek	Lat 47°03'56", long 101°14'05", on east line sec.6, T.141 N., R.83 W., Oliver County, at bridge on county highway, 4 miles southeast of Center.	--	1968-70	7-21-71 9-20-71	[a].01 [a].01

a Estimated.

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